

**THE PLANKTON**  
OF  
**THE SOUTH AFRICAN SEAS.**

BY  
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I.—COPEPODA.

INTRODUCTION.

Some time ago Dr. Gilchrist suggested that I should examine the samples of plankton collected in the South African Seas during the Government's survey of that region. I accepted the proposal with pleasure as this region has a certain bearing on some oceanographical questions in which I am particularly interested. The first set of samples had, with one exception, been obtained by means of a comparatively coarse tow-net fastened on the beam of the trawl. They contained almost exclusively animals, schizopoda, amphipoda, sagittæ, tomopteris and a large amount of copepoda. I intend to give in the following a report on the latter, and hope later on to be able to give an account of the halocyprida and the chætognatha.

The region of South Africa is of the greatest interest in its planktonological aspect, as it represents a battlefield of two mighty currents of different origin, the Agulhas Current and the Westwind Drift. The former carries the warm water of the Indian Equatorial Current towards the south, the latter the water of the Southern Pacific Ocean through the space between Fuegia and the Antarctic Continent.

The east coast of South Africa has a steep slope so that depths of 900 to 3000 metres (500 to 1800 fathoms) will be found at a short distance from the land. On the south side, from about Algoa Bay to the Cape of Good Hope, extends the triangular Agulhas Bank, its southern point being about 2 degrees of latitude south of Cape Infanta. The depths in this region are comparatively small, as a rule 70 to 100 metres (40 to 60 fathoms).

The warm Agulhas Current flows along the east coast of South Africa and east of the Agulhas Bank with a variable velocity, strongest in the summer months, especially in February. As a rule the average velocity amounts to about 2 knots; in the winter, especially in July, the velocity diminishes considerably, and the cold water from the Westwind Drift repels and permeates the current.

South-east of the Agulhas Bank the waters of the Agulhas Current become deflected and mixed with the water of the Westwind Drift, which moves eastwards, in the winter months and April with a velocity of about 1-1.25 knots.

The mixed water of the Agulhas Current and the Westwind Drift continues towards the east with a velocity of 1.5-2 knots. During the passage it sends a branch along the west coast of Australia, and a very mighty one, when it meets the south end of America, or the north going Humboldt Current. This may explain the fact that I found in the samples collected east of Natal a very considerable number of the copepoda discovered by Giesbrecht in the depths west of South America.

The currents over the Agulhas Bank are as a rule weak and variable. Between Cape Town and Cape Agulhas a current sets in in an E.S.E. direction with a velocity of one mile per hour. Along the south coast from Cape Agulhas to about  $27^{\circ}$  E. an eastward running current has been observed. Thus the water south of the Cape Colony is derived, at least to a great extent, from the west, that is from the origin of the northwards running Benguela Current. The latter is to be considered as a branch of the Westwind Drift, more or less mixed with waters from the Brazil Current, the continuation of which it touches during the passage from the South of America.

It might be expected that the waters on the Agulhas Bank would possess a kind of plankton different from that of the waters East of South Africa. This will be proved by the following account. It will be found that of the copepoda found south and west of the Cape Colony a considerable number also occur in the northern hemisphere, north of a line traced from the Newfoundland Banks to the Azores and the Cape Verde Islands, some so far to the north that they pass through the Farøe Channel and reach the coasts of Scandinavia. There is thus a strong probability that the hypothesis I have enunciated, that the waters of the temperate Atlantic in the northern hemisphere originate not from the Gulf Stream, but from the Benguela Current, which is supposed to pass as an under-current below the waters of the tropical Atlantic.

In order that the reader may judge of this question I have compiled from the literature an account of the geographical distribution of all copepoda found in the South African Seas.

I will in the following treat first of the copepoda of the west coast, then of the south coast and, finally, of the east coast.

### Copepoda of the West Coast.

The samples examined were the following.\*

1. (No. 23) Table Mountain, N.  $79^{\circ}$  E., 40 miles, 450 metres (250 fathoms) 18th April, 1900, coarse net. See Marine Investigations of South Africa, I., p. 193.
2. (No. 30) Lion's Head, N.  $54^{\circ}$  E., 38 miles, 350 metres (195-204 fathoms), 16th April, 1900, moderately fine net.
3. (No. 17) Lion's Head, N.  $76^{\circ}$  E., 28 miles, 250 metres (140 fathoms), 16th April, 1900, half-coarse net.
4. (No. 8) Lion's Head, N.  $63^{\circ}$  E., 34 miles, 277 metres (15 fathoms), 19th April, 1900, moderately coarse net.

The result of the examination of these four samples was 43 species, a considerable number, considering that all samples were collected in one and the same month, and chiefly along the bottom.

The following table indicates the species found in every sample ; the signs here, as in the following, indicate the apparent frequency, viz. : *cc* very common, *c* common, + not rare, *r* rare, *rr* very rare.

It is evident that the list cannot be a complete one of the forms occurring in the origin of the Benguela Current, but, nevertheless, it may be of interest to examine the distribution of the species in the Atlantic and Mediterranean.

I consider as tropical such forms as occur in the Equatorial and Florida Currents, as temperate such as occur in the space north of a line from the Newfoundland Banks to the Azores and Cape Verde. I count in this category also such forms as have been found in the Gulf of Guinea, but not in the Florida Current.

Of the species noted west of South Africa

32	per cent.	have been found in the tropical Atlantic,
42	"	temperate Atlantic,
71	"	Mediterranean,
35	"	reach the Farøe Channel,
21	"	have been found north of the Farøe Channel.

### Copepoda of the Agulhas Bank.

The samples examined were as follows :

1. (No. 26) False Bay, off Roman Rock, 37 metres (19.5-22 fath.) 13.x.1898, fine net.
2. (No. 18) Cape Infanta, N.N.W., 4 miles, 62 metres (35 fath.) 6.vii.1900, moderately fine net.
- (No. 4) Cape Infanta, N.N.W., 4 miles, 67 metres, (38 fath.) 6.vii.1900, coarse net.
- (No. 2) Cape Infanta, N. $\frac{3}{4}$ W., 6 miles, 70 metres (40 fath.) 6.vii.1900, moderately fine net.
- (No. 5) Cape Infanta, N. $\frac{1}{2}$ W., 13 $\frac{1}{2}$  miles, 74 metres (42 fath.) 13.vii.1900, coarse net.
- (No. 20) Cape Infanta, N. $\frac{1}{2}$ W., 13 $\frac{1}{2}$  miles, 74 metres (42 fath.) 13.vii.1900, moderately fine net.

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\* The numbers in brackets are the Reference numbers.





## Copepoda of the Agulhas Current.

The samples examined were the following :—

1. (No. 11) Cape Natal W. by N.  $6\frac{1}{2}$  miles, 97 m. (57 fath.)  
14.xii.1900, moderately fine net.
2. (No. 13) Port Shepstone N.W. by W. $\frac{3}{4}$ W. 12 miles,  
530 m. (300 fath.) 5.xi.1901, moderately fine net.
3. (No. 71) Cape Natal N. by E. appr. 27 miles, 780 m.  
(440 fath.) 4.iv.1901, coarse net.
4. (No. 22) Port Shepstone N.W. by W. $\frac{3}{4}$ N. 12 miles,  
900 m. (500 fath.) 5.xi.1901, moderately fine net.
5. Morewood Cove (Natal) N.W. by N. $\frac{3}{4}$ N. 3 miles,  
surface 17.xii.1900 (contained abundantly *Noctiluca  
miliaris*).
6. (No. 24) Port St. John between Anchorage and Bluff  
Point 29 m. 8.iv.1901, moderately fine net.

TABLE III. Copepoda, collected east of South Africa.

No. ...	...	...	...	1	2	3	4	5	6
Depth in metre	...	...	...	97	530	780	900	0	29
Date	...	...	...	17 xii	5 xi	4 iv	5 xi	17 xii	8 iv
				1900	1900	1901	1901	1900	1901
<i>Acartia danae</i>	...	...	...	...	rr	...	rr	...	...
<i>Acrocalanus gibber</i>	...	...	...	...	rr	...	...	...	r
— <i>gracilis</i>	...	...	...	r	rr	...	...	c	r
<i>Aegisthus aculeatus</i>	...	...	...	...	..	...	rr	...	...
— <i>mucronatus</i>	...	...	...	...	...	...	rr	...	...
<i>Aethidius giesbrechti</i>	...	...	...	...	rr	...	rr	...	...
<i>Augaptilus palumboi</i>	...	...	...	...	rr	...	...	...	...
<i>Calanus brevicornis</i>	...	...	...	+	...	...	...	...	r
— <i>darwinii</i>	...	...	...	...	r	r	r	r	...
— <i>finmarchicus</i>	...	...	...	...	...	...	r	...	...
— <i>minor</i>	...	...	...	...	...	...	...	...	r
— <i>tenuicornis</i>	...	...	...	...	r	rr	...	...	...
— <i>vulgaris</i>	...	...	...	r	r	+	r	r	r
<i>Calocalanus pavo</i>	...	...	...	...	rr	...	rr	...	...
<i>Candacia catula</i>	...	...	...	...	rr	rr	rr	...	...
— <i>curta</i>	...	...	...	rr	...	...	r	...	...
— <i>inermis</i> C: e, n.sp.	...	...	...	...	rr	...	...	...	...
— <i>pachydactyla</i>	...	...	...	...	rr	rr	r	...	...
— <i>tenuimana</i>	...	...	...	...	...	...	rr	...	...
— <i>truncata</i>	...	...	...	...	...	...	rr	...	...
— <i>varicans</i>	...	...	...	...	...	rr	rr	...	...
<i>Centropages chierchiæ</i>	...	...	...	r	rr	...	r	...	r
— <i>furcatus</i>	...	...	...	...	...	...	r	...	...
— <i>typicus</i>	...	...	...	r	...	...	...	r	r
<i>Chiridius poppei</i>	...	...	...	...	rr	...	rr	...	...
<i>Chirundina streetsii</i>	...	...	...	...	...	rr	rr	...	...
<i>Clausocalanus arcuicornis</i>	...	...	...	...	r	...	r	...	...
— <i>furcatus</i>	...	...	...	...	r	...	...	+	...

	1	2	3	4	5	6
<i>Conæa rapax</i> ...	...	...	...	rr	...	...
<i>Corycæus danæ</i> ...	...	...	...	r	...	...
— <i>furcifer</i> ...	...	...	...	rr	...	...
— <i>robustus</i> ...	...	...	...	rr	r	...
— <i>speciosus</i> ...	...	...	r	r	...	...
<i>Eucalanus attenuatus</i> ...	...	r	+	+	...	r
— <i>crassus</i> ...	r	...	r	r	...	...
— <i>elongatus</i> ...	...	+	+	+	...	...
— <i>monachus</i> ...	r	...	...	r	...	...
— <i>mucronatus</i> ...	r	...	...	r	...	...
— <i>pileatus</i> ...	...	rr	...	...	...	...
— <i>subcrassus</i> ...	...	...	r	r	...	...
— <i>subtenuis</i> ...	r	r	r	r	...	...
<i>Euchæta acuta</i> ...	...	r	...	rr	...	...
— <i>affinis</i> C: e, n.sp.	...	...	...	rr	...	...
— <i>longicornis</i> ...	...	rr	...	...	...	...
— <i>marina</i> ...	r	...	r	r	...	r
— <i>media</i> ...	...	...	...	rr	...	...
— <i>tonsa</i> ...	...	rr	...	...	...	...
<i>Euchirella messinensis</i> ...	...	rr	r	rr	...	...
— <i>venusta</i> ...	...	...	...	rr	...	...
<i>Gaëtanus armiger</i> ...	...	rr	...	rr	...	...
— <i>miles</i> ...	...	rr	...	r	...	...
<i>Heterorhabdus abyssalis</i> ...	...	rr	...	r	...	...
— <i>austrinus</i> ...	...	rr	rr	...	...	...
— <i>papilliger</i> ...	...	r	...	r	...	...
— <i>spinifrons</i> ...	...	r	r	r	...	...
— <i>tanneri</i> ...	...	...	...	rr	...	...
<i>Lucicutia aurita</i> C: e, n.sp.	...	...	...	rr	...	...
— <i>bradyana</i> C: e, n.sp.	...	...	...	rr	...	...
— <i>clausii</i> ...	...	rr	...	rr	...	...
— <i>flavicornis</i> ...	...	rr	...	rr	...	...
<i>Labidocera acuta</i> ...	r	...	...	...	+	...
<i>Metridia brevicauda</i> ...	...	...	...	rr	...	...
— <i>princeps</i> ...	...	...	rr	rr	...	...
— <i>venusta</i> ...	...	rr	...	...	...	...
<i>Oithona plumifera</i> ...	...	...	...	rr	...	...
— <i>rigida</i> ...	rr	...	...	...	...	...
<i>Oncæa conifera</i> ...	...	r	...	r	...	...
— <i>media</i> ...	...	...	...	r	...	...
— <i>mediterranea</i> ...	...	r	...	r	...	...
— <i>venusta</i> ...	r	r	...	r	...	r
<i>Pachysoma tuberosum</i> ...	...	...	...	rr	...	...
<i>Phaëna spinifera</i> ...	...	...	...	rr	...	...
<i>Phyllopus bidentatus</i> ...	...	...	...	rr	...	...
<i>Pleuromamma abdominalis</i> ...	...	c	+	+	...	...
— <i>gracilis</i> ...	r	+	+	+	...	...
— <i>robusta</i> ...	...	...	...	r	...	...
— <i>xiphias</i> ...	...	r	r	r	...	...
<i>Pontella securifer</i> ...	...	...	...	rr	...	...
<i>Pontellina plumifera</i> ...	...	rr	rr	rr	...	...
<i>Rhinocalanus cornutus</i> ...	r	+	+	r	...	...
— <i>nasutus</i> ...	r	rr	r	...	...	...
<i>Sapphirina gemma</i> ...	...	...	...	rr	...	...
— <i>nigromaculata</i> ...	...	...	...	rr	...	...
— <i>opalina</i> ...	...	r	...	rr	...	...
— <i>sinuicauda</i> ...	...	...	...	...	rr	...
<i>Scolecithrix danæ</i> ...	...	+	+	+	...	r
— <i>persecans</i> ...	...	...	...	rr	...	...
— <i>securifrons</i> ...	...	r	...	rr	...	...
<i>Temora discaudata</i> ...	...	rr	...	...	...	...
— <i>stylifera</i> ...	...	...	...	...	rr	...
<i>Undechæta major</i> ...	...	...	...	rr	...	...
— <i>minor</i> ...	...	...	rr	rr	...	...

The number of species found east of South Africa amounts thus to 92. The geographical distribution will be found as follows :—

In the western Pacific, east of South America, have been found	...	80 per cent.
In the Indian Ocean	...	64 " "
In the temperate Atlantic	...	55 " "
In the Mediterranean	...	50 " "
In the tropical Atlantic	...	19 " "
North of the Farøe Channel	...	8 " "

There is thus, as concerns the copepod-fauna, a very considerable resemblance between the region west of South America and the Agulhas Current.

#### LIST OF SPECIES OF COPEPODA FOUND ROUND SOUTH AFRICA AND THEIR GEOGRAPHICAL DISTRIBUTION.

In the following I have not indicated the literature, because the reader will find in most cases sufficient references in the works of Giesbrecht: "Copepoda, Gymnoplea" in "Das Thierreich," Berlin, 1898, and "Systematik und Faunistik der pelagischen Copepoden des Golfes von Neapel," Berlin, 1892.—In some few cases only references have been necessary.

Abbreviations for authorities are :—

B. Brady.	A. S. A. Scott.
C:e. Cleve.	A. S. & T. A. Scott and
Cls. Claus.	I. C. Thompson.
	G.O.S. Sars.
D. Dana.	T. S. T. Scott.
G. Giesbrecht.	T. I. C. Thompson.
L. Lubbock.	a.o. and others.
N. Norman.	

**Acartia danø**, Giesb.—Sparingly E., S. and W. of South Africa.

*G.D.*—Pacific 18°N.—3°S. 171°E.—80°W. (G.).—Atlantic: Benguela Current, 30°S. 11°E. (C:e). Cape Verde Region (G.), 34°—39°N. 12°—66°W. (C:e). West Mediterranean (C:e).

**Acrocalanus gibber**, Giesb.—Agulhas Current.

*G.D.*—Hongkong (G.). S.E. of New Guinea (A.S.). Malay Archip. (C:e). Ceylon (A.S. & T.). Arabian Sea, Red Sea (C:e, G., a.o.). From 11°N. 84°E. to 16°S. 42°E. (T.). Along the east coast of Africa from the Gulf of Suez to 30°S. (T.).

**Acrocalanus gracilis**, Giesb.—Agulhas Current.

*G.D.*—Pacific 20°N.—4°S. (G.). Indian Oc., Malay Archip. (C:e). Ceylon to Socotra (A.S. & T.), Arabian Sea and Red Sea (C:e), 2°S. 84°E. (C:e).



**Aegisthus aculeatus**, Giesb.—Agulhas Current.

*G.D.*—*Pacific* 3°S. 99°W. (G.). *Atlantic*, 52°N. 16°W., haul from 1410 m. (T.).

**Aegisthus mucronatus**, Giesb.—Agulhas Current.

*G.D.*—*Pacific* 3°S. 99°W. (G.) *Atlantic*, Gulf of Guinea (*A. longirostris* T.S. partim), 52°N. 12°—16°W., hauls from 2264 and 664 m. (T.).

**Aethidius armatus**, Boeck.—G. O. Sars : Crustacea of Norway, Calanoida, p. 25 P. XIII., XIV. *A. a.* Brady, partim, *vide* G.O. Sars.—Sparingly south of the Cape Colony.

*G.D.*—Shetland, Orkney (T.S.). Shagerak. (C : e). Off south and west Norway from Christiania to 71°N. (G.O.S.)—Other localities doubtful, because this species has been confounded with the following. The South African specimens agreed perfectly with the northern. They were only a little smaller or 1,6 millim. in length (1,8 millim. according to G.O.S.)

**Aethidius giesbrechti**, C:e—nomen nov. (*A. armatus* Giesb. F. Neap. p. 213).—Very rare east and west of South Africa.

*G.D.*—3°S-11°N. 99°-124°W. (G.) Gibraltar (G.)

**Augaptilus palumboi**, Giesb.—One specimen, Agulhas current.

*G.D.*—*Pacific* 3°S. 99°W., 1800 m. (G). *North Atlantic*, 52°N. 16°W., haul from 1905 m. (T.).

**Calanus brevicornis**, Lubbock.—Common south and west of the Cape Colony, sparingly east of Natal.

*G.D.*—41°S. 45°E., 35°S. 18°E. and 1°S. 1°W. (L.) 20°S. 38°W. (G.), 14°-18°N., 18°W. (C:e). Off Gibraltar (G.).

**Calanus darwini** (Lubböck).—Agulhas current.

*G.D.*—*Pacific* 0°-14°N. 91°—97°W., and the tropical part (G.). *Malay Archip.* (C:e). N.W. Indian Ocean, Arabian Sea and Red Sea (various authors). East of Africa 8°N. (T.). *Atlantic* 37°N. 46°W. (B.), 1°S. 1°W. (L.), 26°N. 34°W. (B.).

**Calanus finmarchicus** (Gunnerus).—Common south of the Cape Colony, rare east and west.

*G.D.*—Port Townsend (T.). Along the west coast of South America, from 8°N to “Jungfernkap” (G.), 37°S. 133°W. (B.), Hongkong (G.)—Arctic Sea and North Atlantic to 39°N. in the west and 29°N. in the east (C:e). Off Gibraltar, west Mediterranean (G., C:e). Adriatic (Grobber).

**Calanus minor**, Cls.—Very common south of the Cape Colony, rarer west thereof and extremely rare in the east.

*G.D.*—*Pacific*  $34^{\circ}$ - $0^{\circ}$ N.  $91^{\circ}$ - $132^{\circ}$  W. (G.). West of South America, from Caldera to the Equator (G.). North and west of Australia (B.). S.E. of New Guinea (A.S.), Malay Archip. (C:e). *Indian Ocean*,  $14^{\circ}$ - $13^{\circ}$ -N.  $60^{\circ}$ - $54^{\circ}$ E. (G.). Ceylon and the north west Indian Ocean, Arabian Sea, Red Sea (T., A.S., C:e). *Atlantic*: Benguela Current to Cape Verde (G., C:e). North Equatorial and Antilles currents, Florida current to  $48^{\circ}$ N.  $29^{\circ}$ W. (C:e). *Mediterranean* (G.)

**Calanus tenuicornis**, Dana.—Sparingly east and west of South Africa.

*G.D.*—*Pacific*:  $40^{\circ}$ N.  $137^{\circ}$ W. (D.), between  $40^{\circ}$ N. and  $3^{\circ}$ S. (G.). *Atlantic*,  $22^{\circ}$ - $34^{\circ}$ N.  $53^{\circ}$ - $28^{\circ}$ W. (C:e). Gibraltar (G.)—*Mediterranean* (G., C:e).  $52^{\circ}$ N.  $15^{\circ}$ W., haul from 1078 m. (T.).

**Calanus vulgaris** (Dana).—Agulhas Current.

*G.D.*—*Pacific*  $20^{\circ}$ N.- $8^{\circ}$ S. (G.). Sandwich Islands, Fiji Islands, N. and E. of Australia, New Guinea, Philippines (B.), Samoa, Banka Straits (D), Hong Kong (G.), Malay Archip. (C:e).—*N.W. Indian Ocean* (C:e, A.S. and T.), Red Sea (various authors), East Africa from Socotra to  $28^{\circ}$ S. (T.).—*Atlantic*, Gulf of Guinea (T.S., C:e), Brazil Current (C:e), North Equatorial, Antilles and Florida Currents to  $46^{\circ}$ N.  $38^{\circ}$ W., the Azores and Cape Verde Islands (C:e).—*Mediterranean* (various authors).

**Calocalanus pavo**, Dana—Sparingly round South Africa.

*G.D.*—*East Pacific*  $12^{\circ}$ N.- $3^{\circ}$ S. (G.) S.E. of New Guinea (A.S.), Malay Archip. (C:e). *N.W. Indian Ocean* and Arabian Sea (A.S. & T., C:e), Red Sea (A.S., C:e), East of Africa  $28^{\circ}$ S. (T.).—*Atlantic*, Gulf of Guinea (T.S., C:e), Equatorial Antilles and Florida Currents to  $56^{\circ}$ N.  $12^{\circ}$ - $26^{\circ}$ W., Azores and the Canaries (C:e).—*Mediterranean* (various authors).

**Candacia bipinnata**, Giesb.—Common south of the Cape Colony.

*G.D.*—*East Pacific*  $24^{\circ}$ N.- $3^{\circ}$ S. (G.), West of Australia (G.).

**Candacia chirura**, C:e, n.sp.—West of South Africa, 250-350 m., sparingly.

**Candacia catula**, Giesb.—Agulhas Current.

*G.D.*—*Pacific*, Panama and  $5^{\circ}$ N.  $115^{\circ}$ W. (G.), Malay Archip. (C:e). *Indian Ocean* from Ceylon to Socotra (A.S. & T.), Arabian Sea (C:e), Red Sea (G., A.S., C:e).

**Candacia curta**, Dana.—Agulhas Current.

*G.D.*—*Pacific Ocean*,  $0^{\circ}$ N.  $88^{\circ}$ W. and Caldera. (G.)—*Indian Ocean*, Ceylon to Socotra (A.S. & T.), Arabian Sea (C:e), Red Sea (G., C:e),  $50^{\circ}$ S.  $81^{\circ}$ W. (D.),  $30^{\circ}$ S.  $38^{\circ}$ W. (G.), Gulf of Guinea (T.S.).

**Candacia inermis**, C:e n.sp.—Agulhas Current, 530 m.

**Candacia pachydactyla**, Dana.—East and west of the Cape Colony.

*G.D.*—*Pacific*  $0^{\circ}$ – $12^{\circ}$ N.  $87^{\circ}$ W.– $110^{\circ}$ E. (G.). East of Australia, Fiji Islands, Philippines (B.), South China Sea (D.) Malay Archip. (C:e).—*Indian Ocean*, from Ceylon to Socotra (A.S. & T.), Arabian Sea (C:e),  $5^{\circ}$ S.  $83^{\circ}$ E. (C:e).—*Atlantic*, South Equatorial Current (B.), North Equatorial and Florida Currents (C:e).

**Candacia tenuimana**, Giesb.—Agulhas Current.

*G.D.*—*Pacific*,  $16^{\circ}$ N.  $166^{\circ}$ E. (G.), Mediterranean (G.).

**Candacia truncata**, Dana.—Agulhas Current.

*G.D.*—*Pacific*,  $9^{\circ}$ – $15^{\circ}$ N.  $119^{\circ}$ – $138^{\circ}$ W. (G.), Samoa and Kingsmill Islands, Sulu Archip., Ellice Islands (D.).—*Indian Ocean*, Ceylon to Socotra (A.S. & T.), Red Sea (C:e); from  $0^{\circ}$ S.  $64^{\circ}$ E. to  $20^{\circ}$ S.  $39^{\circ}$ E. (T.), East of Africa  $20^{\circ}$ – $28^{\circ}$ S. (T.),  $3^{\circ}$ – $5^{\circ}$ S.  $83^{\circ}$ E. (C:e). *Mediterranean* (T.).

**Candacia varicans**, Giesb.—Agulhas Current, 900 m. *rr.*

*G.D.*—Western Mediterranean (G.).

**Centropages chierchiæ**, Giesb.—Round South Africa.

*G.D.*—*Indian Ocean*, Ceylon and Minikoi (A.S. & T.).—*Atlantic*,  $38^{\circ}$ – $48^{\circ}$ N.  $10^{\circ}$ – $25^{\circ}$ W. (C:e),  $52^{\circ}$ N.  $11^{\circ}$ W. (T.), Gibraltar (G., a.o.), West Mediterranean (C:e).

**Centropages furcatus**, Dana.—Agulhas Current.

*G.D.*—West of America  $10^{\circ}$ N.– $10^{\circ}$ S. (G.), east and north of Australia (B.), S.E. of New Guinea (A.S.), Philippines (B.), Malay Archip. (C:e), Banka Straits (D.), from the Bay of Bengal to Mozambique (T.), Ceylon to Socotra (A.S. & T.), Arabian and Red Sea (C:e, A.S., T.).—*Atlantic*, Gulf of Guinea (T.S., C:e), Brazil Current (C:e), North Equatorial Current (C:e), Mediterranean (T.).

**Centropages typicus**, Kröyer.—Agulhas Current and Agulhas Bank.

*G.D.*—*Atlantic*: Gulf of Guinea, W. of Africa and Europe to  $64^{\circ}$ N. off the coast of Norway. Azores to the Newfoundland Banks and  $38^{\circ}$ N.  $74^{\circ}$ W. in the south; north of Iceland (C:e). *Mediterranean* (various authors). *Adriatic* (Car.).

**Chiridius poppei**, Giesb.—Agulhas Current.

*G.D.*—West Mediterranean (G.).

**Chirundina streetsi**, Giesb.—Agulhas Current 780–900 m. *rr.*

*G.D.*—*Pacific Ocean*:  $35^{\circ}$ N.  $125^{\circ}$ W. haul from 530 m. (G.).

**Clausocalanus arcuicornis**, Dana.—Round South Africa.

*G.D.*—*Pacific* : West of South America to  $53^{\circ}\text{S}$ ., off California (G.),  $20^{\circ}\text{N}$ .- $26^{\circ}\text{S}$ . (G.).—*Indian Ocean* :  $6^{\circ}\text{N}$ .- $36^{\circ}\text{S}$ .,  $92^{\circ}$ - $89^{\circ}\text{E}$ . (C:e). Malay Archip. (C:e). Bay of Bengal (T.). N.W. Indian Ocean, Arabian Sea, Red Sea (C:e, a.o.).  $16^{\circ}\text{S}$ .  $43^{\circ}\text{E}$ . (T.).—*Atlantic* : Benguela Current, Gulf of Guinea, Cape Verde, area between Madeira, Gibraltar, the English Channel,  $56^{\circ}\text{N}$ .  $31^{\circ}\text{W}$ ., the east of New York and the Azores (C:e).—*Mediterranean* (various authors). Adriatic (Car.).

**Clausocalanus furcatus**, Brady.—Sparingly east and west of South Africa.

*G.D.*—*Pacific* : California Current  $34^{\circ}\text{N}$ .  $131^{\circ}\text{W}$ . (G.).  $20^{\circ}\text{N}$ .- $26^{\circ}\text{S}$ . until  $175^{\circ}\text{W}$ . (G.).—S.E. of New Guinea (A.S.). Malay Archip. (C:e)—*Indian Ocean* :  $8^{\circ}$ - $6^{\circ}\text{N}$ .  $72^{\circ}$ - $95^{\circ}\text{E}$ ., Arabian Sea, Red Sea (C:e). Aden to  $7^{\circ}\text{N}$ .  $77^{\circ}\text{E}$ . (A.S.).—*Atlantic* : Brazil Current, Equatorial Currents, Antilles and Florida Currents, Sargasso Sea and Canary Current; northern limit  $40^{\circ}$ - $46^{\circ}\text{N}$ . (C:e). West Mediterranean (G).

**Conæa rapax**, Giesb.—Agulhas Current, 900 m., *rr*.

*G.D.*—East *Pacific*  $13^{\circ}\text{N}$ .- $3^{\circ}\text{S}$ .  $99^{\circ}$ - $132^{\circ}\text{W}$ . (G.).—S.E. of New Guinea (A.S.).—*Atlantic* :  $52^{\circ}\text{N}$ .  $15^{\circ}$ - $16^{\circ}\text{W}$ ., haul from 270 and 900m. (T.), Farøe Channel 1060m. (N.)

**Corycæus danæ**, Giesb.—Sparingly east and west.

*G.D.*—*Pacific* :  $34^{\circ}\text{N}$ .  $131^{\circ}\text{W}$ . and  $19^{\circ}\text{N}$ .- $3^{\circ}\text{S}$ .  $88^{\circ}$ - $175^{\circ}\text{W}$ . (G.).—Malay Archip. (C:e).—*Indian Ocean* : Bay of Bengal (T.), Ceylon to Socotra (A.S. & T.), Arabian Sea (C:e), Red Sea (C:e., a.o). Mediterranean (T.).

**Corycæus furcifer**, Cls.—Agulhas Current and West of South Africa.

*G.D.*—*Pacific* :  $11^{\circ}\text{N}$ - $3^{\circ}\text{S}$ .  $99^{\circ}$ - $124^{\circ}\text{W}$ . (G.).—Malay Archip. (C:e).—*Indian Ocean* : Bay of Bengal (T.). Ceylon and N.W., Indian Ocean (A.S. & T.), east of Africa  $16^{\circ}$ - $20^{\circ}\text{S}$  (T.). Mediterranean (Cls., a.o.).

**Corycæus ovalis**, Cls.—Agulhas Bank *rr*, W. of South Africa *rr*.

*G.D.*—Malay Archip. (C:e). Ceylon and N.W. Indian Ocean (A.S. & T). Arabian Sea (C:e) Red Sea (C:e, a.o.). East of Africa  $12^{\circ}\text{S}$ . (T.)

*Atlantic* : Gulf of Guinea to Cape Verde, Brazil Current to  $16^{\circ}\text{S}$   $34^{\circ}\text{W}$ ., North Equatorial, Antilles, Florida Currents to  $45^{\circ}\text{N}$ .  $16^{\circ}\text{W}$ ., Azores (C:e). Mediterranean (Cls., a.o.).

**Corycæus robustus**, Giesb.—Agulhas Current *rr*.

*G.D.*—*East Pacific Ocean* :  $20^{\circ}\text{N}$ .- $7^{\circ}\text{S}$ . (G.). S.E. of New Guinea (A.S.), Malay Archip. (C:e). *Indian Ocean*,  $6^{\circ}\text{N}$ .  $86^{\circ}$ - $95^{\circ}\text{E}$ ., Arabian Sea, Red Sea (C:e, A.S. & T.).

**Corycæus speciosus**, Dana.—Agulhas Current.

*G.D.*—East Pacific  $5^{\circ}\text{N.}-25^{\circ}\text{S.}$  until  $137^{\circ}\text{E.}$  (G.)—S.E. of New Guinea (A.S.).—*Indian Ocean*: Bay of Bengal (T.). From Ceylon to Socotra (A.S. & T.), Arabian Sea (C:e), Red Sea (A.S., C:e), East of Africa  $8^{\circ}\text{N.}-17^{\circ}\text{S.}$  (T.).—*Atlantic*: from St. Helena to the Gulf of Guinea and Cape Verde, Equatorial, Antilles, and Florida Currents until  $42^{\circ}\text{N.}$   $62^{\circ}-50^{\circ}\text{W.}$ , Azores and Canaries, exceptionally until  $51^{\circ}\text{N.}$   $20^{\circ}\text{W.}$  (C:e), West of Ireland (T.), Brazil Current until  $33^{\circ}\text{S.}$   $15^{\circ}-16^{\circ}\text{W.}$  (C:e), Mediterranean (G.).

**Eucalanus attenuatus** (Dana.)—Agulhas Current.

*G.D.*—East Pacific  $15^{\circ}\text{N.}-15^{\circ}\text{S.}$  (G.), California Current  $25^{\circ}\text{N.}$   $110^{\circ}\text{W.}$  (G.), Kingsmill Island, China Sea. (D.) Malay Archip. (C:e).—*Indian Ocean* from  $7^{\circ}\text{N.}$   $82^{\circ}\text{E.}$  to  $20^{\circ}\text{S.}$   $39^{\circ}\text{E.}$  (T.), Ceylon and the N.W. Indian Ocean (A.S. & T.), Red Sea (C:e),  $5^{\circ}\text{S.}$   $83^{\circ}\text{E.}$  (C:e), East of South Africa  $12-17^{\circ}\text{S}$  (T.).—*Atlantic*: Gulf of Guinea (T.S.), Mediterranean (various authors), Bay of Biscay (L.),  $52^{\circ}\text{N.}$   $12^{\circ}-16^{\circ}\text{W.}$ , hauls from 900 and 1095 m. (T.),  $56^{\circ}\text{N.}$   $19^{\circ}-12^{\circ}\text{W.}$  (T.), N.N.W. of Ireland (N.), Farøe Channel (N.),  $39^{\circ}\text{N.}$   $66^{\circ}-64^{\circ}\text{W.}$  (C:e).

**Eucalanus crassus**, Giesb.—Agulhas Current. False Bay.

*G.D.*—*Pacific*:  $19^{\circ}-20^{\circ}\text{N.}$   $138^{\circ}\text{E.}-175^{\circ}\text{W.}$ , west of South America  $14^{\circ}-26^{\circ}\text{S.}$  (G.), Malay Archip. (C:e).—*Indian Ocean*: Ceylon (A.S. & T.), Red Sea (A.S. & T.).—*Atlantic*: Brazil Current (G.), Gulf of Guinea (T.S.), Mediterranean (G.), Farøe Channel (Wolfenden), N. and N.E. of Scotland (T.S.), Skagerak, exceptionally (C:e).

**Eucalanus elongatus**, Dana.—Agulhas Current.

*G.D.*—Along the west coast of South America from Valparaiso northwards  $6^{\circ}-35^{\circ}\text{N.}$   $81^{\circ}-125^{\circ}\text{W.}$ , east Pacific  $14^{\circ}\text{N.}-3^{\circ}\text{S.}$  until  $132^{\circ}\text{W.}$  (G.), east of Kamtschatka (G.)—Sulu Archip., N. of Celebes (D.).—*Atlantic*: Gulf of Guinea (T.S.),  $33^{\circ}\text{N.}$   $32^{\circ}\text{W.}$  (C:e), W. of Gibraltar, Mediterranean (G.),  $52^{\circ}\text{N.}$   $15^{\circ}\text{W.}$  haul from 1006 m. (T.),  $60^{\circ}\text{N.}$   $7^{\circ}\text{W.}$  (T.S.), N. and N.E. of Scotland, Moray Firth (T.S.), Skagerak 160 m. (Aurivillius).

**Eucalanus monachus**, Giesb.—Agulhas Current.

*G.D.*—Malay Archip. (C:e). Ceylon (A.S. & T.). Gulf of Aden (C:e). Off Gibraltar, Mediterranean (G.).

**Eucalanus mucronatus**, Giesb.—Agulhas Current.

*G.D.*—Pacific  $16^{\circ}-19^{\circ}\text{N.}$   $175^{\circ}\text{W.}-166^{\circ}\text{E.}$  (G.). Malay Archip., Arabian Sea (C:e).

**Eucalanus pileatus**, Giesb.—Agulhas Current.

*G.D.*—West of South America  $10^{\circ}\text{N.}-3^{\circ}\text{S.}$  (G.). Ceylon, Maldives and the Red Sea. (A.S. & T.).

**Eucalanus subcrassus**, Giesb.—Agulhas Current.

*G.D.*—West of South America  $10^{\circ}\text{N.}-3^{\circ}\text{S.}$ , Amoy, Hongkong (G.)—Malay Archip. (C:e).—Ceylon, Minikoi. (A.S. & T.) Red Sea (G., A. S. & T.)—Atlantic, Gulf of Guinea and off Cape Verde (C:e).

**Eucalanus subtenuis**, Giesb.—Agulhas Current.

*G.D.*—East Pacific,  $15^{\circ}\text{N.}-26^{\circ}\text{S.}$ , until  $138^{\circ}\text{W.}$  (G.)—Malay Archip. (C:e)—Indian Ocean, Ceylon (A.S. & T.). Arabian Sea (C:e). Red Sea (A.S.).  $8^{\circ}\text{N.}74^{\circ}\text{E.}$  (A.S.)—Atlantic,  $6^{\circ}-5^{\circ}\text{S.}$   $8^{\circ}\text{E.}-17^{\circ}\text{W.}$  (C:e). Off Cape Verde (G., C:e).

**Euchæta acuta**, Giesb.—Agulhas Current.

*G.D.*—Mediterranean (G., A.S. & T.) Atlantic,  $52^{\circ}\text{N.}16^{\circ}\text{W.}$ , haul from 2264m. (T.).

**Euchæta affinis**, C:e, n.sp.—Agulhas Current.**Euchæta longicornis**, Giesb.—Agulhas Current.

*G.D.*—West of South America  $3^{\circ}-6^{\circ}\text{N.}$  (G.). Malay Archip. (C:e).

**Euchæta marina**, Prestand.—East and West of South Africa.

*G.D.*—West of South America  $20^{\circ}\text{N.}-26^{\circ}\text{S}$  until  $110^{\circ}\text{E.}$ —South of Australia, Crozet Island (B.). Malay Archip (C:e). Ceylon to Socotra (A.S. & T.).  $3^{\circ}\text{S. } 83^{\circ}\text{E.}$  (C:e). Arabian Sea, Red Sea (C:e). From Calcutta to Madagascar (T.). Atlantic,  $32^{\circ}\text{N.}-38^{\circ}\text{S.}$  (B.). South Equatorial and Brazil Currents, North Equatorial, Antilles, and Florida Currents, Sargasso Sea, Azores and the Canaries, rarely until  $51^{\circ}\text{N.}-20^{\circ}\text{W.}$  (C:e),  $49^{\circ}-56^{\circ}\text{N. } 19^{\circ}-68^{\circ}\text{W.}$  (T.) Mediterranean (various authors).

**Euchæta media**, Giesb.—Agulhas Current.

*G.D.*—Pacific  $16^{\circ}\text{N. } 163-166^{\circ}\text{E.}$ , 1500m. (G.)

**Euchæta spinosa**, Giesb.—S.E. coast  $33^{\circ}\text{S. } 28^{\circ}\text{E.}$  71 m.

*G.D.*—Mediterranean (G.)

**Euchæta tonsa**, Giesb.—Agulhas Current, 530 m. *nr.*

*G.D.*—Pacific,  $35^{\circ}\text{N. } 125^{\circ}\text{W.}$ , haul from 530 m. (G.).

**Euchirella messinensis**, (Cls.)—Agulhas Current.

*G.D.*—Indian Ocean, Minikoi (A.S. & T.).  $23^{\circ}\text{S. } 61^{\circ}\text{E.}$  (C:e). ? Gulf of Guinea (T.S.)—Mediterranean. (Cls., G.).

**Euchirella venusta**, Giesb.—Agulhas Current, 900 m. (length of the anterior part of the body 4 millim., of the posterior part 1 millim.).

*G.D.*—West of South America at the Equator (G.).

**Gaëtanus armiger**, Giesb.—Agulhas Current and off Table Mountain.

*G.D.*—*Pacific* :  $5^{\circ}\text{N.}-3^{\circ}\text{S. } 99^{\circ}-115^{\circ}\text{W.}$  (G.).—*Atlantic* : Gulf of Guinea (T.S.).  $52^{\circ}\text{N. } 16^{\circ}\text{W.}$ , haul from 1420 m. (T.). Farøe Channel 1060 m. (N.)

**Gaëtanus miles**, Giesb.—Agulhas Current 530 and 900 m.

*G.D.*—*Pacific* :  $35^{\circ}\text{N. } 125^{\circ}\text{W.}, 3^{\circ}\text{S. } 99^{\circ}\text{W.}$  (G.).—*Atlantic* :  $52^{\circ}\text{N. } 12^{\circ}-16^{\circ}\text{W.}$  hauls from 900 and 1095 m. (T.). Farøe Channel 1060 m. (N.).

**Heterorhabdus abyssalis**, Giesb.—Agulhas Current, 530-900 m., *rr.* Off Table Mountain, 450 m., *rr.*

*G.D.*—*Pacific*,  $14^{\circ}\text{N. } 132^{\circ}\text{W.}$  (G.).—N.W. Indian Ocean (A.S. & T.). *Atlantic*,  $52^{\circ}\text{N. } 16^{\circ}\text{W.}$  haul from 1655 m. (T.).

**Heterorhabdus austrinus**, Giesb.—(Expedition Antarctique Belge, Copepoden, p. 28, P. VI., 1902).—Agulhas Current, 530 to 780 m., *rr.*

*G.D.*—Antarctic Ocean,  $70^{\circ}\text{S. } 84^{\circ}\text{W.}$  haul from 250 m. (G.).

**Heterorhabdus papilliger** (Cls.)—Agulhas Current and off the West Coast, *rr.*

*G.D.*—*Pacific*,  $19^{\circ}\text{N.}-3^{\circ}\text{S. } 175^{\circ}-99^{\circ}\text{W.}$  (G.).—N.W. Indian Ocean (A.S. & T.).—Gulf of Aden (C:e).—Mediterranean (Cls., G.).—*Atlantic*,  $52^{\circ}\text{N. } 16^{\circ}\text{W.}$ , haul from 2580 m. (T.).

**Heterorhabdus spinifrons** (Cls.)—East and west of the Cape Colony, *rr.*

*G.D.*—*Pacific*,  $30^{\circ}\text{S. } 90^{\circ}\text{W.}$  and  $14^{\circ}\text{N. } 160^{\circ}\text{E.}$  (G.).—Minikoi and N.W. Indian Ocean (A.S. & T.).—*Atlantic*,  $52^{\circ}\text{N. } 15^{\circ}-16^{\circ}\text{W.}$ , hauls from 664 and 1710 m.  $55^{\circ}-56^{\circ}\text{N. } 32^{\circ}-44^{\circ}\text{W.}$  (T.).—Mediterranean (Cls., G.).

**Heterorhabdus tanneri**, Giesb.—Agulhas Current, *rr.*

*G.D.*—*Pacific*,  $35^{\circ}\text{N. } 125^{\circ}\text{W.}$ , haul from 530 m. (G.).

**Labidocera acuta** (Dana).—Agulhas Current.

*G.D.*—*Pacific*,  $26^{\circ}\text{N. } 110^{\circ}\text{W.}$  and between  $10^{\circ}\text{N.}$  and  $10^{\circ}\text{S.}$  (G.). Hongkong (G.). Port Jackson (B.).—Malay Archip. (C:e). Indian Ocean,  $8^{\circ}-13^{\circ}\text{N. } 54^{\circ}-75^{\circ}\text{E.}$  (G.).—Bay of Bengal (T.). From Ceylon to Socotra (A.S. & T.). Arabian Sea (C:e). Red Sea (various authors). East of Africa,  $9^{\circ}\text{S.}$  (T.),  $27^{\circ}\text{S. } 49^{\circ}\text{E.}$  (C:e).—Gulf of Guinea (T.S.).—Isle of Man (T.).

**Lubbockia aculeata**, Giesb.—West side of the Cape Colony, 277 m., *rr.*

*G.D.*—*Pacific*,  $0^{\circ}\text{N. } 108^{\circ}\text{W.}$  (G.). Red Sea (C:e). Mediterranean (G.).

**Lucicutia aurita**, C:e, n.sp.—Agulhas Current, 900 m. *rr.*  
(C:e).

**Lucicutia bradyana**, C:e, n.sp. (? *L. grandis*, Giesb.)—Agulhas Current, 900m., *rr.*

*G.D.*—*L. grandis* has been found by Giesb. in the Pacific,  $1^{\circ}\text{N. } 83^{\circ}\text{W.}$

**Lucicutia clausii**, Giesb.—Agulhas Current, 530 and 900 m.

*G.D.*—Pacific,  $3^{\circ}\text{S. } 99^{\circ}\text{W.}$ , 1800 m. (G.). Malay Archip. (C:e). Mediterranean (G.)—Atlantic,  $52^{\circ}\text{N. } 15^{\circ}\text{W.}$ , haul from 918m. (T.).

**Lucicutia flavicornis** (Cls.).—Agulhas Current, 530 and 900 m., *rr.* West of the Cape Colony, 250 m. *rr.*

*G.D.*—Pacific,  $12^{\circ}\text{N.}-3^{\circ}\text{S. } 87^{\circ}-128^{\circ}\text{W.}$  (G.)—Indian Ocean, from Ceylon to Socotra (A.S. & T.). Red Sea (A.S., C:e)—Atlantic: Antilles and Florida Currents until  $40^{\circ}\text{N. } 56^{\circ}\text{W.}$ , Sargasso Sea, Azores and  $34^{\circ}\text{N. } 10^{\circ}\text{W.}$ , (C:e)—Mediterranean (various authors).

**Metridia brevicauda**, Giesb.—Agulhas Current, 900 m. *rr.*

*G.D.*—Pacific,  $16^{\circ}\text{N.}-3^{\circ}\text{S. } 99^{\circ}\text{W.}-166^{\circ}\text{E.}$  1000 to 4000 m. (G.).

**Metridia lucens**, Boeck.—Abundant south and west of the Cape Colony.

*G.D.*—Mediterranean (A.S. & T.). Atlantic, from Nova Scotia to Ireland and the Farøe Channel, North Sea, Skagerak and along the coast of Norway to  $71^{\circ}\text{N.}$  (C:e). Iceland (T.).

**Metridia princeps**, Giesb.—Agulhas Current, 780 and 900 m. *rr.*

*G.D.*—Pacific,  $3^{\circ}\text{S. } 99^{\circ}\text{W.}$  1800 m. (G.)—Atlantic, Gulf of Gascogne (*vide* Giesbrecht),  $52^{\circ}\text{N. } 16^{\circ}\text{W.}$ , haul from 2580 m. (T.).  $62^{\circ}\text{N. } 56^{\circ}\text{W.}$ , (N.).

**Metridia venusta**, Giesb.—Agulhas Current, 530 m.

*G.D.*—Pacific,  $16^{\circ}-5^{\circ}\text{N. } 115^{\circ}-166^{\circ}\text{E.}$  450-1000 m. (G.). Atlantic,  $52^{\circ}\text{N. } 16^{\circ}\text{W.}$ , haul from 2825m. (T.).

**Oithona nana**, Giesb.—(Van Beemen: Publications de circonstance du Conseil intern. pour l'exploration de la mer Nr. 7, 1903).—South of the Cape Colony.

*G.D.*—S.E., of New Guinea (A.S.)—Malay Archip. (C:e). Ceylon (A.S. & T.). Arabian Sea (C:e). Red Sea. (G.)—Mediterranean (G.). Atlantic,  $36^{\circ}\text{N. } 6^{\circ}\text{W.}$ , (C:e), S.W. of Ireland (T.), English Channel, coasts of Holland, North of Jutland, West of Sweden (C:e).



**Oithona plumifera**, Baird.—E. and W., of the Cape Colony. False Bay.

*G.D.*—Pacific :  $20^{\circ}\text{N.}-3^{\circ}\text{S.}$   $99^{\circ}\text{W.}-166^{\circ}\text{E.}$ ,  $0^{\circ}\text{N.}$   $91^{\circ}\text{W.}$  (G.). New Guinea. (A.S.). Malay Archip. (C:e). Bay of Bengal to  $20^{\circ}\text{S.}$   $39^{\circ}\text{E.}$  (T.). Ceylon to Socotra (A.S. & T.). Arabian Sea (C:e). Red Sea (C:e., a.o.). Atlantic :  $33^{\circ}\text{S.}-40^{\circ}\text{N.}$ , North thereof sparingly, North Sea, Skagerak, off the coast of Norway into the Murman Sea (C:e).

**Oithona rigida**, Giesb. - C:e Kongl. Siv. Vet. Akad. Handl. XXXV., n. 5 p. 45. P. V., f.7-18, 1901—Agulhas Current 97 m. *rr.*

*G.D.*—Malay Archip. (C:e). Ceylon and Minikoi (A.S. & T.). Gulf of Aden (C:e). Red Sea (G.).

**Oithona similis**, Cls.—South of the Cape Colony, sparingly (probably because the nets used were too coarse).

*G.D.*—Cosmopolitan, also in the Antarctic Seas,  $70^{\circ}-71^{\circ}\text{S.}$   $81^{\circ}-92^{\circ}\text{W.}$  (G.), and in the Polar Basin, off the New Siberian Islands (G.O.S.). Off Franz Josef Land (C:e).

**Oncaea conifera**, Giesb.—Sparingly round the Cape Colony.

*G.D.*—Pacific,  $12^{\circ}\text{N.}-3^{\circ}\text{S.}$   $87^{\circ}-132^{\circ}\text{W.}$  down to 4000 m. (G.), S.E. of New Guinea (A.S.), Malay Archip. (C:e), N.W. Indian Ocean (A.S. & T.), Arabian Sea (C:e), Red Sea (A.S., C:e), East of Africa,  $12^{\circ}-17^{\circ}\text{S.}$  (T.)—Antarctic Ocean  $70^{\circ}-71^{\circ}\text{S.}$   $83^{\circ}-90^{\circ}\text{W.}$  (G.).

North Siberian Sea,  $78^{\circ}\text{N.}$   $136^{\circ}\text{E.}$  (G.O.S.), West of Greenland (Vanhoeffen), St. Lawrence Gulf (T.), North Atlantic,  $71^{\circ}\text{N.}$   $21^{\circ}\text{W.}$  to  $62^{\circ}\text{N.}$   $1^{\circ}\text{E.}$  in 50 and more metres (C:e), Farøe Channel, 900 m. (N.), south coast of Norway (G.O.S.), Skagerak exceptionally (C:e), Azores rarely (C:e), Mediterranean (G.).

**Oncaea media**, Giesb.—Agulhas Current and off Table Mountain.

*G.D.*—Pacific,  $5^{\circ}\text{N.}-3^{\circ}\text{S.}$   $99^{\circ}-115^{\circ}\text{W.}$  (G.), Malay Archip. (C:e), from Ceylon to Socotra (A.S. & T.), Arabian Sea (C:e). Red Sea (A.S., C:e).

From the east coast of the Cape Colony to the Cape Verde Islands, east of Rio Janeiro, Antilles and Florida Currents to  $47^{\circ}\text{N.}$   $41^{\circ}\text{W.}$ , the Azores and the Canaries (C:e), Mediterranean (G., a.o.).

**Oncaea mediterranea** (Cls). — Round the Cape Colony, sparingly.

*G.D.*—Pacific,  $12^{\circ}\text{N.}-3^{\circ}\text{S.}$   $99^{\circ}-132^{\circ}\text{W.}$ ,  $34^{\circ}\text{N.}$   $131^{\circ}-132^{\circ}\text{W.}$  (G.), Malay Archip. (C:e), Bay of Bengal (T.), from Ceylon to Socotra (A.S. & T.), Arabian Sea (C:e), Red Sea (C:e, A.S.), East of Africa  $8^{\circ}\text{N.}$  (T.)—Atlantic : South Equatorial and Florida Currents to  $40^{\circ}\text{N.}$   $22^{\circ}\text{W.}$ , Sargasso Sea (C:e), Mediterranean (Cls, a. o.),  $52^{\circ}\text{N.}$   $16^{\circ}\text{W.}$ , haul from 900 m. (T.).

**Oncaea subtilis**, Giesb.—South of the Cape Colony.

*G.D.*—Benguela Current  $32^{\circ}\text{S}$ .  $13^{\circ}\text{E}$ . ;  $39^{\circ}$ - $49^{\circ}\text{N}$ .  $6^{\circ}$ - $24^{\circ}\text{W}$ . (C:e), Mediterranean (G. C:e), Farøe Channel (Wolfenden, *vide G.*), Skagerak, once sparingly (C:e).

**Oncaea venusta**, Phil.—Round the Cape Colony.

*G.D.*—Pacific,  $20^{\circ}\text{N}$ .- $4^{\circ}\text{S}$ .  $87^{\circ}\text{W}$ .- $137^{\circ}\text{E}$ . (G.). S.E. of New Guinea (A.S.), Malay Archip. (C:e). From  $19^{\circ}\text{N}$ .  $87^{\circ}\text{E}$ . to  $20^{\circ}\text{S}$ .  $39^{\circ}\text{E}$ . (T.), from Ceylon to Aden (A.S.). Arabian Sea (C:e). Red Sea (C:e., A.S.). East of Africa  $12^{\circ}$ - $28^{\circ}\text{S}$ . (T.).

West of the Cape Colony (C:e). Brazil Current (G.), until  $37^{\circ}\text{S}$ .  $36^{\circ}\text{W}$ . (C:e). North Equatorial and Florida Currents to  $41^{\circ}\text{N}$ .  $57^{\circ}$ - $58^{\circ}\text{W}$ ., Azores and the Sargasso Sea. (C:e). Mediterranean (various authors).  $56^{\circ}\text{N}$ .  $18^{\circ}$ - $24^{\circ}\text{W}$ . (T.).

**Pachysoma tuberosum**, Giesb.—Agulhas Current, 900 m. *rr.*

*G.D.*—Gulf of Panama (G.)— $3^{\circ}30^{\circ}\text{S}$ .  $83^{\circ}30^{\circ}\text{E}$ ., surface (C:e).

**Paracalanus aculeatus**, Giesb.—South of the Cape Colony, sparingly.

*G.D.*—E. Pacific  $10^{\circ}\text{N}$ .- $10^{\circ}\text{S}$ ., until  $119^{\circ}\text{W}$ . (G.). Hongkong (G.)—S.E., of New Guinea (A.S.). Indian Ocean,  $6^{\circ}\text{N}$ .  $92^{\circ}\text{E}$ . (C:e). Arabian Sea (C:e). Red Sea (various authors)—Atlantic : from Ascension to Cape Verde, North Equatorial, Antilles, and Florida Currents to  $41^{\circ}\text{N}$ .  $56^{\circ}\text{W}$ . (C:e). West Mediterranean (C:e.).

**Paracalanus parvus**, Cls.—South of the Cape Colony.

*G.D.*—West of South America,  $55^{\circ}$ - $10^{\circ}\text{S}$ . (G.)—East of Australia (G.)— $0^{\circ}\text{N}$ .  $108^{\circ}\text{W}$ . (G.)—Hongkong (G.)—S.E., of New Guinea (A.S.). From  $9^{\circ}\text{N}$ .  $71^{\circ}\text{E}$ . to Aden (A.S.). Red Sea (A.S.).

Atlantic : West of the Cape of Good Hope, Gulf of Guinea, Cape Verde, Azores, Mediterranean, English Channel, Farøe Channel, North Sea to  $61^{\circ}\text{N}$ ., Skagerak, south of Norway, Kattegatt (C:e). West Baltic (Mœbius.).

Brazil Current (C:e). North Equatorial and Florida Currents to the Newfoundland Banks (C:e).

**Phaëna spinifera**, Cls.—Agulhas Current, 900 m. *rr.*

*G.D.*—Pacific,  $3^{\circ}\text{S}$ .  $99^{\circ}\text{W}$ . and  $14^{\circ}\text{N}$ .  $160^{\circ}\text{E}$ ., in 500 m. (G.). N.W. Indian Ocean (A.S. & T.). Gulf of Aden (C:e). Red Sea (A.S. & T.). From  $3^{\circ}\text{S}$ .  $54^{\circ}\text{E}$ ., to  $20^{\circ}\text{S}$ .  $39^{\circ}\text{E}$ . (T.)—Mediterranean (G.).

**Phyllopus bidentatus**, Brady.—Agulhas Current, 900 m. *rr.*

*G.D.*—Pacific,  $3^{\circ}\text{S}$ .  $99^{\circ}\text{W}$ ., 1800 m. (G.)—South Atlantic,  $37^{\circ}\text{S}$ .  $46^{\circ}\text{W}$ . (B.), Gulf of Guinea (T.S.),  $52^{\circ}\text{N}$ .  $15^{\circ}\text{W}$ ., haul from 1060 m. (T.), Farøe Channel, 1060 m. (N).

**Pleuromamma abdominalis**, Lubbock.—East and West of the Cape Colony.

*G.D.*—Pacific:  $36^{\circ}\text{N. } 125^{\circ}\text{W.}$ ,  $16^{\circ}\text{N.}-26^{\circ}\text{S.}$  (G). Malay Archip. (C:e). From Calcutta to Mozambique (T.).  $23^{\circ}\text{S. } 61^{\circ}\text{E.}$  (C:e). Along the east coast of Africa  $12^{\circ}-20^{\circ}\text{S.}$  (T.) Ceylon and the N.W. Indian Ocean (A.S. & T.). Red Sea (various authors).

Atlantic: Gulf of Guinea (T.S., L.), Cape Verde Islands (C:e). Mediterranean (Cls., G.).  $40^{\circ}-50^{\circ}\text{N. } 56^{\circ}-31^{\circ}\text{W.}$  (C:e).  $52^{\circ}\text{N. } 12^{\circ}-16^{\circ}\text{W.}$  (T.). From the north of Ireland to St. Lawrence Gulf (T.). Farøe Channel (T.).

**Pleuromamma gracilis**, Cls.—Round the Cape Colony.

*G.D.*—Pacific,  $16^{\circ}\text{N.}-26^{\circ}\text{S.}$  (G.)—Malay Archip. (C:e). Indian Ocean,  $13^{\circ}-14^{\circ}\text{N. } 54^{\circ}-60^{\circ}\text{E.}$  (G), from Ceylon to Socotra (A.S. & T.).—Gulf of Aden (C:e).—Atlantic: South of the Azores to  $40^{\circ}-50^{\circ}\text{N. } 16^{\circ}-64^{\circ}\text{W.}$ , (C:e).  $52^{\circ}\text{N. } 16^{\circ}\text{W.}$ , haul from 2825 m. (T.).—Mediterranean (G.).

**Pleuromamma robusta**, Dahl.—G. O. Sars. Crust. of Norway, Calanoida, p. 115 Pl. LXXVIII., LXXIX, 1903.—East and west of the Cape Colony.

*G.D.*—Arabian Sea, Gulf of Aden, Red Sea (C:e).—Atlantic: North of Ireland (N.), Farøe Channel (Wolfenden), North of the Farøe Channel, 200 to 400 m. (G.O.S.), West Norway, off Aalesund (G.O.S.).

**Pleuromamma xiphias**, Giesb.—Agulhas Current, 530 to 900 m. off Table Mountain, 450 m.

*G.D.*—East Pacific,  $20^{\circ}\text{N.}-3^{\circ}\text{S. } 99^{\circ}\text{W.}-160^{\circ}\text{E.}$  (G.)—? Off Gibraltar (A.S. & T.).

**Pontella securifer**, Brady. — Agulhas Current, one single specimen.

*G.D.*—Port Townsend (T.)—Pacific,  $33^{\circ}-25^{\circ}\text{N. } 138^{\circ}-110^{\circ}\text{W.}$ ,  $16^{\circ}\text{N.}-20^{\circ}\text{S. } 109^{\circ}\text{W.}-165^{\circ}\text{E.}$  (G.). Indian Ocean,  $8^{\circ}\text{N. } 72^{\circ}\text{E.}$  (G.). Ceylon and Minikoi (A.S. & T.),  $2^{\circ}-3^{\circ}\text{S. } 83^{\circ}-84^{\circ}\text{E.}$  (C:e). Atlantic: Gulf of Guinea (T.S.),  $5^{\circ}-18^{\circ}\text{S. } 24^{\circ}-40^{\circ}\text{W.}$  (G.).

**Pontellina plumata**, Dana.—Agulhas Current.

*G.D.*—Pacific,  $34^{\circ}-13^{\circ}\text{N. } 97^{\circ}-131^{\circ}\text{W.}$ ,  $15^{\circ}\text{N.}-9^{\circ}\text{S. } 80^{\circ}\text{W.}-137^{\circ}\text{E.}$  (G.). Kingsmill Islands and  $1^{\circ}-3^{\circ}\text{N. } 173^{\circ}\text{E.}$  (D.). Between Port Jackson, Fiji Islands and the Philippines (B.). Malay Archip. (C:e). From Ceylon to Socotra (A.S. & T.). Arabian Sea (C:e). Red Sea (A.S., C:e),  $2^{\circ}\text{S. } 84^{\circ}\text{E.}$  (C:e). East of Africa,  $25^{\circ}\text{S.}$  (T.).—Atlantic: off the Cape of Good Hope (D.), Gulf of Guinea (T.S., a.o.), along the west coast of Africa to Cape Verde, the Azores (C:e, a.o.). Mediterranean (various authors). Brazil Current,  $5^{\circ}\text{N.}-25^{\circ}\text{S. } 24^{\circ}-44^{\circ}\text{W.}$  (G.).

**Pseudodiaptomus serricaudatus**, T. Scott.—South of the Cape Colony, as a rule common.

*G.D.*—Ceylon and the N.W. Indian Ocean (A.S. & T.). Arabian Sea (C:e). Aden (A.S.). Tropical western Africa (T.S.).

**Rhinocalanus cornutus**, Dana.—Agulhas Current, not rare.

*G.D.*—East Pacific,  $15^{\circ}\text{N.}-7^{\circ}\text{S.}$ ,  $138^{\circ}\text{W.}$  (G.). Sulu Sea (D.), Philippines (B.), Malay Archip. (C:e). Bay of Bengal (T.). Ceylon and the N.W. Indian Ocean (A.S. & T.). Arabian Sea (C:e). Red Sea (A.S.), East of Africa,  $3^{\circ}\text{N.}-20^{\circ}\text{S.}$  (T.).—Gulf of Guinea (T.S.). West Africa,  $1^{\circ}-27^{\circ}\text{N.}$ , Canaries (D., L., T.), Mediterranean (G., a.o.). Antilles, and Florida Currents to  $42^{\circ}-43^{\circ}\text{N.}$   $42^{\circ}-45^{\circ}\text{W.}$  (C:e),  $52^{\circ}\text{N.}$   $15^{\circ}-16^{\circ}\text{W.}$ , hauls from 1006 and 1438m. (T.). Farøe Channel (T.).

**Rhinocalanus nasutus**, Giesb.—East of Natal rare, south of the Cape Colony abundant in 37-74 m.

*G.D.*—West of South America from Magellan Straits to  $6^{\circ}\text{N.}$ ;  $20^{\circ}\text{N.}$   $173^{\circ}\text{E.}$  (G.). Ceylon to Socotra (A.S. & T.). Arabian Sea, rare (C:e),  $20^{\circ}\text{S.}$   $39^{\circ}\text{E.}$  (T.). *Atlantic*, from  $6^{\circ}\text{N.}$   $22^{\circ}\text{W.}$  to the Azores (C:e), Gibraltar, Mediterranean (G.); from  $46^{\circ}\text{N.}$   $34^{\circ}\text{W.}$  to  $40^{\circ}\text{N.}$   $56^{\circ}\text{W.}$  (C:e);  $52^{\circ}\text{N.}$   $16^{\circ}\text{W.}$ , haul from 1438 m. (T.); N.N.W. of Ireland, 389 m. (N.);  $65^{\circ}\text{N.}$   $10^{\circ}\text{W.}$  250-400 m. (G.O.S.); North of Scotland (Mœbius); Moray Firth (T.S.); North Sea, between Scotland and Norway (G.O.S.); Skagerak in 120 and more m. (C:e).

**Sapphirina angusta**, Dana.—Off the west coast in 277 m. *rr.*

*G.D.*— $30^{\circ}\text{N.}$   $134^{\circ}\text{W.}$ ,  $18^{\circ}\text{N.}$   $145^{\circ}\text{W.}$ , Coquimbo (G.). Arabian Sea (C:e),  $43^{\circ}-35^{\circ}\text{S.}$   $78^{\circ}-23^{\circ}\text{E.}$  (B., D.).  $27^{\circ}\text{N.}$   $20^{\circ}\text{W.}$  (L.). West Mediterranean (G.).

**Sapphirina gemma**, Dana.—Agulhas Current, *rr.*

*G.D.*—East Pacific,  $8^{\circ}\text{N.}-33^{\circ}\text{S.}$   $35^{\circ}-27^{\circ}\text{N.}$   $131^{\circ}-111^{\circ}\text{W.}$  (G.). Arabian Sea (C:e). N.E. of New Zealand and south of the Cape of Good Hope (D.).  $7^{\circ}-11^{\circ}\text{N.}$ ,  $17^{\circ}-20^{\circ}\text{W.}$  (C:e). Mediterranean (G., a.o.).

**Sapphirina nigromaculata**, Cls.—Agulhas Current, *rr.*

*G.D.*—Pacific,  $20^{\circ}\text{N.}-4^{\circ}\text{S.}$  (G.), Malay Archip. (C:e), Bay of Bengal (T.). Ceylon, Minikoi, Socotra (A.S. & T.), Arabian Sea (C:e), Red Sea (G., a.o.),  $0^{\circ}-6^{\circ}\text{S.}$ ,  $64^{\circ}-51^{\circ}\text{E.}$  (T.).—Gulf of Guinea, Florida Current to  $49^{\circ}\text{N.}$   $23^{\circ}\text{W.}$ , Azores (C:e).

**Sapphirina opalina**, Dana.—Agulhas Current, *rr.*

*G.D.*— $20^{\circ}\text{N.}$   $173^{\circ}\text{E.}$ , Gulf of Panama (G.), Philippines (B.), Red Sea (Steuer).—Gulf of Guinea (T.S.).  $1^{\circ}\text{S.}$   $1^{\circ}\text{W.}$  (L.),  $1^{\circ}-4^{\circ}\text{N.}$   $17^{\circ}-25^{\circ}\text{W.}$  (D.), Mediterranean (G., a.o.), Caribbean Sea (C:e).

**Sapphirina salpæ**, Cls.—Off Table Mountain 450 m. *rr.*

*G.D.*— $38^{\circ}\text{S. } 18^{\circ}\text{W.}$  (G.), Bay of Bengal (T.), Ceylon and the N.W. Indian Ocean (A.S. & T.),  $5^{\circ}\text{S. } 83^{\circ}\text{E.}$  (C:e), Mediterranean (G., a.o.),  $52^{\circ}\text{N. } 16^{\circ}\text{W.}$ , haul from 1438m. (T.).

**Sapphirina scarlata**, Giesb.—Off the west coast, 350 m. *rr.*

*G.D.*— $0^{\circ}\text{-}6^{\circ}\text{N.}$ ,  $80^{\circ}\text{-}88^{\circ}\text{W.}$  (G.),  $3^{\circ}\text{S. } 83^{\circ}\text{E.}$ , (C:e), Red Sea (C:e).

**Sapphirina sinuicauda**, Brady.—Off Natal, surface; off Table Mountain 450 m. *rr.*

*G.D.*— $6^{\circ}\text{N. -}4^{\circ}\text{S. } 80^{\circ}\text{-}89^{\circ}\text{W.}$  (G.),  $2^{\circ}\text{S. } 84^{\circ}\text{E.}$  (C:e),  $10^{\circ}\text{N. } 137^{\circ}\text{E.}$  (G.), Philippines (B.), Ceylon (A.S. & T.), Red Sea (Steuer), Gulf of Guinea (T.S.), Azores (C:e).

**Scolecithricella minor** (Brady)—G.O. Sars, Crust. of Norway, Calan. p. 55, P. XXXVII, XXXVIII, 1902.—Off the west coast, 250–277 m. very rare. The South African specimens were only 1,2 millim. in length; those from the Northern Atlantic 1,4 millim.

*G.D.*—Indian Ocean— $47^{\circ}\text{N. } 50^{\circ}\text{E.}$  (G.), Gulf of Guinea (T.S.),  $56^{\circ}\text{N. } 28^{\circ}\text{-}23^{\circ}\text{W.}$  (T.),  $67^{\circ}\text{N. } 3^{\circ}\text{W.}$  haul from 400 m. (C:e), south and west of Norway to  $68^{\circ}\text{N.}$  (G.O.S.), Skagerak (C:e).

**Scolecithricella neptuni**, C:e n.sp.—Off the west coast, very sparingly in 250–350 m. (C:e).

**Scolecithrix danæ**, Lubbock.—Off the east and west coasts.

*G.D.*—Pacific  $20^{\circ}\text{N. -}26^{\circ}\text{S.}$  (G.), East of Japan (G.), North and East of Australia (B.), Malay Archip. (C:e), Bay of Bengal to  $0^{\circ}\text{S. } 64^{\circ}\text{E.}$  (T.), Ceylon to Socotra (A.S. & T.), Arabian Sea (C:e).

$32^{\circ}\text{S. -}26^{\circ}\text{N. } 13^{\circ}\text{-}34^{\circ}$  (B.), Gulf of Guinea (T.S., C:e) to Cape Verde Islands (C:e),  $12^{\circ}\text{-}37^{\circ}\text{N. } 14^{\circ}\text{-}25^{\circ}\text{W.}$  (L.),  $34^{\circ}\text{N. } 38^{\circ}\text{W.}$  (C:e), Canaries (T.), Mediterranean (G.),  $52^{\circ}\text{N. } 16^{\circ}\text{W.}$ , haul from 2825 m. (T.),  $52^{\circ}\text{-}56^{\circ}\text{N. } 22^{\circ}\text{-}44^{\circ}\text{W.}$  (T.).

**Scolecithrix persecans**, Giesb.—Agulhas Current in 900 m. *rr.*

*G.D.*— $35^{\circ}\text{N. } 125^{\circ}\text{W.}$ , haul from 530 m. (G.),  $52^{\circ}\text{N. } 16^{\circ}\text{W.}$ , haul from 2580 m. (T.).

**Solecithrix securifrons**, T Scott.—Agulhas Current, 530–900 m., *rr.*

*G.D.*—Gulf of Guinea (T.S.),  $52^{\circ}\text{N. } 15^{\circ}\text{-}16^{\circ}\text{W.}$ , haul from 918 and 1710 m. (T.), N.W. of Ireland (N.), Farøe Channel down to 1060 m. (N.).

**Temora discaudata**, Giesb.—Agulhas Current, *rr.*

*G.D.*—Entire Pacific between 20°N. and 9°S. and 26°-35°N. 110°-131°W. (G.). S.E. of New Guinea (A.S.). Malay Archip. (C:e). Ceylon and the N.W. Indian Ocean (A.S. & T.). Arabian Sea (C:e). Red Sea (G., a.o.). Mediterranean (A.S. & T.).

**Temora stylifera**, Dana.—Off Natal in the surface, *rr.*

*G.D.*—Malay Archip. (C:e). From 19°N. 87°E. to 20°S. 39°E. (T.). Ceylon, N.W. Indian Ocean (A.S. & T.). Arabian Sea (C:e). Red Sea (A.S., C:e). From Ascension to the Azores, off Morocco. Mediterranean. Antilles and Florida Currents to 42°N. 42°W. Brazil Current (C:e).

**Undechæta major**, Giesb.—Agulhas Current, 900 m., *rr.*

*G.D.*—Pacific, 36°N. 125°W. and 20°N. 173°E. (G.). Indian Ocean, 19°N. 87°E. Gulf of Suez (T.).

**Undechæta minor**, Giesb.—Agulhas Current, *r.*

*G.D.*—Pacific, 35°N. 125°W. and 16°-20°N. 166°-173°E. (G.). Minikoi and the N.W. Indian Ocean (A.S. & T.). Off Gibraltar (A.S. & T.).

**Xanthocalanus fragilis**, Aurivillius (Kongl. Sv. Vetensk. Akadem. Handlingar XXX nr. 3 p. 32, 1898.—*X. borealis* G. O. Sars in "The Norwegian North Polar Expedition, 1893-1896" V Crustacea, p. 49, P. xi, 1900; Crustac. of Norway, Calan. p. 45, P. XXXI, XXXII, 1902.—T. Scott: 20th Report of the Fishery Board for Scotland, III., p. 452, P. xxii, f. 8, 9, 1902. Compare the systematic notes in the following.)—The west and south Coast, *rr.*

*G.D.*—The north Siberian Sea, 78°N. 136°E. 50 m.; off the west coast of Norway, 59°N., 710 m. (G.O.S.). West Sweden, 50-120 m. (Aurivillius). Shetland (T.S.).

## SYSTEMATIC NOTES.

### **Candacia cheirura**, n.sp.

**Diagn. of the female.**—Terminal setæ of the third leg with outwards turned apex and as long as the distal part of the Re 3. The proximal part of the anterior antennæ 7-jointed. Genital segment with large projecting opening. Second joint of the abdomen with a protuberance on the under side. Proximal part of the setæ of the furca broad. First pair of legs with Si on B1. Fifth pair of legs with tricuspidate apex and with two spines on the exterior side. Length 2,7 mm.

**Male.**—Terminal seta of the Re of the third leg as in the female. Proximal part of the anterior antennæ 7-jointed. On the prehensile antenna the 15th joint has distally on the upper side a small spine, the 19th joint carries on its entire margin close small ridges, the 17th and 18th joints not uniting, the 18th carries strong transverse ridges, joints 15+16  $\frac{5}{6}$  of the joints 17+18. Fifth pair of legs: the left with forceps and shorter than the right. Length 2, 3 mm.

**Description of the female.**—*Colour.*—The following parts are brown: Re 2 and 3 of the first pair of legs, interior side of Re 2 and the entire Re 3 of the second pair, Re 3 of the third and fourth pairs, the terminal spines of the last thoracic segment.

Length of the anterior part, 2 millim.; of the posterior, 0, 7 millim. Greatest breadth 1 millim., in the middle of the anterior part. First thoracic segment as long as the four others together. Last segment symmetrical, ends in two spines, and has on the sides one or two small bristles. Abdomen 3-jointed; genital segment as long as the two following segments together, ventrally with a prominent large genital opening. The second segment, nearly twice as long as the anal segment, ventrally with a prominent rounded protuberance. Furcal branches slightly longer than broad, with a short spine on the exterior corner; Se broad, slightly shorter than the four St, which are broad and of nearly equal length. All very sparingly hairy. Si thin, arises from the interior distal end.

*Anterior antennæ* reach to the furca. Proximal part 7-jointed; distal part 17-jointed. Length of the joints in 0, 01 m.m.:

Aa	...	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
0, 01 m.m.		12	7	7	8	8	5	2	5	5	5	8	8	9	9	13
		17	18	19	20	21	22	23	24-5							
		17	13	16	17	10	6	7	11							

*Posterior antennæ.*—Re  $\frac{3}{5}$  as long as Ri; Ri 1 & B2  $2\frac{1}{2}$  times longer than broad. Re cylindrical, carries at its end 1 small and 6 longer S. Ri carries on the exterior lobe 6 long plumose Sa and one small Si, the interior lobe 5 long plumose setæ, and three very thin bristles.

*Mandible*, as in *C. varicans* (see Giesb., F. Neap., P. XXI, f. 24).

*Maxilla*, similar to the maxilla of *C. longimana* (see Giesb. P. XXII, f. 7). Re 2 & 3, with 1+2+2 S.

*Anterior maxilliped.*—L1 with one long and one very small S; L2 with 2 small S, L3 and L4 each with one spine and a small thin S. B2 with 2 almost equal strong spines inserted at some distance from each other and slightly shorter than the 3 falci-form terminal spines.

*Posterior Maxilliped.*—B<sub>1</sub> as long as B<sub>2</sub> and Ri together; B<sub>2</sub> as long as Ri. S as in the other species. S<sub>2</sub> of B<sub>2</sub> a little shorter than S<sub>1</sub> and S<sub>3</sub>.

*Natatory legs, 1-4 pair.*—B<sub>1</sub> of the first pair with Si. Distal part of Re 3 of the 1st pair longer than the proximal,—St of the 3rd pair as long as the distal part of the joint. Serration of the edge of Re fine.

*Fifth pair of legs.*—B<sub>2</sub> with small Se, Ri without interior setæ ends in three apices, of which the median is the largest; besides two spines on the exterior margin.

**Description of the male.**—*Colour.*—The ends of the last thoracic segment, the comb on the prehensile antennæ and the Si, St and, partly, the third joint of Re of the natatory legs have brown chitin.

*Length* :—anterior part 1,8, posterior part 0,6 millim.;  $2\frac{1}{3}$  times as long as the greatest breadth, in front of the middle.

*Anterior part* 5-jointed. Last thoracic segment asymmetrical, the left corner being prolonged. It carries on the side some small bristles. Of the five abdominal segments the three first are of about the same length and twice as long as the fourth and the anal segments. The first joint carries on the right side a hornlike apophysis (as in *C. curta* and *C. pectinata*). Furca short and broad. Se and the four Si of about the same length, all of ordinary form and plumose. Si half as long and thin. On the distal exterior corner is a small spine.

*Prehensile antenna* very similar to that of *E. armata* and *C. varicans*; its proximal part 7-jointed. Joints 15 + 16  $\frac{5}{6}$  as long as 17 + 18. The joint 15 has distally on the upper side a small spine. The joints 17 and 18 do not unite. The joint 18 carries a comb of large and coarse ridges, the joint 19 along its entire length very fine and close ridges.

*The 5th pair of legs* closely resembling that of *C. varicans*.

### **Candacia inermis**, n.sp.

**Diagn. of the female.**—Terminal setæ of the third pair of legs much shorter than the distal part of Re 3. Proximal part of the antennæ 7-jointed. Last thoracic segment rounded. Fifth pair of legs ends in three teeth of which the distal is the longest; there is, besides, somewhat proximal from the middle, another tooth. Length 3,3 millim.

*Male* unknown.



**Description of the female.**—*Body, anterior part* 2,5 millim. in length, 1 millim. in breadth, *posterior part* 0,75. The last thoracic segment with rounded ends. Abdomen symmetrical. Genital segment symmetrical as long as broad and longer than the second and third together. Furcal branches somewhat longer than broad. Se and the four terminal setæ of equal length, three times longer than the Si.

*Anterior antennæ* do not reach to the end of the furca, 24-jointed, its proximal part 7-jointed. Length of the joints in 0,01 millim.

Aa	...	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
0,01 m.m.		27	9	9	9	9	9	6	8	7	8	11	12	17	19	18
		17	18	19	20	21	22	23	24-5							
		17	17	14	14	10	7	11	18							

*Posterior antennæ.* Ri  $1\frac{1}{2}$  times longer than Re + B1, three times longer than broad.

*Mandible* as in the other species, the masticatory apparatus with one strong exterior tooth, by a gap separate from two smaller ones.

*Maxilla.* Li2 reaches only slightly beyond the Ri, which carries 1 + 2 + 2 S. Re with 6 longer plumose setæ.

*Anterior maxilliped.* B1  $1\frac{1}{2}$  times longer than B2. L1 with 3S. L3 and 4 each with 2S, one strong and one small. B2 with 2 falciform strong spines of about equal length and breadth inserted at some distance from each other. The falciform spine of Ri only slightly longer than those of B2.

*Natatory legs.* B1 of the 1st pair with a short Si, B2 with a Si as long as the Ri; distal part of Re 3 twice as long as the proximal. Re 3 of the third pair  $1\frac{1}{2}$  times longer than Re 1 + 2, its distal part half as long as the joint, its edge coarsely denticulated proximally, but finely serrate distally. Terminal seta falciform, not half as long as the distal part of the joint. Fourth pair, as usually, without Si.

*Fifth pair of legs.* B1 + B2 as long as Ri. The latter with a tooth in the middle of the exterior edge and 3 teeth at the end, the distal one the longest. There are no Si.

### **Euchæta affinis, C:e, n.sp.**

The only female of this species, which belongs to the group of *E. norvegica*, measured in length 6,3 millim. (anterior part 4,5, posterior part 1,8 millim.). The frontal organs occurred on a moderate elevation not protracted into a conical projection. The corners of the last thoracic segment carried a tuft of hairs, but were not provided with an apiculus. The abdomen was naked, and its first segment carried in the middle the strongly projecting genital opening, enclosed

between dissimilar plates. There was no elevated ridge in front of the genital opening. The 1st pair of natatory legs had a two-jointed Re, Re 1 and 2 uniting into one single joint with concave exterior margin, which carried in its distal end a Se as long as Re 3. The sinus between the Se 2 and Se 3 of the Re 3 of the 2nd pair of legs was larger and deeper than that between Se 1 and Se 2 of the same joint. The Se of Re 2 of the 2nd pair reached to the basis of Se 1 of Re 3, was much larger than Se 1 of Re 3, and as long as Se 3 of that joint.

### **Lucicutia aurita, C:e, n.sp.**

**Diagn. of the Female.** Length of the body 8 millim. The head broad, on each side with a short triangular spine. Anterior antennæ reach to the end of the furca. St of the 1st pair of legs as long as Re 3. St of the 5th pair of legs much shorter than Re 3. Si 2 of the same pair of ordinary form, not thicker than the cther.

**Description of the Female.—Body.** Anterior part 4,5, posterior part 3,5 millim. in length. Its form is oblong, only slightly broader in the middle than at the ends,  $3\frac{1}{3}$  as long as broad. Head broad in the front, on each side with a short but broad spine. Abdomen 4-jointed, its genital segment as long as the two following together, which are of equal length. Anal segment as long as the preceding. Furca as long as the three first abdominal segments together. Se nearly in the middle.

*Anterior antennæ* reach to the end of the furca, 25-jointed. Length of the joints in 0,005 millim.

Aa	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	6	6	10	6	6	6	7	7	11	12,5	12,5	20	25	27,5	27,5
				17	18	19	20	21	22	23	24	25			
				26	27	30	25	21	21	20	21	9			

*Posterior antennæ.* B 1 with one Si as long as B 2. B 2 twice as long as broad, with one Si. Re as long as Ri, 8-jointed. Re 8 with one plumose Si, inserted at the basis of the 3 terminal ones and much shorter than them. Ri 1 nearly 4 times longer than broad; its two Si inserted nearer to the distal than the proximal end; the exterior margin of the joint hairy of stiff, small bristles. Ri 2 + 3, half as long as Ri 1; Le with 5 long plumose S and 1 Si. Li with 5 long and 3 short S. The Le carries some small bristles.

*Mandible* elongate; B with 3 plumose Si, reaching to Ri. Re somewhat longer than Ri, 3 times longer than broad. Ri, 3-jointed; joints of equal length. Ri 1 and 3 outside with some small stiff bristles. Re carries 6 plumose S and Ri 1 four, Ri 3 2 + 8 long plumose S. The masticatory apparatus was not examined.

*Maxilla.* Similar to that of *L. flavicornis* (Giesb. F. Neap. P. XIX., f. 9); Le 1 with 5 long plumose Si; Re twice as long as broad and with 5 thinner and 6 coarser, plumose S.—Ri with 5 + 4, plumose S. B2 with 3 S.—Li 3 cylindrical with a small spine on its exterior end and 3 plumose long S. Li 2 also cylindrical and with 3 plumose S. Li 1 twice as long as broad, with strong, almost straight, sparingly hairy spines.

*First maxilliped* similar to that of *L. flavicornis* (Giesb. F. Neap. P. XIX., f. 11).

*Posterior maxilliped.* B2,  $1\frac{1}{2}$  times longer than B1 and as long as Ri, with 5 plumose S, of which S4 is somewhat shorter than S1—3 and S5, which latter is the longest, but shorter than the joint. Of the 5 joints of the Ri the 2nd is the longest, all joints naked on the inside.

*Natator, legs of the 1st-4th pairs.* Re and Ri of all pairs 3-jointed. B1 with straight margins, of the 2nd-4th pairs with a short plumose Si. B2 with convex interior margins; it carries on the 1st pair a short cylindrical processus, from which issues a Si, and at its basis some stiff hairs. Ri of the 1st pair at a higher level than Re; but on the other pairs at the same level. Ri of all pairs reach to the distal margin of Re 2.

Proportional length of the 3 joints of Re and St.

	1p.	2p.	3p.	4p.
Re 1	10	10	10	10
Re 2	7	9	10	9
Re 3	12	25	25	25
St.	15	15	15	12,5

Se of Re 1,1,2 on the first pair, 1,1,3 on the other, longer on the 1st pair than on the other. St of all pairs with finely serrate edges (about 18 teeth in 0,01millim.), Si 1,1,4 on the first 1,1,5 on the other pairs. Re 1 and Re 2 hairy on the inside. The Se of the 2nd-4th pairs are enclosed between a pair of spinules.

The three joints of Ri of equal length. Ri 2 ends on all pairs in a small spinule. Se 0,0,1, Si 1,2,4 on the first 1,2,5 on the other pairs. Exterior margin of Ri 1 and Ri 2 of the 2nd-4th pairs hairy.

*Fifth pair of legs.*—B1 without Si. Re and Ri 3 jointed. Re more than twice as long as Ri; Se 1,1,2; Si shorter than Re 3; Si 0,1,3, of equal thickness. The 3 joints of Ri of equal length; Se 0,0,1; Si 1,1,4. Interior margin of Re 1 and Re 2 and the exterior margin of Ri 1 and Ri 2 hairy.

**Lucicutia bradyana**, C:e, n.sp.

**Diagn. of the female.**—Anterior antennæ reach to the end of the furca. Ri of the 1st pair of legs 3-jointed. St of the 1st pair of legs nearly as long as Re 3, St of Re of the fifth pair of legs shorter than Re 3. Si of the Re 2 of the 5th pair of legs a stout spine as long as Re 3. Length 5,7 millim.

**Diagn. of the male.**—St of Re 3 of the 1st pair of legs nearly as long as Re 3. Ri 2 & 3 of the right leg of the fifth pair loaf-like, with 6S. B2 of the left leg on the interior margin produced into a short spine. Length 5,5 millim.

Brady (Rep. Challenger VIII. 1. p. 50 P. XV., f. 1-9, 16 1883) has identified a copepod, found by the Challenger Expedition, with *Leuchartia flavicornis* of Claus. This, however, cannot be correct as the differences, especially as concerns the size, are too considerable. One female which I found in the gathering off Port Shepstone, 900m., seems to me to agree sufficiently with Brady's species. I found in the same sample one specimen of a male of about the same size as the female, and believe they belong to the same species. There are between the male of my form and of Brady's serious differences, which make the identification somewhat doubtful. The right leg of the fifth pair carries on the Ri 4 setæ in Brady's form, but 6 in my specimen. This may perhaps be accounted for by the supposition that Brady's specimen had lost two setæ. The other difference is in the B2 of the left legs of the fifth pair. It was on my specimen produced into a spine, but in Brady's specimen into a denticulated processus. The difference depends perhaps on the age.

The *Lucicutia grandis*, Giesbrecht, is doubtless very closely allied to both Brady's and my form. The male only is known and differs principally in the B2 of the fifth pair of legs.

The variation in the forms of the group of *L. clausii* is, according to Giesbrecht, considerable, and it therefore seems very probable that *Leuckartia flavicornis*, Brady (von Claus), *Lucicutia grandis*, Giesb., and *Lucicutia bradyana* C:e represent only variations in one and the same species.

**Description of the female.** *Body* in length 5,7 millim (anterior part 3,5, posterior part 2,2 millim),  $3\frac{1}{2}$  times longer than broad (greatest breadth in the middle of the anterior part). Head broad, on each side with a slight angular prominence.—Abdomen 4-jointed, genital segment as long as the two following together, and as long as the inflated abdominal segment. Furca at least 5 times longer than broad, and as long as the two last segments together. The furca has two Se, one very small near the anal segment and another in the middle, reaching to the end of the furca.

*Anterior antennæ* reach to the end of the furca, 25-jointed. Length of the joints in 0,005 millim.

Aa	2	3	4	5	6	7	8	9	10	11	12	13
	6	7	6	6,5	6,5	6	8	7	7	9	9	15
14	15	16	17	18	19	20	21	22	23	24	25	
18	18	20,5	20,5	23,5	23,5	18	18	15	18	18	9	

*Posterior antennæ.* B1 with 1 Si; B2 twice as long as broad with 1 Si. Re as long as Ri and 8-jointed; Ri 1 three times longer than broad, naked on the outside. Re 2 + 3  $\frac{2}{3}$  as long as Re 1. The outside of Le carries some small bristles. Else as in *L. aurita*.

*Mandible.* Re  $1\frac{1}{4}$  times longer than Ri. Ri 3 carries in its top a row of small stiff hairs. Else as in *L. aurita*. The masticatory apparatus carries four strong, almost straight teeth and towards the interior side five smaller ones.

*Maxilla* similar to the maxilla of *L. aurita*.

*Anterior maxilliped* as in *L. aurita*.

*Posterior maxilliped.* B2 with 4 Si, of which Si 1 and 3 are slightly shorter than the other. Interior margin of B2 with a row of small stiff hairs. Ri 1,2 och 3 with a row of stiff hairs at the basis of the setæ. Else as in *L. aurita*.

*Natatory legs of the 1-4th pairs.* Ri on a slightly higher level than Re. B 1 and 2 of the first pair hairy on the interior margin. Proportional length of the joints of Re and St.

		1 p.	2 p.	3 p.	4 p.
Re 1	..	10	10	10	10
Re 2	...	7	7,5	9	7,5
Re 3	...	17	20	25	20
St	...	15	10	—	10

Else as in *L. aurita*.

*Fifth pair of legs.*—Re and Ri 3-jointed. Re more than twice as long as Ri. St shorter than Re 3. Se 1,1,2. Si 0,1,3; Si 2 a strong thick spine, as long as Re 3. Of the three joints of Ri the Ri 3 is the shortest. Ri 2 ends in a small spine. Se 0,0,1. Si 1,1,4. Outside margin of Ri 1 and Ri 2 hairy.

**Description of the male.**—Body in length 5,2 millim. (anterior part 3, posterior part 2,2 millim.), nearly 4 times longer than broad. Abdomen 5-jointed; anal segment  $1\frac{1}{2}$  times longer than the preceding. Furca about six times longer than broad and as long as the three last segments together, with a small Se near the anal segment and a longer one in the middle.

*Anterior antennæ* reach to the end of the furca (the distal part of the prehensile antennæ was lost in my specimen). The right antenna 25-jointed. Length of the joints in 0,005 millim.

2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3,5	4,5	7,5	7,5	6	6	6	6	6	9	9	14	14	18	18	18	18	20	16
21	22	23	24	25														
16	15	15	15	9														

*Posterior antennæ* as in the female.

*Mandible.* Ri 2 and 3 uniting, else as in the female.

*Maxilla* as in the female.

*First maxilliped* as in the female.

*Second maxilliped.*—B1 somewhat shorter than B2. Ri as long as B2. Else as in the female.

*Natatory legs of the 1-4th pairs.*—Proportional length of the three joints of Re and Si :—

		1 p.	2 p.	3 p.	4 p.
Re 1	...	10	10	10	10
Re 2	...	7	7	10	10
Re 3	...	15	18	20	20
St	...	13	8	10	8

Else as in the female.

*Fifth pair of legs* similar to that of *L. grandis* and *L. clausii*. Ri of the right leg loaf-like, with 6 setæ. The margin and the flat side with patches of small stiff hairs. B2 of the left leg protracted inside into a spine-like processus.

### **Scolecithricella neptuni**, C:e, n.sp.

**Diagn. of the female.** Head without crista, anterior antennæ 22-jointed. Teeth of the masticatory apparatus of the mandible with close long and stiff hairs. Spinules on the natatory legs few and delicate. Fifth pair of legs 3-jointed, the third joint ending in three triangular spines, two articulating and with some few spinules, one hairy. Length 1,4 millim.

**Diagn. of the male.** Head without crista. Anterior antennæ 23-jointed. Masticatory apparatus and natatory legs as in the female. Fifth pair of legs : left and right leg of equal length, so also the B1 ; B2 of both legs of about the same thickness throughout. The right leg with rudimentary Ri and a falciform Re  $\frac{3}{4}$  as long as B2. The left leg with a long curved Ri and a short 3-jointed Re. Length 1,2 millim.

**Description of the female.**—Body in length 1,4 millim. (anterior part 1,1, posterior part 0,3 millim.), clumsy, its anterior part being highly vaulted, 5-jointed (length of the joints 0,5 ; 0,18 ; 0,15 ; 0,12 ; 0,13 millim.). Abdomen short, the genital segment as long as the three following together. Furca slightly longer than broad.

*Anterior antennæ* reach to the last thoracic segment, 22-jointed, Aa 8-10 and 24-25 uniting. Length of the joints in 0,005 millim.

Aa.	2	3	4	5	6	7	8-10	11	12	13	14	15	16	17	18	19	20	21
	3	1	1	1	1	1	4,5	1	1	1,5	1,5	1,5	1,5	1,5	1,5	1	1	1
	22	23	24-25															
	1,5	2	4,5															

*Posterior antennæ.* B 2 with 1 S; Re twice as long as Ri and thicker than it. Re 2 twice as long as Re 1 and Re 1+2 as long as the last joint. Ri 1 twice as long as Ri 2+3 and three times longer than broad. The Si reaches to the end of Ri 2+3. The Ri 2+3 twice as long as broad. Le with 5+1 setæ, Li with 5+3 setæ. Exterior margin of the joint hairy.

*Mandible* elongate; Re inserted in the middle of B2, which carries 1 Si reaching to the end of Ri, Re longer and broader than Ri. Teeth of the masticatory apparatus, especially the interior ones, covered with dense long and stiff hairs, giving it the appearance of a brush.

*First maxilliped* stout with the lobes crowded distally. L1 with 3 long spiniferous and 1 somewhat shorter hairy seta. L2 and 3 with 2 longer and 1 shorter seta. L4 with 1 stout falciform and 1 thinner seta. B2 carries 1 very strong falciform seta, 1 thinner but of nearly the same length, and a third somewhat shorter and much thinner seta. The setæ of Ri are all soft and flexible.

*Second maxilliped.* B1 and B2 of about equal length; Ri  $\frac{3}{4}$  as long as B2. B1 with 1+2+1+2+3 setæ, B2 with 3+2 setæ; of the first group the distal is the longest and the median the shortest. Ri 5-jointed, Ri 2 the longest and Ri 5 the shortest. Ri 1 carries 4 setæ.

*Natatory legs.* In my specimen the 3rd and 4th pair were lost. B2 of the 1st pair with 1 plumose Si. Re 1,2 and 3 of about equal length, Se 1,1,1 longer than the joints, narrow and with stiff hairs. St similar to the Si. Si 0,1,3, jointed in the middle. Ri reaching to the middle of Re 2, with a lobus on the exterior side and 2+3 Si, the 3 latter being jointed in the middle. B1 of the 2nd pair with 1 plumose Si. Ri reaches to the distal margin of Re 2. Proportional length of the three joints of Re and St 10:12:18:18. Se 1,1,3. Se 1 comparatively short, the other as long as the joints are broad. Si 1,1,4. Ri 2 nearly three times as long as Ri 1; Se 0,1; Si 1,4. The flat side of Ri carries near the Si a group of some few very delicate spinules.

*Fifth pair of legs* symmetrical, 3-jointed; the third joint, three times longer than the other together, carries in its top 3 strong triangular teeth, the two exterior not articulating and with some few spinules, the third articulating and hairy.

**Description of the male.** Body in length 1,2 millim. (anterior part 0,8, posterior part 0,35 millim.). Anterior part 7-jointed. Abdomen 5-jointed; the anal segment very short, the other of about equal length and breadth. Furca scarcely longer than broad. The longest furcal setæ as long as the abdomen.

*Anterior antennæ* reach slightly beyond the last thoracic segment, 23-jointed or 21-jointed, the Aa 8-10 uniting in younger specimens.

*Posterior antennæ and the mandible* as in the female.

*Maxilla.* Le 1 with 1 shorter and 6 longer plumose setæ. Li as prominent as Ri, with about 7 nearly straight hairy coarser setæ and several finer ones. Li 2 with 2 strong and longer setæ, 1 shorter seta. Li 3 with 1 + 4 setæ. Re is a slight protuberance with 4 comparatively short setæ. Ri 3-jointed, with 2, 2, 4 + 1 setæ.

*First and second maxilliped* as in the female.

*Natatory legs* of the 1-4th pair. Re 3-jointed; Ri of the 1st p. 1-jointed, of the 2nd 2-jointed, of the 3rd and 4th 3-jointed. B 1 of the 1st pair without Si, of the 2nd-4th with a short Si. B 2 of the 1st pair with 1 Si. Ri of the 1st and 2nd pair reach to the distal margin of Re 2, beyond it in the 3rd and 4th pairs. Se of Re of the 1st pair 1, 1, 1, more than twice as long as the joints, on the other pairs 1, 1, 3, short and triangular. St of the 1st pair bristle-like, of the other pairs straight and knife-like, in the 2nd and 3rd pairs longer, in the 4th pair shorter than Re 3; their edge rather coarsely serrate (teeth about 4 in 0,01 millim.). Si of the 1st pair 0, 1, 3; of the others 1, 1, 4. Ri of the 1st pair with 5 setæ. Se of the 2nd pair 0, 1, of the 3rd and 4th 0, 0, 1, but their Ri 2 ends in a small apiculus. Si of the 2nd pair 1, 4, of the 3rd and 4th pairs 1, 1, 4. Small, delicate spinules on the flat side of the legs occur in the 2nd pair on Ri 2 (a set of 3-4 near the distal and proximal part) and on the distal part of Re 3, in the 3rd pair in the distal part of Ri 3 (a row of 6 small bristles) and on the distal part of Re 3, on the 4th pair in Ri 3 and at the distal margin of Re 2.

*Fifth pair of legs* nearly as long as the anterior part of the body, the right and left leg of equal length. B1 of both legs of equal length. B2 of the left leg slightly shorter than of the right one, both of about equal breadth throughout. The B2 of the right leg carries near its distal end a small tubercle (rudimentary Ri) and in the end a falciform Re,  $\frac{3}{4}$  as long as B2. The B2 of the left leg carries a curved Ri, longer than B2, and a 3-jointed Re, half as long as B2.



The species in question differs in so many important characteristics, especially in the 5th pairs of legs and the masticatory apparatus, from the type-species that I am inclined to form for it a new genus, for which I should like to propose the name *Pseudoscolecithrix*.

### **Xanthocalanus fragilis**, Aurivillius.

*Giesbrecht* has described from the Mediterranean two species of this genus, viz., *X. agilis* and *X. minor*, which, according to *G. O. Sars*, however do not represent more than one species, *X. minor* being founded on young specimens. *Aurivillius* added in 1898 two other species, *X. fragilis* and *X. simplex*. In 1900 *G. O. Sars* described from the Polar Basin a form found by *Nansen* and named *X. borealis*. So far I can see there is no essential difference between *X. fragilis* and *X. borealis*. The same form was found by *T. Scott* at Shetland, and the specimens I found in the South African Seas are evidently of the same kind, their fifth pair of legs being 2-jointed. Later Professor *G. O. Sars* describes more fully in the Crustacea of Norway Calanoida, *X. borealis*, which, in full-grown specimens, has 3-jointed 5th pair of legs with 4, not 3 terminal spines. Besides, the right leg of the 5th pairs of the male is rudimentary or wanting. In the species of *Aurivillius* the right leg is nearly as long as the left one. It seems to me possible that two nearly allied species have been confounded. In all cases the specimens from South Africa did not differ essentially from the description of *Aurivillius*. All my specimens were females, in length 2,9 millim. (Norwegian specimens 3,50 millim, from the Polar Basin 4 millim, according to *G. O. Sars*; *Aurivillius* gives no measures for the female, but for the male 2,5 millim).

*I. C. Thompson* has described under the name of *X. giesbrechti* (*Ann. Mag. Nat. Hist.* [7] XII. p. 22, P. IV., f. 1-9, 1903) another apparently very nearly allied form, found west of Ireland in a haul from 2580 m. In case the illustration be correct one cannot identify it with *X. fragilis* as the anterior antennæ reach beyond the furca, but in *X. fragilis* scarcely beyond the genital segment.

There were in the collections I have received still some few new species, in parts belonging to new genera, but the rare specimens I have hitherto found were too incomplete for a full description.

## EXPLANATION OF PLATES.

## PLATE I.

- Fig. 1. *Candacia chirura*, Cleve, ♀ abdomen lateral (× 40).  
 " 2. " " " ♀ furca (two of the exterior setæ broken. In all other specimens the three remaining setæ were also broken, which gave the furca the appearance of a hand. Therefore the name), (× 85).  
 " 3. *Candacia chirura*, Cleve, ♂ abdomen dorsal (× 70).  
 " 4. " " " ♂ furca (× 170).  
 " 5. " " " ♂ prehensile antenna (distal part) (× 170).  
 " 6. " " " ♂ 5th pair of legs (× 170).

## PLATE II.

- " 7. *Candacia chirura*, Cleve, ♀ leg of the 5th pair (× 170).  
 " 8. " " " ♀ leg of the 3rd pair (× 85).  
 " 9. " " " ♀ mandible (× 85).  
 " 10. " " " ♀ maxilliped of the 1st pair (× 85).  
 " 11. *Candacia inermis*, Cleve, ♀ abdomen ventral (× 40).  
 " 12. " " " maxilliped of the 1st pair (× 40).  
 " 13. " " " masticatory apparatus (× 170).

## PLATE III.

- " 14. *Candacia inermis*, Cleve, proximal part of the 1st antenna (× 85).  
 " 15. " " " leg of the 5th pair (× 85).  
 " 16. " " " leg of the 3rd pair (× 85).  
 " 17. *Euchæta affinis*, Cleve, ♀ genital segment (× 40).  
 " 18. " " " *Re* 3 of the 2nd pair of natatory legs (× 85).  
 " 19. " " " leg of the 1st pair (× 85).

## PLATE IV.

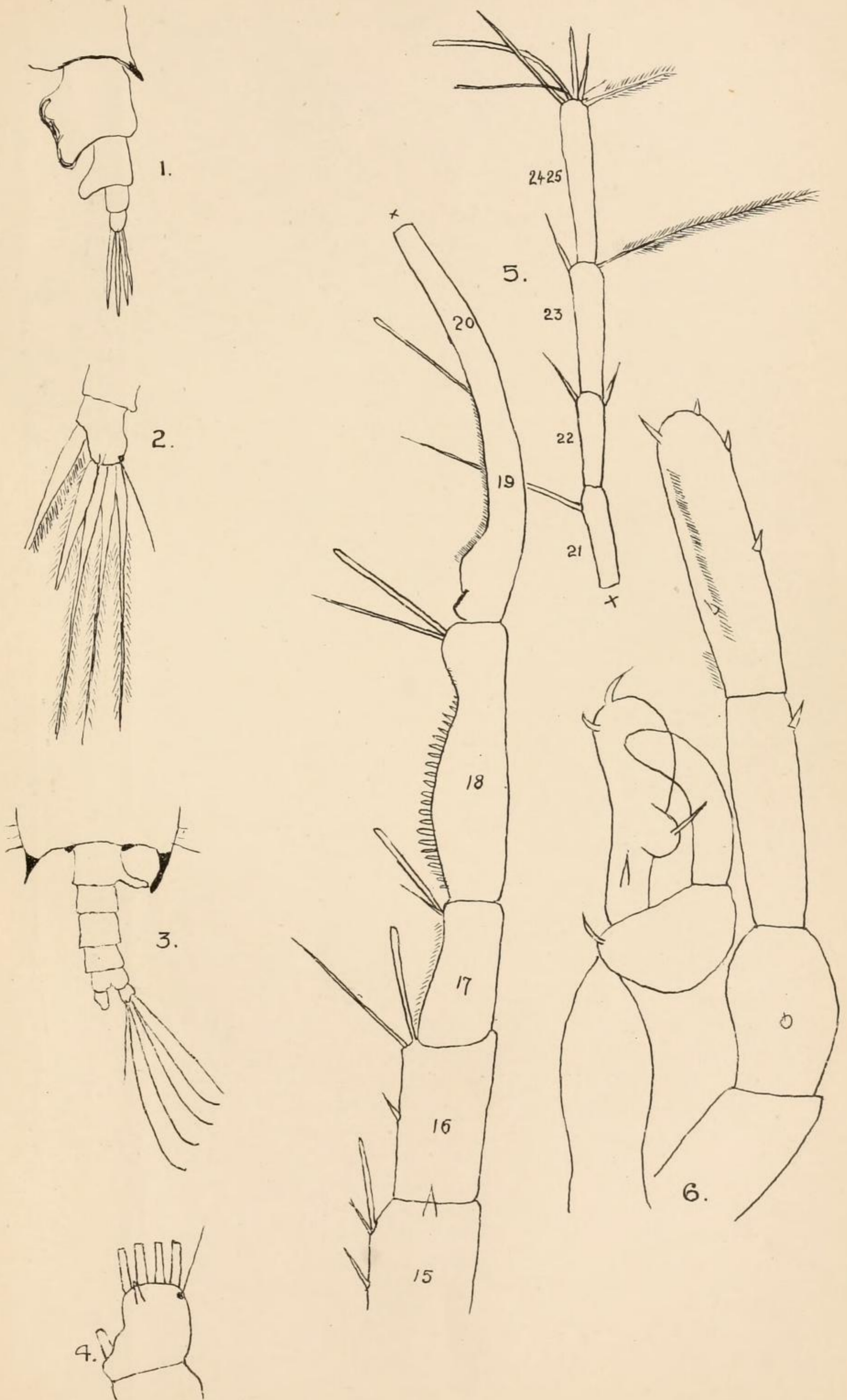
- " 20. *Scolecithricella neptuni*, Cleve, ♂ lateral (× 40).  
 " 21. " " " ♀ antenna of the 1st pair (× 170).  
 " 22. " " " ♀ antenna of the 2nd pair (× 170).  
 " 23. " " " ♀ mandible (× 170).  
 " 24. " " " ♂ maxilla (× 300).  
 (Two setæ of *Li* 3 broken.)

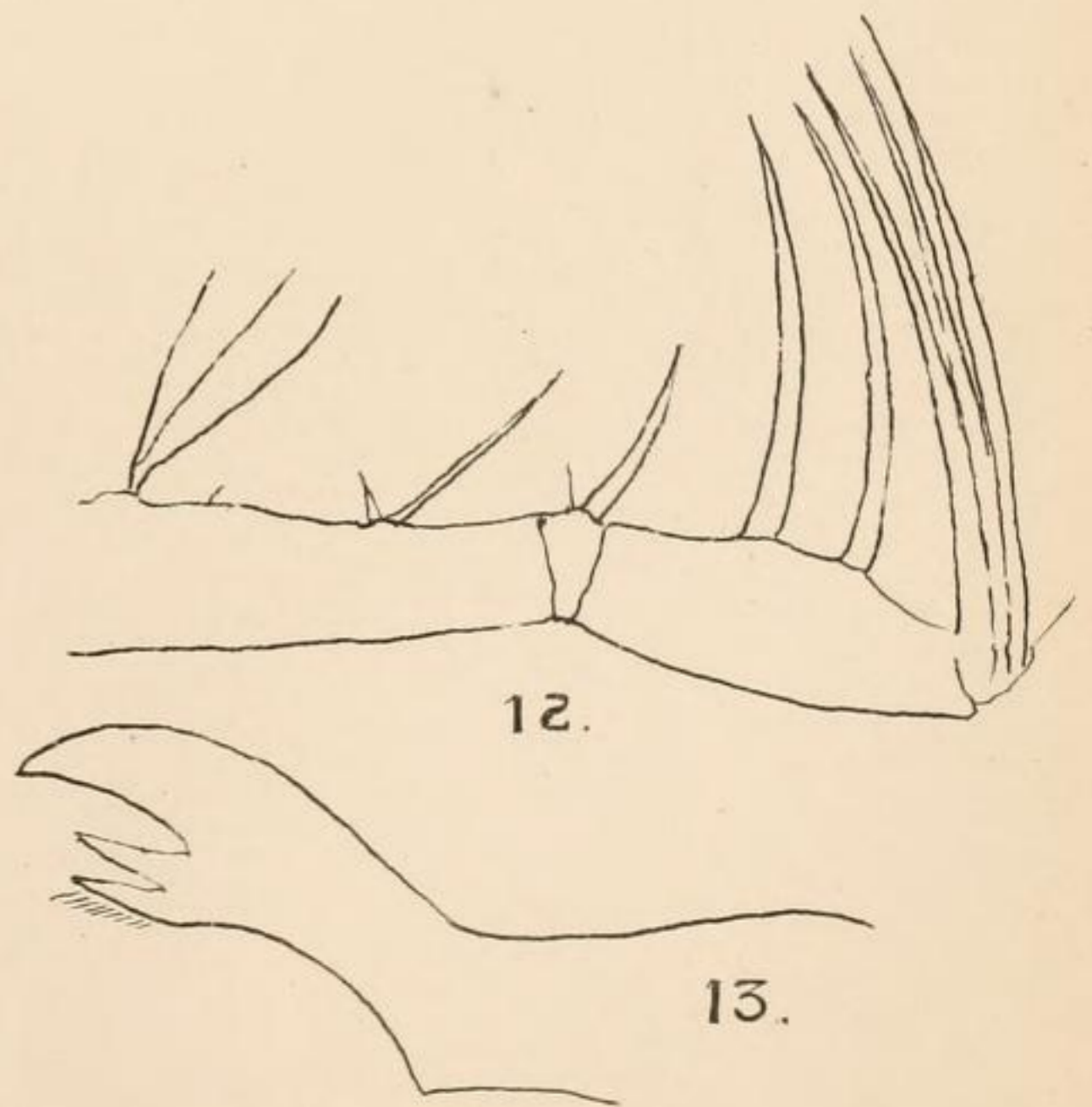
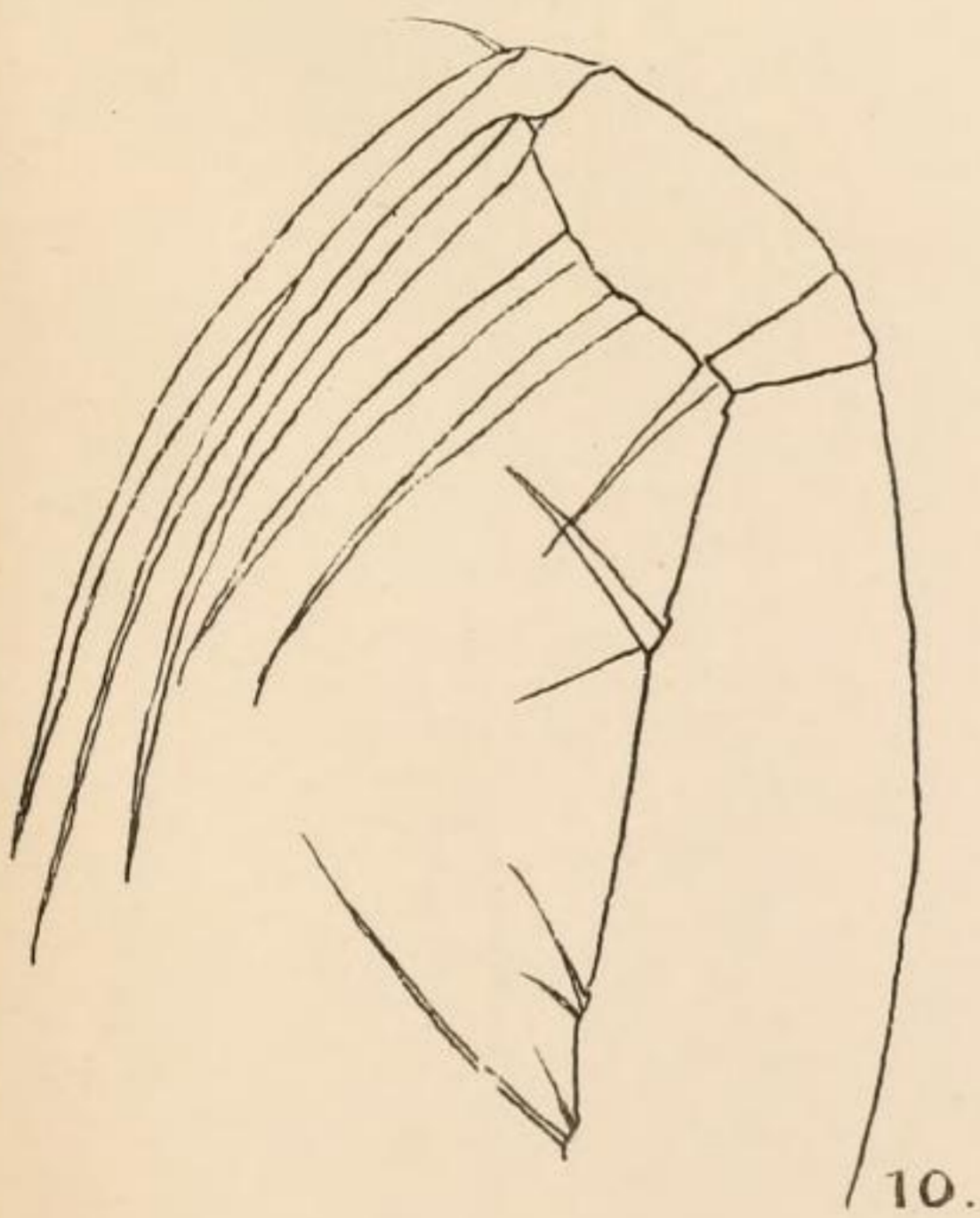
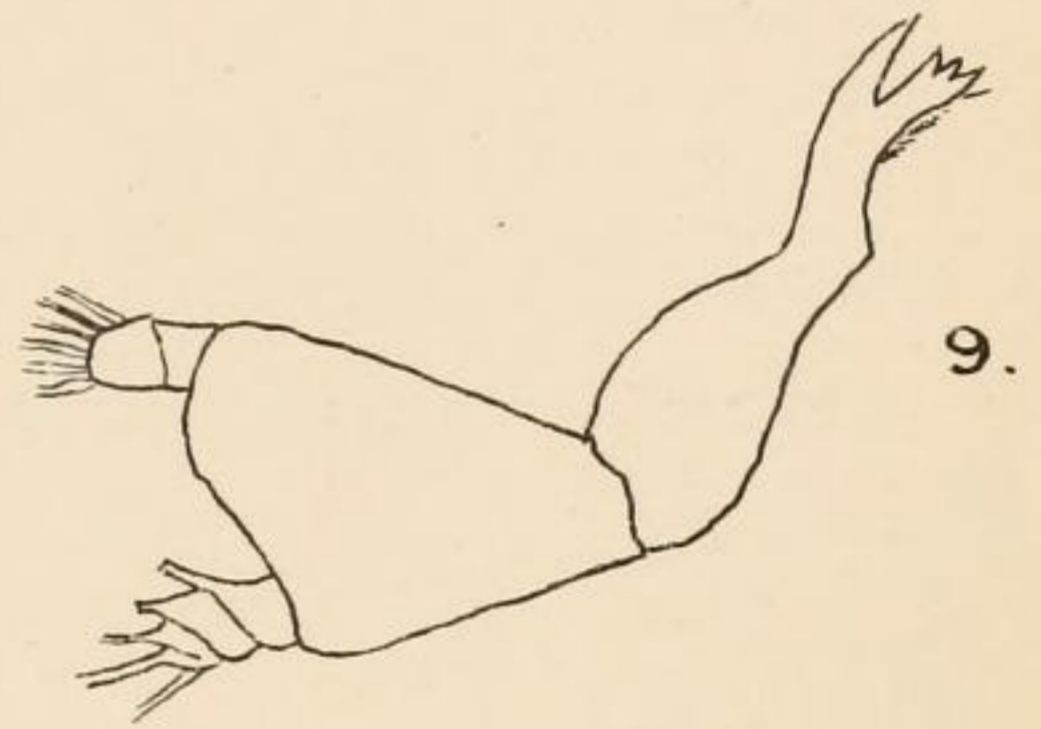
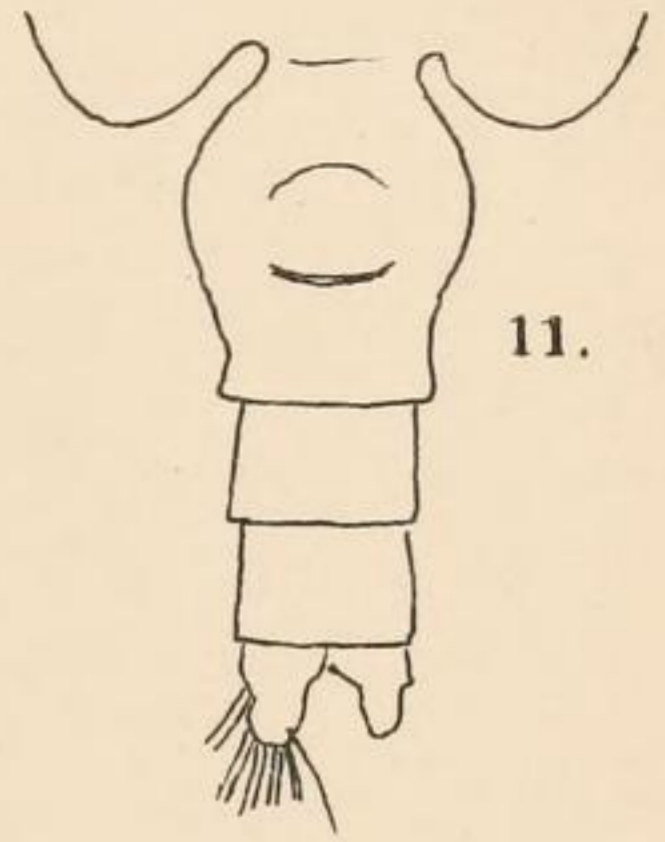
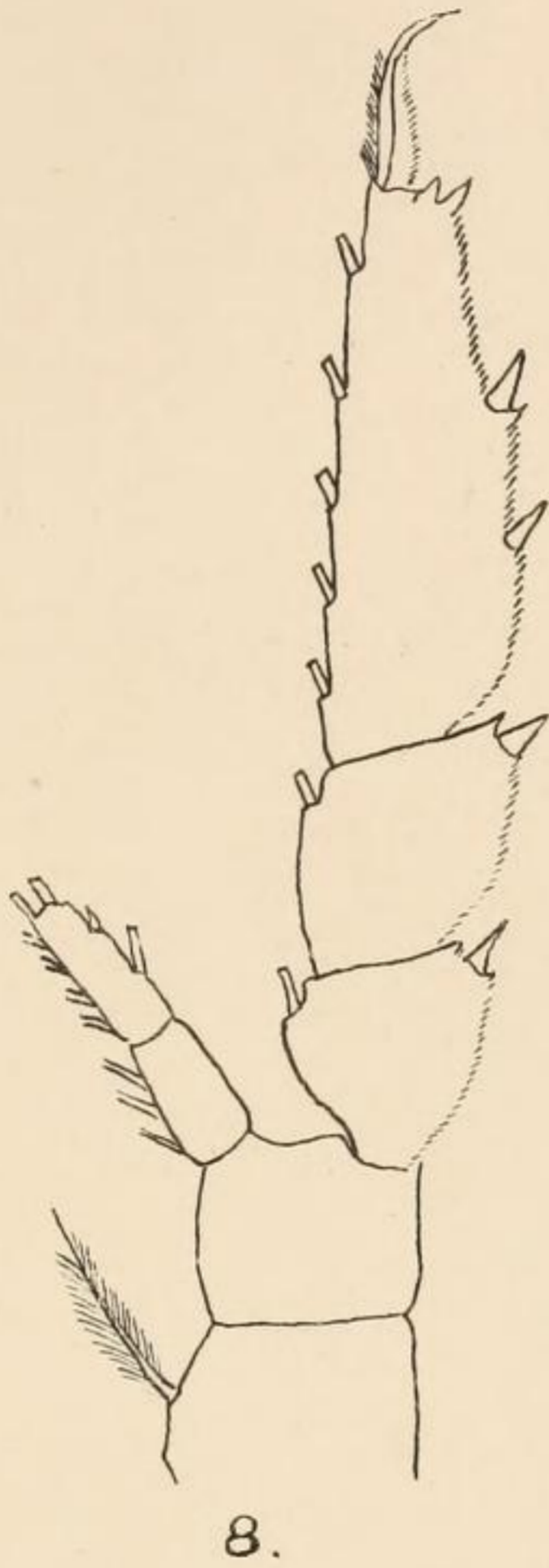
## PLATE V.

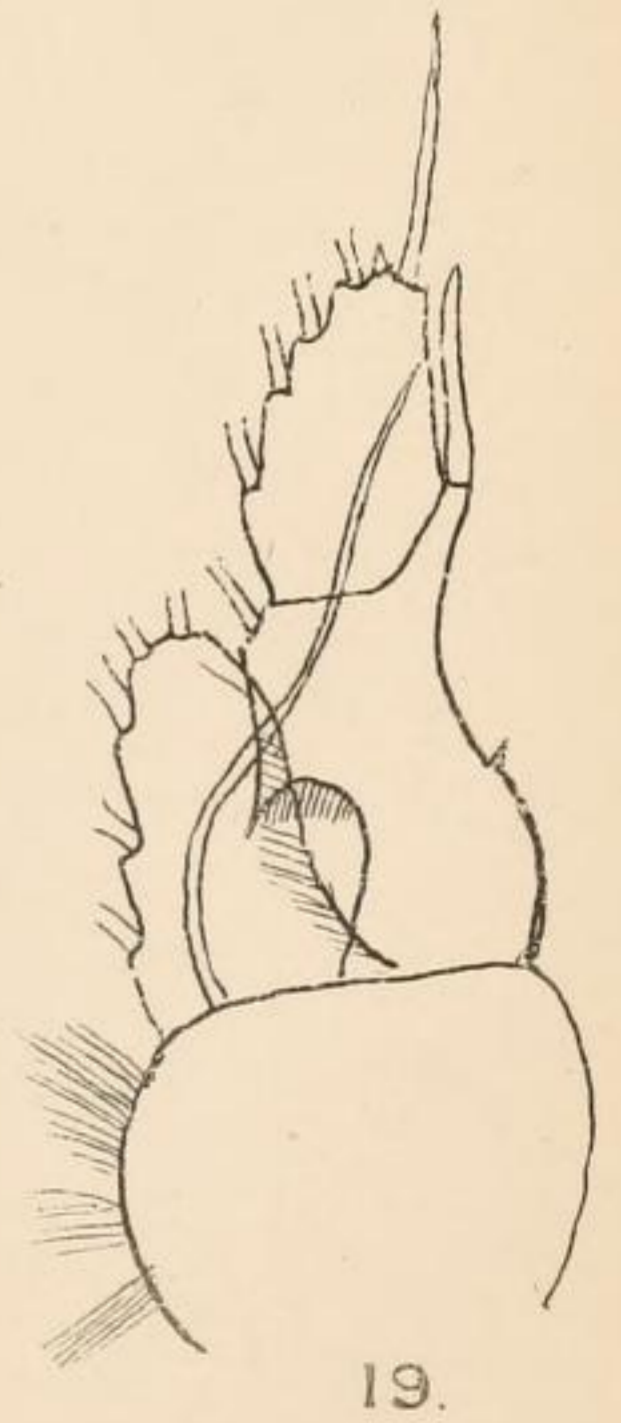
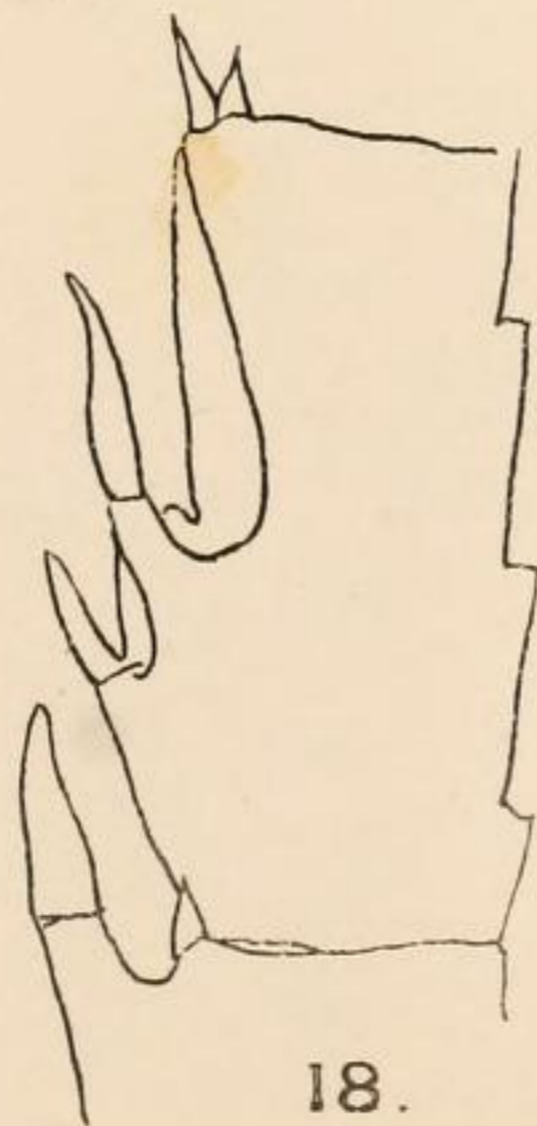
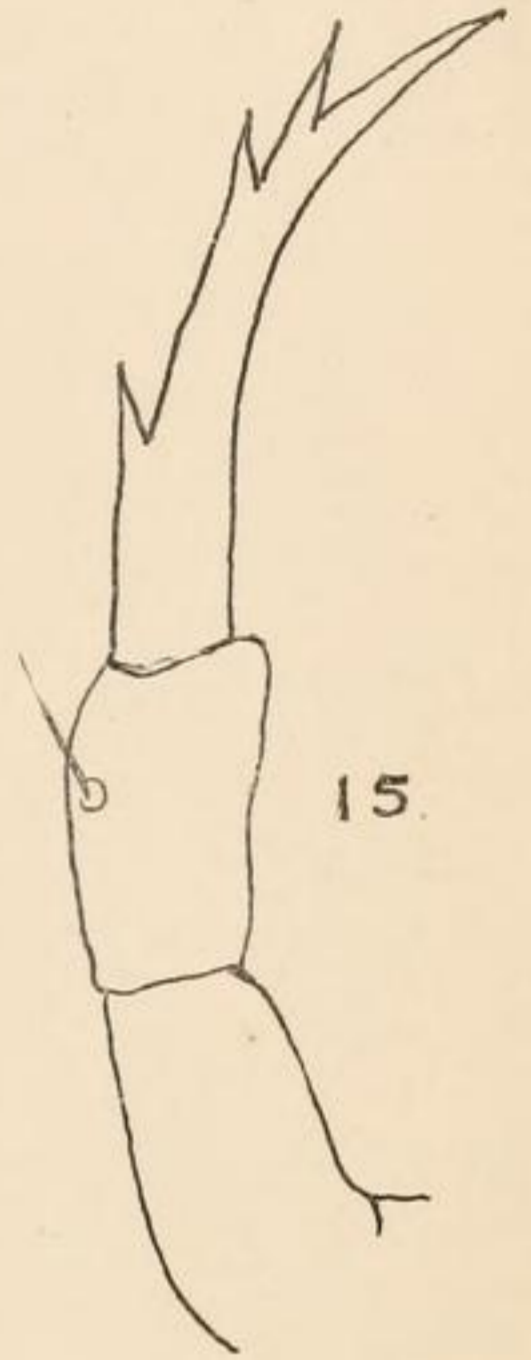
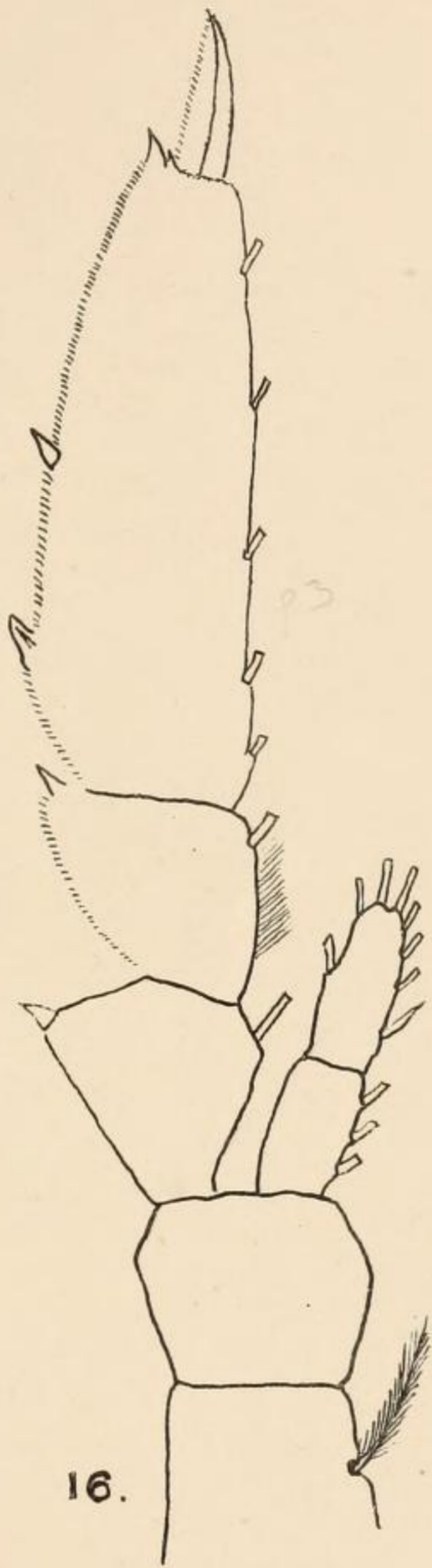
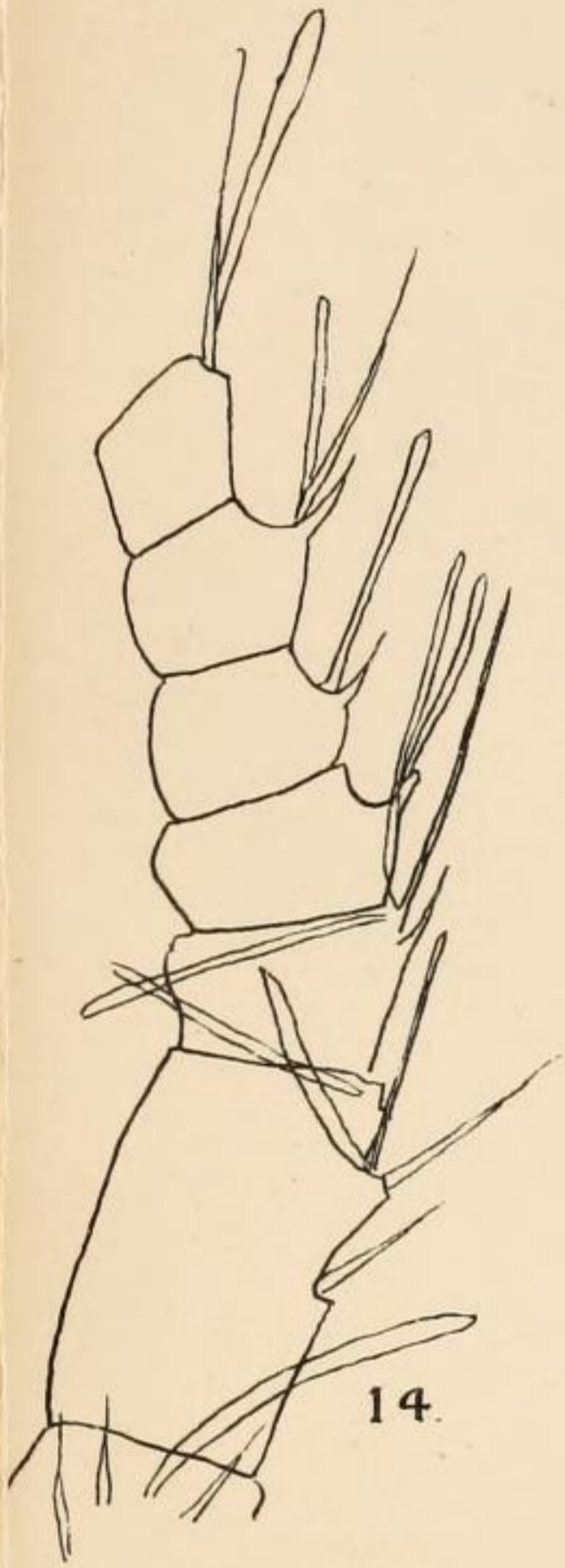
- " 25. *Scolecithricella neptuni*, Cleve, ♀ 1st maxilliped (× 300).  
 " 26. " " " ♀ 2nd maxilliped (× 300).  
 " 27. " " " ♀ leg of the 1st pair (× 170).  
 " 28. " " " ♀ leg of the 2nd pair (× 170).  
 " 29. " " " ♂ leg of the 3rd pair (× 170).

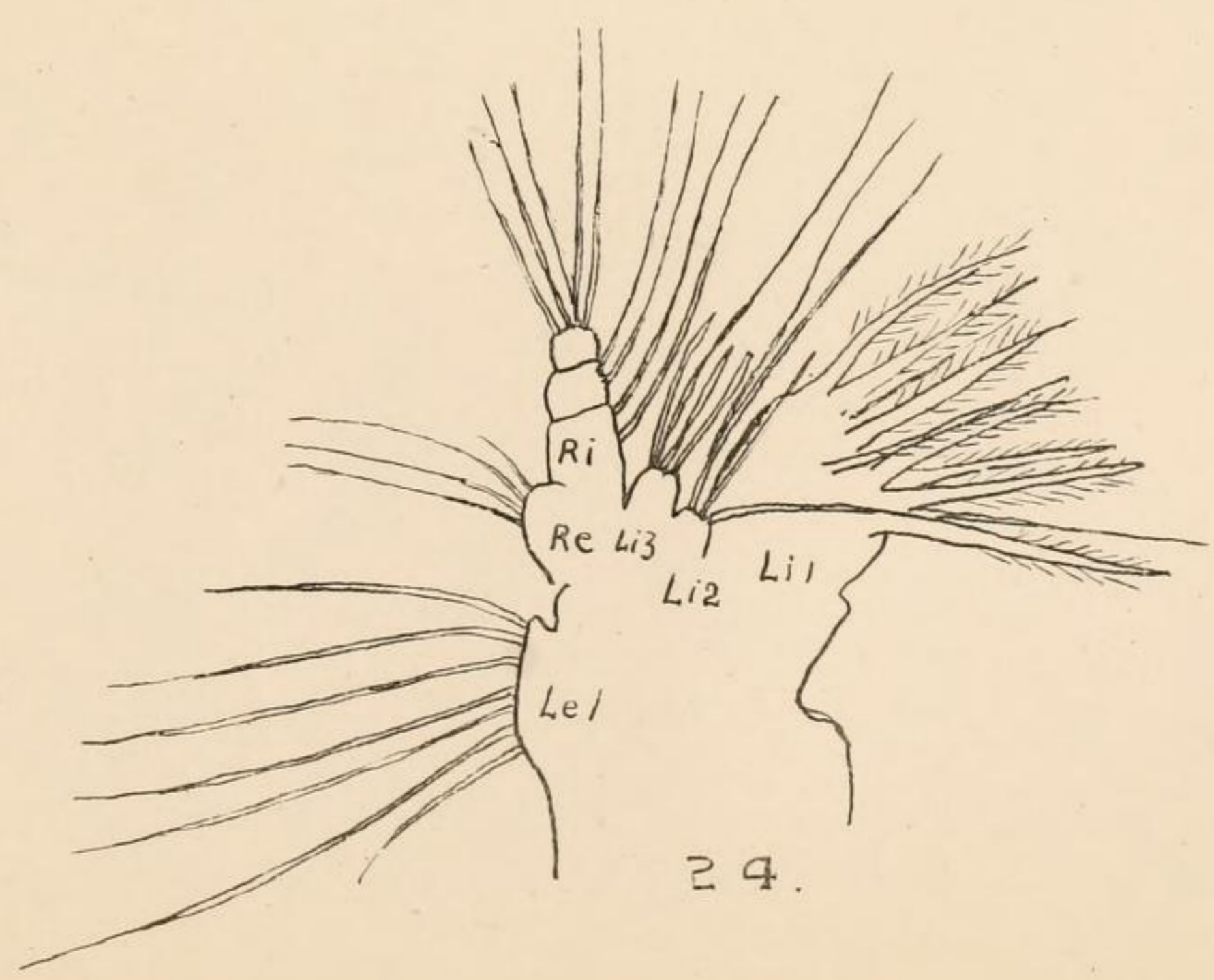
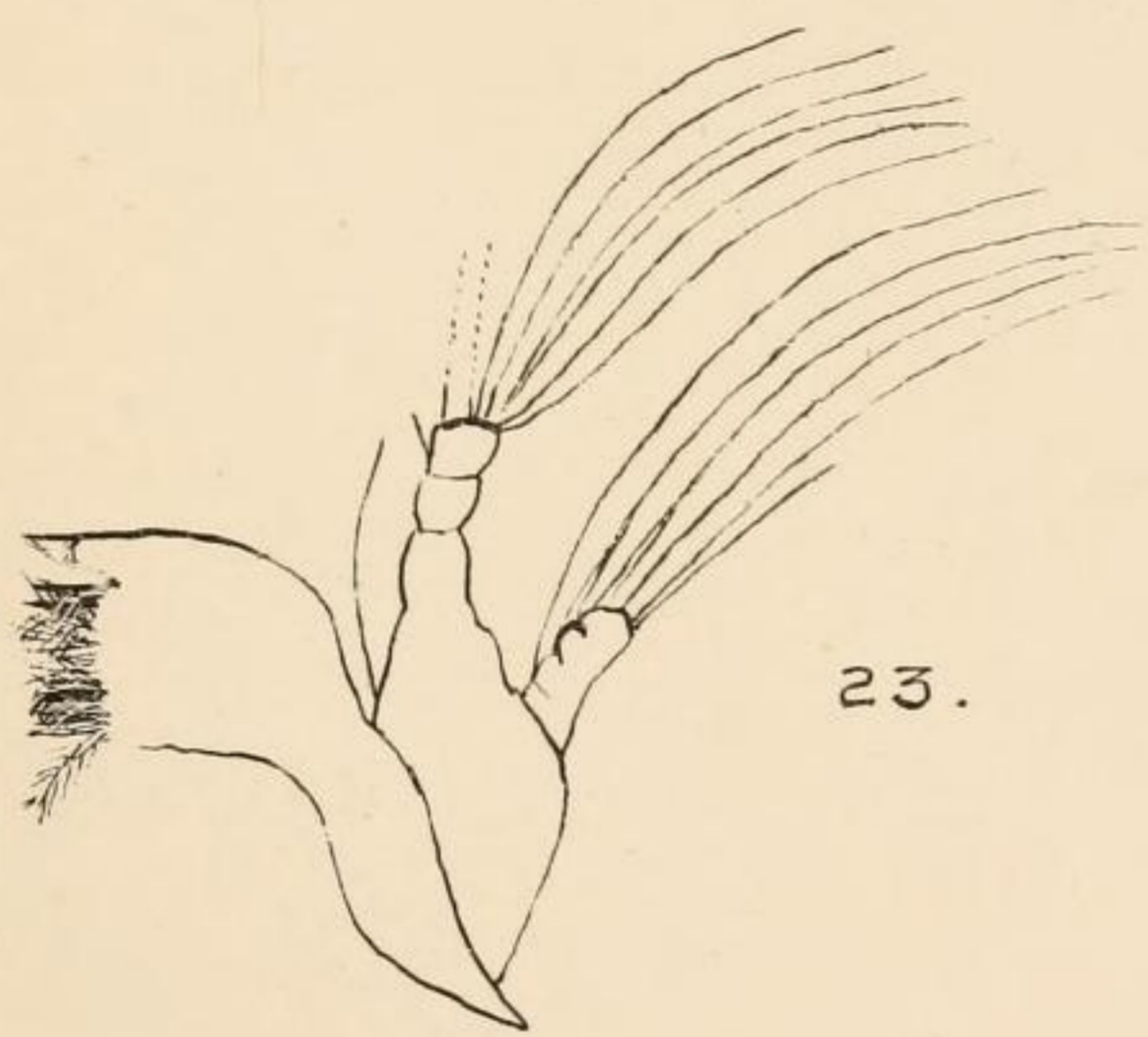
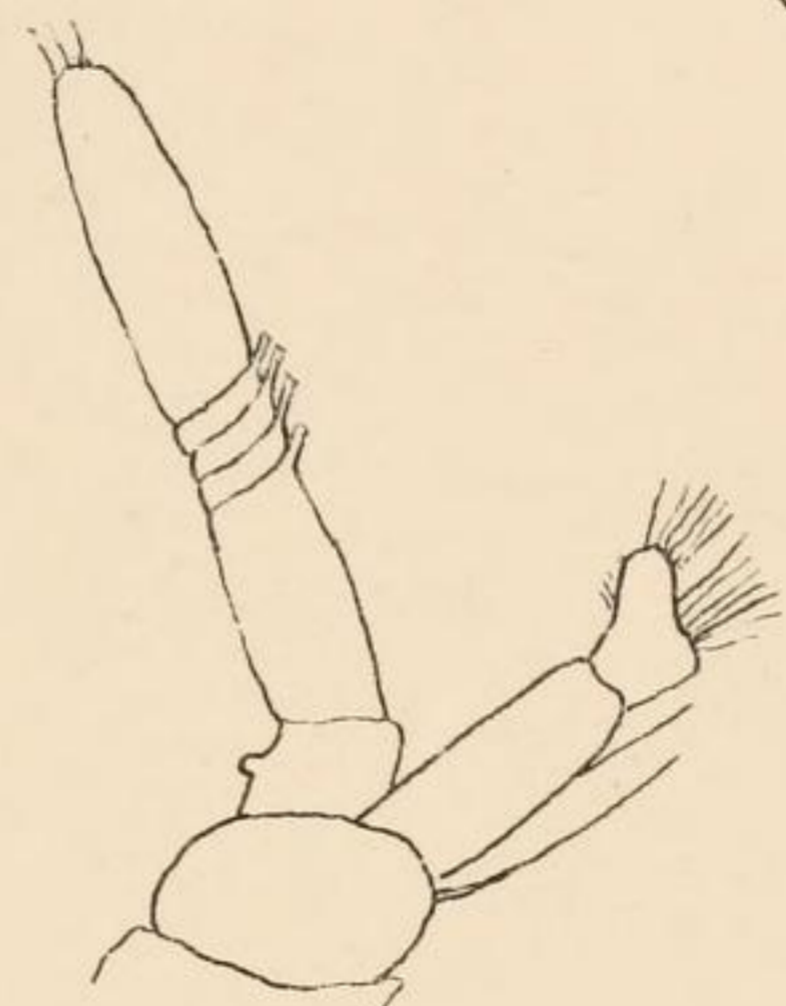
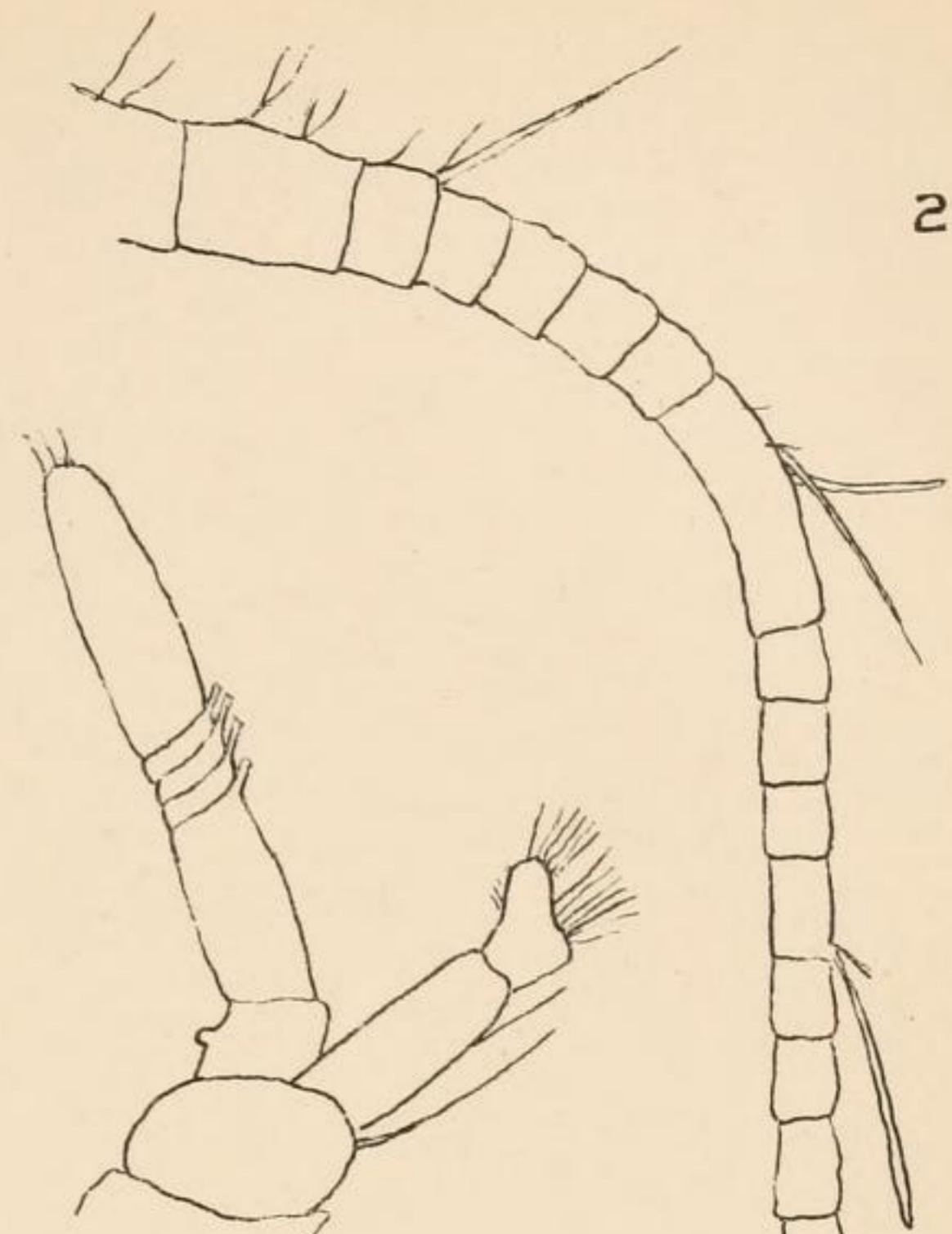
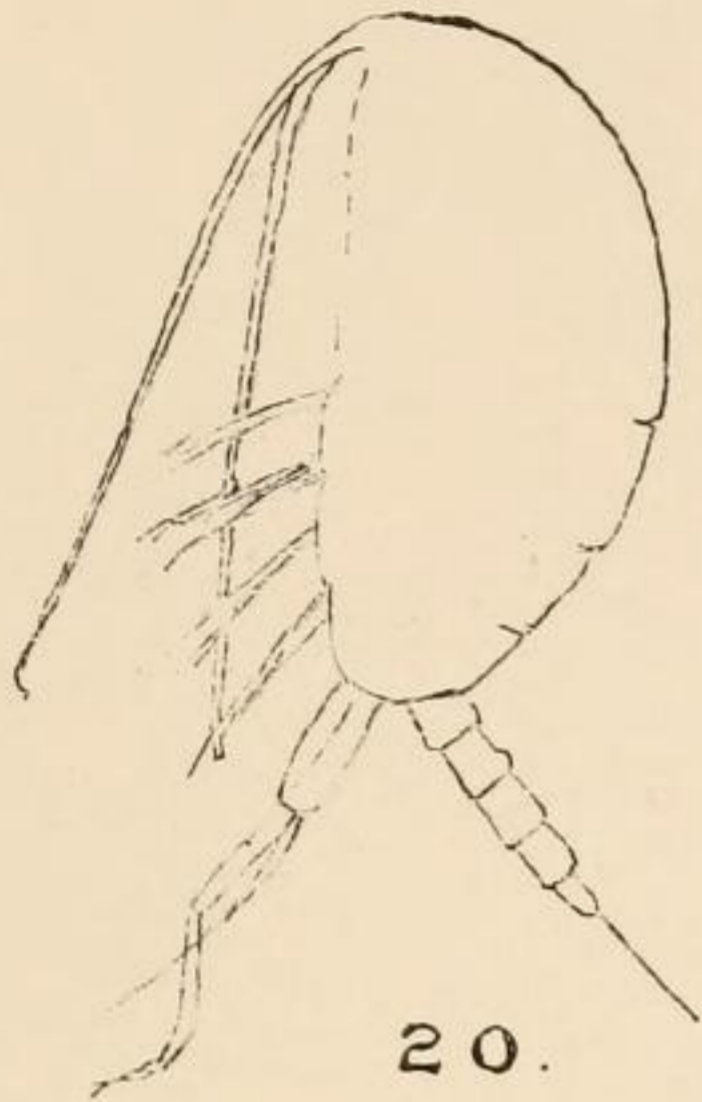
## PLATE VI.

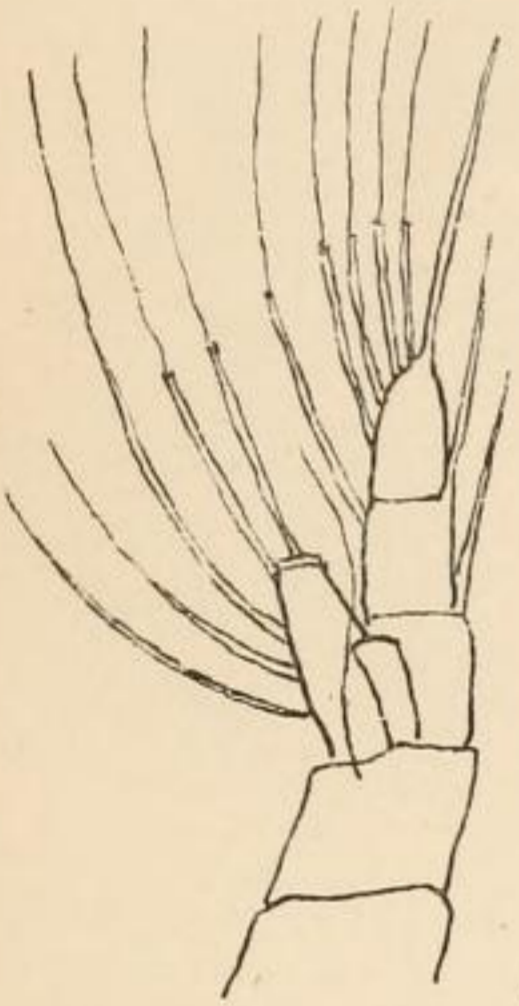
- " 30. *Scolecithricella neptuni*, Cleve, ♀ leg of the 5th pair (× 500).  
 " 31. " " " ♂ 5th pair of legs (× 500).  
 " 32. *Xanthocalanus fragilis*, Auriv, ♀ leg of the 5th pair (× 170).  
 " 33. *Lucicutia bradyana*, Cleve, ♀ *Re* 2 of the 5th pair of legs (× 85).  
 " 34. " " " ♂ 5th pair of legs (× 40).



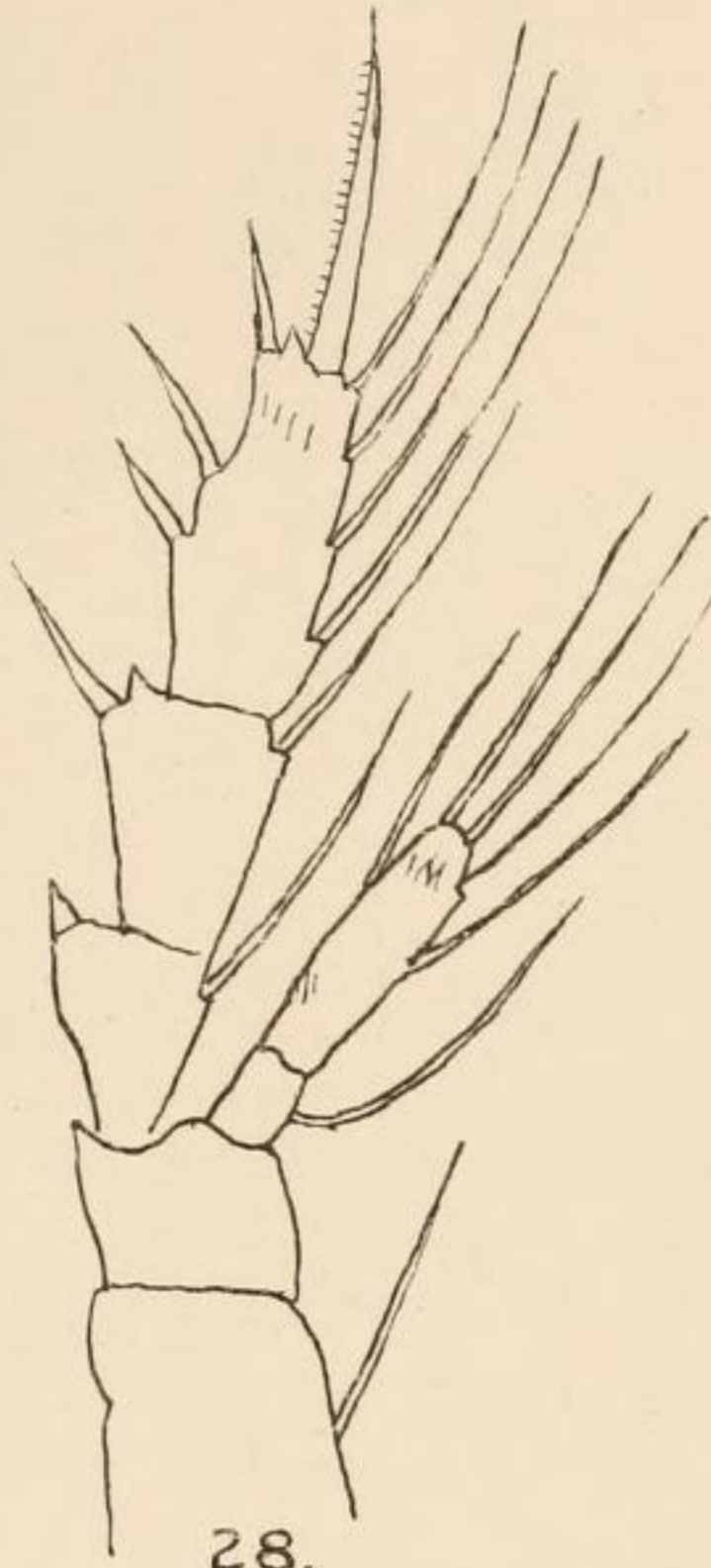




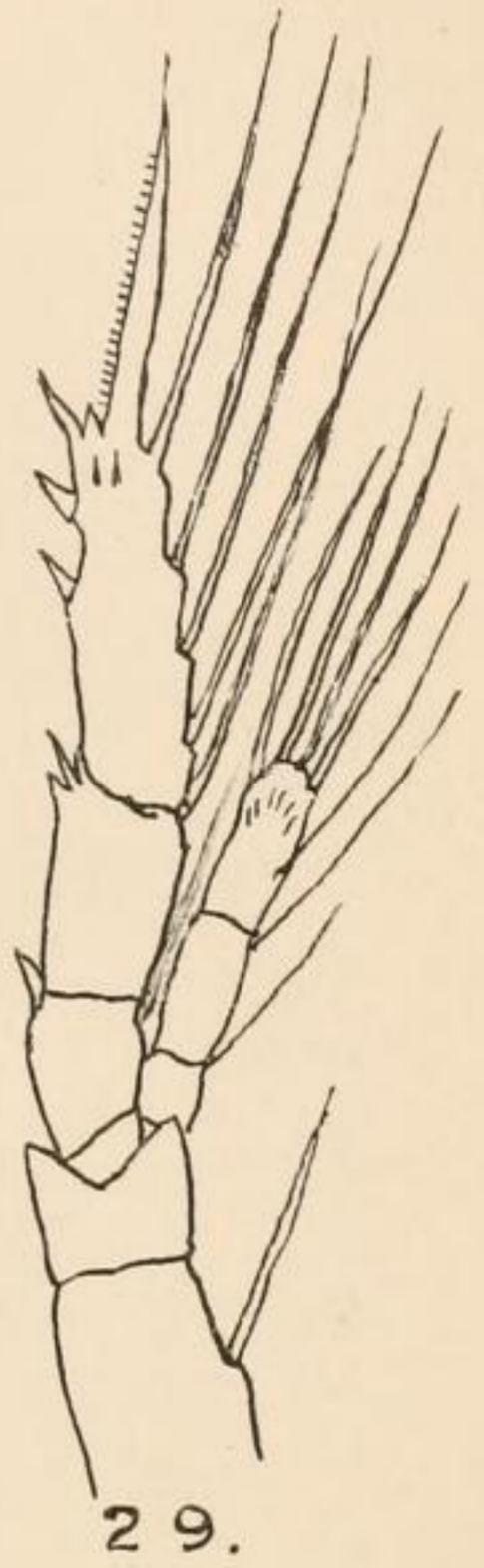




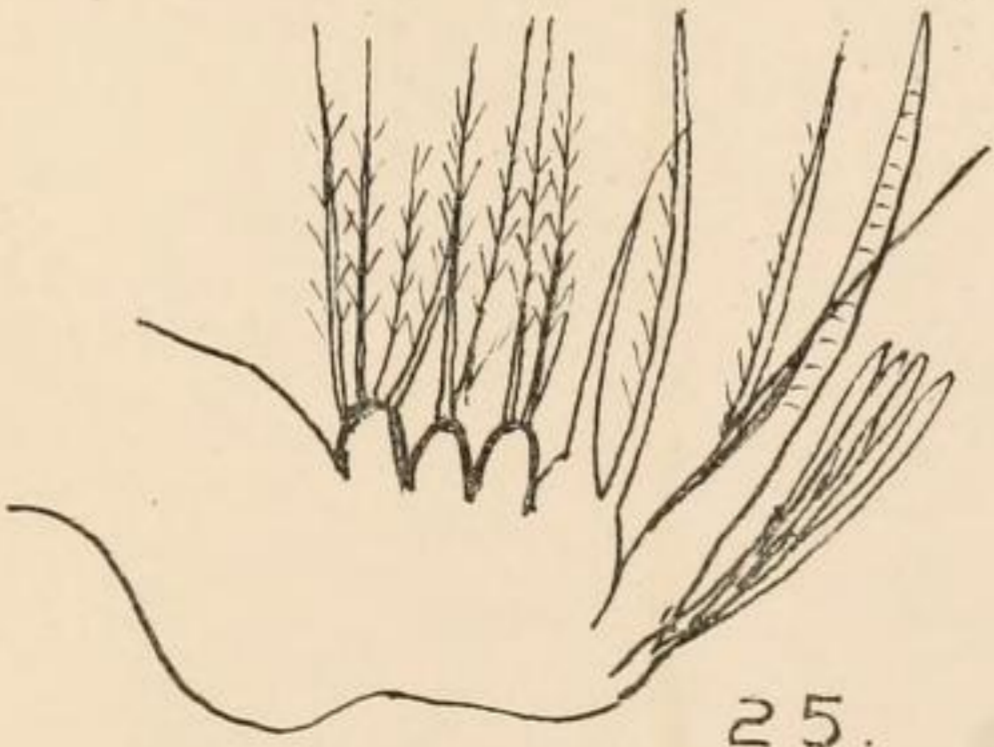
27.



28.



29.



25.



26.

