







ANNALS
OF THE
SOUTH AFRICAN MUSEUM

VOLUME X.

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TRUSTEES OF THE SOUTH AFRICAN MUSEUM.

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ANNALS
OF THE
SOUTH AFRICAN MUSEUM.

(VOL. X.)

1.—*On some South African Dermaptera (Earwigs) in the South African Museum, Cape Town.*—By MALCOLM BURR, D.Sc., F.Z.S., F.L.S., F.E.S., F.G.S.

DR. LOUIS PÉRINGUEY, of the South African Museum, Cape Town, has kindly communicated to me a small box of earwigs from South Africa. The collection contains twenty-two species, of which seven are new. If we exclude three from Rhodesia, there remain seven new out of nineteen from South Africa alone. This is a very high proportion, and should be an incentive to further collecting in a district which has not yet been worked for Dermaptera. And out of the nineteen known species, two were sent to Europe by Mr. Péringuey some years ago, and described by de Bormans, which have not been taken since, and, logically speaking, belong to the same collection.

It is noteworthy that of the new species one is referred to *Apterygida*, Westw., which, as now reduced, contains only its type, the common Mid-European *A. albipennis*, Meg. One is referred to *Chelidurella* and two others to *Mesochelidura*, at least until this group is rearranged, and both these are essentially Palearctic genera.

A new genus is required for the two new *Brachylabinae*, a curious and interesting group, represented by isolated species throughout the tropical world.

Of the two described by de Bormans, one is also referred to *Mesochelidura*, but the other to *Esphalmenus*, a genus which is

otherwise only represented in South America from Patagonia to Ecuador.

It is exceedingly probable that if earwigs are systematically collected in South Africa a number of further new species will be discovered, and I shall be most grateful to any naturalists, especially those who live in or near mountainous districts, who will save and send me any earwigs that they come across. They will be encouraged by the probability of discovering species new to science.

FAMILY APACHYIDÆ.

GEN. APACHYUS, Serville.

1. A. MURRAYI, Dohrn, var. REICHARDI, Karsch.
Apachya murrayi, Dohrn, Stett. ent. Zeit., xxiv., p. 44 (1863).
Apachya reichardi, Karsch, Berl. ent. Zeit., xxx., p. 85 (1886).
 Beira : 1 ♂, P. A. Sheppard, 1905.
 This species is widely distributed throughout Central Africa.

FAMILY PYGIDICRANIDÆ.

GEN. DICRANA, Burr.

1. Sp. n.
 Cape Colony : Port St. John, 1 ♀.
 This is a short-winged form, probably new, but I am unable to describe it without the male.

GEN. PICRANIA, Burr.

1. P. LITURATA, Stål.
Forficesila liturata, Stål, Öfv. Vet. Ak. Förh., xii., p. 347 (1855).
 Natal : Eshowe, 1887, 1 ♀.
 Cape Colony : Touw's River, W. J. Purcell, 1 larva.
 This species is rare in collections and museums ; it is restricted to South Africa, as the one in the Paris Museum recorded by me under this name from Diego Suarez is probably distinct.

FAMILY KARSCHIELLIDÆ.

GEN. BORMANSIA, Verhoeff.

1. B. MERIDIONALIS, Burr.
Bormansia meridionalis, Burr, apud Distant, Insecta Transvaalensia, Appendix. Orth., part v., p. 97, fig. 13 (1904).

Southern Rhodesia : Insiza, 1 ♂.

Hitherto only known from the type, from Zoutpansberg, now in the British Museum.

FAMILY LABIDURIDÆ.

SUB-FAMILY ECHINOSOMATINÆ.

GEN. ECHINOSOMA, Serville.

1. E. WAHLBERGI, Dohrn.

Echinosoma wahlbergi, Dohrn, Stett. ent. Zeit., xxiv., p. 64 (1863).

Natal : Durban, 1 ♂.

Cape Colony : Cape Town, 2 larvæ, L. Péringuey, 1887.

A species widely distributed throughout Africa.

SUB-FAMILY ESPHALMENINÆ.

GEN. ESPHALMENUS, Burr.

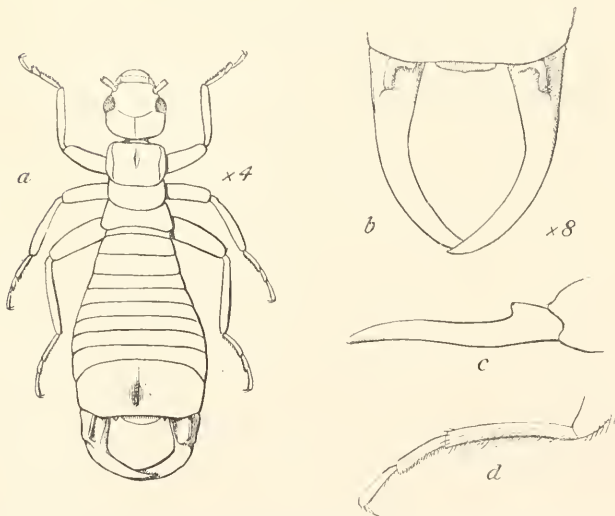


FIG. 1.—(a) *E. peringueyi*; (b) forceps ♂; (c) forceps, side view; (d) tarsus, side view.

1. E. PÉRINGUEYI, Borm. (Fig. 1, a-d).

Gonolabis peringueyi, Bormans, Ann. Mus. Civ. Gen. (2), xx.
p. 451 (1900).

Cape Colony : Cape Town, 2 Nieuwoudtville, 2 ♂ ; Caledon, 1 ♂ ,
June, 1887, L. Péringuey ; Dunbrody, 1 ♂ .

Hitherto only known from de Bormans' type and syntypes, from
Caledon, Cape Colony.

SUB-FAMILY LABIDURINÆ.

GEN. LABIDURA, Leach.

1. *L. RIPARIA*, Pall.

Forficula riparia, Pallas, Reise russ., ii., Anhang., p. 727 (1773).

Recorded from numerous places in Cape Colony, Orange River
Colony, Transvaal, and Rhodesia.

A cosmopolitan species.

GEN. NALA, Zacher.

1. *N. LIVIDIPE*s, Duf.

Forficula lividipes, Dufour, Ann. Sci. Nat., xiii., p. 340
(1828).

Echinosoma obscurum } Kirby, Ins. Transvaalensia, Orth., p. 12
Labidura indistincta } (1900).

Beechuanaland : Vryburg, 2 ♂ , 5 ♀ , Jones, 1904.

Found throughout the Old World. South African specimens of
this species were described by Kirby under the names of *Echinosoma*
obscurum and *Labidura indistincta*.

SUB-FAMILY BRACHYLABINÆ.

GEN. CTENISOLABIS, Verhoeff.

1. *C. TOGOENSIS*, Verhoeff.

C. togoensis, Verhoeff, S. B. ges. Naturf. Fr. Berlin, No. 1, p. 14
(1901).

Cape Colony : Dunbrody, 3 ♀ , 1 larva.

These specimens are undoubtedly referable to *Ctenisolabis*, and
I refer them provisionally to the only known African species, *C.*
togoensis. But these small, rare, apterous earwigs are probably
restricted in distribution, and it is very likely that these specimens
from Cape Colony are distinct from Verhoeff's species from Togo.
But it is impossible to draw good specific distinctions from Verhoeff's
description alone, and a careful comparison of authentic specimens
is necessary in order to establish the identity or distinction.

ANTISOLABIS, n. g.

Oculi parvi, anteriores; elytra omnino desunt; mesonotum haud carinatum; antennæ segmentis sat longis, haud globularibus.

Entirely apterous; eyes small, normal; mesonotum not keeled; antennæ with segments relatively long, cylindrical, not globular.

This genus stands in the same relation to *Nannisolabis* that *Isolabis* stands to *Leptisolabis*; it agrees in the non-keeled mesonotum, but differs in the relatively long and cylindrical antennal segments.

Type: *A. myrmecoides*, Burr.

ANTISOLABIS MYRMECOIDES, sp. n.

Fig. 2, a-c.

Parva, atra; antennæ segmentis 15, cylindricis; pronotum transversum, postice paullo ampliatus; thorax linea media rufa ornatus; caput nitidum; abdomen innitidum.

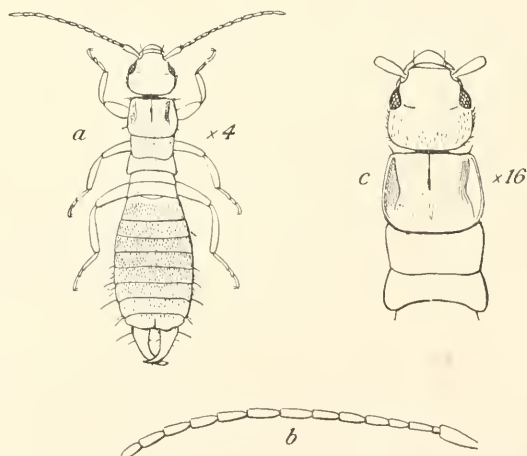


FIG. 2.—(a) *A. myrmecoides* ♂; (b) antenna; (c) head and thorax.

Long. corporis: ♂, 5.5 mm.; ♀, 6.5 mm.

Long. forcipis: ♂, 5 mm.; ♀, 5 mm.

Small, black, with a fine pale pubescence.

Antennæ black, with 15 segments, all relatively long, cylindrical, not globular, fourth nearly as long as the third, which is about as long as the first, the fifth equal to the third.

Head tumid, not pubescent, smooth, shining black; sutures obsolete; eyes small, anterior.

Pronotum sub-rectangular, a little broader than long, and gently widened posteriorly, the posterior angles rounded; black, with a median thin rufous line.

Mesonotum not keeled, rectangular, as also the—

Metanotum, which is feebly concave, with the median rufous line continued from the pronotum.

Legs black, the joints and tarsi yellowish; femora rather thick; tarsi slender and long, first and third segments equal, the second longer than broad.

Abdomen sub-parallel in the ♀, gently dilated in the ♂, dull black.

Forceps cylindrical, thick at the base and rapidly attenuate, gently curved, more strongly in the ♂ than in the ♀, sub-contiguous in the ♂, contiguous in the ♀.

Cape Colony: Caledon, 2 ♂, 6 ♀.

This black little species has a superficial resemblance to an ant. The dull black body, with median rufous line on the thoracic plates, and the smooth shining jet-black head, make it easily recognisable.

ANTISOLABIS SULCATIPES, sp. n.

Fig. 3, *a-d*.

Statura majore; colore fusco-brunneo; corpus sublæve, minutissime punctulatum; pronotum longius quam latius, postice ampliatus; pedes longi; tibiæ utrinque sulcatæ; tarsi segmento tertio quam primum breviori, quam secundum vix breviori.

Long. corporis: ♀, 12 mm.

Long. forcipis: ♀, 2 mm.

Size relatively large, general colour dull, dark brown, body nearly smooth, very finely punctulate.

Antennæ with 15 segments, cylindrical and relatively long, fourth longer than broad; the apical segments passing to ovate; brown, the apical three or four whitish.

Head smooth; sutures obsolete; eyes normal.

Pronotum longer than broad, gently widened posteriorly, the posterior angles rounded, sides strongly reflexed.

Mesonotum smooth, not keeled.

Metanotum similar, concave posteriorly.

Legs long and slender, the tibiæ compressed, with a narrow longi-

tudinal shallow furrow or sulcus down each side; tarsi long and slender, the third segment about one-third and shorter than the first, the second more than half as long as the third.

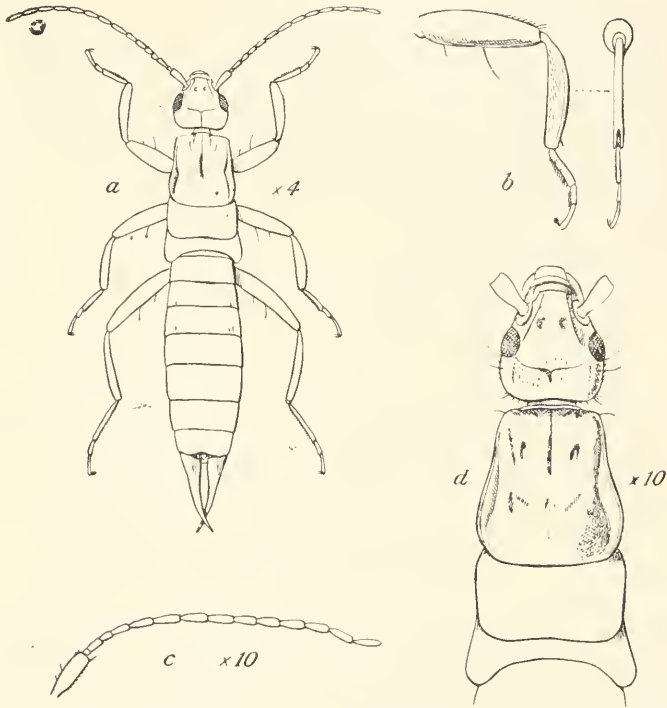


FIG. 3.—(a) *A. sulcatipes* ♂; (b) leg; (c) antenna; (d) head and thorax.

Abdomen smooth, brown.

Forceps typical, but rather long and slender.

Cape Colony: Cape Town, 1 ♀.

This is so well marked a species that I describe it on a single female, as in this group there is but little difference between the sexes.

It is well characterised, among other things, by the furrow on the tibiae.

FAMILY LABIIDÆ.

GEN. LABIA, Leach.

1. *L. MINOR*, Linn.

Forficula minor, Linn., Syst. Nat., ed. x., i., p. 423 (1758).

Cape Colony: Stellenbosch, 3 ♂, 5 ♀, November, 1887, L. Péringuey.

A native of the Palearctic Region. This species is found in Africa from Somaliland to the Congo and Cape Colony; it is now firmly established in North America.

2. *L. MARGINALIS*, Thunb.

Forficula marginalis, Thunberg, Acta Soc. Upsal, ix., p. 52 (1827).

Transvaal: Pietersburg, Shilouvane, 1 ♀.

Delagoa Bay: 1 ♀, L. De Coster, 1889.

Widely distributed throughout Africa.

GEN. SPHINGOLABIS, Bormans.

1. *S. VILLICA*, sp. n.

Fig. 4, *a-b*.

Statura sat forti; caput et pronotum fulvo-rufa; elytra alæque nigræ, abdomen nigrum, pedes flavi; pygidium acuminatum; forcipis braccia ♂ valida, elongata ac depressa, ante apicem dente forti armata.

Long. corporis: ♂, 7·5 mm.

Long. forcipis: ♂, 2·5 mm.

Size medium.

Antennæ with 13 segments, pyriform or sub-conical, the third quite short, the fourth and fifth each quite as long as, or longer than, the third, dark brown.

Head brick-red, rather broad, tumid posteriorly, and somewhat excavate posteriorly; eyes small, black.

Pronotum orange-yellow, as broad as long, anterior margin gently convex, sides straight, posterior margin rounded, flat.

Elytra and wings ample, black, finely punctulate, with a dense close pubescence.

Legs yellow, the femora black at the base; tarsi slender, first and third segments equally long and slender; femora rather thick.

Abdomen parallel-sided, passing from black at the base to deep red near the apex, covered with long reddish bristles.

Last dorsal segment transverse, rectangular, with a feeble depression in the middle of the posterior margin, and a faint tumid elevation on each side of it.

Forceps with the branches in the ♂ remote at the base, stout and rather broad, elongate, and nearly straight, depressed and sulcate

above from base to apex; on the inner margin in the apical third there is a strong sharp tooth; the points are hooked; the whole forceps are deep red in colour and covered with long pale bristles.

Cape Colony: Dunbrody, August 5, 1901, 1 ♂.

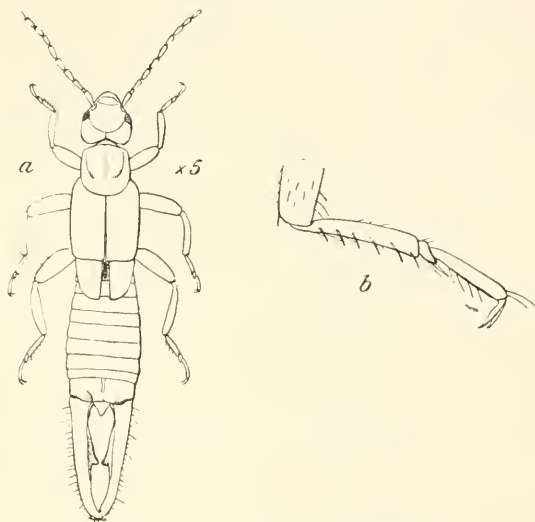


FIG. 4.—(a) *S. villica* ♂ type; (b) tarsus.

The coloration and form of the pygidium and forceps of this species render it easily recognisable. After a good deal of hesitation I place it in the genus *Sphingolabis*, Borm., revived for its type *S. furcifer*, Borm., *S. hawaiiensis*, Borm., only; these are really nothing more or less than rather large and relatively robust *Chetospanias*, and closely related to *Labia*.

FAMILY FORFICULIDÆ.

SUB-FAMILY CHELIDURINÆ.

GEN. MESOCHELIDURA, Verhoeff.

1. *M. PÉRINGUEYI*, Burr (Fig. 5, a-b).

Chelidura péringueyi, Burr, Ann. Mag. N. H. (7), xi., p. 275 (1902).

Cape Colony: Stellenbosch, 4 ♂, 5 ♀, 3 larvæ; Cape Town, 3 ♂, 4 ♀; Table Mountain, 1 ♂, var. *forcipata*; Houw Hoek, 1 ♂.

Only known from Cape Colony.

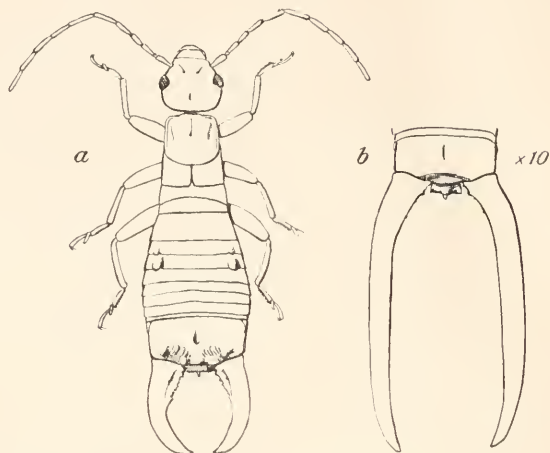


FIG. 5.—(a) *M. péringueyi* ♂ form *cyclolabia*; (b) forceps ♂ form *macrolabia*.

2. *M. PROMONTORII*, sp. n.

Fig. 6, a-b.

Statura gracili; pygidium ♂ truncatum, integrum; forcipis bracechia ♂ basi remota, gracilia, sensim arcuata.

Long. corporis: ♂, 9 mm.; ♀, 8 mm.

Long. forcipis: ♂, 4 mm.; ♀, 2 mm.

Size median, build slender, general colour yellowish brown.

Antennæ red-brown, paler at the base and darker at the apex, with 12 segments, fourth a little shorter than the third, all very slightly thickened at the apex.

Head smooth, dull red, tumid; sutures obsolete.

Pronotum rectangular, transverse, all sides straight, depressed.

Elytra rudimentary, meeting at the suture, but exposing a short portion of the mesonotum and all the metanotum.

Legs yellowish, slender, first tarsal segment slightly longer than the third.

Abdomen very feebly widened posteriorly in the ♂, and gently narrowed there in the ♀, deep red-brown.

Last dorsal segment transverse in the ♂, the posterior margin raised into a low, rugulose ridge, beyond which the surface slopes down to the pygidium; in the ♀ simple, narrow.

Penultimate ventral segment ♂ broadly rounded.

Pygidium ♂ an obtuse tubercle, with face vertical and lower

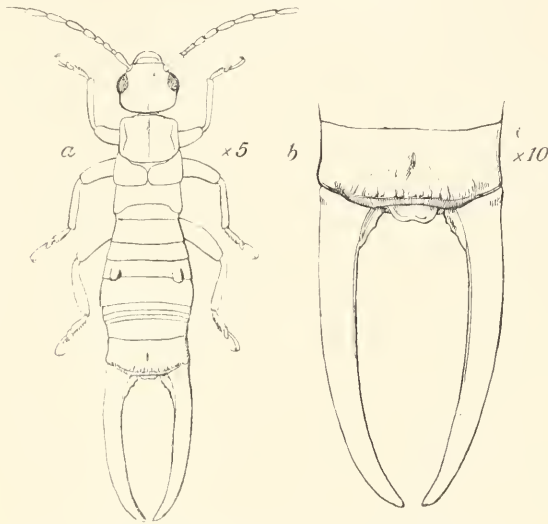


FIG. 6.—(a) *M. promontorii* ♂ type; (b) forceps ♂.

margin produced into a narrow flat transverse lobe, with converging sides and truncate apically; in ♀ minute.

Forceps with the branches in the ♂ slender, remote at the base, gently arcuate, feebly dilated near the base, with an almost obsolete tooth near the apex; in the ♀ simple, straight and sub-contiguous.

Cape Colony: Caledon, ♂ ♀, L. Péringuey, 1905.

This species has a close superficial resemblance to the European *Apterygida albipennis*, which goes even down to the forceps, but the pygidium is not quite the same, and the rudimentary elytra at once distinguish it.

3. *M. KAFFIR*, sp. n.

Fig. 7, a-b.

Elytris valde rudimentariis, ad suturam non attingentibus; pygidium ♂ ♀ emarginatum, lobis acutis; forcipis brachia ♂ remota, gracilia.

Long. corporis: ♂, 8.5 mm.

Long. forcipis: ♂, 3.5 mm.

Build slender; general colour yellowish and reddish brown.

Antennæ dark brown, with 12 segments, all cylindrical, the fourth a little shorter than the third.

Head ferruginous, smooth; sutures obsolete.

Pronotum yellowish brown, rectangular, transverse, depressed.

Elytra present merely as small lateral flaps, exposing the greater part of the mesonotum and all the metanotum, which are of the same colour as the pronotum.

Legs dirty yellow; tarsi slender, first and third segments about equally long.

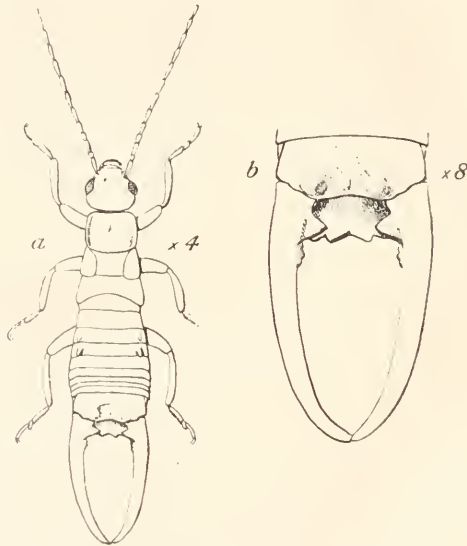


FIG. 7.—(a) *M. kaffir* ♂; (b) forceps ♂.

Abdomen yellowish ferruginous, passing to deep red-brown apically, and gradually dilated towards the apex.

Last dorsal segment transverse, with an irregular median depression and tumid, obtuse tubercle on each side.

Penultimate ventral segment broadly rounded.

Pygidium depressed, broad, like a slightly upturned plate, with a broad triangular emargination and triangular lobe on each side.

Forceps with the branches remote, slender, cylindrical, gently arcuate, with a strong, triangular laminate tooth on the inner margin at the extreme base.

Cape Colony: Dunbrody, 1 ♂, January 14, 1903.

This species is well characteristic by the emarginate pygidium,

with triangular lobes ; it has a superficial resemblance to *Apterygida*, *A. colonica*, and *M. promontorii*. The elytra are reduced to mere lateral flaps (as in *Euborellia stali* and *E. moesta*), and on this account a new genus will be required for its reception.

The ♀ is unknown.

GEN. CHELIDURELLA, Verhoeff

1. *C. PURCELLI*, sp. n.

Fig. 8, *a-b*.

Statura minore ; corpus ad basin abdominis sub-dilatatum, apicem versus sensim angustatum ; forcipis brachia ♂ basi remota, gracilia, sensim arcuata, ad basin margine interno laminato.

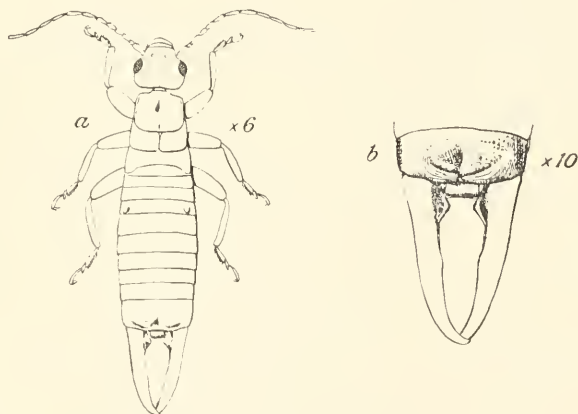


FIG. 8.—(a) *C. purcelli* ♂ type ; (b) forceps ♂

Long. corporis : ♂ , 7·5 mm.

Long. forcipis : ♂ , 7·5 mm.

General colour yellow-brown.

Antennæ with 11 segments, yellowish brown, cylindrical, the fourth a little shorter and little thicker than the third.

Head red-brown, smooth, tumid ; sutures obsolete.

Pronotum broad, trapezoidal, broadened posteriorly, sub-rectangular, all sides straight, depressed.

Elytra rudimentary, much shorter than broad, completely covering the mesonotum but exposing the concave mesonotum, yellowish brown.

Legs yellowish, slender; tarsi short, the first segment hardly as long as the third.

Abdomen deep red-brown, widest at the base, gradually narrowing towards the apex, punctulate.

Last dorsal segment transverse, rectangular, punctulate, with a median sulcus, and with a feeble crested tubercle on each side.

Penultimate ventral segment broadly rounded.

Pygidium short and broad, truncate posteriorly.

Forceps with the branches remote, cylindrical, feebly arcuate, the inner margin produced with a laminate triangular tooth near the base.

Cape Colony: Oudtshoorn, 1 ♂, W. F. Purcell.

This is rather a remarkable species. It must be provisionally placed in *Chelidurella*, but it has no real resemblance to *C. acanthopygia*, the type of that genus. The whole body is spindle-shaped, being gently broadened from the pronotum to the first or second abdominal segment, where the maximum width is attained, and then gradually narrowed to the apex.

SUB-FAMILY FORFICULINÆ.

GEN. APTERYGIDA, Westwood.

1. A. COLONIÆ, sp. n.

Fig. 9, *a-c*.

A. albipennis vicina; differt præcipuè pygidio ♂ quadrato, forcipisque brachiis basi dente forti armatis.

Long. corporis: ♂, 8-10.5 mm.

Long. forcipis: ♂, 3-4 mm.

Size rather small, general colour reddish testaceous.

Antennæ testaceous, with 12-13 segments, the third rather short, fourth a little longer, and the rest gradually longer, all cylindrical.

Head smooth and tumid; sutures obsolete, dark red-brown.

Pronotum quadrate, a trifle longer than broad and slightly widened posteriorly; prozona and metazona not separated, and testaceous.

Elytra testaceous, smooth, truncate apically, the axillary angle feeble, exposing a portion of the mesonotum.

Wings abortive.

Legs testaceous or pale yellow; first tarsal segment about as long as second and third united, second with prominent lobes, third slender.

Abdomen not hairy, sub-parallel, deep ferruginous red, darker apically than basally, the lateral pliciform tubercles black and prominent.

Last dorsal segment ♂ quadrate, ample, smooth, with no median sulcus, but a deep triangular depression in the middle near the posterior margin, which is slightly incrassate and sinuous, being gently produced to form a short rounded lobe on each side of the middle line.

Penultimate ventral segment ♂ ample, very obtusely rounded.

Pygidium ♂ a square, depressed plate.

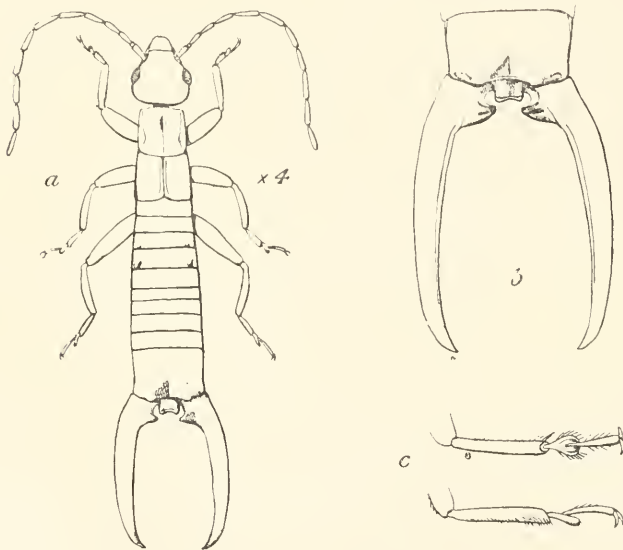


FIG. 9.—(a) *A. colonie* ♂ type; (b) forceps; (c) tarsus.

Forceps with the branches ♂ slender, remote at the base, rather elongate, slightly diverging at the base itself, then very gently arcuate, the tips black and feebly incurved; on the inner margin at the base there is a prominent, dilated, and depressed triangular tooth.

South Africa: 4 ♂, Cape Town, August, 1887.

This species closely resembles the European *A. albipennis*, but the pronotum is longer and narrower, the pygidium more nearly square, and the strong basal tooth of the forceps is very distinctive.

GEN. ELAUNON, Burr.

1. *E. ERYTHROCEPHALUS*, Oliv.
Forficula erythrocephala, Oliver, Enc. méth., vi., p. 468 (1791).
 Beira: 1 ♂, P. O. Sheppard, 1905.
 Amatongaland: 1 ♀, January, 1889.
 Delagoa Bay: 4 ♂, 3 ♀, June, 1889, J. de Costa.
 Cape Colony: Port St. John, 2 ♂, 1 ♀.
 Distributed throughout the Ethiopian Region.

GEN. FORFICULA, L.

1. *F. SENEGALENSIS*, Serv.
Forficula senegalensis, Serville, Orth., p. 39 (1839).
 Griqualand: 1 ♂, var. *forcipata*, 1873.
 Ovampoland: 1 ♂, 1890-1891, Erikson.
 Southern Rhodesia: 1 ♀, Salisbury; 1 ♀, Umtali.
 Cape Colony: 1 ♀, Kowie River, Port Alfred; 1 ♀, Port St. John; 1 ♀, Kentani, Dr. Kolbe.
 Distributed throughout the Ethiopian Region.

SUB-FAMILY OPISTHOCOSMIINÆ.

GEN. HYPURGUS, Burr.

1. *H. MICHELI*, Burr.
Opisthocosmia micheli, Burr, Tr. ent. Soc., London, p. 307 (1904).
 Southern Rhodesia: Umtali, 1 ♂.

I cannot separate this specimen from *H. micheli* from Abyssinia, although it differs slightly in its brighter and more yellowish colour, especially of the elytra, which are somewhat longer, as the wings are perfectly developed. Probably it will eventually be discovered in intermediate localities.

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2.—*Descriptions of some New Geometridæ and Pyralididæ from South Africa.*—By W. WARREN, M.A., F.E.S.

I HAVE lately had submitted to me for identification a few Lepidoptera from the South African Museum. Though comparatively few in number themselves, I found among them a surprisingly large proportion of (as far as I can ascertain) new and hitherto undescribed forms. At the request of Dr. L. Péringuey, to whom I am indebted for the opportunity of examining the specimens, I have written the following descriptions for publication in the Annals of the South African Museum.

FAMILY GEOMETRIDÆ.

SUB-FAMILY GEOMETRINÆ.

GEN. VICTORIA, Warr.

1. VICTORIA MIRABILIS, spec. nov.

Forewing: Deep green covered with white vermiculations; costal streak fuscous with darker dusting, and black dashes before the commencement of each line; veins very finely white; first line at $\frac{1}{4}$, indicated by black dots on median vein, on vein 1, and on inner margin, placed in the middle of a white conical blotch reaching from subcostal vein to inner margin; outer line narrowly white, oblique inwards parallel to termen, from $\frac{3}{4}$ of costa to near middle of inner margin; marked by minute black dots on the veins, followed by a dull pinkish somewhat hourglass-shaped blotch from vein 6 to inner margin, constricted between veins 3 and 4 and much smaller above than below; a subquadrate white apical blotch; marginal lunules black, slightly white-edged; those between 4 and 6 thick and black, that between 3 and 4 wholly white; fringe fuscous; cellspot pear-shaped, pink, blotched with red-brown at its lower end.

Hindwing: Green with long white strigulæ along inner and outer margins, whitish green towards base and along costa; cellspot brown; outer line marked by black vein-dots, followed by a bright pink, round spot between veins 2 and 3; terminal lunules and fringe as in forewings.

Underside whitish green; the white strigulæ, lines, and blotches of upperside showing through; cellspots blackish; costa of forewing ochreous dotted with fuscous; the terminal lunules all darker and clearer; fringe fuscous grey.

Head, antennæ, palpi, and forelegs fuscous varied with rufous; thorax and dorsum fawn-grey; the dorsum mixed with reddish, and with pairs of black sublateral spots; venter and pectus white.

Expanse of wings, 45 mm.

1 ♂ from Durban, Natal.

The ♀ is larger, 50 mm., the pink blotch of forewing white, and all the other white areas larger; the hindwing altogether paler.

PROSOMPHAX, gen. nov.

Forewing: Triangular; costa straight, slightly shouldered at extreme base, and curved before apex, which is prominent; termen oblique and straight; anal angle rounded; frenulum slight.

Hindwing: With apex and termen rounded; anal angle well marked.

Palpi upcurved, very short; tongue slight; antennæ of ♂ bipectinated to $\frac{3}{4}$; hind tibiæ with terminal spurs only.

Neuration: Forewing, cell half as long as wing; vein 2 from $\frac{3}{4}$, 3 close before 4; 5 from shortly below upper end of discocellular; 6, 10, 7, 8, 9 stalked, 9 rising close to apex; 11 anastomosing with 12; hindwing with costal approximated to subcostal near base, but not touching; veins 6, 7 short-stalked.

Type: *Prosomphax callista*, Warr.

2. PROSOMPHAX CALLISTA, spec. nov.

Forewing: Bright deep green covered with minute white dots and striolæ; costal edge in apical half pinkish grey; fringe concolorous.

Hindwing: Silky greenish white; the fringe deeper green.

Underside of both wings uniform smooth green; the inner marginal half of forewing whitish green.

Face ochreous dotted with green, pinkish above; fore tibiæ and tarsi reddish in front; vertex and thorax deep green; abdomen anally and laterally whitish; the dorsum in basal half green;

venter, pectus, and femora deep green; antennal shaft white the pectinations ferruginous.

Expanse of wings, 30 mm.

1 ♂ Cape Town (Rondebosch).

GEN. PRASINOCYMA, Warr.

3. PRASINOCYMA DORSIPUNCTATA, spec. nov.

Forewing: Semihyaline grey-green, covered with dense pale strigulations; costal edge very finely pale; cellspot red-brown; fringe green.

Hindwing: With the cellspot triangular, large.

Underside pale dull green, without strigulations; cellspot of hindwing large. Face olive-green, possibly faded; venter, thorax, and dorsum green, the last with a white dot on each of the three middle segments; shaft of antennæ and a line between their bases white; venter, pectus, and legs whitish; forelegs reddish in front.

Expanse of wings, 32 mm.

1 ♂ from Pinetown, Natal.

Close to *Thalassodes vermiculata*, Guen., which, however, has no cellspots.

SUB-FAMILY STERRHINÆ.

GEN. CINGLIS, Guen.

4. CINGLIS ACENTRA spec. nov.

Forewing: White, sparsely dusted with black scales; the shading pale olive-brown; the costal area above cell to median line, the median nervule and its branches, and vein 1, a slight shade before inner line, and the bands on each side of the subterminal line, all olive, the præsubmarginal space darkest; lines blackish, thick; the inner line angled in cell, then inwardly oblique and waved, inwardly edged with white; outer line lunulate-dentate, incurved on each fold, followed by a fine white line; median line regularly lunulate-dentate, parallel to outer line, the space between them white, crossed by the brown veins; subterminal line white, lunulate-dentate, the teeth pointing inwards, also incurved on both folds; a row of black terminal lunules, finely edged with white; fringe (worn) whitish; cellspot large, black.

Hindwing: Similar, without inner line; the large black cellspot beyond the median line.

Underside duller.

Face dark brown; palpi dark brown above, white beneath; vertex white; thorax and dorsum pale olive-brown; hinder edge of each segment of dorsum belted with white.

Expanse of wings, 20 mm.

1 ♂ from Clanwilliam, South Africa.

The hind legs of the ♂ are without spurs, but not aborted.

SUB-FAMILY HYDRIOMENINÆ.

GEN. ENTEPHRIA, Hüb.

5. ENTEPHRIA AFRICANA, spec. nov.

Forewing: White densely speckled with blackish grey; the basal patch, and the bands limiting the central fascia composed of wavy blackish lines; basal patch and outer band of four lines; the inner band of two; space between third and fourth of basal patch, between second and fourth of outer band, and between the lines of inner band filled up with fulvous brown; the inside edges of the two bands unite at vein 2, the included pale grey space containing the black cellspot; submarginal line whitish, regularly lunulate-dentate, the lunules filled up with brownish; the pale bands on each side of central fascia traversed by two or three obscure blackish lines; a terminal black crenulate line; fringe pale grey with a darker middle line.

Hindwing: Dull grey with a paler grey outer and terminal band; terminal line black, crenulate; fringe pale grey.

Underside grey speckled with darker, somewhat glossy; the markings of the upperside indicated only.

Head, thorax, and abdomen dark grey mixed with paler.

Expanse of wings, 40 mm.

1 ♀ from Cape Town, April, 1878.

GEN. OCHYRIA, Hüb.

6. OCHYRIA TENELLA, spec. nov.

Forewing: Delicate pale green, slightly grey tinged; the small rounded basal patch, the inner band of central fascia, and the outer above vein 4 purplish fuscous; the inner edge below middle, and

the outer in the angle between 6 and 4 black; subterminal line yellowish white, lunulate dentate, the lunules from costa to vein 7, from 6 to 4, and between 1 and 2 filled up with lilac pink, and faintly followed by patches of the same colour and blackish; a lilac spot on inner margin before central fascia; pairs of black spots at ends of veins; fringe white, with purple grey chequering beyond veins.

Hindwing: Whitish, faintly grey tinged, with inner and outer waved grey lines; fringe white beyond terminal black dots.

Underside pale grey, with the lines shown chiefly on costa; hindwing pale.

Head, thorax, and abdomen green freckled with blackish; the hinder edge of dorsal segments marked by black scales; legs externally blackish.

Expanse of wings, 25 mm.

1 ♂ from Cape Colony.

SUB-FAMILY EUCESTIINÆ.

GEN. LITHOSTEGE, Hüb.

7. LITHOSTEGE DECORATA, spec. nov.

Forewing: White, crossed by 3 pale brown bands; the first before middle, bent outwards in cell, edged with black at the outward angle; the other two subterminal and terminal; the former with the inner edge sinuous, and the outer lunulate, the latter narrower, intersected by white veins; the antemedian band is followed on costa and the subterminal preceded by a black spot, from each of which a much interrupted sinuous line runs across wing; fringe brown mottled with white between the veins.

Hindwing: White overclouded with greyish ochreous, the extreme termen and fringe whitish; a somewhat interrupted dark terminal line.

Underside of both wings dull grey; the forewing with the commencement on costa of white submarginal and outer lines; the hindwing with the termen only paler.

Head and collar blackish; thorax and abdomen pure white; antennæ brown.

Expanse of wings, 25 mm.

1 ♂ from Smithfield, Orange Free State (Kannemeyer).

This species will stand in a separate section from typical *Lithostege*, from which it differs in having the antennæ of the ♂ pectinated.

SUB-FAMILY BISTONINÆ.

LIPOGONIA, gen. nov.

Forewing: Elongate; the costa straight, convex only just before apex; termen and inner margin forming a single curve from apex to base; no fovea.

Hindwing: Elongate; apex and termen well rounded.

Antennæ of ♂ plumose; palpi quite short and drooping; tongue absent; frons slightly protuberant; frenulum present; fore tibia with a strong claw at extremity on the outer side; hind tibia with two quite short terminal spurs.

Neuration: Forewing, cell longer than half of wing; discocellular slightly inbent; first median nervule at $\frac{2}{3}$, second at $\frac{8}{9}$; radials normal; subcostal vein strongly bent down at end; veins 7, 8, 9 stalked from the bend; 10 and 11 coincident throughout; hindwing, costal and subcostal approximated for quite half of cell; veins 3 and 7 from well before angles of cell.

Type: *Lipogonia rufivena*, spec. nov.

Distinguished from *Omphalucha*, Warr., by the absence of fovea, and from *Aphilopota* and *Haggardia* by the narrower wings; from all three by the claw of fore tibia.

8. LIPOGONIA RUFIVENA, spec. nov.

Forewing: White, thickly and coarsely speckled and striated with fuscous; costal edge yellowish, with short and numerous black dots; the veins rust colour; inner line squarely bent in cell, from costa at $\frac{1}{3}$, oblique below middle to $\frac{1}{4}$ of inner margin, marked mainly by black spots on the costa and veins; outer line black, thick, regularly lunulate-dentate, curved from $\frac{5}{6}$ of costa to middle of inner margin, immediately followed by a narrow pure white space; submarginal line just beyond, dark between veins, but obscure and interrupted; a row of fine black terminal dashes; fringe mottled fuscous and white; cellspot black.

Hindwing: Paler, the speckling fine and grey; a dentate lunulate outer curved line edged with whitish.

Underside paler, the speckling finer, mixed with yellowish; an outer line in both wings.

Head, thorax, and abdomen whitish, thickly speckled with dark; the frons browner.

Expanse of wings, 34 mm.

1 ♂ from Smithfield, Orange Free State, South Africa, 1909 (Kannemeyer).

SUB-FAMILY ASCOTINÆ.

GEN. ALCIS, Curt.

9. ALCIS AFRICANA, spec. nov.

Forewing: Ochreous washed with pinkish brown and thickly striated with dark brown; the shading dark brown; the lines black; inner line thick, outwardly toothed on the veins, vertical to submedian fold, there bent and incurved basewards; preceded by a dark brown shade; outer line from costa at $\frac{2}{3}$ to middle of inner margin, obliquely curved outwards to vein 5, then inwards to submedian fold, then concave inwards; a brown median line more or less parallel to outer line, containing within its angle a brown black-edged cell ring; submarginal line lunulate dentate, the space between it and the outer line dark brown, diffused to termen between veins 5 and 6, and below 4 with slight paler spaces at inner margin; a black terminal festoon; fringe pale brown, varied with darker brown.

Hindwing: With blackish inner and median lines; the inner touching the black cellspot; the median followed by a thick brown shade; subterminal line preceded by a thick black shade; termen strongly dentate, with black festoon.

Underside uniform greyish ochreous, thickly striated with fuscous, as far as the diffuse thick black submarginal band; the terminal area paler ochreous, especially on vein 4 of forewing, above and below which the band is diffused to termen; both wings with black cellspots and terminal row of spots.

Head, thorax, and abdomen pale brown mixed with darker brown.

Expanse of wings, 38 mm.

1 ♀ from South Africa.

GEN. MYRIOBLEPHARA, Warr.

10. MYRIOBLEPHARA SUBLIMBATA, spec. nov.

Forewing: Whitish washed with pale olive brown and speckled with black; the veins yellowish; the centre of the two folds, the inner margin, and the subterminal line white; inner line at $\frac{1}{4}$, bent in middle, marked by rather large black spots on median and submedian veins; outer line blurred, lunulate dentate, from $\frac{2}{3}$ of costa sinuate to $\frac{2}{3}$ of inner margin; a black ocelloid spot at end of cell; submarginal line irregularly dentate, preceded by a thick black shade interrupted between veins 3 and 4 by a white spot; terminal

area darker; a row of distinct black terminal dots; fringe grey mottled with dark.

Hindwing: Paler, without the olive-brown suffusion, and speckled with blackish only along inner and outer margins; a black ring at end of cell before a very obscurely marked lunulate dentate outer line; a black præsubmarginal shade; terminal black spots and fringe as in forewings.

Underside of forewing olive-grey, of hindwing white, black speckled; both wings with large black cellspot, black-dotted outer line, and thick black præsubmarginal shade, interrupted between veins 3 and 4; a row of black terminal dots.

Head, thorax, and abdomen grey speckled with black; the anal tuft whiter; face and palpi externally brown.

Expanse of wings, 34 mm.

1 ♂ from Cape Dio, Hout Bay (Sclater).

SUB-FAMILY SEMIOTHISINÆ.

GEN. PERIDELA, Warr.

11. PERIDELA INÆQUILINEA, spec. nov.

Forewing: Pale ochreous, the shading fuscous brown, with fine darker striations; lines black; the inner bent or curved below costa, preceded by a space of pure ground colour; median line vertical to vein 3, then inwardly oblique to inner margin near inner line; space between it and inner line pale brown, with black-brown suffusion on submedian fold; outer line oblique outwards to vein 6, then inwards, and again excurved above inner margin, thicker and blacker at each extremity, where it is also preceded by brown striæ; separated from the præsubmarginal brown shade by a space of pure ground colour; subterminal line ochreous, the terminal area beyond it pale fuscous, obliquely limited above vein 6, where it leaves the apex itself pale; fringe worn.

Hindwing: Pale ochreous, with scattered dark striations, forming faint outer and submarginal bands with paler bands in between.

Underside pale ochreous with fuscous dusting; the dark markings of upperside partially showing through.

Head, thorax, and abdomen ochreous, spotted and varied with pale brown.

Expanse of wings, 28 mm.

1 ♂ from Namaqualand, South Africa (Worden).

Close to *P. curvifascia*, Warr., Nov. Zool., iv., p. 110, from Mpetá.

SUB-FAMILY PROSOPOLOPHINÆ.

AGRAMMODES, gen. nov.

Forewing: Elongate triangular; apex prominent; hind margin oblique; hardly curved; hindwing with apex and anal angle rounded; termen slightly indented beyond cell.

Palpi porrect, loosely and roughly haired, the segments indistinct; tongue present; forehead smoothly rounded; antennæ of ♀ simple.

Neuration: Forewing, cell more than half as long as wing; discocellular vertical, incurved in lower half; vein 2 at $\frac{2}{3}$, 3 shortly before 4; radials normal; 7, 8, 9 stalked from the bend in subcostal; 10, 11 stalked; 10 anastomosing moderately with 8, 9, which separate shortly before costa; hindwing with costal and subcostal approximated for fully half of cell so closely as to appear to anastomose; 6, 7 from upper angle; no radial.

Type: *A. leucograptæ*, spec. nov.

12. AGRAMMODES LEUCOGRAPTA, spec. nov.

Forewing: Olive-brown; costa at base narrowing to middle white; a white streak along outer half of cell continued shortly towards apex beyond it; a long streak from base of submedian fold to below vein 3, meeting an oblique streak from apex; the olive ground darker along the streaks; fringe olive-grey.

Hindwing: Whitish grey, darker along termen.

Underside paler, the white streaks of forewing showing through.

Face and thorax olive; abdomen olive-grey; palpi, pectus, and forelegs fulvous.

Expanse of wings, 28 mm.

1 ♀ from Montague Baths, Cape Colony, November, 1902.

GEN. AXIODES, Warr.

13. AXIODES RUFIGRISEA, spec. nov.

Forewing: Dull grey, dusted with darker; the veins fulvous; inner and outer lines pale; the inner acutely angled in cell, then oblique inwards to $\frac{1}{4}$ of inner margin, and dentate on subcostal vein and submedian fold; outer line lunulate dentate, from $\frac{5}{6}$ of costa to $\frac{2}{3}$ of inner margin, strongly indented on submedian fold; space between the lines suffused with brownish fuscous; outer line followed by a dark shade; black terminal lunules between the veins

which end in strong teeth; an oblique black dash from subapical lunule to vein 6, the apex itself pale grey; fringe dark grey with base white between the veins.

Hindwing: Dull fulvous grey, crossed by a paler sinuous outer line; fringe whitish, thickly mottled with fuscous beyond veins.

Underside grey, darker in forewing; costal half of each wing paler than inner half, and speckled with dark.

Head, thorax, and abdomen dark and light grey intermixed; dorsum darker with pale segmental belts.

Expanse of wings, 32 mm.

1 ♂ from Cape Town, 1901.

FAMILY PYRALIDIDÆ.

SUB-FAMILY EPIPASCHIANÆ.

GEN. ISOLOPHA, Hmps.

14. ISOLOPHA ALBICRISTATA, spec. nov.

Forewing: Grey, dusted and tinged with dark grey; veins below costa finely blackish; the veins beyond cell thickly black, interrupted by a broad slightly paler band, incurved below middle, following a darker shade similarly curved; base of submedian interval black, finely underlined with white along vein 1, limited by an oblique white band from median vein to submedian fold, where it ends in a raised tuft of white scales edged with black, connected by white scaling with a second similar tuft lying below the base of vein 1; intervals before termen marked with black specks; fringe blackish fuscous.

Hindwing: Dull white, with a blackish grey broad terminal border, preceded by a curved dark somewhat dentate outer line.

Underside with the dark markings shown.

Head and thorax fuscous grey; abdomen dirty whitish speckled with pale and dark grey; dorsum paler, especially at base, rather glossy; small tufts on metathorax black.

Expanse of wings, 36 mm.

1 ♂, without locality label, from South Africa.

Referred provisionally to *Isolopha*, Hmps., as being the only genus in the *Epipaschianæ* with porrect palpi.

SUB-FAMILY PYRALIDINÆ.

GEN. BOSTRA, Wlk.

15. BOSTRA CONSPICUALIS, spec. nov.

Forewing: Dull greyish pink in median area; the basal and terminal areas chocolate-brown; the former with a diffuse crenulate curved margin at $\frac{1}{3}$; the latter with the inner edge sinuous, but without distinct lines; costal edge of median area yellow with short black striæ, underlined by a fulvous streak, which becomes costal in terminal third; cellspot chocolate; fringe chocolate with a dark line towards tips.

Hindwing: Fulvous orange, becoming deeper fulvous along termen; the fringe chocolate.

Underside vinous red, paling basewards and mixed with yellow in hindwing; fringe pinkish grey.

Head and thorax greyish pink tinged with red; dorsum glossy, reddish grey; palpi deep chocolate; also the legs and pectus and underside of abdomen, the last mixed with fulvous.

Expanse of wings, 36 mm.

1 ♂ from Cape Town.

Nearest to *B. rufimarginalis*, Hmps.

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3.—*Descriptions of Four New Species of South African Hemerobiidæ*
(Order Neuroptera).—By L. PÉRINGUEY, D.Sc., F.E.S., *Director*.

SUB-FAMILY MYRMELEONIDES.

GEN. PALPARES, Ramb.

PALPARES ÆMULUS, n. sp.

Text-fig. 1.

♂ ♀. Antennæ black, slightly shorter than the thorax. Head bright yellow with a black central macule on the vertex; a thick bunch of black hairs at the base of the antennæ; face without black patch; palpi fuscous in the anterior part; thorax one-third longer than broad, clothed all over with long flavescent greyish hairs, yellow with three broad parallel black bands on the upper side; under side black; wings dilated at about or a little beyond the middle, but slightly sharper at tip in the ♂, with the hind, sub-apical margin only very slightly sinuate, hyaline but with a flavous tinge, and the nervures and nervules yellow where not splashed with fuscous black, pterostigma yellow, costal margin and also sub-costal with very regular, sub-quadrangle fuscous spots; at about the median part runs another row of similar tessellation, which, beginning at the base, does not, however, reach beyond two-thirds of the length of the wing; the lower half of the wing is sprinkled with numerous, somewhat irregular fuscous dots, more seriated along the hind margin from the base to the apex where there is also a short horizontal band consisting of four or five agglomerated macules: in the hind-wings is a regular series of spots in the costal margin only, and an agglomeration of five or six such macules after the pterostigma, three large fuscous patches on the disk, a sub-quadrangle one at about the middle of the disk, an irregular, horizontal one between the middle and the apex surmounted by a smaller, sub-oblong above



FIG. 1. PALPARES ÆMULUS.



FIG. 2.—PALPARES SPARSUS, McL.

it and abutting on the sub-costal ; along the hind margin there runs a regular, well-defined row of macules, and there is a juxta-apical, short, fuscous band, similar to that of the fore-wings ; the body is deeply infusate, but there is a more or less distinct, sub-flavescent, dorsal median band reaching from the base to a third of the length in the ♂, but entire in the ♀.

Length of body 42-43 mm. ; clasps 6 mm. ; of fore-wings expanded, ♂ 104 mm., ♀ 115 mm. ; hind-wings, ♂ 106 mm., ♀ 116 mm.

Hab. Natal (Maritzburg), L. Péringuey ; Zululand, A. W. Jones.

This species is very closely allied to *P. sparsus*, ♂, MacLachlan, who has, however, connected with the male of this species the female of *P. æmulus*. My examples of *P. sparsus*, ♂ and ♀, are from the same locality as the ♂ described by the above-mentioned author, and agree with an example named by him in the British Museum.

PALPARES SOBRINUS, n. sp.

Text-fig. 3.

♀. Closely allied to *P. æmulus* ; the colouration of the body is the same, except that the half of the face is deeply infusate ; that



FIG. 3.—PALPARESSOBRINUS.

of the wings is of the same pattern, that is to say, they are sprinkled with small black spots, but in the hind-wing there are no large discoidal reticulated spots. In the fore-wing the sub-costal and radial nervures are not conspicuously yellow as in *P. sparsus*, ♂ and ♀ ; the macules are evenly spread and of even size, except

along the radial nervure, where they are vertical and longer than the others along the median part as far as or near to the pterostigma; in the hind-wings, below and alongside this radial nervure, there is, disposed in the same position as in the fore-wings, a series of small transverse macules a little wider than the others, and the outer of which, set not far from the pterostigma, is semi-arcuate; the other spots, which are somewhat closely set, do not form any distinct patch or band, not even at apex, and they are slightly larger than those on the fore-wings.

Length of body 39 mm.; of fore-wings expanded 100 mm.; of hind-wings 93 mm.

The antennæ are missing in the only example (♀) represented in our Collection.

Hab. Cape Colony (Dunbrody), Rev. J. O'Neil.

This species is more than a local race of *P. sparsus*, but it belongs to the same type, although more broadly differentiated from it than, for instance, *Palpares caffer* from *P. speciosus*.

So far as now known, *P. sobrinus* inhabits the coastal districts of the Eastern Province of the Cape Colony; *P. æmulus* occurs in Natal and Zululand, and is replaced in Southern Rhodesia and along the Zambesi River by *P. sparsus*.

PALPARES ONEILI, sp. n.

Text-fig. 4.

♀. Very light buff with the under side of the antennæ slightly flavescent; antennæ shorter than the thorax; labrum slightly flavescent, head concolorous, vertex very highly raised in the anterior part, sloping thence to the base; palps concolorous; apex of mandibles black; prothorax twice as long as broad, very densely hairy, lanuginose laterally and posteriorly, the lanuginose hairs being white; the long hairs on the pro- and meso-notum are black; in the centre of the dorsal part runs a black line, very narrow on the pronotum but wider on the mesonotum and narrower on the metanotum; on each side is a broad band divided into three on the mesonotum; the abdomen is blackish brown and concolorous, but probably lighter in life; legs flavescent, femora and tibiæ villose and with black bristles, tarsi sub-flavescent; spurs curving at apex, as long as the first and half of the second taken together; wings long, narrow, sharply acuminate at apex, hind border of the fore-wing broadly emarginate from the base to two-fifths of the length where the end of the emargination is lobate and rounded; in the posterior

wings, the emargination although very conspicuous is not lobate at the end; both are hyaline with fuscous markings, the sub-costal and radial nervures are flavescent, and the pterostigma is very indistinct; in the fore-wings the costal interval is sprinkled with black and white seriate patches along the margin from about half the length to the apex, and the hind margin is tessellated in the same fashion from the apex to the post-median lobe, but the macules are large and very distinct; in the centre of the disk there extends a narrow black band on both sides of the cubital vein from the base to past the median part, and parallel to this narrow band, but situated above it,



FIG. 4.—PALPARES ONEILLI.

is another, which begins at about the middle and reaches the apex; and above the terminal part of the emargination of the posterior margin there is a short line; the hind-wings have each three transverse, sinuate, fuscous-brown patches connected above the hind margin by a broad band, sending seriate transverse rami, reaching the margin itself; the third or post-median patch is almost connected with the costal vein, being vaguely interrupted, however, below the radial area, and the upper margin from the pterostigma to the apex is finely tessellated as in the fore-wing.

Easily recognised from any other South African species of *Palpares* by the peculiar emargination of the hind border of the wings, but I do not think that this character is sufficiently important to justify the creation of a new genus.

Length of body (♀) 47 mm. ; of fore-wings expanded 138 mm. ; of hind-wings 128 mm.

Hab. Cape Colony (Oudtshoorn), Rev. J. O'Neil.

SUB-FAMILY NEMOPTERIDES.

GEN. NEMOPTERA, Latr.

NEMOPTERA (ERETMOPTERA) KARROOA, n. sp.

♀. Flavous, variegated with light buff on the neck and thorax ; abdomen buff but with a light flavous median band on the dorsal part ; ventral part pinkish, and having a lateral narrow yellow band. Antennæ equal in length to two-thirds of the wing, yellow, but slightly infusate in the anterior third ; part of the head yellow, only



FIG. 5.—NEMOPTERA KARROOA.

the apex of the epistome and palps slightly infusate ; vertex and neck with three light buff bands ; neck distinct, vertex quadrituberculate ; prothorax twice as long as broad, pronotum narrower at apex than the vertex of the head, plainly elongate and having a lateral and anterior row of bristles, mesonotum nearly as broad as

long, sutures deep, interspaces slightly convex, the median, somewhat broad buff band is hardly visible past the middle, and the lateral ones are sub-dorsal; these bands are no longer distinct on the metanotum; the under side is concolorous, flavous like the legs, which have the ultimate tarsal joints slightly infuscate; wings hyaline with a very distinct flavous tinge; reticulation also flavescent, especially the sub-costal and radial veins which are conspicuously yellow, very bristly, and reaches the pterostigma, which is distinct; the wings are two and a half times as long as broad, not acuminate, but not rounded either at apex, with the posterior margin plainly sinuate at a short distance from the apex; hind-wings very long, very slender, nearly twice as long as the fore-wings, but curving strongly downwards at about two-thirds of the length, where each broadens, becomes plainly quadri-costate, and tapers suddenly near the tip, the enlarged part is more bristly than the anterior, and the constricted part is clothed with a long, black villo-sity; the whole wing with the exception of the constricted apical part is flavescent.

Length 15 mm.; expansion of fore-wings 53 mm.; length of hind-wing from base to curve 41 mm.; with the curve included 51 mm.

This species cannot be mistaken for any other South African one. It is probable that in the ♂ the fore-wings are a little more acuminate.

Hab. Cape Colony (Laingsburg), R. M. Lightfoot.

4.—*On some South African Rhynchota in the South African Museum.*—By W. L. DISTANT.

AMONG the very interesting species described in this paper is the third Phymatid recorded from that region and two new Tingids. The latter are now becoming fairly well known, though numerous species must still be awaiting discovery. The Phymatidæ, as I have previously remarked, are still practically unknown, so far as the Ethiopian region is concerned.

PENTATOMIDÆ.

GENUS MECIDEA.

Mecidea, Dall, List Hem. i. p. 139 (1851).

Type, *M. indica*, Dall.

MECIDEA LINEARIS.

Mecidea linearis, Dall, List Hem. i. p. 139 (1851).

Hab. S. Africa; Prieska (Brit. and S. Afr. Muss.).

Dallas was unable to give a locality for his type; we have now received it from the Cape Colony.

FAMILY COREIDÆ.

OANNES, gen. nov.

Head considerably longer than broad, shorter than pronotum, the lateral lobes broadly prominent, the central lobe acutely projecting in front, behind which are two short porrect spines, and beneath near bases of antennæ three spines, the central one longest; eyes almost midway between base and apex, of moderate size and placed on lateral margins; ocelli between the eyes; antennæ inserted at the apices of the lateral lobes, first joint somewhat strongly incrassated, about as long as head, setose on each lateral margin, second a little stouter than third and about half its length, fourth short and

globose; rostrum reaching the intermediate coxæ, first and second joints short and stout, second not reaching base of head, third longest, its apex and the apical joint received in a central sternal sulcation; pronotum wider at base than long, the lateral margins finely spinous, the lateral angles strongly spinous, anterior margin truncate, basal margin a little concave; scutellum about as broad at base as long, its apex acuminate; corium about as long as head and pronotum together, the lateral margins subparallel; membrane centrally about as long as corium and with distinct basal cells, reaching apex of abdomen in ♂, but not in ♀; abdomen strongly amplified in ♀, less so in ♂; legs slender; abdomen beneath not visible in the carded specimens from which this diagnosis is made.

I am uncertain as to which division of the Coreidæ, according to Stål's arrangement, this genus should be included. It has considerable affinity with the *Atractaria*, but the veins are not emitted from the base of the membrane, where they are distinctly cellular in structure.

OANNES SPINOSUS, sp. n.

Head and antennæ testaceous, the latter with the apical joint black, behind eyes two central longitudinal black lines; pronotum



OANNES SPINOSUS, ♀.

with the anterior lobe testaceous, and with a central pale longitudinal carination margined on each side with black, posterior lobe dull greyish and finely darkly punctate; scutellum testaceous with basal black spots; corium dull greyish, the apical marginal area distinctly more palely punctate, the punctures coarser on the costal area; the dilated abdominal margins reddish testaceous with transverse pale ochraceous spots; mem-

brane dull greyish, some of the veins testaceous; body beneath reddish testaceous; legs dull greyish, more or less annulated with brownish; structural characters as in generic diagnosis.

Long. $6\frac{1}{2}$ mm.

Hab. Cape Colony: Cape Town,

FAMILY LYGÆIDÆ.

RHODESIA, gen. nov.

Broadly oblong; head concealed by anterior produced margin of pronotum, obliquely directed downward, central lobe prominent and widened anteriorly; eyes at base, ocelli near eyes; antennæ four-jointed, first joint shortest but passing apex of head, remaining joints almost subequal in length; pronotum broad, considerably shorter than breadth between pronotal angles, prominently centrally, longitudinally ridged, the anterior area convex and anteriorly produced, thus concealing the head, lateral margins thickly upwardly recurved and broadly rounded at basal angles; scutellum large and broad, moderately raised and inflated, the apex broad and obtusely narrowed; corium about as long as pronotum and scutellum together, the lateral margin a little roundly ampliate and distinctly reflexed, the apical margin sinuate; membrane large, considerably longer than corium; rostrum reaching the second abdominal segment, first joint reaching the anterior coxæ; legs of moderate length and thickness.

The concealed head beneath the anteriorly produced pronotum is the characteristic of the genus, which may be placed near *Aulacopeltus*, Stål.

RHODESIA DURBANI, sp. n.

Sanguineous; two subquadrate spots to pronotum divided by the central ridge, basal area of scutellum, a spot near base and another at apex of corium, membrane, disk of sternum, lateral margins and apex of abdomen beneath, antennæ, rostrum, and legs black; scutellum with the basal black area somewhat reticulately impressed; other characters as in generic diagnosis.

Long. $16\frac{1}{2}$ mm.

Hab. Natal; Durban.



RHODESIA DURBANI.

LYGÆUS PERINGUEYI, sp. n.

Dull pitchy black; head above dull testaceous, an apical fascia and space behind eyes black; pronotum with the anterior margin and two transverse spots on disk ochraceous; apical area of scutellum, and base and apical margin of corium ochraceous; membrane black with an obscure greyish spot at basal angle and a large transverse whitish spot before middle; body beneath more or less ochraceous; a longitudinal fascia on each side of head, transverse sternal fasciæ, a central metasternal spot, antennæ, and legs black; abdomen beneath with the middle of third segment, broad anterior margins to fourth and fifth segments, the whole of the sixth segment, coxæ, and femora beneath castaneous; antennæ black, first joint stoutest, distinctly passing apex of head, second a little longer than either third or fourth, which are subequal; pronotum and scutellum with

**LYGÆUS PERINGUEYI.**

a distinct central longitudinal carination; posterior pronotal angles obtusely subangulate; rostrum reaching the second abdominal segment.

Long. 22 mm.

Hab. Cape Colony; Port St. John's.

FAMILY TINGIDIDÆ.**EUAHANES, gen. nov.**

Broadly ovate; head covered by the pronotal hood; antennæ with the first joint short and incrassate, second a little shorter and less incrassate than first, third very long and slender, fourth short, thickened, pyriform; head spinously produced between the bases of the antennæ; pronotum with a raised, compressed subangulate pronotal hood which is truncated anteriorly, areolate, and covers the head above, the lateral pronotal margins reflexed, dilated, convexly rounded and areolate, the disk tricarinate, posteriorly strongly globosely raised and areolate; elytra broad, moderately narrowed at base and more strongly so towards apex, discoidal

area short, about half the length of the elytra, subcostal area narrowed at base and broader on apical area, costal area wide, hyaline, largely transversely areolate; legs somewhat long and slender, femora moderately thickened, shorter than the tibiae.

This genus belonging to the Div. Tingidaria, by the pronotal hood covering the head and the reflexed rounded pronotal margins approaches, but is not at all closely allied to the Indian genera *Dulinius*, Dist., and allies.

EUAHANES INFLATUS, sp. n.

Antennæ black; pronotum with the disk fuscous, the raised hood, the inflated lateral areas and the globose posterior area dull greyish with the margins of the areolets fuscous or piceous; elytra, excluding the costal area, greyish brown, the margins of the areolets much darker, the costal area hyaline, the margins of the areolets piceous; femora piceous, tibiae ochraceous with their apices piceous, tarsi piceous; structural characters as in generic diagnosis.



EUAHANES INFLATUS.

Long. $3\frac{1}{2}$ mm.

Hab. Cape Colony; Grahamstown.

GENUS *SANAZARIUS*.

Sanazarius, Dist., Trs. S. Afr. Phil. Soc., xiv., p. 431 (1904).

Type *S. cuneatus*, Dist.

SANAZARIUS PRODUCTUS, sp. n.

Head and pronotum pitchy brown; elytra with the discoidal, subcostal, and sutural areas brownish ochraceous, thickly whitely

pubescent, costal area greyish with transverse fuscous lines, a distinct spot a little before middle; body beneath pitchy brown, legs fuscous brown, tarsi apically blackish; head with two long



SANAZARIUS INFLATUS.

converging spines each placed just behind base of antennæ, which have the first and second joints short, second shorter and less incrassated than first, third very long, finely spinulose, fourth short, thick, pyriform; pronotum with a raised subangulate hood with somewhat large areolets, disk tricarinate, its lateral angles broadly, trans-

versely, somewhat obliquely produced.

Long. 3 mm.

Hab. Cape Colony; Grahamstown.

Allied to *S. cuneatus*, Dist., from which it differs by the more produced and obtusely angulate pronotal hood, the broader and less angular pronotal lateral areas, &c.

FAMILY PHYMATIDÆ.

BOTHA, gen. nov.

Head long, about two-thirds the length of pronotum, the margins subparallel, eyes inserted near middle, ocelli a little behind middle of postocular area, post- and ante-ocular areas about equal in length, centrally longitudinally sulcate from apex to a little behind middle; antennæ robust, apical joint longest, slightly longer than the preceding joints together, second and third joints shortest, subglobose and subequal; pronotum shorter than breadth between pronotal angles which are broadly produced, their apices truncate and posteriorly subangulate, anterior half of lateral margins crenulate, two central longitudinal ridges on disk, and a central longitudinal impressed line, posterior angular margins undulate; scutellum about as long as pronotum, longer than broad, the margins distinctly ridged, the apex subangulate or angularly

rounded; corium a little shorter than head and pronotum together, the veins very prominent; membrane slightly passing abdominal apex; abdomen more or less angularly dilated on each side; rostrum extending to about middle of prosternum, first joint considerably longest and stoutest; anterior coxæ long but distinctly shorter than femora.

Type *B. insignis*, Dist.

Allied to the Oriental genus *Amblythyreus*, but differs in having the second and third joints of the antennæ very short, subequal and globose; first joint of rostrum longest, much longer than second, &c.

BOTHA INSIGNIS, sp. nov.

Brownish ochraceous; scutellum, dilated abdomen above, body beneath and legs pale ochraceous; apex of abdomen above, castaneous; antennæ with the first and fourth joints distinctly granulose, the apical thicker and slightly curved at apex; head and pronotum finely granulose; scutellum very finely rugulose, the extreme lateral margins finely crenulate; coxæ strongly granulate; central disk of abdomen beneath moderately testaceous; other structural characters as in generic diagnosis.

Long. 11 mm.

Hab. Cape Colony; Mossel Bay.



BOTHA INSIGNIS.

FAMILY REDUVIIDÆ.

NEOVARUS, gen. nov.

Elongate; moderately depressed; head almost as long as pronotum, eyes placed a little nearer base than apex and extending transversely quite across the lateral areas of the head; ocelli large and prominent, situate between the eyes; antennæ with the first joint slightly passing apex of head, second longest; pronotum transversely constructed before middle, the anterior lobe convex and sculptured but without a central longitudinal sulcation or fissure, its anterior angles obtusely prominent, the posterior lobe with the lateral angles moderately subacutely produced, posterior lateral margins sinuate; scutellum slightly gibbous, transverse, a distinctly raised spine on each lateral margin and a more or

less suberect spine at apex; corium and membrane subequal in length in ♀, membrane a little the longer in ♂, the membrane distinctly not reaching the abdominal apex in ♀; rostrum with the first joint slightly shorter than the second; legs moderate, anterior femora not spinous beneath, anterior tibiæ with an apical spongy fovea for about one-fourth the length from apex; posternum centrally longitudinally sulcate, allied to *Varus*, Stål, but differing in the distinct structure of the scutellum and the non-spinous anterior femora.

The S. African species *Reduvius varius*, Walk., is included in this genus.

NEOVARUS FLAVOMARGINATUS, sp. n.

Ochraceous; head with a curved line on antecular area, a small spot above and behind insertions of antennæ, a larger spot between eyes, and the disk of postocular area black; pronotum with suffusions



NEOVARUS FLAVOMARGINATUS.

to anterior lobe, two broad elongate fasciæ and a short submarginal line to posterior lobe black; scutellum (excluding a short central line) black; apical half of clavus and adjoining interspace to corium and the membrane black; body beneath black; lateral margins of sternum and abdomen, four discal spots to prosternum, a spot on each anterior coxa, a subbasal central spot to abdomen and the legs ochraceous; anterior and intermediate femora and tibiæ biannulated with black, posterior femora

black annulated with ochraceous at base and near apex, posterior tibiæ annulated with black near base, rostrum black, more or less ochraceous beneath and at the margins of the joints; antennæ with the first joint blackish, the second ochraceous, remainder mutilated; pronotum finely punctate and wrinkled; rostrum with the second joint slightly longer than the first; abdomen above black, the connexivum ochraceous; structural characters as in generic diagnosis.

Long. 18-20 mm.

Hab. Cape Colony; Vryburg.

NEOVARUS LUTEIPENNIS, sp. n.

♂. Black; lateral areas of tegmina from base to beyond middle, ochraceous; membrane piceous; antennæ piceous, pilose, first joint passing apex of head, second longest; head centrally longitudinally sulcate from in front of eyes to near apex; ocelli large and somewhat ochraceous; scutellum with a short spine on each lateral margin and a longer and slightly upwardly curved spine at apex; lateral margins of connexivum more or less pilose; membrane not quite reaching abdominal apex; rostrum piceous, first joint slightly shorter than the second; prosternum distinctly longitudinally centrally sulcate; base of anal segment beneath ochraceous.



NEOVARUS LUTEIPENNIS.

Long., ♂, 22 mm.

Hab. Cape Colony; Hanover.

GENUS HOLOTRICHIUS.

Holotrichius, Burm., Handb. Ent. ii. p. 247 (1835).

Type, *H. tenebrosus*, Burm.

HOLOTRICHIUS SEGMENTARIUS, sp. n.

♀. Body, first joint of antennæ and legs greyishly pilose, and above more or less longly fuscously setose, head longer than pronotum, a distinct tubercle on post-ocular area near base, lateral margins of ante-ocular area distinctly setose; eyes moderately small, longer than broad; rostrum pitchy brown, the basal joint greyishly pilose and shortly setose; antennæ with the first joint longer than the ante-ocular area of the head and distinctly longer than the third joint, longly setose, second and third joints pale brownish, their apices piceous; pronotum with the basal margin—including the lateral angles—about twice as broad as the anterior

margin, the anterior angles obtusely angularly produced, a pro-



HOLOTRICHIUS SEGMENTARIUS.

minent rounded tubercle on each lateral margin behind the anterior lobe, the posterior lateral angles prominent and suberect, their apices somewhat conical; scutellum with a long apical, erect, slender, pitchy-brown spine; abdomen ovate, longer than greatest width, basal segment with a narrow basal transverse elevation with a small tubercle at each extremity, lateral margins dilately reflexed, apical segment sub-concavely attenuated on each side, the segmental margins piceously determinated.

Long. 20 mm.

Hab. Cape Colony; Dun-

brody.

A large species somewhat allied to *H. farinator*, Reut., but differing by the tubercles to the lateral pronotal margins, the totally different shape of the posterior pronotal lobe, shorter third joint of antennæ, longer head, &c.

GENUS PIRATES.

Pirates, Serv., Ann. Sc. Nat. xxiii. p. 215 (1831).

Pirates, Burm. (part), Handb. ii. pp. 222 and 239 (1835).

Type, *P. hybridus*, Scop.

PIRATES MONTIVAGUS, sp. n.

Entirely black; head opaque black, about as long as the anterior lobe of the pronotum, a short central longitudinal incision in front of the ocelli which are prominent and shining ochraceous in hue; antennæ fuscously pilose, the basal joint almost smooth, shorter than head, second and third joints subequal in length, each a little shorter than pronotum; rostrum with the first joint a little shorter than the second; pronotum glossy, shining black, anterior lobe longer and narrower than the posterior lobe, coarsely longitudinally grooved, the anterior angles strongly nodulose, the lateral margins

moderately rounded, flattened and narrowing towards the anterior angles, posterior lobe more or less rugosely impressed, its lateral angles non-prominent and rounded; scutellum with the lateral margins ridged, the apex somewhat nodulose; corium and membrane slightly shining black, but duller in hue than the pronotum, apical margin of the membrane faintly fuscous; sternum more or less fuscously pilose; anterior femora strongly grooved beneath; posterior tibiæ longly setose, anterior and intermediate tibiæ with a spongy furrow not reaching middle, anterior femora minutely tuberculously spinose beneath.

Long. 28 mm.

Hab. S. Rhodesia; Matoppo Hills.

The largest Ethiopian species of the genus with which I am acquainted.

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5.—*New South African Micro-Lepidoptera*.—By E. MEYRICK,
B.A., F.R.S.

III.*

By the kindness of Dr. L. Péringuey I have received for examination a further collection of specimens from various sources; the types of the new species are in the South African Museum.

PTEROPHORIDÆ.

GEN. TRICHOPTILUS, Wals.

TRICHOPTILUS CRYPHIAS, n. sp.

♂ ♀. 13–14 mm. Head and thorax brown irrorated with blackish and whitish, posterior margin of thorax white. Abdomen brown mixed with whitish and striated with blackish. Forewings cleft to middle, segments linear; reddish-fuscous suffusedly irrorated throughout with blackish; first segment with slender whitish bars at $\frac{2}{5}$ and $\frac{1}{3}$ of its length, former indicated also on second segment: cilia dark fuscous, on costa with white patches on bars, both margins of first segment with some black and white scales towards apex, upper margin of second segment with some black scales towards apex preceded by some white scales and followed by a white apical patch, dorsum with a white patch on bar of second segment. Hindwings dark fuscous, slightly reddish-tinged; cilia dark fuscous, dorsum with a small black scaletooth at $\frac{2}{3}$ and two or three black scales at apex.

TRANSVAAL, Barberton, in May (H. Edwards); two specimens, not in good condition.

* The two previous contributions are to be found in Vol. V. of the Annals.

GEN. PLATYPTILIA, Hübn.

PLATYPTILIA PATRIARCHA, n. sp.

♂. 16 mm. Head and thorax pale fuscous sprinkled with dark fuscous, forehead without tuft. Palpi $1\frac{1}{2}$, whitish irrorated with dark fuscous. Antennæ whitish lined with dark fuscous. Abdomen fuscous, becoming whitish-ochreous towards base, segmental margins whitish dotted with dark fuscous, anal tuft whitish-ochreous. Forewings cleft to before $\frac{2}{3}$, segments moderately broad, apex pointed, termen oblique, of first segment straight, of second slightly sinuate; light brownish-ochreous irregularly sprinkled with dark fuscous and whitish; costal edge dark fuscous except a whitish patch beyond cleft, slightly thickened above cleft; a cloudy dark fuscous dot in disc at $\frac{1}{3}$, and two transversely placed at angles of cleft; a transverse whitish line on first segment near before termen, preceded and followed by rather dark fuscous suffusion, and a similar less marked line on second segment: cilia ochreous-whitish, at lower angle of first segment with a black dot and fuscous bar, and another black basal dot above this, at apex of second segment with a black basal dot, on dorsum with small black scale-projections beyond middle of wing and beyond cleft. Hindwings dark grey; cilia grey, above apex tinged with whitish, on basal half of dorsum with several small scattered dark fuscous scales.

ZULULAND, Mfongosi, in April (W. E. Jones); one specimen. An early form of the genus

GEN. PTEROPHORUS, Geof.

PTEROPHORUS SORDIDATUS, n. sp.

♂. 19 mm. Head and thorax ochreous-whitish, face fuscous-tinged. Palpi hardly over 1, whitish. Antennal ciliations $\frac{1}{2}$. Abdomen ochreous-whitish, longitudinally streaked with brownish. Forewings cleft to $\frac{3}{4}$, segments moderate, acute; ochreous-whitish, mostly suffused with very pale brownish-ochreous except on second segment, which is suffused with white, darkest on anterior portion of first segment; extreme costal edge dark fuscous from near base to $\frac{3}{4}$: cilia greyish-ochreous, whitish towards base, on costa of first segment white except a dark fuscous patch from its middle to near apex, on anterior margin of second segment rather dark fuscous, on dorsum with large patch of fuscous suffusion before cleft and two smaller ones posteriorly. Hindwings with segments narrow, acute; grey; cilia greyish-ochreous.

ORANGE FREE STATE, Smithfield (D. R. Kannemeyer); one specimen.

MACROTINACTIS, n. g.

Forehead with slightly projecting scales; ocelli obsolete. Labia palpi moderately long, straight, ascending, with appressed scales, terminal joint nearly as long as second, hardly pointed. Forewings bifid, cleft from near middle; 2 almost connate with 4, 3 and 4 stalked, 5 and 6 very short, 7 from below angle, 9 and 10 absent, 11 approximated to 8 at base. Hindwings trifold, third segment with tuft of black scales in dorsal cilia; 3 absent, 5 and 6 obsolete, 7 to apex.

Type *stenodactyla* Fletch. (*Oxyptilus stenodactylus* Fletch., Entom., 1911, 282). An example from Mfongosi, Zululand, in May (Jones) appears to agree sufficiently with the original description, except that the termen of second segment of forewings is concave, its apex falcate, as in Hampson's figure of *Titanoptilus*, to which genus there is undoubted relationship; the two genera constitute a special line of development from *Platyptilia*, quite unconnected with *Oxyptilus*.

GEN. AGDISTIS, Hübn.

AGDISTIS INFUMATA, n. sp.

♂. 23-24 mm. Head whitish mixed with fuscous, face obtusely prominent. Palpi white sprinkled with pale grey. Thorax whitish sprinkled with fuscous. Abdomen fuscous mixed with whitish. Forewings with apex tolerably pointed, termen slightly rounded, rather strongly oblique; light greyish-ochreous, slightly sprinkled with whitish, with scattered black scales; triangular area purplish-grey irrorated with blackish, contrasting strongly with light ground colour, with a small blackish spot at its inverted apex, an elongate one beneath its lower margin beyond middle, and a small one between this and first: cilia whitish-ochreous, with dark fuscous spots at apex and tornus, and two on costa. Hindwings grey, irrorated with dark fuscous towards lower part of termen; cilia whitish-fuscous, with fuscous median shade.

ZULULAND, Mfongosi, in May (W. E. Jones); three specimens.

CARPOSINIDÆ.

GEN. CARPOSINA, Herr.-Sch.

CARPOSINA SITURGA, n. sp.

♀. 19 mm. Head, thorax, and abdomen pale whitish-ochreous. Palpi 4, ochreous-whitish, partially sprinkled with dark fuscous.

Forewings elongate, rather narrow, posteriorly dilated, costa gently arched, apex obtuse, termen almost straight, oblique; whitish-ochreous, slightly and irregularly sprinkled with fine fuscous and dark fuscous irroration tending to form dots on margins; an inwardly oblique mark of dark fuscous irroration on extremity of submedian fold: cilia whitish-ochreous, finely sprinkled with fuscous. Hindwings grey-whitish, slightly greyer towards apex; cilia whitish.

ORANGE FREE STATE, Smithfield (Kannemeyer); one specimen.

TORTRICIDÆ.

GEN. TORTRIX, Lin.

TORTRIX CRISPATA, n. sp.

♂. 19-21 mm. Head and thorax whitish-ochreous, shoulders more ochreous-tinged. Palpi 3, ochreous-whitish irrorated with dark fuscous. Antennæ subdentate, ciliations $1\frac{1}{2}$. Abdomen ochreous-whitish. Forewings moderate, slightly dilated posteriorly, costa anteriorly moderately, posteriorly slightly arched, without fold, apex obtuse, termen nearly straight, slightly oblique; whitish-ochreous suffusedly strigulated or reticulated with yellow-ochreous; costa suffused with ferruginous-brownish, with scattered strigulae of blackish irroration; dorsal edge with some blackish scales; an irregular grey spot sprinkled with blackish towards costa at $\frac{1}{3}$, indicating angle of basal patch; central fascia oblique, rather narrow towards costa, dilated downwards, ferruginous-ochreous partially suffused with grey and sprinkled with blackish; costal spot represented by two blackish-grey strigulae united at extremity, whence a line of small grey strigulae runs to tornus, apical area beyond this with scattered blackish-grey strigulae: cilia ochreous-whitish. Hindwings and cilia ochreous-whitish.

ZULULAND, Mfongosi, in November (W. E. Jones); two specimens. Allied to *capensana*, and might be overlooked as this species, though differently marked; distinct by longer ciliations of antennæ (in *capensana* not over 1), and palpi also rather longer.

TORTRIX MENSARIA, n. sp.

♂. 19 mm. Head, palpi, and thorax yellow-ochreous. Antennal ciliations 1. Abdomen dark grey. Forewings elongate, costa gently arched, without fold, apex round-pointed, termen somewhat sinuate, rather strongly oblique; ochreous-yellow, costal edge

tinged with whitish-grey; whole surface irregularly strewn with small bluish-leadен-metallic spots: cilia whitish-ochreous, base ochreous-yellow. Hindwings dark grey; cilia whitish-ochreous, with grey subbasal shade.

ZULULAND, Mfongosi, in November (W. E. Jones); one specimen.

EUCOSMIDÆ

GEN. EUCOSMA, Hübn.

EUCOSMA SICEESCENS, n. sp.

♂. 20 mm. Head ochreous-whitish. Palpi whitish, somewhat sprinkled with dark fuscous. Thorax whitish, patagia sprinkled with brownish. Abdomen whitish sprinkled with grey. Forewings elongate, somewhat narrow, posteriorly slightly dilated, costa slightly arched, without fold, apex obtuse, termen hardly rounded, rather oblique; pale brownish, irregularly sprinkled and strigulated with dark fuscous; costa with obscure whitish strigulae alternating with dark fuscous irroration; posterior third of wing with suffused irregular partially confluent silvery-whitish striae, one immediately before termen more distinct and preceded in ocellus by three elongate black dots: cilia white irrorated with dark fuscous. Hind-wings with 3 and 4 stalked; rather dark grey; cilia whitish irrorated with fuscous.

BUSHMANLAND, Jackals Water (R. M. Lightfoot); one specimen.

EUCOSMA GALACTITIS, n. sp.

♂ ♀. 17-18 mm. Head white. Palpi white, second joint with long rough projecting scales, with a grey band. Antennae in ♂ simple. Thorax grey mixed with dark fuscous and whitish. Forewings elongate, posteriorly somewhat dilated, costa in ♂ gently, in ♀ moderately arched, in ♂ without fold, apex obtuse, termen sinuate in middle, somewhat oblique; fuscous mixed with brown and dark fuscous; costal edge dark fuscous with pairs of whitish strigulae, whence arise oblique dark leaden strigae not reaching half across wing; an irregular subquadrate white blotch occupying median third of dorsum and reaching more than half across wing, including two or three greyish dots or marks, dorsal edge between this and base irregularly marked with whitish; an irregular white tornal blotch representing ocellus, containing two black dots near middle of posterior edge and apex, and surmounted by a small irregular blackish spot: cilia leaden-fuscous mixed with dark fuscous, with

white toral patch. Hindwings with 3 and 4 stalked; in ♂ grey-whitish, becoming pale grey towards apex, in ♀ light grey; cilia whitish with grey subbasal line, round apex grey.

TRANSVAAL, Barberton, in April (H. Edwards), and Johannesburg, in January (one ♂ in my own collection); ZULULAND, Mfongosi, in May (W. E. Jones); three specimens. At first sight very like *E. leucopetra*, but larger, and the male of that species has a costal fold, besides differences of detail.

CHLIDANOTIDÆ.

GEN. TRYMALITIS, Meyr.

TRYMALITIS SCALIFERA, n. sp.

♂. 18 mm. Head ferruginous, with a white band behind antennæ, lower part of face whitish. Palpi white, second joint ferruginous above. Antennæ grey. Thorax white, spotted with light brownish. Abdomen pale ochreous, apex white. Forewings rather elongate-triangular, costa gently arched, apex obtuse, termen slightly sinuate, rather oblique; snow-white; a small dark fuscous spot on costa near base, and several dark fuscous strigulæ between this and a roundish brown spot resting on costa before middle, thence to apical spot the costa is narrowly dark brown cut by oblique white strigulæ; a rather broad streak of fuscous suffusion partially tinged with ferruginous and transversely strigulated with silvery-whitish extending along dorsum from base to tornus; a rather thick irregular dark brown streak much strigulated transversely with silvery-whitish and somewhat mixed with pale leaden-grey extending from costa before apical mark to dorsal streak at $\frac{2}{3}$; an elongate-triangular ferruginous-orange mark on costa before apex, edged above with white at apex, and beneath by a curved white line, below which is a round yellow apical spot; a series of four small leaden-grey spots before termen, each preceded by a fine black transverse-linear mark: cilia white, at apex ferruginous, tips ferruginous on upper part of termen. Hindwings light grey, apex narrowly whitish; cilia white, with two blackish basal dots at and above apex, and a fine greyish basal line, round apex with a ferruginous postmedian line becoming fuscous on upper part of termen.

ZULULAND, Mfongosi, in November (W. E. Jones); one specimen. Approaches the Australian *optima*, but can be immediately distinguished by the markings on posterior half of costa.

GELECHIADÆ.

GEN. PALTODORA, MEYR.

PALTODORA MAGNANIMA, n. sp.

♂ ♀. 27-28 mm. Head whitish, in ♂ irrorated with dark fuscous. Palpi white, second joint suffusedly irrorated with fuscous or dark fuscous except apical edge, tuft long. Antennæ in ♂ dark grey, in ♀ whitish. Thorax whitish suffusedly irrorated with fuscous or dark fuscous. Abdomen grey. Forewings elongate, very narrow, costa gently arched, apex acute, termen sinuate, extremely oblique; pale brownish-ochreous mixed with whitish and more or less irrorated with dark fuscous, veins sometimes partially streaked with whitish; cloudy dark fuscous dots beneath costa near base and at $\frac{1}{6}$; two cloudy dark fuscous dots on fold obliquely beyond these, connected by a fine dark fuscous streak with plical stigma, this streak edged above with white; stigmata dark fuscous, plical much before first discal, first discal elongate, second dot-like: cilia pale brownish-ochreous, in ♂ largely suffused with fuscous, on termen with interrupted dark fuscous antemedian line. Hindwings grey; cilia light fuscous.

ORANGE FREE STATE, Smithfield (D. R. Kannemeyer); two specimens.

PALTODORA PENTACENTRA, n. sp.

♂. 20 mm. Head and thorax ochreous-white, shoulders dark fuscous. Palpi brownish-ochreous irrorated with dark fuscous, tuft long, terminal joint and apical edge of second white. Abdomen ochreous-whitish. Forewings narrowly elongate-lanceolate, apex produced, acute; whitish-ochreous; costa slightly sprinkled with brownish specks; conspicuous black dots beneath costa at $\frac{1}{6}$ and $\frac{1}{3}$; stigmata black, plical obliquely before first discal: cilia whitish-ochreous. Hindwings ochreous-whitish; cilia whitish-ochreous.

ZULULAND, Mfongosi, in November (W. E. Jones); one specimen.

PALTODORA HELICAULA, n. sp.

♀. 14 mm. Head and thorax whitish, patagia with a line of dark fuscous irroration. Abdomen whitish-ochreous. Forewings elongate, narrow, costa slightly arched, apex acute, termen sinuate, extremely oblique; white, tinged with brownish and irrorated with blackish except on costa and veins, which form undefined white streaks: cilia rosy-whitish irrorated with blackish. Hindwings light grey; cilia whitish-ochreous tinged with grey.

CAPE COLONY, Kimberley, in December (Bro. J. H. Power); one specimen. Bred from a larva in a case closely resembling a snail-shell (*Helix*), formed of grey silk covered with excrement and refuse, being a tube coiled in a spiral cone of three whorls, increasing from apex to mouth, height 6 mm., diameter of bottom whorl 10 mm.; food not recorded. This is a very singular habit, deserving further study.

PALTODORA HIBERNA, n. sp.

♂ ♀. 13–14 mm. Head and thorax white, shoulders somewhat sprinkled with grey. Palpi white, terminal joint blackish except apex. Abdomen grey-whitish. Forewings lanceolate, apex produced, acute; white, sprinkled in ♂ with dark fuscous, in ♀ with grey; undefined spots of dark fuscous irroration on fold at $\frac{1}{4}$ of wing, and towards costa at $\frac{2}{5}$; stigmata dark fuscous, plical very obliquely before first discal, both these in one specimen little marked, second discal followed by an undefined streak of dark fuscous suffusion extended towards apex: cilia whitish, round apex sprinkled with grey or dark fuscous towards base. Hindwings pale grey or whitish-grey; cilia ochreous-whitish.

ZULULAND, Mfongosi, in April and May (W. E. Jones); three specimens.

GEN. MEGACRASPEDUS, Zell.

MEGACRASPEDUS INCOLA, n. sp.

♀. 25 mm. Head and thorax ochreous-whitish, shoulders sprinkled with brownish and black. (Palpi broken.) Forewings elongate, narrow, costa gently arched, apex pointed, termen very obliquely rounded; pale ochreous partially tinged with whitish, and sprinkled irregularly with brownish; two small spots of black irroration on costa towards base, and beneath costa in middle, and four on costa posteriorly; a dot of blackish irroration near base in middle, one in disc at $\frac{1}{6}$, one on fold beyond this, and three representing stigmata, plical rather obliquely before first discal; some scattered black scales towards costa posteriorly: cilia whitish-ochreous, at base on termen with several scattered blackish scales. Hindwings whitish-grey; cilia whitish-ochreous, with a faint greyish shade.

CAPE COLONY, Kimberley, in December (Bro. J. H. Powell); one specimen. Bred from a large ovate woody gall (34 mm. × 23 mm.) on twig of an unnamed shrub. In superficial appearance and in the gall-making habit this species strongly recalls *Oecococcis guyo-*

nella, but does not possess the peculiar neuration of that genus; however the relationship is doubtless real and close.

GEN. GNORIMOSCHEMA, Busek.

GNORIMOSCHEMA INFIRMA, n. sp.

♂ ♀. 10-14 mm. Head and thorax ochreous-whitish, sometimes with a few fuscous specks. Palpi white, second joint irrorated with fuscous except apex, terminal joint sometimes with slight basal and subapical rings of dark fuscous irroration. Abdomen ochreous-whitish. Forewings lanceolate, acute; ochreous-whitish or pale whitish-ochreous, sprinkled with grey and dark fuscous specks; stigmata moderately large, blackish, plical rather before first discal, second discal below middle: cilia ochreous-whitish, towards base with a few dark fuscous specks. Hindwings very pale grey; cilia pale whitish-ochreous.

ZULULAND, Mfongosi, in May (W. E. Jones); BUSHMANLAND, Henkries (R. M. Lightfoot); six specimens. Also TRANSVAAL, Barberton, in December and January (Janse).

GEN. GELECHIA, Hübn.

GELECHIA TRIPLACOPIS, n. sp.

♂. 16 mm. Head and thorax fuscous mixed with dark fuscous and ochreous-whitish. Palpi fuscous irrorated with blackish, apex of joints whitish, terminal joint as long as second. Abdomen grey, anal tuft ochreous-whitish. Forewings elongate, narrow, costa gently arched, apex pointed, termen very obliquely rounded, 6 sometimes out of 7 near base; fuscous irrorated with dark fuscous and somewhat mixed with ochreous-whitish; a small dark fuscous spot beneath costa near base, followed by a spot of ochreous-whitish suffusion; stigmata rather large, blackish, edged posteriorly by spots of ochreous-whitish suffusion and anteriorly more or less with brown, plical much before first discal; a spot of ochreous-whitish suffusion on costa at $\frac{4}{5}$; cilia fuscous, suffused with whitish at base round apex, and spotted with dark fuscous irroration towards base on termen. Hindwings over 1, termen hardly sinuate, 6 and 7 stalked; grey; cilia light grey.

CAPE COLONY, Tulbagh (R. M. Lightfoot); two specimens.

MACHLOTRICHA, n. g.

Head smooth; tongue developed. Antennæ $\frac{1}{5}$, basal joint elongate, without pecten. Labial palpi very long, porrected, second

joint very long, straight, densely rough-scaled above and with very long rough projecting scales beneath, terminal joint directed obliquely sideways, shorter than second, slender, acute. Maxillary palpi minute, filiform, appressed to tongue. Posterior tibiæ smooth-scaled. Forewings with 2 and 3 stalked from angle, 7 and 8 stalked, 7 to apex, 11 from middle. Hindwings 1, trapezoidal, termen slightly sinuate beneath apex, cilia 1; 4 absent, 5 somewhat approximated to 3, 6 and 7 stalked.

A development of *Trichotaphe*.

MACHLOTTRICHA CÆCA, n. sp.

♀. 14 mm. Head, palpi, and thorax dark grey finely sprinkled with whitish, terminal joint of palpi whitish. Abdomen grey. Forewings elongate, costa anteriorly moderately, posteriorly slightly arched, apex obtuse, termen straight, oblique; grey irrorated with blackish, finely sprinkled with whitish; a patch of darker suffusion in disc before middle, and the whitish irroration appears to form a transverse shade at $\frac{1}{5}$, angulated outwards in middle and inwards above this, but no defined markings: cilia dark fuscous sprinkled with whitish. Hindwings grey; cilia light greyish.

ZULULAND, Mfongosi, in May (W. E. Jones); one specimen.

XYLORYCTIDÆ.

GEN. ODITES, Wals.

ODITES CROCOTA, n. sp.

♂. 21 mm. Head and thorax whitish-yellowish. Palpi yellow-whitish, basal half of second joint tinged with ochreous. Abdomen ochreous-whitish. Forewings elongate, rather narrow, costa gently arched, apex obtuse, termen slightly rounded, oblique; whitish-yellowish; second discal stigma blackish: cilia whitish-yellowish. Hindwings and cilia whitish.

ZULULAND, Mfongosi, in October (W. E. Jones); one specimen. Might readily be overlooked for *Cryptolechia straminella*.

ODITES INSONS, n. sp.

♀. 18 mm. Wholly ochreous-whitish. (Palpi broken.) Forewings elongate, costa moderately arched, apex obtuse, termen slightly rounded, oblique.

ZULULAND, Mfongosi, in April (W. E. Jones); one specimen.

COSMOPTERYGIDÆ.

GEN. COSMOPTERYX, Hübn.

COSMOPTERYX LIENIGIELLA Zell.

ZULULAND, Mfongosi, in November (W. E. Jones); one specimen, which, though not in good condition, appears to agree fully in all respects with the ordinary European form; I have no doubt of its specific identity. The foodplant, *Phragmites communis*, the common reed, is cosmopolitan in distribution.

SCYTHRIDÆ.

GEN. SCYTHRIS, Hübn.

SCYTHRIS ROSEOLA, n. sp.

♂ ♀. 16–19 mm. Head and thorax grey suffused with ochreous-whitish, faintly rosy-tinged. Palpi rosy-whitish, suffused with fuscous anteriorly. Antennal ciliations in ♂ 1. Abdomen whitish-grey, in ♂ more whitish posteriorly, in ♀ suffused with whitish-ochreous, anal tuft of ♂ whitish-ochreous, ventral surface ochreous-whitish. Forewings elongate-lanceolate; rather dark fuscous; a rosy-whitish median longitudinal streak from base to near termen; a streak of rosy-whitish suffusion along costa from $\frac{1}{4}$ to apex: cilia fuscous, on costa whitish. Hindwings with 4 and 5 stalked; rather dark grey; cilia fuscous.

ZULULAND, Mfongosi, in March and April (W. E. Jones); MATABELELAND, Bulawayo (H. C. Pead); four specimens.

SCYTHRIS MELANODORA, n. sp.

♂. 16–17 mm. Head and thorax pale whitish-brown. Palpi whitish, second joint greyish-ochreous anteriorly, mixed with blackish towards apex. Antennal ciliations $\frac{2}{3}$. Abdomen whitish-ochreous. Forewings elongate, narrow, costa gently arched, apex pointed, termen faintly sinuate, very oblique; pale whitish-brownish; a small black spot beneath fold at $\frac{1}{4}$ of wing, a black dot just above dorsum obliquely before this; a more or less developed black dot or group of scales on fold rather beyond this, representing plical stigma; second discal stigma black, at $\frac{3}{4}$ of wing, and a blackish dot or group of scales on tornus rather beyond this: cilia whitish-

brownish. Hindwings with 4 and 5 stalked; grey, paler towards base; cilia whitish-brownish.

ORANGE FREE STATE, Smithfield (D. R. Kannemeyer); TRANSVAAL, Barberton, in March (H. Edwards); two specimens.

SCYTHRIS FÆCULENTA, n. sp.

♂. 10 mm. Head, palpi, and thorax grey. Forewings elongate-lanceolate, acute; dark fuscous with bases of scales whitish, appearing grey; cilia fuscous. Hindwings with 4 and 5 stalked; grey; cilia fuscous.

ORANGE FREE STATE, Smithfield (D. R. Kannemeyer); one specimen.

CECOPHORIDÆ.

GEN. CÆSYRA, Meyr.

CÆSYRA RUTILA, n. sp.

♂ ♀. 12-14 mm. Head, palpi, antennæ, and thorax orange-ochreous, terminal joint of palpi half second, antennal ciliations of ♂ 1. Abdomen pale ochreous. Forewings elongate, rather narrow, costa moderately arched, apex tolerably pointed, termen extremely obliquely rounded; ochreous-orange, sometimes slightly sprinkled with brownish posteriorly; cilia concolorous. Hindwings whitish-ochreous; cilia ochreous-yellowish.

ZULULAND, Mfongosi, in October and November (W. E. Jones); four specimens.

HYPONOMEUTIDÆ

THYESTARCHA, n. g.

Head smooth; ocelli absent; tongue developed. Antennæ $\frac{4}{5}$, in ♂ simple, basal joint elongate, without pecten. Labial palpi long, recurved, second joint with appressed scales, somewhat rough towards apex beneath, terminal joint shorter than second, slender, acute. Maxillary palpi very short, filiform, appressed to tongue. Anterior tibiæ and basal joints of tarsi thickened with rough scales, posterior tibiæ with long hairs. Forewings with 2 from $\frac{3}{4}$, 3 from before angle, 4 from angle, 5 approximated, 7 and 8 stalked, 7 to costa, 11 from somewhat before middle. Hindwings under 1, ovate-lanceolate, cilia $1\frac{1}{2}$; 3 and 4 connate, 5-7 nearly parallel.

Intermediate between *Hednophora* and *Isocrita*, both of which genera, together with *Diocosma*, *Eonympha*, *Erotis*, and *Epiphraetis*, I think must be regarded as belonging to this family, the last genus giving the connection with *Gymnogramma*. The *Ecophoridae* may perhaps originate from this group.

THYESTARCHA EDAX, n. sp.

♂ ♀. 13-14 mm. Head whitish-yellowish, back of crown spotted with red. Palpi ochreous-whitish, second joint tinged with crimson towards apex. Thorax whitish-yellow spotted with red. Abdomen pale whitish-ochreous. Forewings elongate, costa moderately arched, apex round-pointed, termen very obliquely rounded; pale ochreous-yellowish, reticulated with orange-red, with a few scattered blackish scales; orange-red streaks, in ♂ suffused with dark purplish, in ♀ marked with series of small bright dark leaden-metallic spots surrounded with black irroration, as under, viz., one from before middle of dorsum to beyond middle of costa, sending a branch from disc to costa before middle, from its costal extremity crossing wing again to termen above tornus, where it meets a streak running all round termen and posterior portion of costa: cilia deep yellow suffused with crimson-reddish. Hindwings pale whitish-ochreous; cilia pale ochreous tinged with reddish.

RHODESIA, Livingstone (R. Power). Two specimens, Cape Colony, O'Kiep, bred from the dried body of the large boring beetle *Apate terebrans*; also TRANSVAAL, Pretoria and Barberton, in February and March (Janse Edwards). The particulars recorded of the larva seem to imply some highly interesting and peculiar form of parasitism, and it is much to be hoped that further investigations may be made.

GEN. ISOCRITA, Meyr.

ISOCRITA PSALACTIS, n. sp.

♀. 13 mm. Head, palpi, thorax, and abdomen ochreous-whitish. Forewings elongate, rather narrow, costa gently arched, apex pointed, termen extremely obliquely rounded; ochreous-whitish; markings fuscous with a few black scales; spots on costa at $\frac{1}{3}$ and dorsum at $\frac{2}{5}$, connected by a streak; a triangular blotch on costa beyond middle, its apex with two faint brownish prolongations in disc, accompanied by some raised black scales; a spot of light fuscous suffusion on tornus; a narrow oblique streak near before apex: cilia ochreous-whitish. Hindwings grey; cilia whitish-ochreous.

ZULULAND, Mfongosi, in November (W. E. Jones); two specimens.

GEN. EPIPHRACTIS, Meyr.

EPIPHRACTIS AULICA, n. sp.

♀. 18 mm. Head and palpi purplish-rosy sprinkled with whitish points, face whitish, terminal joint of palpi half second. Thorax light ochreous-yellow. Abdomen grey. Forewings elongate, costa moderately arched, apex obtuse, termen almost straight, oblique; ferruginous suffused with purplish-rosy; an elongate light ochreous-yellow patch extending along dorsum from base to beyond middle and reaching to fold, terminated posteriorly by an oblique deep purple mark: cilia ferruginous suffused with purplish-rosy. Hindwings grey, somewhat darker posteriorly; cilia grey.

ZULULAND, Mfongosi, in November (W. E. Jones); one specimen.

GEN. GYMNOGRAMMA, Zell.

GYMNOGRAMMA CYANEA, n. sp.

♂ ♀. 19-20 mm. Head, palpi, antennæ, thorax, abdomen, and legs blue-blackish. Forewings elongate, costa gently arched, apex rounded-obtuse, termen rounded, rather oblique; blue-blackish: cilia concolorous. Hindwings and cilia very deep blue, fading to dark fuscous.

ZULULAND, Mfongosi, in October and November (W. E. Jones), four specimens; NATAL, Pinetown (G. F. Leigh), one in my own collection.

GEN. HYPONOMEUTA, Latr.

HYPONOMEUTA NIGRICOLA, n. sp.

♂ ♀. 17-18 mm. Head, palpi, antennæ, and thorax dark leaden-grey, tongue yellow. Abdomen blackish. Forewings elongate, rather narrow, costa gently arched, apex obtuse, termen rounded, rather oblique; dark glossy leaden-grey; about sixteen black dots as follows, viz., two near base (subcostal and median), three in a subdorsal series, three obliquely beyond these above fold, three beneath costa (third little beyond middle), one in disc at $\frac{2}{3}$ (sometimes a second beyond this), and two or three transversely placed towards apex: cilia leaden-grey. Hindwings blackish; an elongate transparent patch beneath cell at base; cilia blackish.

TRANSVAAL, Barberton (H. Edwards); ZULULAND, Mfongosi (W. E. Jones), in March and April; four specimens. Very like *fumigata*, but smaller, and dots differently placed and less numerous, basal hyaline patch of hindwings larger.

GEN. XYROSARIS, Meyr.

XYROSARIS SECRETA, n. sp.

♀. 15 mm. Head white. Palpi and thorax white irrorated with grey and dark fuscous. Abdomen grey. Forewings elongate, narrow, widest before middle, thence attenuated, costa moderately arched, apex pointed, termen faintly sinuate, extremely oblique; whitish-grey, partially tinged with brownish, and finely sprinkled with black points; several minute black dots anteriorly: undefined opposite spots of black irroration on costa and dorsum at $\frac{2}{5}$, and a less distinct spot on costa at $\frac{3}{4}$; a black dot or group of scales in disc at $\frac{3}{4}$; a minute black dot near apex, and one on costa obliquely before this: cilia whitish-grey, on costa sprinkled with blackish. Hindwings grey, thinly scaled towards base but without clear hyaline space; cilia grey.

ZULULAND, Mfongosi, in April (W. E. Jones); one specimen. Very like *maligna*, but without the conspicuous hyaline spaces in hindwings.

PLEXIPPICA, n. g.

Head loosely haired; tongue absent. Antennæ $\frac{4}{5}$, in ♂ serrate, minutely ciliated, basal joint moderately elongate, with strong pecten of scales. Labial palpi moderately long, porrected, second joint clothed with dense rough projecting scales above, terminal joint short, obtuse. Maxillary palpi rudimentary. Posterior tibiae clothed with hairs above. Forewings with 2 from $\frac{3}{4}$, 3 from angle, 7 absent, 8-10 rather near together, 11 from before middle. Hindwings under 1, elongate-lanceolate, cilia 2; 2-5 parallel, 5 and 6 rather approximated towards base, 6 and 7 parallel.

PLEXIPPICA VERBERATA, n. sp.

♂. 16 mm. Head, palpi, and thorax fuscous mixed with white. Abdomen whitish-grey. Forewings elongate, narrow, costa almost straight, apex pointed, termen hardly rounded, extremely oblique; fuscous, irregularly mixed with white, veins darker fuscous; a moderately broad white median longitudinal streak from $\frac{1}{5}$ to $\frac{2}{3}$, divided below its middle by a line of dark fuscous scales not reaching anterior extremity: cilia whitish-fuscous, at base with some dark fuscous scales. Hindwings whitish-grey: cilia pale whitish-ochreous.

BUSHMANLAND, Jackals Water (R. M. Lightfoot); one specimen.

GEN. SCYTHROPIA, Hüb. n.

SCYTHROPIA CROCOSTACTA, n. sp.

♂. 14-15 mm. Head, palpi, and thorax white. Abdomen pale grey. Forewings elongate, rather narrow, costa gently arched, apex obtuse-pointed, termen hardly rounded, very oblique; white; markings pale ochreous-yellow; three small round spots in a longitudinal series in disc from $\frac{1}{5}$ to $\frac{2}{3}$; a small spot towards dorsum at $\frac{1}{4}$; an outwardly oblique streak from beyond middle of dorsum, not reaching half across wing; a small spot on dorsum before tornus: cilia white. Hindwings grey; cilia white, base greyish-tinged.

CAPE COLONY, Tulbagh (R. M. Lightfoot); two specimens.

ELACHISTIDÆ.

GEN. AUGASMA, Herr.-Sch.

AUGASMA (?) NIDIFICA, n. sp.

♂. 13 mm. Antennæ $\frac{4}{5}$, simple, basal joint moderately elongate, with pecten. Forewings lanceolate, 2 from angle, 3-5 absent, 7 and 8 out of 6, 9 absent, 11 from middle; whitish-ochreous: cilia concolorous. Hindwings $\frac{3}{5}$, lanceolate, cilia 3; transverse vein absent between 2 and 5, 3 and 4 absent, 5 approximated to upper angle, 6 and 7 stalked; whitish-ochreous; cilia concolorous.

TRANSVAAL, Krugersdorp, in December (Bro. J. H. Power); one specimen. Bred from an ovate woody gall (19 mm. \times 11 mm.) on twig of an unnamed shrub. This species is probably not a true *Augasma*, but the mouth-parts are damaged, and further material would be requisite to establish a new genus.

COLEOPHORIDÆ.

GEN. COLEOPHORA, Hüb. n.

COLEOPHORA EREMODES, n. sp.

♂. 14 mm. Head white. Antennæ white, faintly ringed with pale fuscous. Palpi light fuscous mixed with white, terminal joint short. Thorax white, partially tinged with fuscous. Abdomen whitish-grey. Forewings very narrow, elongate-lanceolate; light fuscous irregularly mixed with white, tending to form fine white

lines on veins : cilia whitish-ochreous. Hindwings whitish-ochreous tinged with grey ; cilia whitish-ochreous.

BUSHMANLAND, Jaekals Water (R. M. Lightfoot) ; one specimen.

TINEIDÆ.

GEN. TINEA, Linn.

TINEA SUSPICIOSA, n. sp.

♂. 23-25 mm. Head ochreous-orange. Palpi ochreous-yellow or orange, second joint externally dark fuscous. Antennæ dark fuscous, in ♂ pubescent-ciliated ($\frac{2}{3}$), in ♀ spotted with yellowish. Thorax yellow-ochreous, anteriorly orange-tinged. Abdomen rather dark grey, anal tuft ochreous-yellowish. Forewings elongate, narrow, costa gently arched, apex pointed, termen slightly rounded, very oblique ; all veins separate ; yellow-ochreous, slightly tinged with grey or brownish, costal edge clear ochreous-orange, towards base dark fuscous : cilia yellow-ochreous. Hindwings with all veins separate ; rather dark grey ; cilia pale ochreous-yellowish tinged with grey.

ZULULAND, Mfongosi, in March and April (W. E. Jones) ; four specimens.

PICROSPORA, n. g.

Head rough-haired ; tongue very short or obsolete. Antennæ $\frac{5}{6}$, in ♂ shortly ciliated, basal joint moderate, stout. Labial palpi moderately long, subascending, second joint with dense tuft of long rough projecting scales beneath, terminal joint shorter, slender, tolerably pointed. Maxillary palpi short, filiform, porrected. Posterior tibiæ loosely haired. Forewings with 2 from angle, 7 to termen, 11 from before middle. Hindwings 1, elongate-ovate, cilia $\frac{1}{2}$ - $\frac{3}{4}$; veins all separate, 5 and 6 sometimes rather approximated at base.

Type *P. aræa*.

PICROSPORA ARÆA, n. sp.

♂. 12-13 mm. Head and thorax ochreous-whitish. Palpi grey, terminal joint white. Abdomen whitish sprinkled with light grey. Forewings elongate, costa moderately arched, apex obtuse, termen almost straight, oblique ; pale whitish-ochreous, with some fine scattered fuscous points ; minute undefined groups of two or three black points each on fold at $\frac{1}{4}$ and middle of wing, in disc before

middle, and beneath costa beyond middle; a very irregular transverse subterminal series of scattered black points: cilia pale whitish-ochreous. Hindwings whitish-grey; cilia whitish.

ZULULAND, Mfongosi, in March and April (W. E. Jones); two specimens.

PICROSPORA ANASTROTA, n. sp.

♂. 13-16 mm. Head and thorax white, shoulders suffusedly irrorated with dark fuscous. Palpi white, second joint dark fuscous except towards apex, tuft brownish except apical portion. Abdomen grey. Forewings elongate, moderate, rather dilated posteriorly, costa moderately arched, apex obtuse, termen nearly straight, rather oblique; white more or less sprinkled with black and ochreous points, tending to form strigulae; markings formed of black and ferruginous-ochreous irroration in varying proportions; a spot on fold at $\frac{1}{4}$, and sometimes a smaller one between this and costa; a transverse fascia from dorsum beyond middle, becoming obsolete towards costa; a slender irregular fascia from $\frac{2}{3}$ of costa to tornus, receiving at $\frac{3}{4}$ a similar fascia from $\frac{6}{7}$ of costa parallel to termen; some strigulae of black irroration on posterior part of costa, and some black irroration along termen: cilia white, somewhat sprinkled with black points. Hindwings grey; cilia whitish, with indistinct grey line.

ZULULAND, Mfongosi, in October and November (W. E. Jones); four specimens.

GEN. SAPHENEUTIS, Meyr.

SAPHENEUTIS GRANOSA, n. sp.

♂. 12 mm. Head yellow-whitish. Antennal ciliations $1\frac{1}{2}$. Palpi very short. Thorax ochreous-whitish sprinkled with brownish. Abdomen ochreous-whitish. Forewings elongate, moderate, costa moderately arched, apex obtuse, termen very obliquely rounded; whitish-ochreous irrorated with brown: cilia concolorous. Hindwings pale greyish; cilia whitish-ochreous.

ZULULAND, Mfongosi, in October (W. E. Jones); one specimen.

GEN. PSEUDURGIS, Meyr.

PSEUDURGIS SCUTIFERA, n. sp.

♂ ♀. 18-22 mm. Head, palpi, and thorax brownish more or less sprinkled with white and blackish. Antennal pectinations in ♂ 7. Abdomen fuscous, segmental margins dark fuscous. Forewings elongate, posteriorly rather dilated, costa gently arched, apex

rounded-obtuse, termen obliquely rounded; brownish sometimes irrorated with dark fuscous, with scattered black scales and strigulae; several irregular bands of white irroration, edged with white striae, viz., one occupying basal area, one before middle, two narrow ones beyond middle parallel and partly connected, and a narrow one just before termen much enlarged and trifurcate on costa, connected above tornus with preceding, and sending two or three short bars to termen; the dark median band between these is more or less marked with black in disc, and the subtriangular discal area preceding sub-terminal band is more or less suffused with black, sometimes with longitudinal streaks of ground colour: cilia brownish mixed with white, with rows of dark fuscous points. Hindwings rather dark grey; cilia whitish, with two grey shades.

ZULULAND, Mfongosi, in October and November (W. E. Jones), ten specimens; also NATAL, Pinetown (G. F. Leigh), two specimens in my collection.

GEN. AMYDRIA, Clem.

AMYDRIA FRAUDULENTA, n. sp.

♂. 20-21 mm. Head dark fuscous, with some pale hairs. Palpi dark fuscous, second joint with numerous spreading bristles beneath and externally, apex of joints whitish. Antennae fuscous. Thorax dark fuscous, with some pale scales. Abdomen pale greyish-ochreous sprinkled with fuscous. Forewings elongate, rather narrow, costa moderately arched, apex obtuse, termen rounded, rather strongly oblique; bronzy-brown, more or less irrorated with dark fuscous; a suffused round dark fuscous spot in disc at $\frac{2}{3}$; several small suffused dark fuscous spots on posterior half of costa: cilia pale brownish irrorated with dark fuscous. Hindwings fuscous; cilia light greyish-ochreous.

ZULULAND, Mfongosi, in September and October (W. E. Jones); three specimens.

CHLOROPHYTIS, n. g.

Head loosely rough-haired; tongue short. Antennae $\frac{3}{3}$, in ♂ ciliated. Labial palpi moderate, porrected, second joint densely scaled, with rough projecting scales beneath towards apex, terminal joint moderate, slender, hardly pointed. Maxillary palpi very short, filiform, porrected. Posterior tibiae with appressed scales. Forewing with 2 from near angle, 7 to termen, 11 from before middle; surface with small tufts of raised scales. Hindwings 1, rather elongate-ovate, cilia $\frac{2}{3}$; 2-7 all separate.

CHLOROPHYTIS SECURA, n. sp.

♂. 15 mm. Head and thorax yellow-whitish. Antennæ grey. Palpi dark grey, terminal joint and apex of second yellow-whitish. Abdomen pale grey. Forewings elongate, costa moderately arched, apex obtuse, termen slightly rounded, oblique; pale whitish-yellowish or cream colour: cilia concolorous. Hindwings grey; cilia whitish-grey.

ZULULAND, Mfongosi, in May (W. E. Jones); one specimen.

GEN. HAPSIFERA, Zell.

HAPSIFERA GLAREOSA, n. sp.

♂ ♀. 18-19 mm. Head whitish-ochreous. Palpi whitish-ochreous mixed with blackish. Thorax whitish-ochreous partially tinged with brownish, shoulders with a spot of blackish irroration. Abdomen grey mixed with whitish. Forewings elongate, rather narrow, costa moderately arched, apex obtuse, termen very obliquely rounded; 9 absent; whitish-ochreous or pale brownish-ochreous, sometimes somewhat strigulated with pale ferruginous-ochreous; a series of small spots of blackish irroration along costa; stigmata blackish, plical somewhat obliquely beyond first discal; a blackish dot beneath costa beyond middle, one in disc towards apex, one on dorsum towards tornus, and one at tornus: cilia whitish-ochreous, somewhat sprinkled with blackish. Hindwings grey; cilia whitish-ochreous tinged with fuscous.

SOUTHERN RHODESIA, Insiza (G. French); Bulawayo (H. C. Peard); three specimens.

ADELIDÆ.

GEN. CEROMITIA, Zell.

CEROMITIA MELANOSTROTA, n. sp.

♂. 23-25 mm. Head white, forehead with a fuscous bar, face suffused on sides with fuscous. Labial palpi short, whitish, with short projecting hair-scales beneath. Maxillary palpi long. Antennæ grey, becoming whitish towards apex. Thorax fuscous mixed with white. Abdomen grey, anal tuft ochreous-whitish. Forewings elongate, rather narrow, slightly dilated posteriorly, costa moderately arched, apex obtuse, termen very obliquely rounded; veins all separate; grey, more or less irrorated with white; all veins marked with rows of minute irregular groups or dots of black scales; a more

or less indicated slender irregular black streak along lower margin of cell; an irregular transverse black discal mark or line of scales on end of cell; irregular small black dots along posterior part of costa and termen: cilia whitish-grey. Hindwings with all veins separate; grey, paler and thinly haired anteriorly; cilia whitish-grey.

CAPE COLONY, Capetown, in August (R. M. Lightfoot); two specimens.

CEROMITIA SOMPHODES, n. sp.

♂. 20-22 mm. Head light brownish-ochreous, back of crown whitish, face centrally whitish. Labial palpi short, white, maxillary rather longer. Antennæ whitish, tinged with fuscous towards base. Thorax pale brownish mixed with whitish. Abdomen whitish-grey, anal tuft ochreous-whitish. Forewings elongate, rather narrow, posteriorly slightly dilated, costa moderately arched, apex obtuse, termen very obliquely rounded; all veins separate; pale fuscous, mixed with whitish, irregularly strewn with black scales between veins; a round blackish dot on lower angle of cell; some rather large blackish dots on posterior half of costa and termen: cilia pale fuscous mixed with whitish. Hindwings pale whitish-fuscous, thinly haired; cilia concolorous.

ZULULAND, Mfongosi, in March and April (W. E. Jones); four specimens.

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6.—*The Pseudoscorpions of South Africa based on the Collections of the South African Museum, Cape Town.*—By EDV. ELLINGSEN, Kragerö, Norway.

INTRODUCTION.

At the commencement of the present century the knowledge of the Pseudoscorpions of Tropical and Southern Africa was not very extensive, *Chelifer octentoctus* Balzan, *Chelifer Simoni* Balzan, *Chelifer tenuimanus* Balzan, and *Garypus senegalensis* Balzan being then almost the only species known from that part of the world. During the last ten years, however, the position has quite altered. It will be seen from the Bibliography that C. J. With, Alb. Tullgren, and the author of this publication have, during that period, contributed especially to the knowledge of the Central and South African species of this interesting group of animals. Naturally a great number of the species from a territory so little explored as this has been in this respect would be expected to prove new to science, and a glance at the list below will give ample evidence that such has proved to be the case.

In the vast area of Africa, bordered on the north by the Desert of Sahara, the following species of Pseudoscorpions (including those first mentioned in this publication) have been found, the species of *Chelifer* being enumerated in the divisions hitherto generally used :—

ATEMNUS.

<i>Chelifer Braunsi</i> Tullgren.	<i>Chelifer Letourneuxi</i> E. Simon.
„ <i>Conradti</i> Tullgren.	„ <i>O'Swaldi</i> Tullgren.
„ <i>equester</i> With.	„ <i>Palmquisti</i> Tullgren.
„ <i>equestroides</i> Ellingsen.	„ <i>pusillus</i> Ellingsen.
„ <i>Fææ</i> Ellingsen.	„ <i>rotundus</i> With.
„ <i>guineensis</i> Ellingsen.	„ <i>Sjöstedti</i> Tullgren.
„ <i>indivisus</i> Tullgren.	„ <i>subindicus</i> Ellingsen.
„ <i>insubidus</i> Tullgren.	„ <i>Voeltzkowi</i> Ellingsen.

LAMPROCHERNES.

<i>Chelifer camerunensis</i> Tullgren.	<i>Chelifer lamellatus</i> Tullgren.
„ <i>cocophilus</i> E. Simon.	„ <i>octentoctus</i> Balzan.
„ <i>comorensis</i> Ellingsen.	„ <i>toyoensis</i> Ellingsen.
„ <i>ferox</i> Tullgren.	

TRACHYCHERNES.

<i>Chelifer armatus</i> Tömösváry.	<i>Chelifer glabratus</i> Ellingsen.
„ <i>boncicus</i> Karsch.	„ <i>perpusillus</i> Ellingsen.
„ <i>cinicoides</i> Fabr. var.	„ <i>rubidus</i> Ellingsen.
<i>basiléensis</i> Ellingsen.	„ <i>subfoliosus</i> Ellingsen.
„ <i>concinus</i> Tullgren.	

CHELIFER s.s.

<i>Chelifer angulatus</i> Ellingsen.	<i>Chelifer paradoxus</i> nov. sp.
„ <i>angustatus</i> Tullgren.	„ <i>sculpturatus</i> Lewis.
„ <i>Bayoni</i> Ellingsen.	„ <i>segregatus</i> Tullgren.
„ <i>Büttneri</i> Ellingsen.	„ <i>Simoni</i> Balzan.
„ <i>canceroides</i> Linné.	„ <i>socotrensis</i> With.
„ <i>exiguus</i> Tullgren.	„ <i>Strandi</i> Ellingsen.
„ <i>facetus</i> Tullgren.	„ <i>subruber</i> E. Simon.
„ <i>garypoides</i> Ellingsen.	„ <i>tenuimanus</i> Balzan.
„ <i>Kewi</i> Ellingsen.	„ <i>termitophilus</i> Tullgren.
„ <i>minusculoides</i> nov. sp.	„ <i>torulosus</i> Tullgren.
„ <i>minusculus</i> nov. sp.	„ <i>tumuliferus</i> Tullgren.
„ <i>mucronatus</i> Tullgren.	„ <i>Walliskewi</i> nov. sp.

<i>Myrmochernes africanus</i> Tullgren.	<i>Garypus senegalensis</i> Balzan.
<i>Pseudochiridium Trägårdhi</i> Tullgren.	<i>Garypinus capensis</i> nov. sp.
	„ <i>obscurus</i> Tullgren.
<i>Cheiridium ferum</i> E. Simon.	<i>Olpium arabicum</i> E. Simon.
„ <i>museorum</i> Leach.	„ <i>deserticola</i> E. Simon.
„ <i>subtropicum</i> Tullgren.	„ <i>nitens</i> Tullgren.
<i>Feaella mirabilis</i> Ellingsen.	„ <i>pusillum</i> Ellingsen.
„ <i>mucronata</i> Tullgren.	„ <i>Schultzei</i> Tullgren.
<i>Garypus capensis</i> nov. sp.	„ <i>subgrande</i> Tullgren.
„ <i>impressus</i> Tullgren.	„ <i>vermis</i> E. Simon.
„ <i>insularis</i> Tullgren.	<i>Ideobisium Godfreyi</i> nov. sp.
„ <i>minutus</i> Tullgren.	„ <i>quadrispinosum</i> Tullgren.
„ <i>Purcelli</i> nov. sp.	

<i>Chthonius clathratus</i> Tullgren.	<i>Chthonius serratidentatus</i> nov.
„ <i>contractus</i> Tullgren.	sp.
„ <i>Godfreyi</i> nov. sp	„ <i>sinuatus</i> Tullgren.
„ <i>mordax</i> Tullgren.	„ <i>tetrachelatus</i> Preyssler.
„ <i>natalensis</i> Tullgren.	ler.

Recent researches by C. J. With and other zoologists have proved that the genus *Chelifer* will certainly in the future have to be divided into several new genera, based on the different shape of the sexual apparatus of the males, and With has already formed several groups from this point of view: the *birmanicus* group, the *cimicoides* group, the *subruber* group, and the *caneroides* group. I shall therefore try to bring the species of *Chelifer*, enumerated above, into these different groups, as far as it is possible at present; in some cases this cannot yet with certainty be done. I place beside the groups the names which may ultimately perhaps be used as generic titles. The name *Withius* has been proposed by H. Wallis Kew,* the other names have been used before as generic or subgeneric names, but based on other characters.

BIRMANICUS-TYPE (*Atemnus*).

<i>Chelifer Braunsi</i> Tullgren (probably, only ♀ known).	<i>Chelifer O'Swaldi</i> Tullgren.
„ <i>Conradti</i> Tullgren.	„ <i>Palmquisti</i> Tullgren.
„ <i>equester</i> With.	„ <i>pusillus</i> Ellingsen (probably, only ♀ known).
„ <i>equestroides</i> Ellingsen.	„ <i>rotundus</i> With.
„ <i>Feae</i> Ellingsen.	„ <i>Sjöstedti</i> Tullgren.
„ <i>ferox</i> Tullgren.	„ <i>subindicus</i> Ellingsen (probably, only ♀ known).
„ <i>guineensis</i> Ellingsen.	„ <i>togoensis</i> Ellingsen.
„ <i>indivisus</i> Tullgren.	„ <i>Voeltzkowi</i> Ellingsen.
„ <i>Letourneuxi</i> E. Simon (perhaps, only ♀ known).	

CIMICOIDES-TYPE (*Chernes*).

<i>Chelifer boncicus</i> Karsch.	<i>Chelifer concinnus</i> Tullgren.†
„ <i>cimicoides</i> Fabr. var.	„ <i>rubidus</i> Ellingsen.
„ <i>basileensis</i> Ellingsen.	„ <i>subfoliosus</i> Ellingsen.

* H. Wallis Kew, "A Synopsis of the False-scorpions of Britain and Ireland" (Proc. Royal Irish Acad., vol. xxix., p. 49).

† Tullgren refers this species to the *subruber*-type.

SUBRUBER-TYPE (Withius).

<i>Chelifer angulatus</i> Ellingsen.	<i>Chelifer perpusillus</i> Ellingsen
„ <i>angustatus</i> Tullgren.	„ <i>Simoni</i> Balzan.
„ <i>Bayoni</i> Ellingsen.	„ <i>subruber</i> E. Simon.
„ <i>Büttneri</i> Ellingsen.	„ <i>tenuimanus</i> Balzan.
„ <i>glabratus</i> Ellingsen.	„ <i>termitophilus</i> Tullgren.
„ <i>paradoxus</i> Ellingsen.	„ <i>tumuliferus</i> Tullgren.

CANCROIDES-TYPE (Chelifer).

<i>Chelifer cancroides</i> Linné.	<i>Chelifer mucronatus</i> Tullgren.
„ <i>facetus</i> Tullgren.	„ <i>sculpturatus</i> Lewis.
„ <i>Kewi</i> Ellingsen.	„ <i>socotrensis</i> With.
„ <i>minusculoides</i> Ellingsen.	„ <i>torulosus</i> Tullgren.
„ <i>minusculus</i> Ellingsen.	„ <i>Walliskewi</i> Ellingsen.

The place of the following species is doubtful, partly because females only have as yet been found, and partly because the species are very little known and have not been examined as regards the sexual apparatus of the males.

<i>Chelifer armatus</i> Tömösváry.	<i>Chelifer exiguus</i> Tullgren (♀ only).
„ <i>camerunensis</i> Tullgren (♀ only).	„ <i>lamellatus</i> Tullgren (♀ only).
„ <i>cocophilus</i> E. Simon.	„ <i>octentoctus</i> Balzan.
„ <i>comorensis</i> Ellingsen (♀ only).	„ <i>segregatus</i> Tullgren (♀ only).

NOTE.—*Chelifer garypoides* Ellingsen belongs perhaps to a special group.

The fauna of Central and South Africa, as regards the Pseudoscorpions, is thus rather a rich one, comprising 87 species, of which 10 are described as new, but other new species will certainly be found by further investigations, especially of the central parts of the area. It will perhaps be of some interest to give a survey of what was known before this publication about the distribution of these animals in the above-named parts of Africa, following the first enumeration of the species.

CHELIFER BRAUNSI Tullgren.

Described from Cape Colony: Algoa Bay (Tullgren, 22. p. 58). Afterwards recorded from Zululand: Lake Sibayi (Tullgren, 21. p. 224). In both cases only females.

CHELIFER CONRADTI Tullgren.

Described from West Africa: Camerun (Tullgren, **23**, p. 60), ♂ and ♀. The species has been taken nowhere else.

CHELIFER EQUESTER With.

Widely distributed; the types were from the district of Kilimanjaro: Taveita (With, **26**, p. 126), ♂ and ♀. Afterwards recorded from German East Africa: Amani (Ellingsen, **6**, p. 28); Natal: Port Natal (Ellingsen, **9**, p. 357); "Africa australis," leg. Drège, with no other locality (Ellingsen, **9**, p. 357); East Africa, Usambara: Mombo (Tullgren, **20**, p. 9); Zululand: Dukudu Bush (Tullgren, **21**, p. 224). For new localities, see further.

CHELIFER EQUESTROIDES Ellingsen.

West African species. The types were from Portuguese Guinea: Rio Cassine; S. Thomé: Ribeira Palma; Island of Principe: Roça Inf. D. Henrique and Bahia Oeste; Fernando Po: Punta Frailes; and French Congo: Fernand-Vaz (Ellingsen, **4**, p. 251), ♂ and ♀. Taken nowhere else.

CHELIFER FEAE Ellingsen.

The type specimens were from the Caboverdian Islands: San Thiago (Ellingsen, **4**, p. 248), ♂ and ♀. Afterwards recorded from Camerun: Jos, Albrechtshöhe, and Natal: Delagoa Bay (Ellingsen, **9**, p. 357). New localities in the special part.

CHELIFER GUINEENSIS Ellingsen.

Syn.: *Chelifer (Atemnus) pallidus* Balzan (nomen præocc.).

Balzan described this species from specimens from Sierra Leone. Since that time it has proved to be a widely distributed species in Western Africa: Portuguese Guinea: Rio Cassine; San Thomé: Ribeira Palma; Fernando Po: Basilé and Punta Frailes; French Congo: Fernand-Vaz (Ellingsen, **4**, p. 246); Togo: Bismarcksburg and Misahöhe; Camerun (Ellingsen, **9**, p. 358).

CHELIFER INDIVISUS Tullgren.

The only locality is that of the type: East Africa, Usambara: Mombo (Tullgren, **20**, p. 7), ♂ and ♀.

CHELIFER INSUBIDUS Tullgren.

A South African species, described from Cape Colony: Port Elizabeth (Tullgren, **22**, p. 59); later it was recorded from Herero-

land : Uitdraai (Tullgren, **24**. p. 286), ♂ and ♀. A new locality in the special part.

CHELIFER LETOURNEUXI E. Simon.

The species was described from Egypt, and has also been taken in Tunisia and Arabia. But its area of distribution extends to Somali: Bela (Pavesi, **13**. p. 158), and to the district of the White Nile: Kaka (Tullgren, **19**. p. 4).

CHELIFER O'SWALDI Tullgren.

The only locality is Madagascar: Nossibé (Tullgren, **22**. p. 55), ♂ and ♀.

CHELIFER PALMQUISTI Tullgren.

The type specimens are from the district of Kilimanjaro: Meru and Kiboscho (Tullgren, **20**. p. 12), ♂ and ♀. Later on it was recorded from Nyassa and from the coast of Zanzibar (Ellingsen, **9**. p. 358).

CHELIFER PUSILLUS Ellingsen.

The only locality is the Island of San Thomé: Vista Alegre, in West Africa (Ellingsen, **4**. p. 250), ♂ and ♀.

CHELIFER ROTUNDUS With.

C. J. With has described this species from Asia: The Nicobars. I have referred to this species specimens from Madagascar and from "Africa australis" (leg. Drège) (Ellingsen, **9**. p. 359).

CHELIFER SJÖSTEDTI Tullgren.

This large and beautiful species is one of the most widely distributed Pseudoscorpions in the western part of the area under consideration. The species was described by Tullgren from specimens, taken by Dr. Yngve Sjöstedt at Itoki in Camerun (Tullgren, **18**. p. 99). It has since been recorded from several other localities; Congo: Yumbi (Ellingsen, **3**. p. 3); Spanish Guinea (E. Simon, **14**. p. 124); Portuguese Guinea: Rio Cassine; French Congo: Fernand-Vaz and N'kogo; and a variety *Thoméensis* Ellingsen from S. Thomé (Ellingsen, **4**. p. 245); Fernando Po; Camerun: Jaunde Station; Kawandi?; Central Africa: Mukenge (Ellingsen, **9**. p. 359); Congo: Itimbiri (Ellingsen, **8**. p. 218).

CHELIFER SUBINDICUS Ellingsen.

Only known from the locality, where the type (♀) was taken, Central Madagascar (Ellingsen, **9**. p. 360).

CHELIFER VOELTZKOWI Ellingsen.

This species is only known from Madagascar. The types (σ and ♀) were collected in S.W. Madagascar (Ellingsen, **9**, p. 363); a variety: *elongata* Ellingsen, was taken at Marovoay in Madagascar (Ellingsen in: Strand, **16**, p. 488).

CHELIFER CAMERUNENSIS Tullgren.

The type specimens came from Camerun (Tullgren, **18**, p. 100). Later on the species was recorded from Camerun: Buea (Ellingsen, **11**, p. 63), and from Fernando Po (Ellingsen, **9**, p. 366). Females only have been taken.

CHELIFER COCOPHILUS E. Simon.

Eug. Simon established the species on specimens from Kelantan in the Malay Peninsula and recorded it afterwards from Spanish Guinea (E. Simon, **14**, p. 124), in neither case with indication of sex.

CHELIFER COMORENSIS Ellingsen.

The only locality, till now, is that of the type specimen, ♀ , the archipelago of the Comores: Mayotte (Ellingsen, **9**, p. 367).

CHELIFER FEROX Tullgren.

The type specimens (σ) were from French Congo: Ogowe, and from "Gaboon" (Tullgren, **22**, p. 51).

CHELIFER LAMELLATUS Tullgren.

The type specimen (♀) was collected in Natal: van Reenen (Tullgren, **21**, p. 223).

CHELIFER OCTENTOCTUS Balzan.

The only specimen, no sex indicated, badly preserved ("quod igne vastatum mihi videtur," Balzan *l.c.*), was recorded by Balzan from "Africa australis" (Balzan, **1**, p. 515). The species has not been retaken.

CHELIFER TOGOENSIS Ellingsen.

The species was established on specimens (σ) from Togo: Bismarcksburg, and from Camerun: Jos. Albrechtshöhe (Ellingsen, **9**, p. 369). It was later on recorded from Uganda: Bugala (Is. di Sesse) (Ellingsen, **10**, p. 536), and from Camerun: Bibundi (Ellingsen, **11**, p. 63).

CHELIFER ARMATUS Tömösváry.

A rather dubious species, based by Tömösváry on specimens from Ashanti, West Africa (25, p. 18). Still more doubtful is the record of this species by Daday, from Herzegovina and Corfu.

CHELIFER BONCICUS Karsch.

This species was established by Karsch on specimens from Japan. In the collections of the Berlin Museum there is one female from N.W. Madagascar which I was unable to distinguish from examples from Japan in the same collections (Ellingsen, 9, p. 373).

CHELIFER CIMICOIDES Fabr.

var. BASILÉENSIS Ellingsen.

This species, common in Europe, has a variety, taken by L. Fea in the Island of Fernando Po : Basilé (Ellingsen, 4, p. 252).

CHELIFER CONCINUS Tullgren.

The types, ♂ and ♀, were from Orange Free State : Bothaville (Tullgren, 22, p. 41). Tullgren, in a later publication, recorded the species from Zululand : Lake Sibayi (21, p. 224). New localities in the special part.

CHELIFER GLABRATUS Ellingsen.

A West African species, the types of which (♂ and ♀) were collected in N. Camerun : Jos. Albrechtshöhe (Ellingsen, 9, p. 374).

CHELIFER PERPUSILLUS Ellingsen.

Only known from British East Africa : Takanuga, ♂ and ♀ (Ellingsen, 9, p. 378).

CHELIFER RUBIDUS Ellingsen.

Leonardo Fea collected the types of this species, ♂ and ♀, in Portuguese Guinea : Rio Cassine, and in S. Thomé : Ribeira Palma (Ellingsen, 4, p. 254). I have referred to the same species a specimen from Ecuador in South America.

CHELIFER SUBFOLIOSUS Ellingsen.

The species was based on a male (Ellingsen, 9, p. 381), with no other indication of locality than "Africa." The species is recorded from Cape Colony, collected by the Rev. Robert Godfrey.

CHELIFER ANGULATUS Ellingsen.

The types of this species, the only known specimens, ♂ and ♀, were taken by L. Fea in the Island of Principe: Roça Inf. D. Henrique and Bahia do Oeste (Ellingsen, 4. p. 258).

CHELIFER ANGUSTATUS Tullgren.

The only locality is Kilimanjaro: Kibonoto, ♂ (Tullgren, 20. p. 14).

CHELIFER BAYONI Ellingsen.

The types, ♀ only, were from Uganda, Archipelago di Sesse: Buvama (Ellingsen, 10. p. 538). New localities in the special part: also males.

CHELIFER BÜTTNERI Ellingsen.

The species was based on specimens, ♂ and ♀, from West Africa, Togo: Bismarcksburg (Ellingsen, 9. p. 384); a female from the Nyassa Mountains (*loc. cit.*) seems to belong to the same species.

CHELIFER CANCROIDES Linné.

This species, common in Europe, has been transported by man to other parts of the world, and has been recorded from some localities in Africa, for instance from the Cape of Good Hope (Ellingsen, 9. p. 384). I have in my collection a male from the Gold Coast (West Africa), collected by Biedermann. Some other localities will be given in the special part below.

CHELIFER EXIGUUS Tullgren.

The type specimen, a female only, was collected at Kilimanjaro: Kibonoto (Tullgren, 20. p. 13). A new locality in the special part.

CHELIFER FACETUS Tullgren.

The type specimens, females only, were from Natal: Stamford Hill (Tullgren, 21. p. 224). A new locality in the special part.

CHELIFER GARYPOIDES Ellingsen.

The species was founded on specimens, ♂, from Portuguese Guinea: Bolama (Ellingsen, 4. p. 259). Later on C. J. With recorded it from St. Paul's Rock in mid-Atlantic (With, 29. p. 19). New localities will be given in the special part.

CHELIFER KEWI Ellingsen.

This species seems to be a common one in the south of Africa: the original specimens came from Cape Colony: Witte Hardt,

Nieuwveldt, about 5,000 feet above the sea (Ellingsen, **7**. p. 164), ♂ and ♀. A form of this species, var. *Fülleborni* Ellingsen, is recorded from East Africa: Langenburg, and British East Africa: Takanuga (Ellingsen, **9**. p. 385). Several new localities, with a number of specimens, together with some interesting notes on the manner of life of this species, will be given in the special part.

CHELIFER MUCRONATUS Tullgren.

A very beautiful species. The type specimens, ♂ and ♀, were taken in the Orange Free State: Bothaville, and Cape Colony: Port Elizabeth (Tullgren, **22**. p. 32), and the species has since been recorded from Zululand: Dukudu (Tullgren, **21**. p. 220). More information on this species will be given in the special part.

CHELIFER SCULPTURATUS Lewis.

One of the most remarkable and curious species, if not the most curious one, among the Chelifers. The species was founded by Lewis in 1903 (Lewis, **12**. p. 497) on specimens, ♂ and ♀, from Natal (taken in beehives), and redescribed (from the same specimens) by C. J. With (**26**. p. 122). In the collections of the South African Museum there are some specimens from Natal and Transvaal (see the special part).

CHELIFER SEGREGATUS Tullgren.

A single specimen, ♀, from South Africa, Hereroland: Rooibank (Tullgren, **24**. p. 285). A new locality in the special part.

CHELIFER SIMONI Balzan.

Syn.: *Chelifer madagascarensis* Ellingsen.

One of the most widely distributed species in the tropical parts of the world, especially in Africa, but it is also recorded from some localities out of this continent, perhaps imported. In Africa this species has a wide distribution; in West Africa, especially, many localities are known. Originally described from Sierra Leone (Balzan, **1**. p. 531), and redescribed as *Ch. madagascarensis* (Ellingsen, **2**. p. 137) from Madagascar, it has been afterwards reported from Camerun by Tullgren (**18**. p. 100), and from Camerun: Jaunde and Jos. Albrechtshöhe (Ellingsen, **9**. p. 387); from Camerun: Bibundi (Ellingsen, **11**. p. 63); Islands of Cabo Verde: Brava; S. Thiago: Orgaos Grandes; S. Nicolão; Portuguese Guinea: Bissau, Rio Cassine, and Bolama; San Thomé: Ribeira Palma; Fernando Po: Punta Frailes (Ellingsen, **4**. p. 255); Benguela: Huxe

(With, **28**, p. 66) ; Togo : Bismarcksburg, and Senegal (Ellingsen, **9**, p. 387). From the central and eastern parts of Africa we have the following localities : Uganda : Bugala (Ellingsen, **10**, p. 536) ; Eritrea : Ghinda (Ellingsen, **8**, p. 218), and Réunion (Ellingsen, **9**, p. 387). A new locality will be given in the special part.

CHELIFER SOCOTRENSIS With.

The type specimens were from Socotra, ♂ and ♀ (With, **26**, p. 116).

CHELIFER STRANDI Ellingsen.

The species was founded on specimens, ♂ and ♀, from German East Africa : Amani (Ellingsen, **6**, p. 30), and has been taken nowhere else.

CHELIFER SUBRUBER E. Simon.

A cosmopolitan species to which were referred some specimens from German East Africa : Amani and Bomola (Ellingsen **6**, p. 28).

CHELIFER TENUIMANUS Balzan.

A species very nearly related to *Ch. Simoni* ; established by Balzan on specimens from Madagascar : Nossi-bé (Balzan, **1**, p. 532), and not since met with.

CHELIFER TERMITOPHILUS Tullgren.

Only known from Natal : Stamford Hill (Tullgren, **21**, p. 221), ♂ and ♀.

CHELIFER TORULOSUS Tullgren.

Tullgren based the species on specimens, ♂ and ♀, from Cape Colony : Port Elizabeth (Tullgren, **22**, p. 35), and reported it afterwards from Natal : Stamford Hill, and from Zululand : Dukudu (Tullgren, **21**, p. 220). I am very much inclined to believe it the same species as *Ch. Kewi* Ellingsen.

CHELIFER TUMULIFERUS Tullgren.

An interesting species from Namalaland : Port Nolloth (Tullgren, **24**, p. 284). As regards a new locality, see the special part.

MYRMOCHERNES AFRICANUS Tullgren.

This species belongs to a genus autochthon in Africa ; the single species known is the above from Cape Colony : Port Elizabeth (Tullgren, **22**, p. 61). Females only, and taken nowhere else.

PSEUDOCHEIRIDIUM TRÄGÅRDHI Tullgren.

The tropical genus *Pseudochiridium* With is represented in Africa by this species from Natal: Town Bush, Maritzburg (Tullgren, 21. p. 226).

CHEIRIDIUM MUSEORUM Leach.

A species widely distributed throughout all Europe and also reported from Algeria, in inhabited places. It was, therefore, a very remarkable incident, that this species was taken in Cape Colony: Pirie Forest, on yellow-wood. As regards its occurrence there, see the special part.

CHEIRIDIUM FERUM E. Simon.

This species was hitherto known only in Europe: France, Italy, and Switzerland. It has been taken by the Rev. Robert Godfrey in Cape Colony: see the special part.

CHEIRIDIUM SUBTROPICUM Tullgren.

The types of this species were taken in Zululand: Umfolozi (Tullgren, 21. p. 220), ♂ and ♀. As regards its occurrence in Cape Colony, see the special part.

NOTE.—Two other species of this genus are known: *Ch. corticum* Balzan, from South America, and *Ch. formosanum* Ellingsen from Asia. I quite agree with Tullgren (21. p. 216), that *Cheiridium tetrophthalmum* Daday (from Hungary) does not belong to this genus, but to *Garypus*.

FEAELLA MIRABILIS Ellingsen.

The types of this species, on which the genus *Feaella* was founded, were taken by Leonardo Fea in Portuguese Guinea: Bolama (Ellingsen, 4. p. 263), and the animal has been taken nowhere else.

FEAELLA MUCRONATA Tullgren.

The species was based on specimens from Natal: Amanzimtoti (Tullgren, 21. p. 228). See the special part.

GARYPUS IMPRESSUS Tullgren.

The only localities for this species were, till now, those of the type specimens, viz., Natal: Van Reenen, and Amanzimtoti, and Zululand: Junction of the black and the white Umfolozi (Tullgren, 21. p. 229). For further localities, see the special part.

GARYPUS INSULARIS Tullgren.

The only locality known is that of the type specimen, ♀, Seychelles (Tullgren, 22. p. 63).

GARYPUS MINUTUS Tullgren.

The type specimen, ♀, was from Cape Colony: Port Elizabeth (Tullgren, 22. p. 66). Tullgren afterwards reported it from Natal: Stamford Hill and Van Reenen (21. p. 229). Several new localities will be reported in the special part.

GARYPUS SENEGALENSIS Balzan.

Syn.: *Garypus olivaceus* Tullgren, 22. p. 63.

I have no doubt that Tullgren's species is a synonym of *G. senegalensis* Balzan.

Balzan (1. p. 535) indicates no locality for the type specimens, certainly only by neglect, for in giving the species the name *senegalensis*, he must have understood that the specimens had come from Senegal. Tullgren based his species *G. olivaceus* on specimens from Orange Free State: Bothaville (22. p. 65), and has later reported it from Natal: Stamford Hill, as well as from Zululand: Lake Sibayi, Dukudu, and junction of the Black and White Umfolozi (Tullgren, 21. p. 229).

As regards new localities, see the special part.

GARYPINUS OBSCURUS Tullgren.

The type specimens, ♀ only, were from Orange Free State: Bothaville (Tullgren, 22. p. 69); afterwards reported from Zululand: Entendweni, Mtetwa, and junction of the Black and the White Umfolozi (Tullgren, 21. p. 229). Further localities in the special part.

OLPIUM ARABICUM E. Simon.

E. Simon described this species from specimens from Arabia. This locality was the only one, until some examples from the Islands of Cabo Verde: Ilheo Razo (Ellingsen, 4. p. 263) were identified as belonging to this species; afterwards it was recorded from Madagascar: Ste. Marie (Ellingsen, 9. p. 390), and from Uganda: Is. di Sesse, Bugala (Ellingsen, 10. p. 538). In the special part will be given a locality from South Africa. It thus seems that the species (if rightly identified) belongs more to the African than to the Arabian fauna.

OLPIUM DESERTICOLA E. Simon.

Originally described from Tunisia and Algeria; a number of specimens from the area in question, viz., several places in the Islands of Cabo Verde: Boa Vista; Brava; S. Thiago: Pedra Badejo; and Fogo: S. Felipe (Ellingsen, **4**. p. 264), were identified with this species. It has also been recorded from Sicily.

OLPIUM NITENS Tullgren.

The type specimen is from South Africa, Great Namaqualand: Lüderitz Bay (Tullgren, **24**. p. 287). Some new localities will be given in the special part.

OLPIUM PUSILLUM Ellingsen.

The original specimen, a ♂, was from Cape Colony: Fishhoek near Simonstown (Ellingsen: in Strand **17**. p. 596). As to the relationship between this species and the preceding one, see the special part.

OLPIUM SCHULTZEI Tullgren.

The single type specimen of this species was described from South Africa, Great Namaqualand: Prince of Wales Bay (Tullgren, **24**. p. 287).

OLPIUM SUBGRANDE Tullgren.

The species was described from a single specimen from South Africa: Kalahari, between Kang and Khakhea (Tullgren, **24**. p. 288). Another locality (in Rhodesia) will be given in the special part.

OLPIUM VERMIS E. Simon.

This species, originally described from Egypt and reported later from the whole of the southern coast of the Mediterranean, has also been recorded from the Island of Annobom, on the Guinea Coast (Ellingsen, **4**. p. 263). One female.

IDEOBISIUM QUADRISPINOSUM Tullgren.

The species was based on ♀ from Natal: Town Bush, Maritzburg (Tullgren, **21**. p. 231). In the special part will be reported several localities in Cape Colony.

CHTHONIUS CLATHRATUS Tullgren.

The type specimens were from Natal: Town Bush, Maritzburg, and from Zululand: Lake Sibayi (Tullgren, **21**. p. 234), ♂ and ♀. A new locality will be given in the special part.

CHTHONIUS CONTRACTUS Tullgren.

This species, too, was based on specimens from Natal: Van Reenen; Amanzimtoti; and Stamford Hill. Zululand: Lake Sibayi; Junction of the Black and the White Umfolozi (Tullgren, **21**. p. 233), ♂ and ♀. It has also been recorded from Eritrea: Ghinda, on the Red Sea, ♀ (Ellingsen, **8**. p. 219). The Rev. Robert Godfrey has taken it on the Pirie Mountains (see the special part).

CHTHONIUS MORDAX Tullgren.

The type specimens, ♂ and ♀, were collected in Natal: Caversham, and Stamford Hill; and in Zululand: Lake Sibayi (Tullgren, **21**. p. 235). This species is widely distributed in Cape Colony, a great number of specimens having been collected (see the special part).

CHTHONIUS NATALENSIS Tullgren.

Reported only from Natal: Stamford Hill, ♂ (Tullgren, **21**. p. 232).

CHTHONIUS SINUATUS Tullgren.

The type specimen was collected in Camerun (Tullgren, **18**. p. 101). Afterwards the species was recorded for Portuguese Guinea: Rio Cassine, and from San Thomé: Vista Alegre (Ellingsen, **4**. p. 265). A new locality (in Cape Colony) will be given in the special part.

CHTHONIUS TETRACHELATUS Preyssler.

This species is widely distributed throughout the palæarctic area, and also occurs in North America; curiously enough some specimens of this form were found in a collection from the Seychelles (Ellingsen, **9**. p. 402).

It was with great interest that I looked forward to the examination of the rich collections of Pseudoscorpions which the Director of the South African Museum in Cape Town had been kind enough to place at my disposal, and the results fully justified my expectations, and of no less interest were the collections which the Rev. Robert Godfrey had brought together chiefly from the environs of the Pirie Mission. Beside the new species, there were several, already known, of great interest, of which may be mentioned: *Chelifer sculpturatus* Lewis, *Ch. tumuliferus* Tullgren, *Cheiridium muscorum* Leach, *Cheiridium ferum* E. Simon, and *Feaella mucronata* Tullgren, to point out only the more remarkable ones. The knowledge of the distribution of these animals in the south of Africa has thus been very much enlarged, thanks to the zeal with which several naturalists have collected for the Museum.

As was mentioned in the Introduction, 87 species are now known from the area in question, and of these no less than 42 species were represented in the collections from the South African Museum and from Mr. Godfrey, of which 10 species are believed to be new.

1. CHELIFER EQUESTER With.

In the collections of the South African Museum there were specimens from two localities:—

Transvaal Province: Shiliowane (Rev. H. Junod), 2 ♀; Natal Province: Durban (C. N. Barker), 2 ♂.

2. CHELIFER FEAE Ellingsen.

Cape Province. East London (J. Wood), 1 ♂.

The Rev. R. Godfrey reports for this species the following localities, from which I have examined 2 ♂, 1 ♀:—

Cape Province. King William's Town Div.: Burnshill, Pirie, and Nukwane; Victoria East Div.: Woodstock and Lovedale, collected by Miss Fanny Ross and Mr. Godfrey, on blue gum and on yellow-wood.

Mr. Godfrey writes of this species: "A tree species, living in the looser outside bark, taking shelter in crannies when disturbed. I obtained immature specimens moulting in nests, November 21, 1907. On November 27, 1907, I found one in a very roomy nest on a gum-tree; the animal was at one corner of the nest, and the larval mass (quite detached from her) was at the other corner. This is the only instance in which I have seen such a thing, and I would need to see

it a second time before I could definitively record it, as there is a possibility of the separation having been caused as I wrenched off the bark." *

3. CHELIFER INSUBIDUS Tullgren.

The Rev. Godfrey gives in a letter the following list of localities for this species :—

Cape Province. King William's Town Div.: Pirie Forest, Pirie, Frankfort Hill, and Ntaba Kandoda, under bark of yellow-wood and on wild fig. I have examined 2 ♂, 2 ♀, 2 jun.

"A forest species, living on trees" (Godfrey in litt.).

4. CHELIFER CONCINNUS Tullgren.

Cape Province. Cape Town (W. F. Purcell), 1 ♂, 1 ♀; Stellenbosch Div.: Faure (W. F. Purcell), 1 ♀.

Tullgren's type specimens were certainly rather young, to judge from his statement of their colour and of the longitudinal stripe of the abdomen being indistinct owing to the pale colour of the tergites. Yet, the colour of the specimens from Cape Colony, too, is rather a light one. Another reason for supposing that Tullgren's specimens were not adult, is that he refers the species to the *subruber* group, although with a sign of interrogation; the species belongs certainly to the *cimicoides* group, and this the whole appearance also seems to indicate. Tullgren's specimens also certainly had the abdomen very much contracted, as he states that the palps are much longer than the body; in the specimens mentioned above, with abdomen extended, the palps are at least no longer than the body. The specimens from Cape Province have the femur and the tibia of the palps more robust, which, too, seems to indicate that the specimens are more developed.

5. CHELIFER SUBFOLIOSUS Ellingsen.

Cape Province. King William's Town Div.: Ntaba Kandoda (R. Godfrey), 1 ♂, 1 ♀.

I think the above two specimens belong to this species, though I have no original specimens to compare them with. The species seems to belong to the *cimicoides* group, not to the *subruber* group which I thought from the type specimens to be the case, perhaps on account of their young state.

* I have seen such a thing once myself, in Norway, with a *Chelifer Cyrneus* L. Koch, the larval mass separated from the mother (Ellingsen, Norske Pseudoscorpioner. II. Chra. Vid. Selsk Forh., 1903, No. 5, p. 10).

6. CHELIFER BAYONI Ellingsen.

Cape Province. King William's Town Div.: Pirie, 1 ♀ in the nest of the Fiscal Shrike (*Lanius collaris* L.); Izeli, 2 ♀ in a stable; Green River, 2 ♀ jun., all collected by Mr. Godfrey; Blythwood (W. J. A. Moir), 1 ♂, 4 ♀, 3 jun. (I have also seen a specimen (♀) found in Port Elizabeth Museum, forwarded for identification by Mr. Hewitt, Grahamstown Museum.)

The male in the last lot proves that the species belongs to the *subruber* group.

7. CHELIFER CANCROIDES L.

Cape Province. Stellenbosch Div.: Faure (W. F. Purcell), 1 ♂; Stellenbosch (L. Péringuey), 1 ♀; Malmesbury Div.: Berg River (W. L. Sclater), 1 ♀.

8. CHELIFER EXIGUUS Tullgren.

Cape Province. Cape Peninsula: Bergvliet, 1 ♀, in nest of a bee.

The specimen agrees in all essentials with the description of this species, with the following exceptions: The colour is, on the whole, reddish-brown, and the cephalothorax is not quite evenly granulate, but has some dispersed bigger tubercles.

9. CHELIFER FACETUS Tullgren.

Cape Province. King William's Town Div.: Pirie (R. Godfrey), 3 ♂, 1 ♀ jun.

Tullgren, as will be seen from the Introduction, based this species on specimens (♀) from Natal. I have referred the above specimens from Pirie to the same species, as they agree well with Tullgren's description, the fact that my specimens, at least the adult ones, are males, being, of course, taken into consideration; it is evident from the males that the species belongs to the *cancroides* group, but the tergites are destitute of lateral keels and of posterior spine-like tubercles. The claws have no teeth; the posterior claw of I. pair of legs is a little abnormal, being somewhat irregular and straightened. The trochantin of the IV. pair of legs is characterised by being perpendicularly articulated, as stated by Tullgren.

10. CHELIFER GARYPOIDES Ellingsen.

Cape Province. Robertson Div.: Montagu Baths (W. F. Purcell), 1 jun.; Cape Peninsula: Simonstown (R. M. Lightfoot), 1 ♀; Retreat Flats (R. M. Lightfoot), 2 ♂; (W. F. Purcell), 1 ♀, 1 jun.; Table Mountain (R. M. Lightfoot), 1 ♂; near Platteklip (W. F. Purcell), 1 ♂.

In the Rev. R. Godfrey's collection: Port Elizabeth, 2 ♂, 1 ♀, 1 jun., under stones on the veld (Godfrey); King William's Town Div.: Green River (Godfrey), 1 jun.

11. CHELIFER KEWI Ellingsen.

Cape Province. Cape Peninsula: Cape Town, Salt River, and Wynberg (W. F. Purcell, R. M. Lightfoot), 14 ♂, 9 ♀, 25 jun.; Devil's Peak (W. F. Purcell), 2 ♂; Hout Bay (W. F. Purcell), 11 ♂, 6 ♀, 1 jun.; St. James (W. F. Purcell), 1 ♂, 2 ♀, on sea-shore; Sea Point (W. F. Purcell), 1 ♂; Cape Flats, at Zeekoe Vlei (W. F. Purcell), 1 ♂, 1 ♀; Bergvliet (W. F. Purcell), 8 ♂, 5 ♀, 1 jun., in grass; Miller's Point, near Simonstown (W. F. Purcell), 5 ♂, 2 ♀; Simonstown Mountains (D. L. Patrick), 1 ♀; Signal Hill (R. M. Lightfoot), 1 ♀; Knysna Div.: Balmoral (W. F. Purcell), 9 ♂, 9 ♀, 1 ♂ jun., 1 ♀ jun.; Hanover (S. C. Cronwright Schreiner), 2 ♂; Caledon Div.: Hermanuspetrusfontein (R. M. Lightfoot), 8 ♂, 1 ♀; (H. Herman), 4 ♂.

I have examined several specimens from the Rev. R. Godfrey's collection; he gives in a letter the following localities:—

King William's Town Div.: Green River, Pirie, and King William's Town; Victoria East Div.: Lovedale. They were taken under stones, in a hen-house, in a garden (Miss Fanny Ross), and under a piece of wood, in a stable.

NOTE 1.—About this species, Mr. Godfrey gives in a letter some interesting particulars: "Like *Chelifer cancroides*, this species seems to depend largely on man for the extension of its range. It is a very common species here, and practically always attendant on man. I have found only one specimen at a distance from human haunts. On November 5, 1908, I found a female with well-developed larval mass in a nest under a stone. The nest was of sand, with larger pieces of grit; it was very sparingly lined with silk, and therefore by no means firm. The attachment of silk on the surface of the stone was also very sparing. Measurement of nest at surface of attachment, 5 × 4 mm. On April 1, 1908, I found one eating an immature *Chelifer*; it seemed to have hold simply by the mouth apparatus. While I held the *Chelifer Kewi*, I saw it deliberately remove the husk from its mouth with its right palp."

NOTE 2.—Even in an immature state, the male and female of this species may, I think, be distinguished before the sexual apparatus is visible, the males already in that state having the galea simple and of smaller size, and coxa IV. rather slender, the females with the galea somewhat more robust and with teeth, and coxa IV. very robust.

12. CHELIFER MINUSCULOIDES NOV. SP.

♂. Two eyes, one on each side.

Colour.—Cephalothorax and tergites greyish brown, palps more reddish brown, the other parts paler.

Cephalothorax a little longer than broad behind, rather regularly and roundly narrowing forwards, rounded in front, the front margin nearly straight. Two narrow but distinct transverse grooves; the anterior one about in the middle, nearly straight, only a little curved forwards laterally; the posterior groove much nearer to the hind margin than to the anterior one, in the middle slightly curved backwards, laterally somewhat widened. The posterior corner of cephalothorax *not produced* into spine-like tubercles. The surface somewhat glossy, rather coarsely granulate, but with *no bigger tubercles*; the hairs truncate.

Abdomen.—The tergites divided longitudinally by a fine stripe, except the first and the last ones. Tergites 1–5 more or less distinctly *keeled* laterally (the keels decreasing in strength backwards) and produced *into spine-like tubercles* posteriorly. The surface somewhat glossy, coarsely shagreened. The hairs slender and truncate, but most of them are broken; no tactile hairs on the last segment. The sternites also divided longitudinally, except the last one, glossy and slightly shagreened; the hairs slender and pointed.

Palps about as long as the body (with abdomen contracted). Coxa glossy and nearly smooth. The other joints glossy and nearly smooth, except trochanter and femur, which are somewhat granulate on the inner and partly on the upper side; the hand especially is very glossy and smooth. The hairs short, dentate, passing into truncate and pointed ones. Trochanter with a distinct stalk, roundish, semicircular in front, behind with a rounded, coarsely granulate tubercle, above with a rounded tubercle, pointing backwards. Femur with a distinct stalk, three times as long as broad, nearly straight in front, only a little sinuated towards the tip, behind regularly and moderately convex. Tibia with a moderately long stalk, this excepted a little shorter and a little broader than femur, regularly and moderately convex in front, behind somewhat less convex, most so towards the extremity. Hand with a distinct stalk, and regularly rounded base, $1\frac{1}{2}$ times as broad as tibia, on both sides about evenly and moderately convex, passing gradually into the fingers. Fingers robust, considerably curved, a little shorter than the hand.

Mandibles.—Galea very small and simple.

Legs smooth and glossy. Coxa IV. strongly curved with very distinct coxal sac opening. The hairs pointed. The inner claw of I. pair of legs somewhat irregular and straightened, the other claws simple. The species belongs to the *canroides* group.

Length 1.50 mm. (abdomen contracted); width 0.64 mm.

Measurements.—Cephalothorax: long. 0.57; lat. 0.50. Femur: long. 0.43; lat. 0.14. Tibia: long. 0.40; lat. 0.17. Hand: long. 0.43; lat. 0.26. Fingers: long. 0.39 mm.

Habitat.—Cape Province. King William's Town Div.: Pirie Forest, May 13, 1908 (R. Godfrey), 1 ♂, on a tree.

NOTE.—The species is allied to *Ch. minusculus* nov. sp. (see below), but differs from it in having keels and lateral spine-like tubercles on the tergites, the palps less granulate, the hairs more simple, and one claw of I. pair of legs abnormal. Both species, *Ch. minusculus* and *Ch. minusculoides*, are nearly allied to *Ch. mucronatus* Tullgren. These two names were proposed by the Rev. Godfrey.

13. CHELIFER MINUSCULUS nov. sp.

♂. Two eyes, one on each side.

Colour.—Cephalothorax and tergites greyish brown; sternites, palps, and legs pale reddish brown.

Cephalothorax as long as wide behind, nearly parallel-sided up to the anterior groove, then narrowing forwards, in front, the front margin included, regularly rounded. Two transverse grooves, very little developed, both of them nearly straight, the anterior groove about in the middle, the posterior one considerably nearer to the hind margin than to the first. The posterior corner of cephalothorax *not* produced into a spine-like tubercle laterally. The surface glossy, minutely and densely granulate, with *no bigger tubercles*. The hairs truncate and dentate.

Abdomen.—All tergites divided longitudinally by a fine stripe. *No tergites produced into spine-like tubercles laterally*; there are some traces of keels on several of the tergites, but they are very little developed. The surface glossy, minutely and densely granulate. The hairs very short, but strongly clavate; no tactile hairs on the last segment. The sternites divided longitudinally, like the tergites, glossy and shagreened, with fine, pointed hairs.

Palps a little longer than the body (with abdomen somewhat extended), slender. Coxa glossy, a small central area nearly smooth, around this area slightly granulate. The other joints glossy, slightly

and densely granulate, except the fingers. The hairs of trochanter and femur more or less distinctly clavate, those of the other joints dentate, all of them short, those of the fingers fine and pointed, partly long ones. Trochanter with a distinct stalk, roundish, strongly convex in front, behind with a small tubercle, above with a rounded protuberance, pointing backwards. Femur with a distinct stalk, about $3\frac{1}{2}$ times as long as broad, nearly parallel-sided, the front margin straight, behind somewhat obliquely widened from the stalk, the hind margin very little convex or nearly straight, and rounded only at base and tip. Tibia with a distinct stalk, considerably shorter and only a little broader than femur, twice as long as wide, somewhat obliquely shaped, the outer side proximally nearly straight, somewhat convex towards the extremity, the front side regularly and moderately convex, tibia in all only a little tapering towards the tip. Hand with a distinct stalk, and regularly rounded base, about $1\frac{1}{2}$ times as broad as tibia, exteriorly slightly convex, the inner side more strongly so, passing obliquely into the fingers. Fingers moderately robust, considerably curved, about as long as the hand, with no accessory teeth.

Mandibles.—Galea very minute, pointed and simple.

Legs.—Coxæ glossy and nearly smooth; the other joints more or less granulate. Coxa IV. slightly curved, with distinct coxal sac opening. The hairs partly clavate, partly simple. All claws normal and simple. The species belongs to the *cancroides* group.

Length 1.75 mm. (with abdomen extended); width of abdomen 0.74 mm.

Measurements.—Cephalothorax: long. 0.60; lat. 0.60. Femur: long. 0.52; lat. 0.16. Tibia: long. 0.36; lat. 0.18. Hand: long. 0.39; lat. 0.24. Fingers: long. 0.43 mm.

♀. The female, in all essentials, the sexual apparatus excepted, resembles the male, but is of somewhat larger size, about 2 mm. long. Galea small, though a little stronger than that of the male, with some small teeth at the tip. Claws simple.

Habitat.—Cape Province. King William's Town Div.: Pirie Forest, where it was found by the Rev. R. Godfrey, abundant on yellow-wood. I have examined 11 ♂, 7 ♀, and 8 young.

NOTE 1.—This species is among the smallest of the *cancroides* group; it is distinguished by having only traces of keels on the tergites, and neither these nor the cephalothorax have the corners laterally produced; the claws in both sexes are normal and destitute of teeth.

NOTE 2.—The Rev. R. Godfrey in a letter remarks on this species as follows:—

“This is a true forest species, which occurs on yellow-wood everywhere in Pirie Forest. It is not necessary to give dates for this species. June and November are the only months in which I have not found it, and the reason undoubtedly is because I have not purposely looked for it then. This species moults in a nest of silk with dust-covered rim, appressed between two flakes of bark and measuring 1.5 mm. across. On December 12, 1907, I found the discarded moult in one nest, along with the creature itself; and on March 13, 1908, I took a newly moulted individual out of a nest. The ♀ makes no nest for reproductive purposes, but lives a free life at the time she is carrying the larval mass attached to the under side of the abdomen. Dates December 12, 1907, and February 12, 1908.”

14. CHELIFER MUCRONATUS Tullgren.

Cape Province. Uitenhage Div.: Witteklip, Van Staden's River (I. L. Drège), 2 ♂, 1 ♀, under bark of the sneezewood-tree.

A great number of specimens of this species have been collected in King William's Town Div.: Pirie, Cweneve, and Burnshill (nearly all of them by Miss Fanny Ross, and a single one by the Rev. R. Godfrey); they have been taken, according to Mr. Godfrey, on blue gum, red gum, apple-tree, and *Rhus villosa*. I have examined 8 ♂, 8 ♀. The species has also been taken in Victoria East Div.: Lovedale (Godfrey), 2 ♂, on blue gum; Stutterheim Div.: Weltondale (Miss Ross), 3 ♂, 1 ♀, on mimosa.

(I have also seen 1 ♂, 1 ♀ from Port Elizabeth (I. L. Drège), belonging to the Albany Museum, Grahamstown.)

Mr. Godfrey writes of this species: “A tree species. As the above data show, nearly every specimen I have has been collected for me by Miss Fanny Ross, Pirie. She obtained a female with its larval mass attached, living free on a blue gum, November 18, 1908.”

NOTE.—Tullgren says, in his description of this species, that the cephalothorax and palps are not glossy; all specimens I have examined are somewhat glossy, yet I have no doubt that my specimens belong to this species. An excellent character for the males of this form is the spine of the antero-exterior corner of coxa IV. Not always as many as 8 tergites (as Tullgren states) are produced into a spine-like tubercle and keeled; sometimes fewer may be so produced.

15. CHELIFER PARADOXUS NOV. sp.

♂. Two large eyes, one on each side.

Colour.—Cephalothorax and tergites brown, palps reddish brown, the under side and legs pale brownish.

Cephalothorax much longer than wide (about as 4 : 3), nearly parallel-sided till towards the eyes ; but the lateral contour is rather irregular on account of the transverse grooves being a little produced laterally ; near the eyes the cephalothorax is a little rounded, the front margin nearly straight. Two transverse grooves very well developed, the anterior one about in the middle, nearly straight, very broad and deep, somewhat widened laterally ; the posterior groove at about equal distance from the hind margin and the first groove, nearly straight too, less developed ; the posterior corners of cephalothorax *not* produced into a spine. The surface nearly glossless, coarsely granulate, but with no bigger tubercles : along the front margin a row of distinctly clavate hairs ; the other hairs are apparently broken.

Abdomen long and slender. All tergites divided longitudinally by a fine stripe. All tergites (except the last one) have a *feeble, dark lateral keel*. The surface glossless and coarsely granulate, along the hind margin each tergite is provided with short and strongly clavate hairs ; no tactile hairs on the last segment. The sternites divided longitudinally, glossy and shagreened, with fine and pointed hairs, and additionally on the sclerites 6-9 provided *with areas of bristles*. The species belongs to the *subruber* group.

Palps somewhat longer than the body (with abdomen extended), thus long and slender. Coxa glossy and slightly granulate or nearly smooth ; the other joints glossy below, above nearly glossless, more or less granulate, except the fingers. The hairs of the inner side (especially those of trochanter and femur) distinctly clavate, the other hairs dentate. Trochanter with a rather long stalk, a little longer than wide, on both sides slightly convex, above with a strong protuberance, which basally is nearly perpendicular, distally sloping towards the extremity. Femur with a distinct stalk, about four times as long as broad, thus rather slender, in front distinctly *concave*, behind gradually widened from the stalk, the hind margin distinctly convex, a little narrowing towards the tip, but femur on the whole cannot be said to be club-shaped. Tibia with a rather long stalk, about as long and as wide as femur, club-shaped, behind in the greater central part slightly *concave*, convex towards the tip, in front gradually widened from the stalk, the inner side distinctly convex. Hand with a distinct stalk, and regularly rounded base, only a little

broader than tibia, exteriorly nearly straight, in front slightly convex or nearly straight, passing a little obliquely into the fingers. Fingers robust, slightly curved, a little shorter than the hand (4:5).

Mandibles.—Galea small and simple.

Legs more or less granulate, with partly clavate, partly dentate, and simple hairs. Tibia of IV. pair very broad (high), being very convex on the inner side. Claws small and simple.

♀.—The female has the palps somewhat more robust, tibia with no concavity exteriorly, and the tibia of IV. pair of legs slender. Galea of the single specimen broken.

Length (with abdomen extended) 2.22 mm., width of abdomen 0.79 mm.

Measurements.—Cephalothorax: long. 0.79; lat. 0.57. Femur: long. 0.72; lat. 0.19. Tibia: long. 0.64; lat. 0.20. Hand: long. 0.57; lat. 0.23. Fingers: long. 0.46 mm.

Habitat.—Cape Province. King William's Town Div.: Ntaba Kandoda (R. Godfrey), 1 ♂ (type); Transkei, Butterworth: Blythswood, 1 ♂; Kei Bridge, 1 ♀ (R. Godfrey).

NOTE.—Though this species belongs to the *subruber* group, it has the tergites slightly keeled, a thing till now observed only in the species belonging to the *cancroïdes* group, with the exception of a South American species, *Ch. satanas* With, also belonging to the *subruber* group. The keels in *Ch. paradoxus* are certainly only slightly developed, and are seen best when the animal is examined in alcohol, but they are nevertheless present. The species, on account of the slender palps, has much in common with several other forms of the *subruber* group, for instance *Ch. angulatus* Ellingsen, but that species is much larger and has still more slender palps.

16. CHELIFER SCULPTURATUS Lewis.

Transvaal Province: Johannesburg (H. A. Fry), 1 ♂; Natal Province: Richmond (Rev. J. R. Ward), 1 ♀, 1 jun., in beehives; Pietermaritzburg (C. Fuller), 1 ♂, 1 ♀.

The immature specimen from Richmond has the exceedingly coarse granulation, which is found on the palps in the adult specimens, much less developed, and present only, in a smaller degree, on the inner side of femur and tibia. I have not been able, with certainty, to detect eyes, either in the adult specimens or in the immature one. It is interesting to note that the specimens from Richmond were taken in beehives, as were the type specimens.

During the printing I have received from Mr. Godfrey a couple of

palps of this species, taken in Griqualand East: Isolo by Miss Fanny Ross, June, 1912, in beehives.

17. CHELIFER SEGREGATUS Tullgren.

Cape Province. Clanwilliam Div. (C. L. Leipoldt), 2 ♀.

The femur of the palps is somewhat more robust than should be the case according to Tullgren's figure, but in all else the specimens agree well with the description.

18. CHELIFER SIMONI Balzan.

Cape Province. Stellenbosch Div.: Faure (W. F. Purcell), 1 ♀.

I have also examined 5 ♂ and 14 ♀, sent by the Rev. R. Godfrey, who gives the following localities: Victoria East Div.: Lovedale, many under stones in manure heap in company with *Ch. Kewi*, and some on gum-tree. King William's Town Div.: Pirie, two under stones; Cwenewe, eight on dead tree; Burnshill, one on mimosa. Griqualand East, Isolo (Miss Fanny Ross), 3 ♂, 2 ♀.

Mr. Godfrey gives the following details on its habits: "This species is interesting because of its two distinct habitats, on trees and on the ground. It makes a nest for moulting purposes, and the ♀ makes a nest for reproduction. The latter nests I have found on January 1, 1908, on a tree; diameter of nest, 4.5 mm. I have seen this species carrying as prey another false-scorpion in its chelicerae."

19. CHELIFER TUMULIFERUS Tullgren.

Cape Province. Cape Peninsula: Bergvliet (W. F. Purcell), 4 ♂, 3 ♀.

NOTE 1.—When Tullgren, in his description of this species, says, "Am Innenrande hat es (das Femur) nahe am Stielchen einen charakteristischen, kleinen Knollen. Vor diesem Knollen ist das Glied sehr schwach *konvex*," I suppose the last word is a misprint for "*konkav*," to judge from the figure. In the above-mentioned specimens (♂♂) the concavity is indeed quite considerable, except in one specimen, where it is less pronounced and very like Tullgren's figure. The stalk of the femur, too, is better marked out in my specimens than is indicated in Tullgren's description and figure. But I have no doubt that the specimens from Bergvliet belong to Tullgren's species.

To the description given by this author I shall make some additional remarks: Tullgren puts a mark of interrogation as to his specimen being a ♂; I do not think this is necessary, as I will try to

show in the following. I feel quite sure that the species belongs to the *subruber* group, more especially as the males, examined by me, have bristled areas on 5 or 6 sternites, one small area on each side near the median line: these areas are quite small (contrary to what is the case in most other species of the *subruber* group) and with proportionally few bristles.

Together with these males were some females which in all essentials resemble the males, except in the *femur being normally shaped, with no basal protuberance on the front side of femur*; tibia and hand are (as usual in ♀) somewhat more robust, and the fingers proportionally somewhat shorter; femur and tibia somewhat more strongly granulate; femur is in front proximally slightly convex, distally slightly concave.

NOTE. 2.—The females mentioned above very much resemble the female which Tullgren has described under the name of *Chelififer lamellatus*. Tullgren, it is true, says of this species that it has only “deutliche Augenflecke,” thus no real eyes, but eye-spots and real eyes are often easily confounded. What Tullgren means by “Lamellen” in this species I have not quite been able to realise. If this suggestion of mine is right, *Ch. tumuliferus* may be ♂ and *Ch. lamellatus* ♀ of the same species. But I dare not at present unite the two.

20. CHELIFER WALLISKEWI NOV. SP.

♂. Two eyes of moderate size, one on each side.

Colour.—Body and palps dark reddish brown, the keels of abdomen blackish red, the under side, legs, and mandibles palish brown.

Cephalothorax distinctly longer than wide behind, gradually narrowing forwards, rounded in front, the front margin slightly convex. Two very prominent transverse grooves; the posterior one, especially, is very broad and deep; the anterior groove about in the middle, straight, somewhat widened laterally; the posterior one considerably nearer to the hind margin than to the first, distinctly curved forwards and, like the first, widened laterally. The hind corner of cephalothorax produced into a small, brown, spine-like process, sometimes rather indistinct. The surface somewhat glossy, densely granulate, and provided additionally with scattered bigger granules; these are laterally bigger and pointed. The very few hairs (which are left?) truncate and slightly dentate.

Abdomen.—The three anterior tergites and the last one entire, the other tergites divided longitudinally by a fine stripe; yet in one

specimen the last tergite is partly divided. The 7 or 8 anterior tergites are provided with lateral keels and produced posteriorly into a spine-like process; this process is rather small. The surface somewhat glossy and slightly granulate. The hairs are mostly broken and lost, some left are short and truncate; at the tip of the lateral spine-like process there is (when not broken) a hair, slightly clavate. All sternites divided longitudinally; but the division of the last sternite is only partial; the surface somewhat glossy and shagreened. The hairs broken or lacking.

Palps (when abdomen contracted) longer than, or (when abdomen extended) as long as the body; moderately slender. Coxa glossy and slightly granulate; the other joints, too, glossy and granulate, but in addition there are on some of the joints bigger and pointed granules; for instance on trochanter, except on the under side, on the femur above, but especially on the front side some very big ones, also some smaller ones on the hind surface; on the inner side of tibia, too, some bigger granules. Fingers smooth. The clothing of hairs is rather scattered, consisting of short, truncate, and a little dentate hairs, curved forwards or nearly depressed; on several of the bigger granules the hairs are rather clavate. Trochanter with a distinct stalk, somewhat longer than wide, oblong, in front and behind moderately convex, above with a rather strong and rounded protuberance. Femur with a distinct stalk, about 5 times as long as wide at the tip, the inner side straight or slightly concave, behind gradually widened from the stalk, the outer side slightly convex, femur in all a little curved and slightly club-shaped, viz., gradually increasing in width distally. Tibia with a short but distinct stalk, decidedly club-shaped, distinctly shorter than femur, and at the extremity about as wide as the femur, behind nearly straight, only somewhat convex near the extremity, or slightly convex; in front nearly straight, a little sinuated near the tip. Hand with a very short stalk, and the base obliquely rounded, oblong, as long as and about $1\frac{1}{2}$ times as wide as tibia, exteriorly slightly convex or sometimes nearly flat, interiorly somewhat more strongly convex, more or less gradually passing into the fingers. Fingers about as long as the hand or a little shorter, considerably curved, rather slender, with no accessory teeth.

Mandibles.—The galea was broken in all specimens examined.

Legs.—All joints glossy and more or less granulate. Coxa IV. curved (as usual in the *cancroides* group), on the exterior corner provided with a brown, rounded, somewhat irregular spine-like process; this process, strictly speaking, is situated on the back of the joint,

thus sometimes difficult to see; coxal sac present. *Trochanter I. and II. posteriorly produced into a broad, rounded process*, most pronounced in trochanter I. Femur IV. on the back in the proximal half provided with *several small, irregular spines* (or granules). *Femur III. and IV. at the tip exteriorly and interiorly produced into a point* (or spine). *Tarsus I. with the tip exteriorly produced into a very strong point*, which is sometimes divided. Claws with no teeth, rather small; one claw of I. pair normal, the other very small and nearly straight. The species belongs to the *caneroides* group.

♀. The female, beside the sexual apparatus, naturally differs from the male in lacking the keels and the spine-like projections of the cephalothorax and the tergites, and in having coxa IV. normally shaped with no coxal sac. In addition, the tarsus of pair I. is normal, trochanter I. and II. have their processes less developed; the process of the back of coxa IV. is lacking, and femur III. and IV. are not produced apically. One female had one of its galeas unbroken: it was rather small with some apical teeth.

Length (♂) 3·86 mm.; breadth of abdomen 1·57 mm.

Measurements (♂).—Cephalothorax: long. 1·14; lat. 1·00. Femur: long. 1·36; lat. 0·28. Tibia: long. 1·07; lat. 0·31. Hand: long. 1·07; lat. 0·49. Fingers: long. 0·97 mm.

Habitat.—The types of this species were collected by the Rev. R. Godfrey at Transkei, Butterworth: Blythswood, Bushman's Rock, July 13, 1909, under stones; I have examined 3 ♂ and 2 ♀ from this locality. It has also been taken by Mr. Godfrey in King William's Town Div.: Green River, 1 ♀. In the collection from the South African Museum also some specimens of this species were present, though mostly very badly preserved, viz.:—

Cape Province. Swellendam Div.: between Stormevlei and Brakfontein Farm (Zonder Einde Mountains) (W. F. Purcell), 1 ♂, 4 ♀ (adult), broken. Oudtshoorn Div.: In the caves at Cango (W. F. Purcell), 4 ♂, 1 ♀ (young). Cape Peninsula (W. F. Purcell), 1 ♂ (young).

The specimens from Cango Caves and Cape Peninsula certainly belong to this species; they are rather immature, but the sexual apparatus, at least externally, seems to be well developed. But they have not the dark colour of the adults, and the bigger granules of the palps are not yet well developed.

This species is very well distinguished by several characters, given in the description. It belongs to those of the *caneroides* group having slender palps, but cannot well, as regards the males, be confounded with any hitherto described species.

21. CHEIRIDIUM MUSEORUM Leach.

Cape Province. King William's Town Div.: Pirie Forest (R. Godfrey and Miss Fanny Ross), 2 specimens; on yellow-wood.

NOTE.—The capture of this species and the next one in South Africa, in a wild state, is indeed very astonishing, but my comparison of them with European specimens of both species has left me no doubt that they do indeed belong to the European forms of this genus. As will be seen from the Introduction, *Ch. museorum* is in Europe found in or near inhabited places, while the other species is only taken in a wild state. One of the specimens I have examined was a male.

22. CHEIRIDIUM FERUM E. Simon.

I have examined, of this species, 6 specimens from South Africa, males and females. According to Mr. Godfrey the localities were the following:—

Victoria East Div.: Lovedale, Alice. "Many nests under the bark of gum-trees. The nests, made of white silk only, are very conspicuous; one surface of the nest is attached to the bark, and the other surface lies over this attached layer" (Godfrey in litt.). King William's Town Div.: Pirie Forest, common on yellow-wood.

As to the occurrence of this species in South Africa, see the Note to the preceding one.

23. CHEIRIDIUM SUBTROPICUM Tullgren.

Cape Province. Victoria East Div.: Woodstock, Alice, 2 specimens.

"Both were taken on yellow-wood. One was found free, and the other was inside a dust-covered nest, and was carrying four larval young. Not met with again" (Godfrey in litt.).

24. FEAELLA MUCRONATA Tullgren.

Cape Province. Cape Peninsula: St. James (W. F. Purcell), 2 ♂.

Among the characters in which this species differs from *F. mirabilis* Ellingsen, the mandibles are much larger and almost entirely visible from above, while in *F. mirabilis* they are entirely covered by the anterior part of cephalothorax; the cephalothorax is also considerably narrower proportionally to the width of abdomen than is the case in the West African species.

The characteristic recess ("Vertiefung") which Tullgren describes

as present between the two anterior pairs of coxæ in the *female* I cannot detect in the two *males* I have examined; perhaps this feature is found only in the females. The projection of the base of the femur of the palps is small, of smaller size than Tullgren seems to indicate, but the protuberance of the trochanter is very large. The colour I should prefer to call brickly as in *F. mirabilis*.

25. GARYPPUS CAPENSIS nov. sp.

♀. Four large eyes, two on each side, about half a diameter from one another, situated (as usual in *Garyppus*) on an eminence; the anterior eye looking forward and obliquely upwards, the posterior one showing directly backwards; the anterior eye about 5 diameters from the front margin of cucullus.

Colour.—Cephalothorax dark chestnut, with a large blackish red, rather glossless central spot near the hind margin. Palps chestnut with the fingers somewhat darker. The tergites spotted; the ground colour pale greyish brown, each sclerite with one large brown spot laterally and another, somewhat smaller, brown spot at a little distance from the median line; the anterior two or three tergites have the spots somewhat effaced, their colour being rather brownish on their whole surface. The sternites have their colour distributed in the same manner as the tergites, but less regularly and with the spots of a paler colour.

Cephalothorax has the hind margin a little longer than the length of cephalothorax, and is on the whole somewhat triangular, strongly and gradually narrowing forwards from the posterior corner to the contraction which forms the cucullus; the latter is very long and very sloping (genuine *Garyppus* cephalothorax); the front margin with very conspicuous sinuation; cucullus with deep and conspicuous longitudinal groove from off the eyes, but this groove terminates before reaching the front margin. No transverse groove visible. The surface very glossy (except the dark spot posteriorly, which is somewhat less glossy) and coarsely granulate, laterally most coarsely. The hairs (most of them broken) of cephalothorax moderately long, robust, broad, somewhat clavate.

Abdomen.—Tergites divided very distinctly by a rather broad longitudinal band, except the first and the last one. The surface rather glossless, coarsely granulate, provided with hairs of the same kind as those of cephalothorax (mostly broken). The sternites are also divided longitudinally, but less distinctly; less coarsely granulate, a little glossy; the hairs like those of the upper side.

Palps distinctly shorter than the body, but abdomen is very much extended. The surface glossy and coarsely granulate all round. The hairs are longer than usual in *Garypus*, thick (as in cephalothorax) and distinctly widened apically, thus clavate, equally strong on both sides of the palps. The fingers have only fine and pointed hairs. Coxa somewhat produced in front, but the extremity is truncate. Trochanter with a distinct stalk, globose, semicircular in front, behind with two protuberances, an upper one and a lower one: the upper protuberance is much rounded and is the larger one, the lower protuberance of smaller size and not so much rounded. Femur with well-pronounced stalk, about $2\frac{1}{2}$ times as long as wide, robust, after the rounding at the stalk with the inner side nearly straight or slightly convex, behind roundly widened from the stalk, the posterior side distinctly convex. Tibia conspicuously shorter than, and as broad as, femur, with a moderately long stalk, behind distinctly convex, most strongly so towards the extremity, in front gradually widened from the stalk, somewhat swollen in the central part, somewhat sinuated towards the tip. Hand with a distinct stalk, about $1\frac{1}{3}$ times as wide as tibia, with obliquely rounded base, the outer side slightly convex, the inner side somewhat more strongly so. Fingers very robust, curved, much shorter than the hand (3:4).

Mandibles of very small size. Galea small, from the middle divided into three simple but rather strong branches.

Legs more or less granulate, with clavate hairs; only tibia at the extremity and the tarsi have in addition some slender hairs. Femur I. and II. have *pars basalis distinctly shorter than pars tibialis*, the basal part being thus trochantin-like, with distinct articulation; first tarsal joint distinctly longer than the second; tibia a little longer than tarsus. Tibia III. and IV. distinctly longer than the corresponding tarsi. Coxa IV. rather long with the hind margin straight. Arolium longer than the claws; the latter are simple.

The species is a large and robust one. Length 5.4 mm.; width of abdomen 2.3 mm.

Measurements.—Cephalothorax: long. 1.15; lat. behind 1.35. Femur: long. (excl. of the stalk) 1.15; lat. 0.50. Tibia: long. (excl. of the stalk) 0.93; lat. 0.50. Hand: long. 1.15; lat. 0.67. Fingers: long. 0.83 mm.

Habitat.—Cape Province. Malmesbury Div.: Stompneus Bay in St. Helena Bay (J. E. C. Goold), 1 ♀.

NOTE.—Of special interest, in this species, is the construction of femur I. and II., having the basal part shorter than the tibial part: in spite of this it is necessary to refer the species to *Garypus* and not

to *Garypinus*, the shape of cephalothorax and of the cucullus being so decidedly *Garypus*-like, and this must certainly be of more weight than the construction of femur I. and II. mentioned above. In spite of the palpal coxa being somewhat produced (but truncate at the extremity), the species must, I suppose, belong to the *Garypus minor* group and not to the *saxicola* group, but in that case it will be one of the largest, if not the largest, species of its group.

26. GARYPUS IMPRESSUS Tullgren.

Cape Province. King William's Town Div.: Pirie Forest (R. Godfrey), 2 ♀ adult, 2 very young specimens. Griqualand East: Isolo (Miss Jessie K. Mackinnon), 1 young.

NOTE 1.—I have examined the five above specimens which I refer to this species. The adult specimens are of somewhat larger size than Tullgren's—about 3 mm. against Tullgren's 1·75 mm.—but the characteristic transversal impression of the hand will, I think, decide their belonging to Tullgren's species. Beside the difference in size there are, however, still some characters to be remarked upon in Godfrey's specimens: Cephalothorax is of a dark brown colour, but has (well pronounced even in the young specimens) a paler coloured triangular area extending half-way to the eyes. Tullgren has in his figure given the femur and the tibia of the palps a very irregular appearance (he mentions no such thing in the description); Godfrey's specimens certainly have also on the inner side of femur and tibia some bigger granules, but not approximately on the same scale as Tullgren's figure. But this carries no great weight, being just a character in which some species of *Garypus* (for instance, *G. minor* L. Koch) vary very much.

NOTE 2.—The Rev. R. Godfrey gives in a letter some very interesting information on this species: "This is a ground-loving species, living under stones in the forest. It makes nests for the purposes of moulting and reproduction. The nests are hemispherical, attached to a stone; they are made of earth particles, lined with silk, with a silk layer over the enclosed surface of the stone as well.

"I have found individuals moulting in nests on April 16 and September 19, as well as half-grown young ones in nests on December 9. I have found nests with females carrying their larval mass on September 19 and December 9.

"On September 19, 1908, I obtained a number of these creatures, and, having no tube with me, I put them alive in a roll of paper. On reaching home, I found an adult eating a colourless moulting

individual. While sucking its prey, the *Garypus* used its chelicerae to hold it, having the finger with the galea on the under side of the prey; but when changing the position of the prey it used its large nippers, removing the prey from its chelicerae, turning it about and then pressing it again as far as possible into both chelicerae, and then removing its large nippers from the prey. In walking, the cannibal *Garypus* carried its prey in its chelicerae. Once I lost sight of the feeding *Garypus*, and found it prowling on the platform of the microscope; on touching it, I caused it to drop its prey from its chelicerae, but, on replacing it in the observation tray and putting the dried-up prey beside it, I soon saw it fearlessly pick up the shrivelled prey again. It picked it up with its left pedipalp and held it at arm's length while it cleaned the fingers of its right pedipalp in its serrula. It then transferred the prey to its chelicerae and marched off again with it, keeping its pedipalps stretched out in front on either side and the nippers expanded vertically as it walked. How slow the process of sucking the juices of the prey was may be judged from the fact that my observations extended over four hours, and that even then the *Garypus* had not finished its meal."

27. GARYPUS MINUTUS Tullgren.

Tullgren has (*loc. cit.*) described a species, *Garypus minutus*, on, as he says, a female "wahrscheinlich nicht geschlechtsreif," and of very small size, 1.38 mm. I suppose, however, that he has had before him not a young female, as he states, but a young male, the galea being recorded to be pointed and simple. This species is very well characterised and easily distinguishable by the shape of the hand of the palps; this has a form somewhat like a rectangle, with the inner and outer sides rather straight. In the collection under consideration there are some specimens having the hand of this shape and also as regards the other characters agreeing well with Tullgren's description, but these specimens are very young and form the transition to more adult stages which have some characters lacking in the younger stages, and, therefore, not mentioned in Tullgren's description. Be it at once understood that the hand may vary very much, not only according to the stage of development, that is to the size, but also in the same stage.

One of the characters alluded to above consists in the hand, especially in more adult specimens, at the extremity (thus at the base of the fingers) being contracted, often nearly perpendicularly to the fingers, more or less strongly, either on both sides, interiorly and exteriorly, or only on the inner side (this contraction in the

present species must not be confounded with what occurs in another species, *Garypus impressus* Tullgren, mentioned above, which has a transversal impression *across* the base of the fingers). This contraction in *G. minutus* makes the hand still more angular than is the case in younger specimens, cf. Tullgren's figure. The central part of the inner side is, however, generally nearly straight, or may sometimes be somewhat convex. The galea has the usual difference in *Garypus*: small and simple in ♂, larger and provided with some teeth in ♀.

That the species may be an immature stage of *Garypus olivaceus* Tullgren (= *G. senegalensis* Balzan), as Tullgren somewhere suggests, I think quite out of the question.

I mentioned above that this species varies very much as to the hand, especially in the different stages of development, and therefore think it will be of interest to give some remarks on the specimens from different localities, as follows:—

Cape Province. George Div.: Montagu Pass (W. F. Purcell), 1 very young; typical,* yet with no trace of real contraction of the hand.

Mossel Bay (W. F. Purcell), 1 ♀ very young; typical, but with a slight indication of contraction.

Clanwilliam Div.: Waterfall Kloof, near Boshkloof (R. Pattison), 1 ♀ adult; the contraction distinct on the inner side, less distinct on the outer side of one hand; scarcely visible on the other hand.

Clanwilliam Div.: Van Rhijndorp Road (C. L. Leipoldt), 1 ♂ adult; nearly typical, but with distinct contraction on both sides.

Robertson Div.: Kogman's Kloof (W. F. Purcell), 1 ♂; nearly typical, distinct contraction on both sides.

Caledon (W. F. Purcell), 2 ♀ adult; distinct contraction on both sides in one specimen; in the other very slightly behind.

Bredasdorp Div.: Marcus Bay (H. A. Fry), 1 ♂, 1 ♀, both adult; though the specimens are rather well developed, the contraction is proportionally less pronounced than usual in other examples of the same size.

Swellendam Div.: Between Stormsvlei and Brakfontein Farm (Zondereinde Mountains) (W. F. Purcell), 1 ♀ adult; nearly typical, but contracted at the inner side of the hand.

Besides these, there were in Godfrey's collection a couple of specimens, one adult from Victoria East Div.: Lovedale, August, 1910, certainly belonging to this species, and another very immature one from King William's Town Div.: Pirie, rather doubtfully referable to

* I use the expression "typical" here in accordance with Tullgren's description and figure.

this form ; the latter was taken from a nest of a grass warbler (*Cisticola lais* Sharpe), December 19, 1910.

During the printing I received from Mr. Godfrey 2 specimens, ♂ and ♀, from Griqualand East : Isolo, taken by Miss Fanny Ross, June, 1912.

In Godfrey's collection there are several young examples which in all essentials resemble the above species except as regards the shape of the hand. While the typical form has the inner half of the hand rather broadened, the central part of the inner side is, nevertheless, rather straight or, at most, a little convex ; but Godfrey's specimens have the inner part of the hand so much broadened with no straight central line, that the hand, on account of this, gets a triangular appearance. Till more specimens are found, I shall call this form

var. TRIANGULARIS,

a name which, in case the form should prove to be a new species, would be a characteristic one. For the hand is indeed most characteristic and peculiar. I will add, that in one specimen a slight indication of a contraction of the hand is present, indicating relation to the typical form.

I have examined 9 specimens, according to Mr. Godfrey, taken in the following localities :—

Cape Province. King William's Town Div.: Izeli, 5 in nests ; Frankfort Hill, 3,000 feet, 1 specimen under a stone. Transkei, Butterworth : Blythswood, Bushman's Rock, 1 specimen. Orange Free State Province : Bloemfontein, Naval Hill, 2 specimens.

28. GARYPUS PURCELLI nov. sp.

Four small eyes, two on each side, about 1 diameter from each other, but not situated on a common eminence ; the anterior eye about 3 diameters from the front margin of the cucullus.

Colour.—The adult specimen (♀) : cephalothorax and palps dark brown, the tergites palish brown, with no distinct colour spots. The other specimen, immature, is on the whole palish brown.

Cephalothorax considerably longer than wide (11:8) ; the lateral margins, from behind till midway, nearly parallel-sided, the anterior half regularly rounded, *with no distinct contraction* at the base of the cucullus, the front margin short and distinctly sinuated in the middle. Cucullus is thus *very little pronounced* and *rather short*. Near the hind margin a straight transverse groove. The surface distinctly and

regularly granulate, nearly glossless. The hairs are broken. Cephalothorax is, on the whole, more like that of a *Garypinus* than of a *Garypus*.

Abdomen.—No longitudinal division of the tergites is visible. The surface distinctly granulate and nearly glossless. The sternites are not divided; they are slightly shagreened and glossy. On one specimen a couple of tactile hairs are present on the last segment. No other hairs were found (probably broken off).

Palps about as long as the body with abdomen extended. The surface of all joints (coxa included) nearly glossless, distinctly and regularly granulate all round, except the fingers, which are smooth and glossy. The hairs are nearly all of them broken (or lacking), one or two hairs of one hand are very short and slender. The fingers, on the contrary, have a proportionally dense clothing of long and pointed hairs, among them some long tactile ones. Coxa in front somewhat rounded. Trochanter with a distinct stalk, about as long as wide, very convex in front, behind with two tubercles, an upper one and a lower one, the lower one more central or basal, the upper one more distal, both rounded. Femur with a distinct stalk, nearly four times as long as wide (thus rather slender), a little widened from the stalk behind as well as in front, slightly convex on both sides, only slightly narrowing towards the extremity. Tibia with a distinct stalk, somewhat club-shaped, the outer side slightly convex proximally, distally more strongly so, the inner side regularly convex on the whole length; tibia is only slightly narrowed at the tip, considerably shorter and a little broader than femur. Hand with a distinct stalk, with the base oblique and only a little rounded, the outer side nearly straight, except at the passage into the fingers (in the younger specimen the outer side of the hand is somewhat convex), the inner side strongly convex; the hand is about $1\frac{1}{2}$ times as wide as the tibia. Fingers rather slender, slightly curved and a little longer than the hand (5:4).

Mandibles of small size. Galea rather robust, at the tip indistinctly tridentate.

Legs glossy and slightly granulate or nearly smooth, with simple, pointed hairs. Femur I. and II. have the basal part nearly twice as long as the tibial one, with distinct articulation; the tarsal joints about of equal length; the whole tarsus only a little longer than the tibia. Tibia III. and IV. are only a little shorter than the tarsus. Coxa IV. rather short with the hind margin rounded. Arolium distinctly longer than the claws; these are simple.

Length of the adult specimen, 3.3 mm.; width of abdomen, 0.86 mm.

Measurements.—Cephalothorax: long. 0·79; lat. 0·57. Femur: long. 0·76; lat. 0·20. Tibia: long. 0·61; lat. 0·24. Hand: long. 0·57; lat. 0·36. Fingers: long. 0·71 mm.

Habitat.—Cape Province. Beaufort West (W. F. Purcell), 1 ♀, 1 jun.

NOTE 1.—The first specimen is adult and well-coloured, and is the type, but there is no doubt that the other specimen also belongs to the same species, although it is of paler colour, less developed and of smaller size.

NOTE 2.—I have been in great doubt as to the genus to which this species ought to be referred. The anterior part of cephalothorax, which is rounded, with no or, at least, little pronounced cucullus, making cephalothorax not much *Garypus*-like, seems to exclude it from the genus *Garypus*. But other characters—for instance, the strong granulation and the construction of the two anterior pairs of legs (which is quite *Garypus*-like)—indicate it to be excluded from the two other possible genera, *Garypinus* and *Olpium*, at least as these are established at present. For further remarks on this subject, see Note to *Garypus capensis*, above; but it may be said that the more species that are described of the family *Garypidæ*, the more difficult becomes the arrangement of the genera, so that the safe establishment of these certainly cannot yet be undertaken. I have, however, at least provisionally, referred the new species to *Garypus*, in spite of the construction of the cephalothorax.

29. GARYPUS SENEGALENSIS Balzan.

1891. *Garypus senegalensis* Balzan, 1. p. 535.

1907. *Garypus olivaceus* Tullgren, 22. p. 63.

Cape Province. Cape Peninsula: Wynberg (H. Beard), 1 ♂ jun.; Table Mountain, near Platteklip (W. F. Purcell), 1 ♀, of rather pale colour; St. James, on seashore and on mountain-side (W. F. Purcell), 2 ♀ adult and 2 jun.; Kenilworth Flats (Cyril French), 1 ♂; Cape Town, Museum Garden (R. M. Lightfoot), 1 ♂ jun. (the sexual region already dark); Plumstead Flats (W. F. Purcell), 2 ♂ adult, 2 immature, very young; Newlands (L. Péringuey), 1 ♂, 1 ♀, variety (see below); Stellenbosch (L. Péringuey), 1 ♀ jun. Natal Province: Richmond (Rev. J. R. Ward), 2 ♂ jun., 1 ♀. Transvaal Province: Johannesburg (W. F. Purcell), 1 ♀.

In the Rev. Godfrey's collection:—

Cape Peninsula: Foot of Table Mountain, 1 ♀ with larval mass in nest under stone, November 12, 1907. Orange Free State: Bloemfontein, Naval Hill, 1 ♀ jun.

“This is a ground species, living under stones. The pregnant ♀ makes a nest like that of *Obisium muscorum*, but of much rougher material, with the usual lining of silk, attached to the under side of a stone” (Godfrey in litt.).

NOTE.—After having examined a number of specimens from South Africa, I have no doubt that *G. olivaceus* Tullgren is the same species as *G. senegalensis* Balzan. Balzan’s figure of this species agrees very well, but there are some remarks in Balzan’s description which need to be taken into consideration. Balzan says of the cephalothorax: “*Sulco transverso, distincto.*” Tullgren, on the contrary: “*Querfurchen fehlen, die erste Furche ist aber angedeutet.*” In another place, however, Tullgren says that the groove is “*ziemlich deutlich.*” In the South African specimens it may be different: in some of them the groove is more distinct than in others. I should prefer to express it thus: the transverse groove exists, but may sometimes be only a little pronounced. Balzan says of the tibia of the palps: “*Superne et interne post petiolum, vix gibbosum.*” Tullgren mentions no such thing, but this gibbosity is certainly present also in his specimens. Balzan’s figures of the galea show that he had before him both ♂ and ♀, though he mentions nothing about the sexes; Tullgren had only ♀.

The male has, however, some characters which Tullgren has had no opportunity of seeing, not having had males for examination, nor has Balzan observed these characters. Besides the shape of the galea (observed by Balzan), which in the male is small and pointed, with no teeth (Balzan seems to have drawn it rather too robust), these characters are the following: the sexual region of well-developed specimens is of a dark reddish-brown colour, sufficiently dark to be seen with the naked eye; femur and tibia of the palps are on the inner side provided with a row of bigger tubercles of which that next to the base of tibia is somewhat bigger than the others; this tubercle represents the gibbosity mentioned by Balzan (see above), and is probably present in both sexes. The front margin of cephalothorax in the male has, besides the central sinuation, another smaller sinuosity on each side of this, the front margin thus becoming quadridentate (in the ♀ there is only a central sinuation, as Tullgren rightly observes). The hand of the palps is a little more slender than that of the female.

To the common description of the species (♂ and ♀) may be added: The coxa of the palps is, as Tullgren observes, truncate in front; the front margin is even a little concave, the inner corner with a small point, the outer one with a very long bristle (if not

broken, as it sometimes is). Some specimens are larger than stated by Balzan and Tullgren, the length attaining 2.9 to 3 mm.

The specimens, ♂ and ♀, from Newlands (leg. L. Péringuey, see above) diverge somewhat from typical ones in having the hand somewhat more slender and more narrowing towards both ends, and the sexual region of the male not quite so dark-coloured, though the specimens appear to be adult.

30. *GARYPINUS CAPENSIS*, nov. sp.

Four eyes, two on each side, nearly contiguous, the anterior one scarcely 1 diameter from the front margin.

Colour.—Palps reddish brown, the fingers darker; tergites, sternites, and cephalothorax brown, the sternites paler; the brown area of cephalothorax does not quite attain the hind margin, being limited behind by a transverse groove, strongly curved backwards; the area lying behind this groove is very pale. The other parts of the animal pale greyish brown.

Cephalothorax considerably longer than wide (about 4:3), the slightly convex lateral margins are somewhat convergent up to the eyes, in front of these a little contracted, the front margin slightly convex. Cucullus is very short. A transverse groove, strongly recurved, seems to limit the brown colour of cephalothorax. The surface smooth and glossy. The few hairs left are pointed.

Abdomen very slender, as is the whole body. The tergites and sternites are broadly divided longitudinally, except the last one. The three anterior pairs of sclerites above are very short, and have the longitudinal division broadest. The surface smooth and glossy, with moderately long and pointed hairs.

Palps considerably shorter than the body, with abdomen extended, smooth and glossy, with moderately long hairs which are thin and pointed. Trochanter with a short stalk, pernae formed, a little longer than wide, slightly convex in front, slightly concave behind. Femur with a distinct stalk, slender, three times as long as wide, nearly parallel-sided, slightly convex in front, behind nearly straight, only a little rounded at the base and the tip. Tibia with a distinct stalk, considerably shorter and a little broader than femur, somewhat convex and almost equally so on both sides, rounded at the tip. Hand with a stalk, and with a regularly rounded base, about $1\frac{1}{2}$ times as wide as tibia, equally and slightly convex on both sides, passing gradually into the fingers. Fingers moderately robust, a little curved, and a little shorter than the hand.

Mandibles very small. Galea of the male short and apparently simple, that of the female somewhat longer and with some minute teeth at the tip.

Legs with simple hairs. Femur I. and II. have the basal part a little shorter than the tibial one and the articulation only slightly developed; the first tarsal joint a little shorter than the second; the whole tarsus a little shorter than tibia. Femur III. and IV. are very broad, the tarsus considerably shorter than tibia. The claws simple. Arolium divided.

Length 2·8 mm.; breadth of abdomen 0·57 mm.

Measurements.—Cephalothorax: long. 0·57; lat. behind 0·40. Femur: long. 0·43; lat. 0·13. Tibia: long. (excl. of stalk) 0·29; lat. 0·16. Hand: long. 0·41; lat. 0·23. Fingers: long. 0·36 mm.

Habitat.—The Rev. R. Godfrey, who collected this species, gives the following list of localities in the Cape Province:—

Victoria East Div.: Woodstock, Alice, in nests on yellow-wood; Lovedale, 3 specimens on gum-tree. King William's Town Div.: Cwencwe, 2 females with larval mass in nests, 1 individual free; Xukwane, 5 specimens on tree. I have examined 5 of these specimens.

NOTE 1.—The species is nearly related to *Garypinus patagonicus* Ellingsen from Patagonia, but the latter is somewhat larger, more robust, and has the galea more branched and the hand proportionally more slender; otherwise there is but little difference. It is more easily distinguished from *G. nobilis* With from Asia which, for instance, has considerably more robust palps.

NOTE 2.—Mr. Godfrey gives in a letter the following particulars: "This species lives under the bark of trees and is of very active habits. The female makes a silk nest, of very loose texture, between flakes of bark; the nest is appressed to the bark, sometimes on one side only, sometimes on both sides. The nest is of silk only, without any covering of dust or specks of wood. I have found the females in nests in the months of August, November, and December."

31. GARYPINUS OBSCURUS Tullgren.

Cape Colony. Hanover (S. C. Cronwright Schreiner), 11 ♂, 17 ♀, 3 ♀ jun.; Calvinia (G. French), 6 ♂, 4 ♀.

In the Rev. R. Godfrey's collection:—

Herschel Div.: Bensonvale (W. J. A. Moir), 2 ♂.

NOTE.—Tullgren knew only the females of this species. I have examined several males which in all essentials resemble the females, but are of smaller size, and have somewhat more slender palps and

the galea very minute and simple, with no teeth. Tullgren says of the palps, that they are smooth and glossy; the surface of the palps, indeed, is not granulate, but is somewhat uneven, and in some places irregularities are met with which might be called a kind of granulation. One larval mass contained 12 animals.

VAR. GRANULATUS NOV.

In the collection of the South African Museum are some specimens, 2 ♂ and 4 ♀, with no indication of locality. I identify these with *Garypinus obscurus*, but as they differ from the typical form in some details, I have regarded them as a variety, distinguishable by the following characters: They are of somewhat larger size and more robustly built, the femur of the palp is a little granulate on the inner and the lower surface (but see my remarks above on the typical form), and the trochanter has the tubercle behind stronger and more pointed.

I have later received this variety from Mr. John Hewitt, Director of the Albany Museum, Grahamstown, 5 ♀, collected at Kimberley (J. H. Power).

32. *OLPIUM ARABICUM* E. Simon.

Transvaal Province. Zoutpansberg Div.: Kleinfontein Farm (R. Godfrey), 1 specimen, on rocky ground.

The specimen sent to me by the Rev. R. Godfrey from the above locality differs in no essential particulars from the *Olpium arabicum* E. Simon. I have compared it with specimens from the Guinea Coast and from Uganda.

During the printing I received from Mr. Godfrey another specimen (♂) of this species from King William's Town Div.: Debe Nek (leg. Miss Fanny Ross).

33. *OLPIUM NITENS* Tullgren.

Cape Province. Bredasdorp Div.: Marcus Bay (H. A. Fry), 1 ♀. Cape Div.: Maitland Flats (W. F. Purcell), 1 ♀. Cape Peninsula: Cape Flats, at Zeekoe Vlei (W. F. Purcell), 2 ♀ jun.

NOTE.—There is great probability of this species being the female of *Olpium pusillum* Ellingsen, founded on a male from Fishhoek, near Simonstown.

34. *OLPIUM SUBGRANDE* Tullgren.

Rhodesia: Baviaan's Kopje, 3 miles East of Umtali (D. L. Patrick), 1 ♂.

The specimen is of somewhat smaller size (σ 2.6 mm. long) than Tullgren's type (♀ 3.16 mm.); but the males of *Olpium* generally are smaller than the females. The species seems to be recognisable, among other things by having the femur of the palps somewhat curved.

35. *IDEOBISIUM GODFREYI* NOV. SP.

No eyes. (*Idcoblothrus*.)

Colour.—Both specimens examined are very pale, especially the body; the palps have somewhat more colour and are reddish.

Cephalothorax about as long as wide, the lateral margins, which are nearly straight or slightly convex, are convergent forwards throughout the whole length, the front margin slightly convex, with no central tooth. The surface smooth and glossy. No hairs.

Abdomen.—Tergites and sternites smooth and glossy. Some few hairs left are short and pointed.

Palps very robust, about as long as the body, with abdomen contracted, smooth and glossy. The hairs of the inner side long and pointed, those of the outer side short and pointed. Trochanter with a very short stalk, about as long as wide, slightly convex in front, centrally a little gibbous behind. Femur with a very short stalk, robust, $2\frac{1}{2}$ times as long as wide, basally in front somewhat convex, distally distinctly concave, behind a little widened from the stalk, the outer side nearly straight, centrally a little concave; femur on the whole slightly tapering towards the extremity, thus widest near the base. Tibia with a short stalk, broadly oblong or subglobose, rather equally and strongly convex on both sides, behind, however, most so distally; tibia considerably shorter and a little wider than femur. Hand with a distinct stalk, and with the base nearly regular and somewhat truncate; the outer side nearly straight, except the convex passage into the fingers, distinctly convex in front, passing gradually into the fingers. Fingers very robust, slightly curved and somewhat shorter than the hand.

Mandibles proportionally of small size. Galea small, pointed, straight, and simple.

Legs with pointed hairs. The femora of the two posterior pairs of legs broad. Claws simple.

Length.—One of the specimens with abdomen much contracted is about 1 mm. long, the other specimen a little longer; width of abdomen 0.4 mm.

Measurements.—Cephalothorax: long. 0.34; lat. behind 0.33; in front (viz., the length of the front margin) 0.21. Mandibles: long. 0.14. Femur: long. 0.29; lat. at the base 0.11. Tibia: long.

(excl. of stalk) 0·20; lat. 0·14. Hand: long. 0·24; lat. 0·17. Fingers: long. 0·20 mm.

Habitat.—Cape Province. King William's Town Div.: Frankfort Hill (R. Godfrey), April, 1909, 2 specimens, under stones, 3,000 feet above the sea.

NOTE.—This species is closely related to *Ideobisium* (*Ideoblothrus*) *bipectinatum* Daday, from New Guinea. I have compared the South African form with a specimen from the Bismarck Archipelago, which I have identified with Daday's species, and I should be inclined to take them to be varieties of the same species were it not that the localities are so far apart. But there are, nevertheless, some small differences: the New Guinea form has the galea curved, the front side of femur more convex in the basal part, and the outer side nearly straight, tibia still more subglobose, thus shorter in proportion to the width, the outer side of the hand not quite straight, but somewhat convex, and the fingers proportionally shorter. Both species are of small size. *Ideobisium Godfreyi* is the first *Ideoblothrus* known from Africa.

36. IDEOBISIUM QUADRISPINOSUM Tullgren.

Cape Province. Cape Peninsula: (R. M. Lightfoot), 1 ♂, 1 jun.; Signal Hill (W. F. Purcell), 6 ♂, 6 ♀, 8 jun.; (R. M. Lightfoot), 1 ♂; (S. C. Cronwright Schreiner), 1 ♀; Wynberg Hill (F. Treleaven), 1 ♂; Table Mountain at Kasteel's Poort (W. F. Purcell), 1 ♀; Newlands (L. Péringuey), 7 ♂, 2 ♀ (on these specimens see special remark below). Caledon (W. F. Purcell) 1 ♀.

In the Rev. R. Godfrey's collection there are 2 ♂, 4 ♀, 3 jun. from King William's Town Div.: Pirie Forest and mountains.

During the printing I received from Mr. Godfrey one specimen from Griqualand East: Isolo (Miss Fanny Ross), June, 1912.

Mr. Godfrey remarks in a letter: "A ground species living under stones, in the forest and also on the open hillsides, up to 3,000 feet. It is not at all abundant."

NOTE.—I have referred all specimens mentioned above to Tullgren's species, in spite of some differences from his description.

Tullgren's specimen was certainly very young and of small size; the former fact is apparent from the very pale colour; there are among the specimens enumerated above some that are pale and young and then of about the same size as Tullgren's animal. But if my identification is correct, the adult species is of a considerably greater size. The largest specimens came from Newlands (L. Péringuey leg.), and among these are two females which attain

the considerable length of 5.5 mm. (Tullgren's was only 1.74 mm. long), but then the abdomen is extended to the greatest possible extent, and Tullgren's example may have had the abdomen much contracted, which, among the Pseudoscorpions, is of great consequence as concerns the length; the males from the same locality were of considerably smaller size. The specimens from the other localities were all smaller, but, with few exceptions, seemed to be younger and not quite mature, although the sexual area of the males appeared quite developed. As regards the galea, I shall make the following remarks: It is only in some younger specimens that the galea seems to be in some measure such as described and figured by Tullgren. Moreover, the galea may vary exceedingly. In the smaller (and younger) specimens the galea is divided into branches, but the division does not always extend to the base; this may be different even in the same animal. But in the larger and the largest specimens the form of the galea becomes more intricate, the chief branches being often quite considerably rebranched and provided with teeth, and such is especially the case with the large specimens from Newlands. As, however, all other characters in all essential particulars agree well, I have looked on this variation in size and in the form of the galea only as differences derived from the different stages of age, and have not even tried to make any varieties. On the whole it may thus be said that the younger and smaller the specimens are, the more simple is the galea and the nearer is the approach to Tullgren's type. Finally, it may be remarked that there is no essential difference between the galea of the male and of the female.

The palps of the male are somewhat more slender than those of the female, the hand, especially, of the female is more robust than that of the male, particularly in large specimens; the same is the case with the tibia.

A remarkable character which Tullgren overlooks, or at least does not mention, is worthy of notice: The inner margin of the fingers of the palps, that of the fixed finger as well as that of the movable one, is provided with a membranaceous, somewhat transparent, longitudinal, rather high, raised ridge or rim, on which the teeth are placed; this membrane is especially developed in the distal half of each finger; such a transparent membrane has not as yet been observed in any species of Pseudoscorpions, or at least not mentioned in the literature, to my knowledge, except in *Chthonius mordax* Tullgren, and in that species the ridge is not quite membranaceous, properly speaking, and not transparent.

37. *CHTHONIUS CLATHRATUS* Tullgren.

Cape Province. Cape Peninsula: Table Mountain, near Platteklip (W. F. Purcell), 1 ♀.

I have referred this specimen, not quite adult, to the above species; it has the same kind of dentition on the fingers of the palps as *Chthonius sinuatus* (see this species below). Tullgren says nothing about the shape of the fingers; in my specimen these are nearly straight, by which the species is easily distinguished from *Chthonius sinuatus*. Tullgren's description on the whole agrees very well. The posterior eyes are very little developed, but this happens often in *Chthonius*.

38. *CHTHONIUS CONTRACTUS* Tullgren.

Cape Province. Oudtshoorn Div.: Cango Caves (W. F. Purcell), 1 specimen immature, destitute of eyes.

King William's Town Div.: Pirie (R. Godfrey), 1 ♂, 1 ♀, 1 jun.


NOTE.—The male has its palps somewhat more slender than those of the female. The teeth of the fingers, similarly shaped on both, are small, triangular, pointed, and situated considerably apart from each other.

The specimen found in the dark caverns at Cango is destitute of eyes, but belongs certainly to this species.

39. *CHTHONIUS GODFREYI* nov. sp.


Four moderately large eyes, two on each side, about 1 diameter apart from one another, the anterior one about 2 diameters from the front margin.

Colour.—Cephalothorax, mandibles and palps pale reddish brown, the tergites reddish olive, the other parts palish brown.

Cephalothorax about as long as wide in front, strongly narrowing backwards, the lateral margins  curved, only very little contracted in front of the eyes; the front margin slightly convex, a little sinuated in the middle, and there provided with a more or less rounded projection, which, together with the adjoining part of the front margin on both sides, is slightly dentate; on each side of the projection a long and robust bristle. The surface minutely shagreened and glossy. Hairs lacking.

Abdomen.—The tergites and sternites glossy and very minutely shagreened transversally. Hairs lacking.

Palps a little longer than the body, glossy and somewhat shagreened, a little more strongly so than the body; the hairs very few

and scattered, pointed, those of the inner side long and strong, those of the outer side very short and more slender. Trochanter with a short stalk, and very short, of the shape usual in *Chthonius*, slightly convex in front, a little concave behind. Femur long and slender, 5 times as long as wide, nearly parallel-sided, except in the distal third which is somewhat widened on both sides, thus on the whole somewhat club-shaped; the inner side at the stalk as usual with a sinuation. Tibia very short and of the usual shape. Hand scarcely pedicellate, very short and broad, with the base obliquely rounded, the outer side slightly convex, the inner side somewhat more strongly so, slantingly passing into the fingers. Fingers very slender, seen from above nearly straight, a little more than twice as long as the hand; seen laterally the fingers are strongly curved, the movable finger regularly curved throughout its whole length, most strongly so at the tip; the fixed finger is doubly curved like ; the fixed finger distinctly longer than the movable one; the fixed finger has long, narrow, pointed teeth with great interstices, centrally the teeth are longest and have the largest interstices, basally and apically the teeth are lower and placed more closely. *The movable finger is practically destitute of teeth*; the margin is, however, not quite entire, but has some very low traces of teeth.

Mandibles large and robust, shagreened; the fixed finger provided with 5 to 6 teeth, the central ones the largest, decreasing in size backwards; the movable finger with 8 to 9 very small teeth in the distal half. On the outer side of the movable finger there is generally the usual projection.

Legs.—The two posterior pairs of legs very robust, particularly the femora. Claws simple.

Length 2·3 mm.

Measurements.—Cephalothorax: long. 0·64; lat. in front 0·57; lat. behind 0·43. Mandibles: long. 0·53. Femur: long. 0·93; lat. at the tip 0·18. Tibia: long. 0·28; lat. at the tip 0·18. Hand: long. 0·43; lat. 0·28. Fingers, the fixed one: long. 0·93 mm.

Habitat.—Cape Province. King William's Town Div.: Pirie (R. Godfrey), 6 ♂, 3 ♀, 1 jun.

NOTE.—This species is related to *Chthonius contractus* Tullgren, with, for instance, the same shape of cephalothorax, but differs from it in several characters: The fingers of the palps, which are curved and not of equal length; the movable finger nearly completely lacking teeth (Tullgren, as to *Chthonius contractus*, in this respect refers to *Chthonius terribilis* With, which has distinct teeth on both fingers), more precipitous passage from the hand to the fingers; finally, the

fingers are more than twice as long as the hand (in *Chthonius contractus* as 31:18).

40. CHTHONIUS MORDAX Tullgren.

Cape Province. Cape Peninsula: Table Mountain, near Platteklip (W. F. Purcell), 16 ♂, 11 ♀, 1 jun., and (R. M. Lightfoot), 2 ♂, 6 ♀; above Klaassenbosch (W. F. Purcell), 1 ♀; Table Mountain with no nearer locality (R. M. Lightfoot), 2 ♀; Signal Hill (W. F. Purcell), 16 ♂, 13 ♀; Kalk Bay (R. M. Lightfoot), 4 ♂, 3 ♀; Camp's Bay (W. F. Purcell), 10 ♂, 8 ♀; Cape Peninsula, no nearer locality (R. M. Lightfoot), 3 ♀.

The Rev. R. Godfrey's collections contained 12 ♂, 11 ♀, 3 jun. Mr. Godfrey has collected this species in the following localities: Cape Peninsula: Foot of Table Mountain, 4 ♂. King William's Town Div.: Pirie, "very abundant."

"This species makes no nest for any purpose whatsoever as far as I have seen. The female carries her larval mass about with her, leading a free life. The usual number of larvæ is seven, though it may be as low as four. I have found the female carrying her larval mass in April, August, September, October, and December" (R. Godfrey in litt.).

NOTE.—This species seems to be very abundant, and is likely to be distributed throughout the whole of Cape Province; it is particularly very abundant in the Cape Peninsula. It is easily recognised, having some very distinguishing characters. Among these are: The shape of the palps, something similar to the palps of *Chthonius tetrachelatus* Preyssler, having the upper side of the hand distally depressed (or rather curved), but not so much and not so abruptly as is the case in the latter species; no confounding is, therefore, possible. Tullgren gives us a good figure of the palps. Further may be added: The projection at the base of the movable finger, although this projection may be of different size and, therefore, sometimes rather little prominent; and finally, the undulating lamella of the movable finger, very characteristic; but this lamella in younger specimens and in such as have recently cast their skin, is often rather little developed, and then the margin of the finger is nearly entire; the few, generally 4, teeth near the tip are, on the contrary, always present.

The length of the fingers in proportion to the hand may vary; generally they are a little longer than the hand, but are often of about the same length.

The articulation between the two parts of femur of the two posterior pairs of legs, especially of the last pair, is well developed.


The colour of the specimens from the Cape Peninsula is generally somewhat paler than of those from the interior.

The number of eggs or larvæ seems to vary between 4 and 9; they generally lie in a circle with one or two in the middle. The time of reproduction seems to be nearly the whole year; specimens with larval mass have been noted in all months, except January, March, and November.

41. *CHTHONIUS SERRATIDENTATUS* NOV. SP.

Four small eyes, two on each side, about $\frac{1}{2}$ diameter from each other, the anterior one about 1 diameter from the front margin.

Colour.—Palps and mandibles pale reddish, cephalothorax, tergites, and sternites pale brownish.

Cephalothorax distinctly shorter than wide in front (5:6), strongly narrowing backwards, the lateral margins  curved, scarcely contracted in front of the eyes; the front margin very little convex, not sinuated centrally, but provided in the middle with a rather large, triangular, pointed projection, which is minutely dentate; there has, in all probability, originally been a bristle on each side, but this has been lost; in one specimen its position is still to be seen. The surface minutely shagreened and glossy. Hairs not present.

•Abdomen.—Tergites and sternites slightly shagreened and glossy. Hairs not present.

Palps about as long as the body, rather robust, glossy and shagreened, on the inner side with long and thick bristle-like hairs, on the outer side hairs are lacking in two specimens, in the third some few short ones are left. Trochanter very short and with a very short stalk, of usual shape, the inner side slightly convex, the outer one concave. Femur with a short and indistinct stalk, rather short and robust, four times as long as wide in the distal third, somewhat club-shaped, gradually increasing in width distally, especially in the distal half, the inner and outer contour thus being slightly concave. Tibia very short, strongly curved, and shaped as usual. Hand with a short stalk; short, with the base obliquely rounded, rather broad, on both sides slightly and equally convex, rather abruptly passing into the fingers; worthy of attention is a *strong bristle* seated on a little wart on the inner side, near the tip of the hand. Fingers very much longer than the hand (about 12:7), very slender, seen from above slightly curved, about of equal length; laterally seen the fingers are nearly straight, only a little curved towards each other at the tip; the inner margin of both fingers is provided with teeth of about equal shape; these teeth are triangular and pointed, adherent

at their base; most of the *teeth*, particularly those of the fixed finger, are provided with one or two smaller teeth, especially on the proximal side of each tooth; the movable finger has such dentate teeth only in the distal third, basally the teeth become lower, truncate and simple.

Mandibles large and robust, shagreened; the fixed finger with 4 to 5 large teeth in the central part and some very small ones basally; the movable finger has several small teeth. The projection of the outer side of the movable finger only slightly developed.

Legs with very strong, bristle-like hairs. The two posterior pairs robust with rather broad femora. Claws simple.

Length 2.06 mm.

Measurements.—Cephalothorax: long. 0.57; lat. in front 0.67; lat. behind 0.49. Mandibles: long. 0.57. Femur: long. 0.76; lat. 0.19. Tibia: long. 0.21; lat. 0.17. Hand: long. 0.40; lat. 0.28. Fingers: long. 0.67 mm.

Habitat.—Cape Province. King William's Town Div.: Pirie (R. Godfrey), 3 ♀.

NOTE.—This species is especially marked out by the teeth of the fingers, which are exceedingly characteristic, being somewhat like the teeth of a shark; though each tooth has only one or two secondary teeth, the whole series calls to mind the row of teeth of a shark.

In South Africa there are 3 species of *Chthonius* with cephalothorax, narrowing very much backwards: *Chthonius contractus* Tullgren and the two new species described here: *Chthonius Godfreyi* and *Chthonius serratidentatus*. These three species are, however, easily distinguishable by the dentition of the palpal fingers, *Ch. contractus* having both fingers provided with slender, pointed, and remotely placed teeth; *Ch. Godfreyi* one finger with similar teeth, but the other nearly destitute of such ones; and finally *Ch. serratidentatus* with the characteristic teeth just mentioned.

42. CHTHONIUS SINUATUS Tullgren.

Cape Province. Cape Peninsula: Retreat (W. F. Purcell), 1 ♀.

I have compared this single specimen with one from San Thomé (Guinea Coast), which I have identified with Tullgren's species. The South African animal has the hand of the palps somewhat more robust, but in both cases the hand is convex on both sides, and in both cases the inner margin of the fingers is provided with small,

closely placed teeth. The fingers of both specimens are distinctly curved. I suppose that both examples belong to one and the same species, that mentioned above.

Synoptic Key

to the South African species of *Chthouius*, based chiefly on the dentition of the palpal fingers.

- | | |
|---|------------------------------|
| No teeth | <i>Ch. natalensis</i> . |
| Teeth present | 1. |
| 1. Movable finger with undulatory lamella | <i>Ch. mordax</i> . |
| Movable finger with no undulatory lamella | 2. |
| 2. The teeth are dentated | <i>Ch. serratidentatus</i> . |
| The teeth not dentated | 3. |
| 3. Movable finger with no teeth, fixed finger with slender teeth, and large interstices | <i>Ch. Godfreyi</i> . |
| Both fingers with teeth | 4. |
| 4. Teeth of same kind on both fingers, triangular, pointed, with large interstices.. .. . | <i>Ch. contractus</i> . |
| Teeth very small, closely placed | 5. |
| 5. Fingers nearly straight | <i>Ch. clathratus</i> . |
| Fingers distinctly curved | <i>Ch. sinuatus</i> . |

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- 7.—*The Sympoda* (Part VI. of S.A. Crustacea, for the Marine Investigations in South Africa)*.—By the Rev. THOMAS R. R. STEBBING, M.A., F.R.S., F.L.S., F.Z.S., Fellow of King's College, London, Hon. Member of New Zealand Inst., Hon. Fellow of Worcester College, Oxford.

THE Sympoda are a group in many ways remarkable. Its boundaries are at present as sharply defined as any systematist could possibly wish. All known Crustaceans are either clearly Sympoda or clearly not Sympoda. None hover doubtfully on the outskirts of this society. On the other hand, within its limits the relations are highly perplexing. There is so much interlacing of characters, together with so many fine gradations, that any settled standard of classification is difficult to adopt, or if adopted to uphold against reasonable objections. For distinguishing families practical convenience solicits a choice of external and easily observable features. The widely separated eyes of *Nannastacus* offered such a character, till the kindred *Cumella* was found with a single eye. The presence or absence of a distinct telson sets one group of families in a marked manner apart from another group. Yet between the greatly elongated segment in *Makrokyllindrus* and the disappearance of the segment in *Bodotria* there are not a few intermediaries, so that a comparatively short and narrow telson in *Leptostylis* leads on through a short and blunt one in *Petalosarsia* to forms in which the telsonic segment is produced between the uropods, though the produced part is not articulated, and in *Eudorellopsis biplicatus*, Calman, this unarticulated portion is marked off "by a very distinct transverse groove." In some of the appendages the third or "ischial" joint is apt to disappear. Accordingly its presence or absence seemed likely to be available for classificatory purposes. But this proved disappointing, because, though the joint is often quite definitely present, and some-

* Parts I.—III. have been published in the "Marine Investigations in South Africa"; Parts IV. and V. in Vol. VI. of the "Annals of the South African Museum." In Part V., pp. 409–418 treat of the Sympoda (olim *Cumacea*).

times quite definitely missing, there are other cases when the ring is incomplete or when coalescence with the preceding joint can only be inferred from a line of suture. The endopod or inner ramus of the uropods may be a single piece or it may be divided into two or three joints of varying relative lengths. The resulting differences are rather easy to observe, and have been, in fact, of much service in classification. But even here perplexities occasionally arise. Among the species of *Sympoda* earliest described are *Bodotria scorpoides* (Montagu) and *Bodotria arenosus*, Goodsir. These are so much alike that their generic separation is hardly to be thought of. Nevertheless the uropod of the former has a two-jointed endopod, while that of the latter is provokingly undivided.

When the question arises of arranging the families in a natural order, one would probably think precedence appropriate to those which retain the most primitive characters. Among these would be the most complete segmentation of the body and the fullest equipment of the segments with their several pairs of appendages. On the first account the families with a distinct telson should stand before those without one. But when the second point is also considered, we find the full complement of five pairs of pleopods combined with entire want of a distinct telson, or in one case with a telson of the smallest type. All other families with the telson distinct have a diminished number of pleopods, varying from three pairs to none. These differences refer only to the male sex, because, so far as at present known, all the females with singular unanimity dispense with pleopods altogether. In some families, however, the males are in this respect like the females.

The provision of exopods or swimming branches on the peræopods in the two sexes has its uses for systematic arrangement. But while in the majority of families the adult males have these branches well developed on the first four pair of peræopods, the females are never so well provided, having at most exopods well developed on the first three pairs and a rudiment on the fourth. In both sexes the exopods may be limited to the first pair of peræopods. For full advantage to be taken of these much-varying characteristics it is obviously important that both sexes should be observed. But, owing probably to the respective habits of these, it not unfrequently happens that new species have to be, or at any rate are, founded on specimens of a single sex, so that the characters of the other sex have to be guessed at or left out of count.

These are a few of the difficulties which confront the systematist in points the most readily available for his purpose. There are

plenty more in those other details of the organism which cannot well be studied without dissection and microscopic examination. The mandibles may have the trunk pointed at the base or very blunt, the molar stout or slender, spines of the spine-row numerous or very few; the palp of the first maxillæ may end in two filaments or only one, or the palp may be missing altogether; important variations in the terminal joints of the first maxillipeds are indeed more or less easily discernible, but this is not the case with the branchial apparatus which is out of view in complete specimens, but which has important differences to offer in the number and disposition of the branchial leaflets. Even the comparative uniformity of the intestine cannot be depended on, since *Cyclaspoides sarsi*, Bonnier, and *Platycuma holti*, Calman (Fisheries, Ireland, 1904, I. [1905], p. 30, pl. 3, figs. 39-56), agree with many of the Cladocera in having a coiled instead of a straight alimentary canal.

It is reasonable to suppose that the Malacostracan type of body was gradually produced in far-distant ages, but the pattern is now so wonderfully persistent and traceable under all sorts of disguises, that missing parts are almost certainly due to losses, not to inheritance of ancestral defect. Hence, as above suggested, we may be allowed to assume that the organism with the largest number of distinct parts comes nearest to the original pattern. On this principle the family Vaunthompsoniidae will stand first, having in the male five pairs of pleopods together with exopods on the first four pairs of peræopods, and in the female exopods on the first three of those pairs. The Sympodommatidae agree as to pleopods, but have exopods only on the first three pairs of peræopods in the male as well as in the female. The Bodotriidae with the same number of pleopods have well-developed exopods only on the first peræopods in each sex. The only other family with five pairs of pleopods is the Ceratocumatidae, which might claim precedence over the families already named in respect of its distinct telson, which they are without, but it is inferior to the Vaunthompsoniidae by having exopods in the male on the first two only instead of the first four pairs of peræopods, and in its only known species it has lost the fifth peræopods altogether.

The present essay proposes the adoption of fourteen new species, nine new genera, and a new name for a genus already known, but a more important innovation affects the framework of the group at large. In view of a forthcoming monograph, which avowedly aims, not at introducing novelties, but simply at recording the actual state of science, it has seemed desirable here to name a great number of

Pleopods, Pairs in Male.	Peraeopods, Pairs with Exopods in		Telson.	Apical Spines of Telson.	Antennal, Accessory Flagellum.	Antenna 2 of Female, Joints.
	♂	♀				
5	4	3	0	..	very small	2
5	3	3	0	..	very small	2
5	1 or 1 + 2r	1 or 1 + 2r	0	..	very small	1 or 2
5	2	?	small	0	very small	?
3	4	3 + r	0	..	very small	3
3	4	2 + 2r	large	3 or more	well developed	4
3	4	2 + 2r	large	3	well developed	5
3	4	1	large	3	well developed	4
2	4	2 or 2 + 2r	large	2	well developed	4
2	4	2 + 2r	small	0	very small	3 or 4
2	4	2 + 2r	large	0	small	4
?	?	2 + 2r	large	3	very small	? 4
2	4	2	large	2	small	? 4
2	4	2	large	2	small	5
2	4	2	large	2	rather small	?
2 or 1 + r	4	2 + 2r	small	0	very small	1 or 2
2	4	3	0	..	very small	1, 2, or 3
1	4	3	0	..	small	3
0	4	3	0	..	small	?
0	4	2 + 2r	large	3 or more	well developed	4 or 5
0	4	?	large	0	very small	?
0	4 or 2	2	large	0 or 2r	very small	3 or 4
0	4	2 or 0	0	..	very small	1, 2, or ? 3
0	4	2	0	..	very small	?
0	4	2	0	..	very small	1
0	2	2	0	..	small	3

In the table above *r* stands for *rudimentary*. In most families the mandibles are tapering at the base and have a blunt molar, the second maxillæ are apically divided, the first maxillipeds are more than 4-jointed, and in the second maxillipeds the inner margin of the apical joint is not strongly dentate.

Mandibles.	Maxilla 1, Apical Filaments of Palp.	Maxilla 2.	Maxilliped 1.	Maxilliped 2, Apical Joint.	Uropod, Joints of Inner Ramus.	
..	2	..	..	..	2	Vaunthompsoniidae
..	2	..	..	..	2	Sympodommatidae
..	1 or 2	..	..	..	1 or 2	Bodotriidae
..	2	..	..	..	1	Ceratocumatidae
..	2	..	..	..	2	Leptocumatidae *
..	2	..	..	..	3	Hemilampropidae
..	no palp	..	..	..	3	Paralampropidae
..	no palp	..	..	..	3	Platysympodidae
..	2	..	..	..	3	Diastylidae
..	2	..	..	..	2 or 3	Colurostylidae
..	2	..	..	..	3	Oxyurostylidae
..	?	..	..	..	?	Pseudodiastylidae
broad at base	2	..	..	..	3	Diastylolididae
..	2	..	..	..	2	Ekdiastylidae
..	2	..	..	..	1	Holostylidae
..	2	..	..	..	1	Pseudocumatidae †
broad at base	1	..	..	..	2	Leuconidae
broad at base	1	..	..	..	2	Paraleuconidae
broad at base	?	..	..	..	2	Hemileuconidae
..	1 or 2	..	..	..	3	Lampropidae
..	2	..	..	..	3	Dicidae
..	2	..	..	..	2 or 1	Gynodiastylidae
..	1 or 2	..	..	..	1	Nannastacidae
molar narrow	2	..	..	{strongly dentate}	1	Procampylaspidae
molar stilliform	1 or 2	undivided	4-jointed	..	1	Campylaspidae
broad at base	1	..	..	..	1	Heteroleuconidae

* A new family for the genus *Leptocuma*, Sars, 1873, with the species *L. kinbergii*, Sars, 1873, and *L. minor*, Calmar, 1912.

† Name modified from Pseudocumidae, instituted by Sars to receive his genus *Pseudocuma*, 1865, and allied genera.

families among which all the genera of the group will in that monograph be distributed. The accompanying tabulation of several characters will give the student an opportunity of understanding at a glance and criticising at his leisure the proposed arrangement. There are several obvious weaknesses. Besides those which depend on unavoidable want of information, there are those due to alternative characters, to reliance on features of little significance, and to the use of indefinite terms such as large and small. In defence it may be pleaded that the case is essentially one in which convenience should be studied and compromise accepted, since Nature makes a mock of our pragmatistical divisions and is continually supplying the links which the evolutionist desires and the systematist abhors.

The naturalist who happens to be a grammarian, or the grammarian who happens to be a naturalist, will find among the names of Sympoda, as among the names in almost any other branch of zoology, a plentiful supply of false concords. This arises from the tiresome and ridiculous idea that the termination of a generic name can make a species masculine, feminine, or neuter. How Nature must laugh! As though because of the Latin words *Aquila* and *Vultur* an eagle must be a hen and a vulture a cock! Since some one must make a beginning, if so inconvenient and unnatural a rule is to be discountenanced and discarded, I here brave reproof and reproach by making all the species of Sympoda of one and the same gender, and that the masculine. In due time, if editors are graciously pleased to allow it, the virtue of simplicity will be recognised and common sense will win a victory over a vexatious custom.*

FAMILY VAUNTHOMPSONIIDÆ.

1879. *Vaunthompsoniida*, G. O. Sars, Arch. Naturv. Kristian., vol. iv., p. 63.

In this family, though there is no distinct telson, the telsonic segment is notably produced between the peduncles of the uropods, this being especially the case in the genus *Gaussicuma*, Zimmer, 1907. In that genus the pseudorostral lobes do not meet in front of the eyelobe, thus distinguishing it from *Bathycuma*, Hansen, 1895, in which they do meet. Both these genera agree in having the second joint of the third maxilliped strongly produced at the outer distal

* See "Knowledge," vol. xxxiii., pp. 259 and 470, 1910, for a fuller discussion of this subject.

angle—a feature not possessed by the typical genus *Vaunthompsonia*, Bate, 1858.

GEN. BATHYCUMA, Hansen.

1895. *Bathycuma*, H. J. Hansen, *Ergebn. Plankton-Exp.*, vol. ii., G.c., p. 55.
 1905. *B.*, Calman, *Fisheries, Ireland, for 1904, I.*, p. 17.
 1905. *B.*, Calman, *Siboga-Exp.*, vol. xxxvi., p. 9.
 1908. *B.*, Zimmer, *Deutsch. Tiefsee-Exp.*, vol. viii., p. 164–166.
 1912. *B.*, Calman, *Proc. U.S. Mus.*, vol. xli., p. 614.

General form elongate. Pseudorostral lobes meeting in the front. First pedigerous segment short, but well exposed. Telsonic segment produced between the bases of the uropods. Eye wanting. Mandible with long spine-row and strong molar. First maxillæ with bisetose palp. First maxillipeds comparatively broad, the epipod furnished with several branchial leaflets. Third maxillipeds with second joint distally produced, the fourth little expanded. First four peræopods in male, only the first three in female, carrying exopods. All five pairs of pleopods in male well developed.

To this genus Dr. Calman in 1905 transferred *Leucon brevisrostris*, Norman, 1879, and also in 1905 described a new species, *Bathycuma longirostris*, to which he added *Bathycuma longicaudatus* in 1912, calling it "*Bathycuma (?) longicaudata*."

BATHYCUMA NATALENSIS, n. sp.

Plate XLIX.

All the five species assigned to this genus show signs of very near relationship. It is an inconvenient circumstance that in two cases only the male is known, and in two others only the female. Only in the case of *B. brevisrostris* (Norman) is the situation saved by Dr. Calman's decision that *Vaunthompsonia cæca*, Bonnier, 1896, is a synonym of Norman's species. From Norman's account of the female the form about to be described differs in respect to the third maxillipeds, the telsonic segment, and the uropods. From Bonnier's description and figures of the young male it differs further in regard to the first and second maxillipeds. From *B. longirostris*, Calman, founded on a young male, it differs strikingly in characters of the pseudorostral lobes, and from *B. longicaudatus*, Calman, founded on an immature female, it differs conspicuously by inferior size and in the proportions of the first antennæ. From the typical species, *B. elongatus*, Hansen, also described from an immature

female, it differs in the proportions of the mandibles and the uropods.

The pseudorostral lobes meet for a short distance in front of the little triangular eyelobe; seen from the side they project a little upwards in an acute point, and laterally are truncate, meeting the serrate lower margin without forming any produced tooth; seen from above they show a slightly serrate sinuous front. The carapace is about one-fourth of the total length from pseudorostral point to end of telsonic segment; the medio-dorsal line is carinate, the first third showing the alternating spinules in double line commencing on the eyelobe and seemingly fading away into a single line obscurely continued to the hind margin. High magnification shows an extensive distribution of minute denticles, each projected from one of the irregular hexagonal cells of the surface, most of these cells having an internal marking suggestive of their capacity to produce a denticle.

The first pedigerous segment appears to be firmly united to the carapace. The four following segments are bordered below with firm edges. The lower borders of the first five pleon segments are flattened out. The produced part of the telsonic segment is almost semicircular, with a little serration on each side of the middle of the apical border. Norman assigns to *B. brevirostris* "telson very short, semiovate, smooth." Bonnier figures the part in question as semi-ovate, but rather long in relation to the antecedent part of the segment.

As in all species of the genus, the eye is wanting. The first antennæ have a geniculate first joint, the second shorter than the third, the two-jointed flagellum shorter than the third joint of the peduncle, its first joint being dilated near the base and fringed with long filaments, the shorter second joint carrying the usual annulated setæ and others; the minute two-jointed accessory is provided with a close-set fascicle of very long setæ. That this rather striking apparatus is not mentioned in the other species is no doubt due to the sex of the female specimens and probably to the immaturity of the males. The second antennæ have characters commonly found in male Symptoda, unless the interlocking of the third and fourth joints of the peduncle may prove to be exceptional (but Sars has figured something similar in *Bodotria* and *Leucon*); the short penultimate joint pushes up a small lobe between the two widely separated lobes of the antepenultimate; the flagellum was not complete in any specimen, but the proximal portion showed a very great number of short joints furnished with setules.

The upper lip is emarginate. The mandibles have the basal section longer than the part on the other side of the strong molar; a spine-row of twenty-one spines leads on to a very narrow cutting plate, which in one mandible is accompanied by a narrow accessory. In Hansen's *B. elongatus* the basal section of the mandible is, contrary to custom, shorter than the spiniferous portion. The first and second maxillæ are normal.

The first maxillipeds have a long second joint, the third missing, the fourth and fifth broad, closely united, the fifth fringed with a row of eight bifid teeth, the two following joints small; the branchial apparatus with eight leaflets agrees better with Hansen's account for *B. elongatus* than with Bonnier's figure and description of this part in his *Vaunthompsonia cæca*. The second maxillipeds have a slender, sinuous, strongly ridged second joint twice the length of the rest of the limb, with the third joint scarcely forming a complete ring, instead of a joint twice as long as broad as represented in Bonnier's figure. The third maxillipeds have the second joint well produced and serrate on inner side of the apical process, but without the strong armature of spines described by Norman for his species. After the small third joint the rest of the limb is missing.

The first peræopods were available only to the end of the second joint; the exopod has a remarkably broad basal joint, the flagellar part having a first joint not very long, but succeeded by no less than seven short joints. The second peræopods have the second joint serrate, the third short, the much-spined seventh about as long as the fifth with the little sixth.

The pleopods have the peduncle little longer than the subequal rami, the one-jointed endopod with its lateral process little produced across the two-jointed exopod, of which the second joint, like the endopod and peduncle, is amply provided with setæ.

The exopod of the uropods is about three-fourths as long as the peduncle, and has eight slender spines on its inner margin. The scarcely shorter endopod is fringed with about seventeen little spines and four larger on the inner margin of its large first joint: the much thinner second joint, more than half as long, has a dozen little spines on the inner margin, on which the peduncle has a varied assortment of a score.

Length of male 11 mm. Female unknown.

Locality. Cape Natal N. by E. 24 miles; depth 805 m.; No. 12605, sent by Dr. Péringuey.

FAMILY SYMPODOMMATIDÆ, n.

Without distinct telson; with exopods only on the first three pairs of peræopods in both sexes; with five pairs of pleopods in the male.

SYMPODOMMA, n. g.

General form slender, elongate, width diminishing gradually from carapace to pleon. Eyelobe narrowly linguiform, separating the pseudorostral lobes, in which the sinus is well defined by the produced antero-lateral angle. All five pedigerous segments dorsally exposed, the first short. Pleon elongate; telsonic segment produced between the bases of the uropods. First antenna with both flagella slight. Third maxilliped with second joint distally much produced, fifth not much distally widened. First three pairs of peræopods in both sexes with exopods, fourth and fifth pairs without any. Five pairs of pleopods in the male. Uropods with both rami two-jointed.

The name of the genus is compounded of the tribal name and *ὄμμα*, an eye.

Under this genus I group the new species *Sympodomma africanus*, and three previously known under other names: 1. *S. anomalus*, assigned by G. O. Sars in 1871 and 1873 with much hesitation to the genus *Leucon*, but in 1879 and 1887, again with some doubt, transferred to *Vaunthompsonia*; 2. *S. weberi*, described by Calman in 1905 as *Heterocuma? weberi*, and 3. *S. diomedææ*, the species described by Calman in 1912 as a companion of the preceding species in the genus *Heterocuma*.

SYMPODOMMA AFRICANUS, n. sp.

Plate L.

The present species bears a close resemblance to that recently described by Dr. Calman from Japan under the name *Heterocuma diomedææ* (Proc. U.S. Mus., vol. xli., p. 612, text figs. 6-9, 1912), but is distinguished by the different armature of the carapace and by the proportions of the uropods.

The pseudorostral lobes are kept quite apart by the advanced eye-lobe, the slightly expanded pellucid apex of which appears to be occupied by numerous small lenses; an angular antennal sinus is formed by the well-advanced antero-lateral angle, from which commences a serration carried some way along the lower margin. A

median carina, beginning on the eyelobe, is carried right through to the hind margin, on the frontal lobe carrying three conspicuous forward-pointing teeth just as in the Japanese species, but not as there behind these teeth dividing into two tuberculated ridges, nor are the sides of the carapace here tuberculate except for a single pair of tubercles anteriorly outside the frontal lobe. Microscopic denticles can be made out along the centre of the carina and scattered over the minutely squamose surface of the carapace.

The pedigerous segments after the first are laterally keeled, and after the second have a median pair of carinæ. There is a slight interlocking laterally between the third and fourth segments. No ventral spine was found on these segments. The first five pleon segments have each a dorsal and lateral pair of carinæ, but the telsonic segment though elevated in the middle is scarcely to be called carinate; its rounded end is well produced between the bases of the uropods.

In the first antennæ the geniculate first joint is as long as the subequal second and third joints combined; the small flagellum is three-jointed, with the third joint minute, the sensory filaments long; the accessory flagellum with its two joints is not nearly as long as the first joint of the principal. The second antennæ of the specimen had the usual character for a male not fully adult, giving promise, however, of very numerous joints.

The mandibles have a strong molar, finely toothed on the apical margin; the spine-row contains at least a score of spines. The first maxillæ show an elongate palp, with two unequal terminal filaments. The second maxillæ with the usual armature appear to be longer than usual. The first maxillipeds have the marginal teeth of the ante-penultimate joint apparently simple, although a spine projecting from below under a low magnification makes the upper tooth seem bifid; the second joint at the apex of its inner margin shows a tooth of unusual size. In the second maxillipeds the slender second joint is much longer than the five following joints combined. The second joint of the third maxilliped is more than twice as long as the five following joints combined, wider at both ends than in the middle, much produced apically; the fourth joint is also produced, but is little longer than broad; the three following joints are narrow. The long first pereopods have the sixth joint less than twice the fifth and not a fourth longer than the seventh. In the short second pair the sixth joint is not longer than the third, the seventh as long as fifth and sixth combined. Exopods to the third pair were not satisfactorily made out, but may be presumed, as they occur in both sexes of the allied Japanese species.

The five pairs of pleopods were without swimming setæ, the one-jointed inner branch having a narrow process across the line of junction between the two joints of the outer branch. In the uropods the endopod is about two-thirds as long as the carinate peduncle, a little longer instead of shorter than the exopod, its first joint about twice as long as the second, instead of subequal to it.

Length of specimen, subadult male, 18 mm. Female unknown.

Locality. Cape Point N. 81 E. 32 miles; No. 17643, sent by Dr. Péringuey.

FAMILY BODOTRIIDÆ.

1901. *Bodotriidæ*, T. Scott, Rep. Fish. Board Scotl., vol. xix., p. 273.

Telson wanting, telsonic segment little produced between the uropods; exopods only on the first pair of peræopods or also with rudiments on the second and third pairs in both sexes; five pairs of pleopods in the male; inner branch of uropods two-jointed or simple.

To this family are referred *Bodotria*, Goodsir, 1843; *Iphinoë*, Bate, 1856; *Cyclaspis*, Sars, 1865; *Stephanomma*, Sars, 1871; *Heterocuma*, Miers, 1879; *Cumopsis*, Sars, 1879; *Eocuma*, Marcusen, 1894; *Cyclaspoides*, Bonnier, 1896; *Zygosiphon*, Calman, 1907.

From these genera the species *Iphinoë brevipes*, Hansen, and *Iphinoë crassipes*, Hansen, have been already considered, and the species *Iphinoë zimmeri*, Stebbing, described, in the Catalogue of S. African Crustacea, 1910; a specimen of *Cyclaspis spectabilis*, Zimmer, mentioned in the same work, has since been obtained by Dr. Péringuey from Cape Point, E. by N. 29 miles; Museum No. 17585, and another, No. 12605, from a depth of 805 m., Cape Natal, N. by E. 24 miles; the Catalogue further notices *Eocuma sarsii* (Kossmann).

GEN. BODOTRIA, Goodsir.

1843. *Bodotria*, Goodsir, Edinburgh New Philosophical Journal, vol. xxxiv., pp. 120, 128.

Carapace without lateral cornua; first pedigerous segment inconspicuous, the second large. Only the first pair of peræopods carrying exopods in either sex; second peræopods with the third joint indistinct; inner branch of uropods either two-jointed or simple.

The two species here added to the genus are distinguished from *B. arenosus*, Goodsir, 1843; *B. pulex*, Zimmer, 1903; and *B. similis*, *B. siamensis*, *B. parvus*, all three established by Calman in 1907, because those five species have the inner branch of the uropods simple, whereas the new species have it two-jointed, in agreement with *B. scorpioides* (Montagu), 1804; *B. gibbus* (Sars), 1879; *B. pulchellus* (Sars), 1879; and *B. sublevis*, Calman, 1907. But while each of the four last-mentioned species is provided with an eye, that organ is apparently wanting in the two new species.

BODOTRIA MONTAGUI, n. sp.

Plate LI.A.

This species is closely related to *Bodotria scorpioides* (Montagu), but exhibits the following points of difference in the female sex, to which the single specimen belongs. The integument is not hard and strong. The eyelobe shows no trace of an eye. The carapace exhibits a pair of oblique grooves, diverging near the middle backwards from the central carina. In the first antennæ the third joint is not longer than the second. The second maxillipeds are without the six strong spines on the distal part of the second joint's outer margin, that part being furnished with four very slight setules. The third maxillipeds have the second joint narrowed in the middle. In the first peræopods the fifth joint, though decidedly longer than the sixth, is considerably shorter than the sixth and seventh combined. In the second peræopods there is a faint indication of the third joint, but with incomplete articulation. In dorsal outline the fourth pedigerous segment is not separated from the third and fifth by any deep incisions, and the telsonic segment is little produced between the peduncles of the uropods.

The comparison has been instituted between the South African specimen and the excellent figures and description given in 1879 and 1899 by Professor Sars of "*Cuma Edwardsi*, Goodsir," which is now recognised as a synonym of *Bodotria scorpioides* (Montagu). Though the differences above mentioned are rather numerous, the points of resemblance are also so many and so close that it seems unnecessary to repeat descriptions practically available in the writings of Professor Sars. Among the minute details which he gives is a character of the first maxillæ, the elongate palp of which has its unequal apical filaments furnished with little lateral hairs pointing in different directions. It is difficult to see the hairs at all, but in the southern specimen some point upwards and some downwards as described by Sars for the northern species.

Length of specimen 4·5 mm.

Locality. Lat. 32° 53' 30" S., long. 28° 11' 00" E.; depth 75 m.
No. 83, sent by Dr. Gilchrist.

BODOTRIA AUSTRALIS, n. sp.

Plate LI.B.

This species, like the preceding, showed no visual elements and had a yielding integument which permitted the flattening out of the carapace, thus making visible a pair of lateral ridges on the under side with a scalloped edge. The outer edge of the extended carapace is fringed beneath with a series of little raised processes. The antero-lateral angle is well marked. The last three pedigerous segments and first two of the pleon are separated from one another and their neighbours by deep depressions. The first antennæ have the third joint shorter than the second. The second maxillipeds have the second joint widest distally instead of in the proximal half. The first peræopods have the sixth joint not longer than the seventh, and the two combined not so long as the fifth joint. In the second peræopods the third joint makes no appearance. The rami of the uropods are two-thirds the length of the peduncle, the exopod being inconsiderably longer than the endopod, of which the second joint is a little over a third of the first.

Length of female specimen 3·25 mm. Male unknown.

Locality. Lat. 32° 53' 30" S., long. 28° 11' 00" E.; depth 75 m.;
No. 83, sent by Dr. Gilchrist.

FAMILY CERATOCUMATIDÆ.

1905. *Ceratocumilæ*, Calman, Fisheries, Ireland, 1904, I., p. 37.

The telson is distinct, but small and unfurnished with spines; only the first two pairs of the peræopods are furnished with exopods; the seventh joint in the two following pairs ends in a curved spine; the pleon carries five pairs of pleopods; the inner ramus of the uropods is 1-jointed.

The characters are all taken from the male, the other sex being as yet unknown.

GEN. CERATOCUMA, Calman.

1905. *Ceratocuma*, Calman, Fisheries, Ireland, 1904, I., p. 37.

As the family depends at present on one sex of a single species, it is, perhaps, inexpedient to attempt a selection of generic characters.

CERATOCUMA HORRIDUS, Calman.

1905. *Ceratocuma horrida*, Calman, Fisheries, Ireland, 1904, I., p. 39, pl. 4, fig. 57-75.

This remarkable species has been fully described and figured by Dr. Calman. Briefly may be mentioned the numerous procurved processes on the flattened oblong carapace, the expanded lateral processes of the second and third pedigerous segments, the absence of limbs from the fifth pedigerous segment (while both pairs of antennæ give evidence of maturity), the peculiar processes with their dense tufts of radiating setæ on the short sixth joint of the first peræopod, and the great length of the slender uropods, in which the equal rami are very much longer than the peduncle. The only point in which the South African specimen differs from Dr. Calman's description and figures is in a small bulbous expansion of the base of this peduncle. The capacity of the telson for closing down over the anal opening, when exercised, has the effect of obscuring its existence. The South African specimen measures 4 mm.

Locality. Cape Natal N. by E. about 24 miles; depth 805 m.; No. 12605, sent by Dr. Péringuey.

FAMILY HEMILAMPROPIDÆ, n.

Telson large, with more than two apical spines; first antennæ with both flagella well developed; exopods on the first four pairs of peræopods, but those on the third and fourth pairs only rudimentary in the female; first peræopods with second joint much shorter than the rest of the limb; three pairs of pleopods in the male; uropods with 3-jointed inner ramus.

The system here followed makes it imperative to separate from the Lampropidæ those genera in which the male has three pairs of pleopods. It seems also desirable to institute a family Paralampropidæ for the genus *Paralamprops*, Sars, 1887, containing the species *P. serratocostatus* (Sars), 1885, and *P. asper*, Zimmer, 1907, this family being distinguished from the Hemilampropidæ by the first maxillæ, which here have no palp. That feature the family shares, so far as is known, only with the Platysymphodidæ, but the latter family has in the female exopods only on the first pair of peræopods, whereas in the Paralampropidæ there are in that sex exopods on the first four pairs, although, as often elsewhere, those on the third and fourth peræopods are rudimentary. The genus *Platysympus* has a

new name in place of the preoccupied *Platyaspis*, Sars, 1870. It contains the species *P. typicus* (Sars), 1870, and *P. brachyurus* (Zimmer), 1907. The species *orbicularis*, which Dr. Calman referred to *Platyaspis* in 1905 and to *Paralamprops* in 1912, may, perhaps, be transferred to a new genus *Platytyphlops* to be subsequently introduced. The suggestion made by Professor Sars in 1900 that *Chalarostylis*, Norman, 1879, might be referred to the *Platyaspidæ* (now *Platysymphodidæ*) will not suit the character of the first maxillæ in Norman's *Chalarostylis elegans*, since Dr. Calman has observed that those appendages have a normal bisetose palp.

GEN. HEMILAMPROPS, Sars.

1882. *Hemilamprops*, Sars, Forh. Selsk. Christian., 1882, pp. 11, 55.

1899. *H.*, Sars, Crustacea of Norway, vol. iii., p. 21.

As this is at present the only genus assigned to the family, the family characteristics may suffice to define it. The species included are *H. roseus* (Norman), 1863; *H. cristatus* (Sars), 1870; *H. uniplicatus* (Sars), 1872; *H. assimilis*, Sars, 1882; *H. normani*, Bonnier, 1896; *H. pellucidus*, Zimmer, 1908.

HEMILAMPROPS PELLUCIDUS, Zimmer.

Plate LII.

1903. *Hemilamprops pellucida*, Zimmer, Deutsch. Tiefsee-Exp., vol. viii., pt. 3, pp. 171, 172, pl. 39, figs. 53, 54, pl. 40, figs. 55-59.

1910. *H. p.*, Stebbing, S.A. Crustacea, pt. 5, p. 415.

The specimens here described and figured, if not in absolute agreement with the young female and still younger male, examined by Dr. Zimmer, do not admit of any real doubt that they belong to the same species.

The integument is pellucid, delicate, microscopically scabrous. Pseudorostral lobes short, subacute, with serrate edges. Carapace in both sexes rather deep, the small triangular eyelobe without lenses, the medio-dorsal line carrying four or five forward-pointing denticles, immediately followed by a nearly level line of twenty denticles reaching back beyond the middle of the carapace and succeeded by a groove between the inflated branchial regions. Pedigerous segments combined shorter than the carapace. Pleon longer than those segments and carapace together. Telson with three long apical spines, its denticulate margins carrying six to eight pairs of

spines on the nearly parallel-sided hinder half; in the nearly adult male the telson is longer than in the female, with a narrower base.

First antenna with serrate edge to the large first joint, third joint small, and in the male not longer than broad, flagellum in the female of five or six joints, with accessory of three joints, the third microscopic; in the male the flagellum is four-jointed, with accessory of three well-developed joints. Second antenna of the female small, four-jointed, with a seta on the rather large first joint and another on the small second joint; second antenna in the male showing a flat process on the side of the penultimate joint of the peduncle, the last joint long, probably composite, the flagellum long, annulated, the very numerous short rings not having attained their full development.

The first peraeopod has the second joint much curved, with its convex border distally serrate. The second peraeopod has the second joint shorter than the succeeding joints combined, of which the strongly spined fifth is longer than the short sixth and long narrow seventh together. The third and fourth peraeopods have the second joint more dilated in the male than in the female, in correspondence with the exopods well developed in the former sex but reduced to two-jointed rudiments in the latter; the third joint of the third peraeopod in the male shows no sign of the peculiar flattened spines found in adult males of northern species belonging to this genus.

The three pairs of pleopods in the male with short apical setae may be taken to represent a subadult character.

Peduncle of the uropods in the female longer than the telson with its apical spines and longer than either ramus; in the male it is subequal to the telson with its spines and shorter than the rami; of these the exopod is a little the shorter, with the first the longer of its two long joints; the endopod has its first joint much longer than the two following joints combined, these two being subequal in the female, but the second shorter than the third in the male.

Length 8.5 mm.

Locality. Cape Point N. 81° E. 32 miles; No. 17386, sent by Dr. Péringuey.

FAMILY DIASTYLLIDÆ.

1856. *Diastyllidæ* (part), Bate, Ann. Nat. Hist., Ser. 2, vol. xvii. p. 449.

1900. *D.* (part), G. O. Sars, Crustacea of Norway, vol. iii., p. 41.

All the pedigerous segments distinct; telson large, with only two apical spines; accessory flagellum of first antennæ distinct; mandibles normal, not broad at the base; first maxillæ with bisetose palp; branchial leaflets numerous, often spirally arranged; exopods on the first four pairs of pereopods in the male, on the first two pairs in the female and sometimes rudiments on the third and fourth pairs; two pairs of biramous pleopods in the male; inner branch of uropods three-jointed.

With this definition the family will be restricted to the genera *Diastyllis*, Say, 1818; *Leptostyllis*, Sars, 1869; *Diastylopsis*, S. I. Smith, 1880; *Paradiastyllis*, Calman, 1904; and the new genera *Adiastyllis*, *Malrokylindrus*, and *Ekleptostyllis*. But this compactness has to be purchased at the cost of establishing several new families closely allied in most of their features. Thus a two-jointed inner ramus of the uropods introduces a new genus, *Ekdiaastyllis*, in the Ekdiaastyllidæ, with *E. sculptus* (Sars), 1871, and eight companion species transferred from *Diastyllis*. *Holostyllis* in the Holostyllidæ is instituted to receive *Diastyllis helleri*, Zimmer, 1907, and with it *Cuma gayi*, Nicolet, 1849, both of which are set forth as having a simple inner ramus to the uropods. In *Diastylroides*, Sars, 1900, the Diastylroididæ have a genus in which the mandibles are broad at the base instead of normally tapering, and the second pleopod has only a single ramus. The Pseudodiastyllidæ, dependent on *Pseudodiastyllis ferox*, Calman, 1905, known only in the female sex, have an elongate telson with more than two apical spines. In the Oxyurostylidæ, *Oxyurostylis smithi*, a new genus and species, established by Dr. Calman in 1912, exhibits a sharply pointed telson with no apical spine or spines. The Colurostylidæ, in the original representative *Colurostylis pseudocuma*, Calman, 1911, have a short telson without apical spines and a two-jointed inner ramus to the uropods, but "*Colurostylis* (?) *occidentalis*," Calman, 1912, has that ramus three-jointed. The Gynodiastyllidæ are separated from all the families just mentioned by having no pleopods in the male. The species originally assigned to the genus *Gynodiastyllis*, Calman, 1911, agree in having a rather small, unarmed telson not produced beyond the anus, and as in *Paradiastyllis* with no exopod to the third maxillipeds

in the female. But the relations of the species among themselves are rather complicated, since the type species, *G. carinatus*, agrees only with *G. lævis* in having no exopods on the third and fourth peræopods of the male, while *G. lævis* is separated from the type and Dr. Calman's other two species, *G. costatus* and *G. bicristatus*, by having the inner ramus of the uropods simple. A family Dicideæ, with the new genus and species *Dic calmani*, was instituted in the General Catalogue of South African Crustacea, published in 1910, and *Dic tubulicauda* (Calman), is accepted by Dr. Thomas Scott.

GEN. DIASTYLIS, Say.

1818. *Diastylis*, Say, J. Ac. Sci. Philad., vol. i., p. 313.

1900. *D.*, G. O. Sars, Crustacea of Norway, vol. iii., p. 42.

Pseudorostral lobes with antero-lateral corners usually little produced; telson long, post-anal portion narrowly produced, elongate, with several pairs of lateral spines; second antennæ of adult male very long; third maxilliped with exopod in both sexes; third peræopods not widely separated from the second in the adult female; both pairs of pleopods in the male well developed, the outer ramus two-jointed.

The genus *Paradiastylis*, Calman, 1904, has no exopod on the third maxilliped of the female, and the adult female of *Diastylopsis* has the second and third peræopods widely separated. Distinguishing points of other genera in the family are noticed under other headings. *Diastylis* itself, after all the deductions here made, still contains thirty-three species. In six of these the third and fourth peræopods of the female have rudimentary exopods. In the remainder these rudiments are regarded as wanting, but it is an open question in regard to *D. tricinctus*, Zimmer, 1903, only known in the male, and *D. armatus*, Norman, for which these peræopods have not been described.

DIASTYLIS ALGOÆ, Zimmer.

1908. *Diastylis algoe*, Zimmer, Deutsch. Tiefsee-Exp., vol. viii., p. 188, pls. 44, 45, figs. 96-108.

1910. *D. a.*, Stebbing, S.A. Crustacea, pt. 5, Annals S.A. Mus., vol. vi., p. 418.

Three numbers should be added to the stations from which this species was obtained by Dr. Gilchrist, namely, 78, 83, 131, the localities being respectively lat. 33° 54' 15" S., long. 25° 53' 30" E.,

depth 57 m.; lat. $32^{\circ} 53' 30''$ S., long. $28^{\circ} 11' 00''$ E., depth 75 m.; Sebastian Bluff, W.N.W. 2 miles, depth 44 m.

ADIASTYLIS, n. g.

This genus is separated from *Diastylis* as having the proximal division of the telson long and cylindrical, while it is distinguished from *Makrokyllindrus* by having the short post-anal part furnished with lateral spines. It contains the new species *A. acanthodes*, together with *A. longipes* (Sars), 1871, *A. costatus* (Bonnier), 1896, both transferred from *Diastylis*, and *A. longicaudatus* (Bonnier), 1896, originally referred to *Leptostylis*, from which it differs strikingly by the length of the telson.

It is not improbable that the species agree in having the first peræopods elongate, but those limbs were mutilated in the specimens from which *A. costatus* and *A. acanthodes* were described—a calamity to which the front legs are especially liable when they are of great length.

ADIASTYLIS ACANTHODES, n. sp.

Plate LIII.

The present species is unfortunately known only in the male sex. The carapace of the single specimen was damaged, the first legs were defective from the end of the second joint and the endopod of the uropods from what appears to be the end of the second joint.

The pseudorostral lobes meet for some distance in advance of the apparently sightless eyelobe, being produced acutely as far as the end of the first joint of the first antennæ; their upper surface is diversified, in common with the rest of the carapace, with numerous denticles of various sizes. The carapace seems to be devoid of ridges. The five pedigerous segments are free, much denticulate, each with a pair of conspicuous dorsal teeth, unless the first segment be an exception; that and the following segment have each the front margin serrate; the side-plates were not clearly made out but appear to have some denticles larger than those on the general surface. The pleon is longer than the anterior division of the body, all of it denticulate except the telson, with several conspicuous dorsal denticles and a few such subventral; the fifth segment the longest and the sixth the widest of the first six, the telson much longer than the fifth segment, about two-thirds as long as the peduncle of

the uropods, its last third very narrow, tapering, somewhat curved, with an apical pair of spines, larger than the unsymmetrically placed lateral spines, four on the left, three on the right.

First antennæ with stout peduncle carrying a few denticles, the first joint the longest, the third ending in a subcircular process from which amidst a bush of filaments issue the two very slender flagella, the principal five jointed, its first joint the longest, the accessory four-jointed, its first joint the shortest. Second antennæ with second joint of peduncle four times as long as the third, twice the fourth, and two-thirds the length of the fifth joint; the flagellum short, not twice the peduncle, of about twenty joints.

The mouth organs show substantial agreement with those in *Diastylis*, the upper lip slightly emarginate, the first maxillæ with bisetose palp, the mandibles with tapering base, not broad as in *Diastylolites*, the molar well developed but not very stout, the first maxillipeds with no great number of branchial leaflets, the third with long plumose setæ on the somewhat dilated end of the long curved second joint.

First peræopods with second joint much like that of the third maxillipeds, but much more denticulate and forming a narrower neck; the distal joints missing. Second pair with a much shorter second joint, stout, not longer than the long fifth and short sixth joints combined, fourth joint not half the length of the slender fifth, nor the sixth half the seventh. The following limbs successively shorter, the third and fourth distinguished by their denticulate second joint, strikingly narrowed distally. The fifth pair being as usual devoid of exopods, such as are borne by the five preceding pairs of appendages, has a smooth uniformly narrow second joint.

The first pleopods are considerably larger than the second, with more numerous setæ on the peduncle; the little two-jointed outer ramus slightly shorter than the one-jointed inner, while in the second pair there is equality or the outer ramus is a little the longer, in each case carrying four plumose setæ while the inner ramus has eight. The peduncle of the uropods about equals in length the fourth, fifth, and sixth pleon segments combined, the exopod equalling the fifth and sixth combined, and barely exceeding the two remaining joints of the endopod, in which the second joint is two-thirds the length of the first.

Length of the specimen about 9 mm., of which the pleon occupies 5 mm.

Locality. Cape Natal N. by E. about 24 miles; depth 805 m.; No. 12605, sent by Dr. Péringuey.

MAKROKYLINDRUS, n. g.

Carapace denticulate; no distinct eye; telson elongate, basal portion cylindrical, much longer than the short post-anal portion, which carries only the two apical spines. Peræopods of the female, so far as known, without rudimentary exopods on the third and fourth pairs.

Name compounded of *μακρός*, long, and *κύλινδρος*, a cylinder.

It seems convenient to assign to this genus, besides the new species *M. fragilis*, four species previously placed under *Diastylis* and one doubtfully assigned by Bonnier to *Diastylopsis*, so that *Makrokylindrus* will contain *M. josephinæ*, described by Sars in 1871; *M. erinaceus* (Sars), 1887; *M. dubius* (Bonnier), 1896; *M. cingulatus* (Calman), 1905; *M. serricauda* (Scott), 1912; and *M. fragilis*, n. sp.

MAKROKYLINDRUS FRAGILIS, n. sp.

Plates LIV., LV.

The integument displays conspicuously a network of hexagonal cells, regular or irregular, with a few smooth spots on the sides of the pedigerous segments. The pseudorostral lobes are subacutely produced in front of the prominent rounded but seemingly sightless eyelobe. Along the line of junction there is on each side a dorsal series of spines successively smaller to the rear, more numerous in the male than in the female. The processes overhang the peduncle of the first antennæ to the end of its second joint; a receding convexity joins the lower margin without any projecting corner. Behind the eyelobe a central ridge, elevated at the middle, ascends to a bilobed girdle which crosses the carapace a little behind the middle. Each lobe of the girdle descends forward to a point at which it meets a dentate carina diverging upwards from the base of each pseudorostral process; from the same point a ridge descends almost perpendicularly towards the lower margin, but before reaching it divides, sending a short branch forward to the base of the pseudorostrum and a somewhat longer one backward to the lower margin. Behind the slightly advanced median point of the girdle the dorsal line of the carapace undulates in gentle descent to the hind margin in the female, with smooth curve in the male. First and second pedigerous segments short, the first partially covered, third and fourth dorsally coalesced but laterally distinct, with considerable rounded dilatation of the side-plates of the third segment, fifth comparatively long, the hinder angles rounded. First three segments of pleon in the male each with a pair of small dorsal

teeth, the rest and all in the female smooth; sixth segment not much shorter than the fifth, and near the uropods much wider; the telson rather longer than both combined, evenly cylindrical for about seven-ninths of its length, then narrowing over the anal valves to the truncate apex which is occupied by a pair of rather large spines; the sides of the telson are serrate in the upper half, but smooth near the base and in the lower half.

First antennæ with long peduncle, stout in the male, first joint dentate at the apex, second equally long, third much shorter, slender in the female, stout in the male, flagellum slender, joints seemingly four, with the usual long setæ at apex, accessory with 2 joints and a very long apical seta at least in the male, in which sex there is a fascicle of sensory filaments attached to a broad process at the base of the flagella, possibly representing the first joint of the principal flagellum. Second antennæ four-jointed in the female, carrying seven plumose setæ, terminal joint very small, sometimes in geniculate attachment. In the male the penultimate joint of the peduncle has a proximal tooth on the outer margin; the outer margin of the long last joint is fringed with very small tufts of setules.

Upper lip emarginate. Lower lip with the lobes apparently deeply indented on the inner margin.

Mandibles with strong molar, spine-row with spines as many as twenty, or sometimes rather fewer, one mandible with an accessory plate and the principal plate minutely quadridentate, the other mandible without accessory plate and narrower principal.

First maxillæ with inner plate broad, five spines on its narrow apex; the palp not very long, with two apical setæ. Second maxillæ seemingly with undivided distal plate, carrying numerous spines on the distal margin and one on the lateral surface, the slightly projecting basal lobe fringed with very numerous short setæ.

First maxillipeds like the maxillæ of very delicate texture, the epipod voluminous, in the male carrying numerous branchial leaves, general structure as in *Diastylis*. Second maxillipeds with second joint rather broad, nearly as long as the rest combined, carrying two plumose setæ at the apex of each margin, third joint distinct, very small. In the females with well-packed ovaries no fan of vibratory setæ was discovered, but in place of the fans a pair of long simple processes with some apical setules. Third maxillipeds with second joint much longer than the rest combined, much curved, strongly produced at the outer apex, which is rounded and furnished with five long plumose setæ, the fourth to the seventh joints differing little in length but the last two much the narrower.

First peræopod with second joint stout and long, much curved; the rest of the limb probably long and slender, as in all the specimens it is missing. Second peræopod with second joint shorter than the rest of the limb, in which the third joint is short but distinct, the denticulate fifth joint longer than the fourth or seventh, the sixth as usual very small. The three following pairs are successively shorter, with no trace of exopods in the female, and in correspondence with this the second joint very slender, whereas in the third and fourth pairs of the male which have exopods this joint is stout. The fifth peræopod is small in both sexes, but with the full number of joints.

The pleopods of the male are similar on the first and second segments of the pleon, having a rather long peduncle with two short rami, the inner one-jointed, furnished with five plumose setæ, of which three are apical, the outer two-jointed, with four setæ, its second joint the shorter. The third and fourth pleon segments show some ventral setæ, presumably vestiges of pleopods now absent.

The uropods have a narrow peduncle, not quite so long as the fifth and sixth pleon segments combined, but much longer than the rami, of which the three-jointed endopod is two-thirds the length of the peduncle, and the exopod little more than two-thirds that of the endopod. In the female specimen figured there are ten spinules along the inner margin of the peduncle, and seven, five, and four respectively on that of the first, second, and third joints of the endopod.

Average length of adult specimens, 10 mm.

Locality. Cape Natal N. by E. about 24 miles; depth 805 m.; No. 12605, sent by Dr. Péringuey.

GEN. LEPTOSTYLIS, Sars.

1869. *Leptostylis*, G. O. Sars, *Nyt. Mag. Naturv.*, vol. xvi., p. 343 (39).

1900. *L.*, Sars, *Crustacea of Norway*, vol. iii., p. 67.

1911. *L.*, Stappers, *Duc d'Orléans Campagne Arctique*, *Crust. Malacostracés*, p. 116.

In general agreement with *Diastylis*, but having a shorter telson, with lateral spines few or none; second antennæ in male with flagellum not very long; all the species with rudimentary exopods on third and fourth peræopods of the female; pleopods of the male less fully developed than in *Diastylis*.

This genus appears to suit eleven species, beginning with *L. ampul-*

laceus (Liljeborg), 1856. to which Sars added *L. longimanus*, *L. macrurus*, and *L. villosus* in 1869, the first of these having been described in 1865 under *Diastylis*. In 1873 he described *L. mancus*, re-described by Zimmer in 1902, and by him transferred to *Diastylis* in 1908. *L. productus*, Norman, dates from 1879, and has been followed by *L. antipus*, Zimmer. *L. crassicauda*, Zimmer, both in 1907, with *L. gracilis* and *L. borealis*, Stappers, in 1908, and here a new species. Dr. Stappers suggests the possibility that his two species may prove to be only the two sexes of a single species, but deems it very improbable.

Leptostylis walkeri, Calman, 1907, is transferred to a new genus *Ekleptostylis*, in which the short telson is furnished with many lateral spines, and in the male has a lobe uniquely produced over the narrow distal portion.

LEPTOSTYLIS MACRUROIDES, n. sp.

Plate LVI.

This species combines some of the characters for which *Leptostylis macrurus* and *L. villosus* are notable. The latter is described by Sars as having the lower edges of the pseudorostral lobes "throughout divided into peculiar lamellar serrations." These resemble a machicolated parapet, and this curious feature occurs in the new species, which, however, is easily distinguished from *L. villosus* both by the carapace and the uropods. On the other hand, to *L. macrurus* of Sars it makes a near approach in these and some other respects. The proportions and general appearance are certainly very similar. But the carinæ in *L. macrurus* are serrate in the ordinary way, not machicolated; the telson is "but slightly narrowed distally," instead of much narrowed; the rami of the first pleopods are more strongly developed; and other differences combine with these to separate it from the southern form.

The dorsal line of the carapace is convex between a slightly upturned pseudorostral projection and a slight upturning of the hind margin. From the base of the pseudorostral projection issue two long curved lateral carinæ which reunite before reaching the hind margin; each of them is machicolated in the anterior half, the upper one then becoming serrate, the lower one almost smooth; the eyelobe is small, seemingly eyeless; the whole surface is pitted with minute glassy circles, each with a microscopic hair. Some at least of the pedigerous segments and the first two of the pleon segments have long slender latero-ventral spines, of which no mention is

made in the northern species. The fifth pleon segment is very long and narrow, the telson as long as the sixth segment, the terminal part much narrowed, carrying an apical pair of spines attended by a very small subapical pair.

The first antennæ have a stout peduncle, the third joint short, with circular process bearing the usual brush of filaments, from among which springs the slender flagellum, of five joints, the second the longest, the fifth minute; in the four-jointed accessory the first joint is shorter than the second or third, the last minute. The second antennæ have a long slender peduncle, the second joint much longer than its neighbours, the fifth nearly thrice as long as the second. The flagellum missing.

The mouth organs are of delicate structure. Upper lip emarginate. Mandibles with strong molar and ten spines in the spine-row. First maxillæ with narrowly ended plates and bisetose palp, the third maxilliped with second joint much longer than the next five joints combined.

First peræopods with long and remarkably bent second joint; rest of the limb missing. Second peræopod with second joint bent, stout, not distally narrowed, much shorter than the five following joints combined, sixth joint as long as the fourth, seventh considerably shorter than fifth. Third peræopods with second joint distally narrowed, much longer than following joints together, one margin strongly serrate. Fourth peræopod like the third, but with second joint considerably shorter. Fifth peræopod slender throughout, second joint longer than the other five combined.

Pleopods with the peduncles not tapering as in *L. macrurus* but parallel-sided, the exopod minute, especially in the first pair, and the endopod of that pair much shorter in proportion to the breadth than represented by Sars for his species. Peduncle of uropods about twice and a half as long as the telson, but considerably less than twice the endopod, of which the first joint is longer than the second but shorter than the third, with 4, 3, 3 spines on the inner margin and a much larger apical spine; exopod broken.

Length of specimen, adult male, about 5 mm.

Locality. Cape Natal N. by E. 24 miles; depth 805 m.; No. 12605, sent by Dr. Péringuey.

FAMILY EKDIASTYLIDÆ, n.

This family is distinguished from the restricted Diastylidæ by having the inner ramus of the uropods two-jointed.

EKDIASTYLIS, n. g.

With the character of the family.

The species allotted to this genus are *E. sculptus*, *E. insignis*, *E. abbreviatus*, all assigned to *Diastylis* by Sars in 1871; *E. fimbriatus* (Sars), 1873; *E. politus* (S. I. Smith), 1882; *E. horridus* (Sars), 1887; *E. mystacinus* (Sars), 1887; *E. hexaceros* (Zimmer) 1908; and *E. argentatus* (Calman), 1912.

EKDIASTYLIS HEXACEROS (Zimmer).

1908. *Diastylis hexaceros*, Zimmer, Deutsch. Tiefsee-Exp., vol. viii. p. 187, pl. 44, figs. 93-95.
 1910. *D. h.*, Stebbing, S.A. Crustacea, pt. 5, Annals S.A. Mus. vol. vi., p. 418.

I have not myself met with this species, which was taken by the German Expedition outside the Agulhas Bank in a depth of 565 m.

FAMILY LEUCONIDÆ.

1879. *Leuconidæ*, G. O. Sars, Arch. Naturv. Kristian., vol. iii., p. 6, vol. iv., p. 74.
 1900. *L.*, Sars, Crustacea of Norway, vol. iii., p. 28.

All the pedigerous segments distinct; telson wanting; eye wanting; first antennæ with accessory flagellum small; mandibles broad at the base, spines few; first maxillæ with unisetose palp; branchial leaflets few; exopods on first four pairs of peræopods in the male and the first three in the female; two pairs of pleopods in the male; inner branch of uropods two-jointed.

To this family are assigned the genera *Leucon*, Krøyer, 1846; *Eudorella*, Norman, 1867; *Eudorellopsis*, Sars, 1882; and *Pseudo-leucon*, Zimmer, 1903. From it are detached the three genera *Paraleucon*, *Hemileucon*, and *Heteroleucon*, all instituted by Dr. Calman in 1907. The first of these I take as representative of a

new family Paraleuconidæ, in which the male has only one pair of pleopods. In the second, for which the family Hemileuconidæ is proposed, the male has no pleopods, and this is the case also with the Heteroleuconidæ, represented by *Heteroleucon*, which has the further character to separate it from the other three families that only the first two pairs of peræopods carry exopods in either sex.

GEN. LEUCON, Krøyer.

1846. *Leucon* (part), Krøyer, Naturhist. Tidsskrift, Ser. 2, vol. ii., p. 208.

1900. *L.*, Sars, Crustacea of Norway, vol. iii., p. 29.

Carapace with longitudinal, medio-dorsal, serrate crest in female, but often not in male; pseudorostral projection prominent; peduncle of first antennæ not conspicuously geniculate, accessory flagellum minute; terminal joint of second antennæ in female well defined.

The new species here introduced brings the number of species at present included in this genus up to twenty.

LEUCON KALLUROPUS, n. sp.

Plate LVII.

This species belongs to the small group in which the one-jointed accessory flagellum of the first antenna is not shorter than the first joint of the principal flagellum, and to the still smaller group in which the outer ramus of the uropod is much shorter than the inner. It makes undoubtedly a close approach to *Leucon longirostris*, Sars, taking into account the successive descriptions of that species by Sars in 1871, by Norman in 1879, and by Calman in 1906. Sars had at command a young male ending with the second segment of the pleon, the fragment being scarcely 4 mm. long. He describes the accessory flagellum of the first antenna as rudimentary and like a tubercle. It was taken off the coast of Portugal at a depth of 1,036 m. Norman's specimen, a female, was taken at the entrance of Davis Strait in lat. 59° 10' N., at a depth of 3,109 m. Calman examined specimens male, female, and young from the Mediterranean, taken at depths between 950 and 1,200 m. He did not find among them the rudimentary accessory flagellum of the first antenna, but only such as matched in length the first joint of the principal. He gives the total length of the adult male as 6 mm., from which it may be inferred that the specimen described by Sars was at least as long when perfect, or probably longer. There is a

tendency throughout the genus *Leucon* for the pseudorostrum in the male to be shorter than that in the female, but the difference is nowhere so extreme as in the sexes of *L. longirostris*, where the produced part is more than a third of the length of the carapace in the adult female, but only a fifth of that length in the adult male.

The present species is unfortunately known only from a single adult male specimen, which differs, so far as can be determined, from the adult male of *L. longirostris* chiefly in the less-produced telsonic segment and the proportions and armature of the uropods.

The outline of the pseudorostrum was not made out with precision. Integument squamose. Fifth pedigerous segment with procurved ventral spines. Telsonic segment with produced portion much instead of little shorter than the base.

In the first antennæ the third joint is shorter and much narrower than the second, and carries two slightly feathered setæ; the four-jointed principal flagellum has the first joint nearly as long as the three following combined, and carries on the outer margin approaching the middle a fascicle of setæ: the one-jointed accessory flagellum is narrower than the first joint of the principal, but about equal to it in length. The second antennæ have the large last two joints of the peduncle fringed with tufts of short setæ, which till resolved by high magnification look like fringed single setæ.

The upper lip is only slightly emarginate. The mandibles are powerful. The palp of the first maxillæ ends in a single filament; the second are without setæ on much of the inner margin. The first maxillipeds have a long seta on the second joint, third joint absent, the fifth joint as long as the second and very setose, the sixth with a strong plumose seta overhanging the small seventh joint, which is tipped with a serrate spine. Second maxillipeds full-jointed; the third the same, its second joint broad, rather longer than the narrow following joints combined, with strong spines or setæ on the fore-part of the apical border.

First pereopods broken, the second joint much narrowed distally, part of the margin fringed with setæ. Second pair not elongate, its second joint rather longer than the remaining joints combined, the terminal joint not longer than the antepenultimate, fringed with a longitudinal series of five spines, and having its blunt apex armed with three long feathered seta-like spines. In these and the much shorter following pereopods the true third joint does not seem to be distinct from the long second joint. In the last three pairs the last four joints are all short, the last much the narrowest and tipped

with two smooth spines narrowed at about the middle of their length; long serrate spines are distributed on the other joints.

The first pleopods have a peduncle considerably longer than that of the second pair, which has three slender spines on its inner margin; in both pairs the one-jointed inner ramus is a little shorter than the two-jointed outer; both rami are very small, and each carries six plumose setæ. The peduncle of the uropods is a little longer than the first joint of the endopod, the inner margin fringed with numerous unequal slender spines, of which there are a few on the outer margin. The first joint of the endopod is more than three times as long as the second; its inner margin is fringed with over a score of serrate spines besides two or three of seta-like character at the top; beginning above the middle of the outer margin is a series of eight slightly plumose spines; of these there are four on the outer margin of the second joint, which has its inner margin prettily fringed with eight little serrate spines, the apex carrying two stout spines, one short and one long, both microscopically serrate; the exopod is a little shorter than the first joint of the endopod, and has five spines on each margin of its second joint, those on the inner slender and finely serrate; there are four elongate spines on its apex.

Length of the specimen about 5 mm. Female unknown.

Locality. Cape Natal N. by E. 24 miles; depth 805 m.; No. 12605, sent by Dr. Péringuey.

FAMILY LAMPROPIDÆ.

1882. *Lampropidæ* (part), G. O. Sars, Vid. Selsk. Forh. Christiania, No. 18, p. 11.

1899. *L.* (part), G. O. Sars, Crustacea of Norway, vol. iii., p. 17.

Pseudorostral lobes not strongly produced; all pedigerous segments distinct; telson well developed, with more than two apical spines; both flagella of first antenna well developed; second antenna of female more conspicuous than usual; palp of first maxilla bisetose or with only one apical seta; first four pairs of peræopods with exopods, those of the female rudimentary on the third and fourth pairs; no pleopods in either sex; inner ramus of uropods three-jointed.

This definition excludes the genera *Hemilamprops* and *Paralamprops*, in which the male has three pairs of pleopods, but it admits a new genus *Platytyphlops* here described, and provisionally

allows the inclusion of another, *Stenotyphlops*, in which, however, only the female is at present known. The last is distinguished from its companions by having only one seta or apical filament on the palp of the first maxilla, and both the new genera are distinguished from *Lamprops*, Sars, 1862, by their blindness.

PLATYTYPHLOPS, n. g.

Carapace broad, depressed, eyelobe devoid of visual elements, pleon slender, telson carrying three apical spines. First antenna with the flagella long and nearly equal. Second antenna of female four-jointed. First maxilla with bisetose palp. In the male the first four pairs of peraeopods have exopods; in the female the first two pairs are similarly furnished, but the third and fourth pairs have only microscopic rudiments of them. Fifth pair of peraeopods rudimentary. Pleon in both sexes without pleopods.

The generic name is derived from *πλατύς*, broad, in allusion to the character of the carapace, resembling that in the *Platysympodidae*, and *τυφλώψ*, blind-faced, to emphasise the fact that this is a blind genus in the family *Lampropidae*, of which the typical genus was named from the brightness of the eyes.

The comparatively large size of the specimens for which the genus is instituted makes it very improbable that the want of pleopods in the male and the dwarfed, apparently functionless, fifth peraeopods in both sexes, could be juvenile characteristics. Nevertheless, it had to be borne in mind that the specimen, 7·5 mm. long and apparently adult, for which Sars instituted *Leptostylis manca*, was entirely devoid of fifth peraeopods, and yet a specimen, 10·5 mm. long, was subsequently found by Dr. Zimmer to be provided with the limbs in question well developed (see Hamburger Magahaensische Sammelreise, Cumaceen, p. 9, 1902). Fortunately, however, in the present case doubt is to a great extent dispelled by the presence in the collection of a fragmentary specimen containing eggs in the marsupium, yet with the diminutive appendages on the fifth pedigerous segment.

PLATYTYPHLOPS PERINGUEYI, n. sp.

Plates LVIII., LIX.

Pseudorostral lobes short, upturned. Carapace rounded oval, a little longer than broad, the margin forming a sharp carina all round, fringed with microscopic pellucid overlapping scales. The sightless ocular lobe small, triangular; the frontal lobe broad; the medio-

dorsal line from the front to a little beyond the middle convex and finely serrate; near the end this carina is flanked by the commencement of a submedian pair of short carinae which rise each into a conspicuous rounded process and then gradually fade away towards the hind margin. The pedigerous segments combined are about half as long as the carapace, the first shorter and narrower than the second, the second and third raised in the middle but flattened and rounded at the sides, apparently overlapping subacute angles; the fifth cylindrical, not wider than the long, narrow pleon, which greatly exceeds in length the preceding portion of the body. The telson, about as long as the fourth segment of the pleon, has the anal opening near the base, thence narrowing to the apex which is occupied by three spines, forming a kind of fan, with a lateral pair a little higher up; between these and the middle of the telson two other lateral pairs are placed, successively smaller.

First antenna with long first joint, more than twice as long as the second, which is rather longer than the third, all three carrying plumose setae, flagella rather shorter than the peduncle, the principal flagellum five-jointed, the accessory four-jointed. In the female specimen the minute fifth joint of the principal flagellum appears to be succeeded by a still smaller sixth joint. In both sexes a couple of setae attached to the fourth and fifth joints have the usual annulated appearance.

The second antenna of the female carries three plumose setae on the rather large first joint, one such seta on the small second joint; the third joint is narrow, nearly as long as the first, with a small tooth near the base and a seta midway between that and the apex; the fourth joint is very slender, but fully twice as long as the third, with some apical setules. In the male specimen the flagellum has the annulated appearance indicative of incomplete maturity.

The upper lip has the free border a little emarginate. The spinerow of the mandibles consists of about thirteen spines. On the palp of the first maxilla the subapical seta is much shorter than the apical. The first maxillipeds have seven unequal loosely disposed branchial sacs on the epipod, and two very small coupling spines on the basal joint. In the second maxillipeds the third joint is distinct. The third maxillipeds have the second joint not apically produced or widened, shorter than the remaining joints combined, the third joint short, distinct, the fifth longer than the sixth, apparently less so in the female than in the male, the seventh fringed with somewhat adpressed spines, and, as it were, prolonged by an apical spine exceeding the length of the joint itself.

The first and second peraeopods are slender and elongate, with the full number of joints, the second joint in each shorter than the rest combined; among these in the first pair the sixth joint is the longest, while in the second pair it is shorter than any except the third. In the remaining pairs the second joint is longer than the rest of the joints combined. The third and fourth pairs are alike in the two sexes, except for the minuteness of the difficultly discernible two-jointed exopods in the female; they have the sixth joint set forward on the truncate apex of the fifth, leaving room behind for insertion on that apex of the long spines by which the sixth joint is overlapped. The minute fifth pair are probably vestigial; they are pellucid, and the last three joints are microscopic.

The peduncle of the uropods is a little longer than the endopod, its inner margin carrying numerous spines (9-13), the endopod on inner margin of its three joints having respectively 8-9, 3-4, and 2 spines, besides an apical spine. The exopod, which is a little longer than the telson, reaches just beyond the base of the endopod's third joint.

Length of the specimens about 10 mm.

Localities. No. 17585, Cape Point E. by N. 29 miles; 17643, Cape Point N. 81° E. 32 miles. The specimens were sent by Dr. Péringuey, out of respect for whom the species is named.

When describing this species and defining the genus, I felt convinced that Dr. Calman's *Platyaspis orbicularis* (Fisheries, Ireland, Sci. Invest., 1904, I. [1905], p. 42, pl. 5, figs. 77-81) must be congeneric. That species, however, was founded on a specimen which did not extend beyond the first pedigerous segment. But quite recently (Proc. U.S. Nat. Mus., vol. 41, p. 631, figs. 29-39, 1912), with far more advantageous material, Dr. Calman has given a fresh description with numerous instructive figures, and provisionally transferred his species to the genus *Paralamprops*. He recognises that it is distinguished from that genus by the possession of a normal palp on the first maxillæ, but having only female specimens at his disposal, he could not make use of the further distinguishing character that the male has no pleopods. At least this is the case if the nearly adult South African specimen of the new species may be trusted as establishing that character. The two species of the new genus are well distinguished by differences in the carapace, but in many respects they show very close agreement, and it was not till I had studied Dr. Calman's account of *P. orbicularis* that I was able, by renewed investigation, to make out the rudimentary exopods on the third and fourth peraeopods of *P. peringueyi* in the female.

STENOTYPHLOPS, n. g.

Carapace narrow, eyelobe without visual elements, all five pedigerous segments conspicuous, pleon slender, telson carrying three apical spines. First antenna with both flagella elongate. Second antenna of female four-jointed. First maxilla with unisetose palp. First maxillipeds with terminal joint peculiarly widened at the base. In the female first and second peræopods with exopods, third and fourth having only microscopic rudiments of them. Fifth peræopods apparently wanting.

Male unknown.

The generic name, from στενός, narrow, and τυφλώψ, blind-faced, is intended to indicate the many points of resemblance between this genus and *Platytyphlops*, although the typical species in one of the genera has a broad carapace, and in the other a narrow one. The present genus is further distinguished from its ally by having the palp of the first maxillæ furnished with a single apical seta or filament, and by what appears to be the unique conformation of the terminal joint in the first maxillipeds. The absence of the fifth peræopods, as a negative character based on a single specimen, will naturally be accepted with reserve, but the degraded condition of those limbs in *P. peringueyi* is suggestive of a decline through inactivity to extinction.

STENOTYPHLOPS SPINULOSUS, n. sp.

Plate LX.

The whole surface seems to be more or less densely sprinkled with minute spinules, among which are some that are rather larger, but the close reticulation renders it difficult to make out the arrangement.

The pseudorostral lobes are slightly upturned, meeting in a point well in advance of the little triangular eyeless eyelobe, from which a keel traverses the middle line far backwards, flanked somewhat behind the centre of the carapace by a pair of raised ridges. The general shape of the carapace is narrowly oval, with sides sharply inflexed. The five pedigerous segments, all dorsally conspicuous, diminish gradually in width to the fifth, which is no wider than the slender pleon. The telson is about four-sevenths of the length of the peduncle of the uropods, inflated rather more than a third of its length for the anal opening, then converging to its three-spined apex, the margins serrate, and below the middle having three pairs of spines, successively larger but none equalling the apical

trio; on the left side a small spine above the middle appears to have no counterpart on the right.

The upper lip is emarginate. The lower lip has the lobes tipped with inward projecting points. The mandibles have a powerful molar and quadridentate cutting edge, accompanied on one of the pair by an accessory plate slightly smaller than the principal, and fourteen spines in the spine-row, of which the foremost six are feathered. On the other mandible there is no accessory plate, but one additional spine, the row not showing any feathering of the spines.

The first maxillæ have the usual five spines on the inner plate, apparently eleven on the outer, the palp elongate, conspicuously with a single but very long apical seta.

The first maxillipeds have the broad antepenultimate joint fringed with seven much-divided spines, the next joint broader than long, exceeded in length by the following joint, which is greatly expanded in its basal half but quite narrow in the terminal, the re-entering angle of the hind margin being beset with blunt teeth. The second maxillipeds are slender throughout, the second joint elongate, the third short, scarcely forming a complete ring. The third maxillipeds have the second joint curved, not apically widened or produced, longer than the five remaining joints combined, of which the fifth is the longest, the seventh short and narrow; the exopod is slender. The mutilated first peræopod was probably of considerable length, the second is slender, with second joint not quite so long as the five following joints combined, among which the well-spined fifth is longer than the short sixth together with the needle-like seventh; the exopod is smaller than that of the larger first peræopod. The third and fourth peræopods are much shorter than the second, the second joint longer than the rest combined, and carrying near its origin a microscopic two-jointed exopod; the fourth joint about equals the fifth and sixth together, both of which carry long apical setæ with annulated terminals; the seventh joint is almost spine-like but not very sharply pointed. Of fifth peræopods no trace could be discerned.

The uropods have serrulate margins; the endopod, four-fifths the length of the peduncle, has a first joint about twice as long as the two following joints combined, the second being a little longer than the third, the spines on the inner margin being respectively ten, three, and one; the exopod, which reaches nearly to the middle of the third joint of the endopod, has seta-like spines on both margins.

Length of the specimen, 12 mm.

Locality. Cape Point E. by N. 29 miles; No. 17585, sent by Dr. Péringuey.

FAMILY NANNASTACIDÆ.

1866. *Nannastacidæ*, Bate, Zoological Record (for 1865), vol. ii., p. 329.

1900. N., G. O. Sars, Crustacea of Norway, vol. iii., p. 79.

1900. N., Stebbing, Willey's Zoological Results, pt. 5, p. 611.

Pseudorostral lobes with the anterolateral corners well defined; all the pedigerous segments distinct; telson wanting; one eye or two eyes usually present; first antenna with accessory flagellum very small; second antenna of female small, indistinctly jointed; mandibles normal; terminal joint of first maxilliped usually dilated; exopods on first four pairs of peræopods in the male, on none but the first two in the female; no pleopods in either sex; inner branch of uropods simple.

The family includes *Nannastacus*, Bate, 1865; *Cunella*, Sars, 1865; *Cunellopsis*, Calman, 1905; *Platycuma*, Calman, 1905; *Schizotrema*, Calman, 1911; *Diops*, Paulson, 1875, being usually regarded as a synonym of *Nannastacus*, although this can hardly be justified except on the view that Paulson's description and figures are misleading. With respect to the three-jointed second antennæ of the female he is very explicit, as also in ascribing a single filament to the palp of the first maxillæ. In 1911 Dr. Calman allotted six new species to *Nannastacus* all agreeing with *N. suhmi*, Sars, 1887, in having no exopod on the third maxilliped of the female. He was deterred from giving to this group a new generic designation by the further discovery that two of the species, *N. reptans* and *N. tardus*, had no exopods even on the first and second peræopods of the female. The case was complicated by the close resemblance of these species respectively to *N. minor* and *N. agnatus*, in which the first and second peræopods of the female have well-developed exopods, the relationship being so near that Dr. Calman says "it must be admitted as quite possible that *N. reptans* may be merely an individual variation or a phase in the life-history of *N. minor*, and that *N. tardus* may stand in the same relation to *N. agnatus*." Under these circumstances it seems clear that *N. reptans* and *N. tardus* can be safely assigned to a new genus, *Paranannastacus*, in which the leading character is the absence of an exopod from the third maxilliped. This character they share with five other members of the group, from which they would eventually be separated in a family Paranannastacidæ, if or when it might be established that the unique feature of all the peræopods being devoid of exopods in the female was not accidental or temporary.

GEN. SCHIZOTREMA, Calman.

1911. *Schizotrema*, Calman, Trans. Zool. Soc. London, vol. xviii., pt. 4, pp. 341, 360.

The leading character of the genus, to which it owes its name, is the circumstance that the exhalent respiratory orifices are paired and widely separated from each other. As, however, this feature is not confined to the present family, it is convenient to amplify the generic definition by some additional characters. As only females were known when the genus was first established, the absence of pleopods in the male had to be presumed, as well as the presence of exopods on the first four pairs of peraeopods in that sex. The new species, as represented by a male specimen, confirms both of those anticipations. In the female the exopods are confined to the first two pairs of peraeopods, but both sexes have exopods on the third maxillipeds. There is no distinct telson, and the inner ramus of the uropods is one-jointed.

In all the three forms already described the peduncle of the uropods is shorter than the inner ramus, so that the new species will be found to be conspicuously distinguished from them by having the rami of the uropods very much shorter than the peduncle.

SCHIZOTREMA CALMANI, n. sp.

Plate LXI.

In lateral view the pseudorostral lobes are seen to be upturned, in dorsal aspect they are wide apart and slightly divergent. Following what appears to be a small upturned eyeless eyelobe the median line of the carapace is finely denticulate and setulose throughout almost its whole length; the lateral margins are fringed with denticles for some distance, the teeth at first rather conspicuous but presently dwindling to disappearance. Owing to the smallness of the specimen and the texture of the integument, details of the carapace were not satisfactorily made out before dissection, and owing to its brittleness the result of dissection was in this respect equally disappointing. Of the pedigerous segments the last four have laterally flattened edges cut into teeth, all but the last being rather widely expanded. The pleon segments show lines of denticulation which are conspicuous both dorsally and ventrally on all but the telsonic segment, and also lateral ridges; the fifth segment is long and distally narrowed, the telsonic segment short.

In the first antenna the first joint is much the largest, somewhat geniculate, and having a small distal tooth; the second joint is similarly furnished, and is longer than the third; the slender

flagellum is indistinctly four- to five-jointed, and accompanied by three long filaments; the accessory is minute, perhaps two-jointed. The second antennæ have the penultimate joint of the peduncle more than half as long as the following joint; both have ample brushes of setæ; the flagellum, if complete, is not extremely long.

The mandibles have a narrow cutting edge, supplemented in one member by a narrow accessory plate, four to five spines in the spine-row, and a moderately strong molar.

The maxillæ were not clearly deciphered, but appear to be normal.

The first maxillipeds show some seven branchial leaflets on the epipod; they have a broad antepenultimate joint fringed with pectinate spines, and the last joint very slender, not stumpy or elliptical as in certain species of *Cumella* and *Nannastacus*. The second maxillipeds have the third joint distinct, the three following joints broad, not elongate, the seventh very small. In the third maxillipeds the second joint is broad, rather longer than the following joints combined, carrying long plumose setæ on the free outer (not produced) part of its apical border, the third joint is missing, the fourth has long plumose setæ on the distal part of its outer margin, the fifth is wider but a little shorter than the curved apical sixth, the seventh is slender, subequal in length to the fourth; the exopod is of moderate size.

In the first pereopods the second joint is shorter than the following joints combined, distally narrowed, the third joint is longer than broad, the fourth distally widened, half as long as the fifth, which is about three-fourths of the sixth; the slender seventh in length equals the fourth; the exopod is larger than that of the third maxillipeds; the following exopods successively diminish in size. The second pereopods have a second joint rather shorter than the following joints combined, little more than twice as long as its greatest breadth, its edges somewhat denticulate; the third joint is nearly if not quite obsolete, the fourth little longer than broad, the fifth twice and a half as long as the sixth but scarcely longer than the seventh. The third and fourth pereopods have the second joint narrowly piriform, the narrow end distal, the third joint well developed, the fourth short, the fifth longer than the sixth, the seventh very small, with a long unguis or curved spine. In the third pereopod the second joint is longer but the fifth shorter than in the fourth pair. The fifth pereopods are very slight in structure, the second joint longer than the rest combined, the seventh joint shorter than the third, the fifth a little longer than either the fourth or sixth.

The uropods have about thirty spinules or denticles on each of three edges of the peduncle, which is twice as long as the endopod. The latter has six good-sized spines along its serrate inner margin, some submarginal spinules, and a very long apical spine. The exopod, about four-fifths as long as the endopod, has a fairly long apical spine, but is otherwise slightly armed.

The length of the single specimen, a male, is about 2.5 mm., thus being, although so small, considerably larger than any of the three species of the genus previously described. The specific name is given out of respect to Dr. Calman, who instituted the genus.

Locality. Cape Natal distant N. by E. 24 miles; depth 805 m.; No. 12605, sent by Dr. Péringuey.

FAMILY PROCAMPYLASPIDÆ, n.

Telson wanting; no distinct eye; first antenna with accessory flagellum very small; mandible with narrow molar; second maxilla normal; first maxilliped with seventh joint small, unexpanded; second maxilliped with strong teeth projecting from inner margin of the terminal joint; exopods on first four pairs of peræopods of male, only on first two of female; no pleopods in either sex; inner branch of uropods simple.

GEN. PROCAMPYLASPIS, Bonnier.

1896. *Procampylaspis*, Bonnier, Ann. Univ. Lyon, vol. xxvi., p. 541.

1900. *P.*, Stebbing, Willey's Zool. Results, pt. 5, p. 611.

This being at present the only genus, will have the characters of the family. In addition to the new species *P. tridentatus*, it contains *P. armatus*, Bonnier, 1896, with *P. echinatus*, Bonnier, of the same date, by Calman held to be a synonym of the preceding species; *P. bonnieri*, Calman, 1906, and *P. compressus*, Zimmer, 1907, briefly described without illustrative figures.

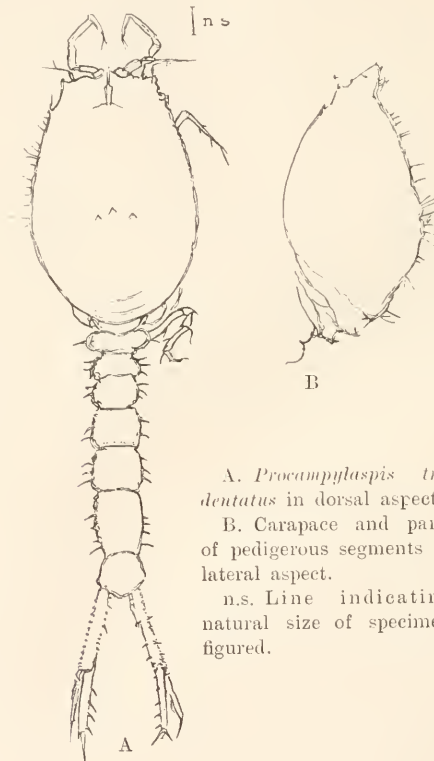
PROCAMPYLASPIS TRIDENTATUS, n. sp.

Plate LXII.

This genus is specially remarkable for the form of the last joint in the second maxillipeds. In the forms described by Bonnier as *P. armatus* and *P. echinatus*, which are considered by Calman to be one and the same species, this joint has in addition to its terminal

unguis four stout teeth. The figures which Bonnier gives of these teeth under the two names are not precisely alike, but in his text he makes no allusion to the difference. The species now added to the genus has, however, only three teeth to this joint instead of four, and to that mark of distinction the specific name calls attention.

The integument is conspicuously squamose. The pseudorostral



A. *Procampylaspis tridentatus* in dorsal aspect.

B. Carapace and parts of pedigerous segments in lateral aspect.

n.s. Line indicating natural size of specimen figured.

lobes a little upturned meet for a short space in front of the narrow bidenticulate eyelobe; their margins in dorsal aspect are obliquely truncate and finely denticulate; they form a sinus, and after a bulge descend to a small antero-lateral tooth, which is followed at some distance by a similar tooth on the lower margin. The carapace is longitudinally well arched, not actually carinate, with scattered hairs and a little denticle behind the centre of the median

line, the denticle perhaps not constantly present. The pedigerous segments narrow successively towards the pleon. The pleon segments are laterally, as so commonly in male *Sympoda*, bicarinate for the protection of the slender flagellum of the second antenna; the fifth segment is distally narrowed, not very elongate, though much longer than any of the other segments, telsonic segment not longer than broad.

First antenna with first joint geniculate, larger than second, second than third, flagellum slight, three-jointed, accessory minute, one-jointed. Second antenna with penultimate joint of peduncle more than half as long as the last joint, furnished with strong brush of setae; first joint of the long slender flagellum knobbed at the base.

Upper lip not quite symmetrically bilobed. Lower lip with inward pointing apical tooth to each lobe. Mandibles with cutting plate and accessory finely dentate, spine-row of six spines, molar slender, with its narrow apex divided into about six close-set teeth, of which the hindmost is the strongest. First maxilla with only seven spines on apical margin of outer plate, palp with two very unequal apical filaments. Second maxilla with eleven seta-like spines distributed on its divisions.

First maxillipeds having the large laminar antepenultimate joint bordered by six spatulate spines with an ordinary spine at the apex and followed by two short joints, of which the second is much the narrower and tipped with a slender spine. The proximal joints are not easy to distinguish, but between that which carries the two little coupling spines (the true second joint) and the laminar fourth joint there is an indication of an intervening third joint. The branchial elements of the epipod are numerous. The second maxillipeds have the second joint not twice as long as broad, with a plumose seta at the apex of its inner margin, a short third joint, the fourth as long as the fifth, with a plumose seta springing from a little prominence on the side where a square marking gives a deceptive appearance of an articulation, the sixth joint is subequal to the fifth, the much-curved seventh has three strong teeth, the middle tooth the longest. The third maxillipeds have a powerful second joint, bent, much longer than the remaining joints combined, with three long plumose setae on the slightly produced outer apex, the third joint very small, the fourth much widened distally, the fifth much shorter than either the fourth or sixth, but longer than the narrow seventh.

The first pereopods are remarkable because the third joint, which so often in appendages of the *Sympoda* gives trouble by its elusive smallness, here has a length equal to that of the inner margin of the

fourth or the outer margin of the fifth joint; the slender sixth is about twice as long as the still more slender seventh. The exopods of the first four peræopods, like those of the third maxillipeds, have the peduncular joint narrow compared with the stout second joint of the limb, while the first joint of the flagellum is unusually long, and at least in that of the first peræopods with a denticulate margin. In the second peræopods the third joint is short but outdrawn to a conspicuous apical spine; the fourth joint is much stouter but not longer than the fifth, which together with the small sixth cannot make up the length of the slender straight seventh joint. The third peræopods have the stout second joint much narrowed distally, longer than the slender rest of the limb, in which the fifth joint is considerably the longest, the seventh almost spine-like. The fourth peræopods are very like the third, but with the second joint a little shorter and less narrowed distally, while the fifth joint is a little longer than in the preceding pair. The fifth peræopods are very like the two preceding pairs, except for the absence of an exopod and the strikingly different second joint, which is very slender and not much longer than the fifth joint.

The endopod of the uropods is rather less than two-thirds of the length of the serrately margined peduncle, and carries nine spines on its inner edge, the apex having a large spine flanked by two smaller ones; the much narrower and shorter exopod has a slender apical spine with a small one adjoining and a small spine or two on its inner edge.

Length of the specimen 4.5 mm.

Locality. Cape Natal distant N. by E. 24 miles; depth 805 m.; No. 12605, sent by Dr. Péringuey.

FAMILY CAMPYLASPIDÆ.

1879. *Campylaspida*, G. O. Sars, Arch. Naturv. Kristian., vol. iv., pp. 6, 126.

1900. C., Sars, Crustacea of Norway, vol. iii., p. 82.

Telson wanting; first antenna with accessory flagellum very small; second antenna of female imperfectly developed; mandible with molar slender, acute; second maxilla an undivided plate; first maxilliped of four joints, the last minute; second maxilliped without strong teeth on inner margin of the terminal joint; exopods on first four pairs of peræopods of male, only on first two of female; no pleopods in either sex; inner branch of uropods simple.

GEN. CAMPYLASPIS, Sars.

1865. *Campylaspis*, G. O. Sars, Forh. Selsk. Christian. for 1864, p. 200 (75).

1900. *C.*, Sars, Crustacea of Norway, vol. iii., p. 83.

This being at present the only genus, the characters of the family suffice for its definition. It contains twenty-three species, including the two here described as new.

CAMPYLASPIS OVALIS, n. sp.

Plate LXIII.

This species, which agrees with *C. vitreus*, Calman, in the transparency of the integument and shares with that and *C. macrophthalmus*, Sars, the possession of two long lateral keels on the carapace, is at once distinguished from the former by not having a transverse keel to divide the carapace dorsally into two compartments, and from the latter by having the eyelobe obsolete instead of peculiarly elongate. At first sight the species was suggestive of the genus *Platycuma*, Calman, but it proved to be generically distinct.

The pseudorostral lobes are very briefly and obtusely produced in advance of a minute eyeless eyelobe. In dorsal view the carapace presents a flattened oval appearance, wider in front than behind. The oval is formed by the somewhat raised edges of a surrounding keel, the central part broadly convex, with a depression on either side and towards the rear. Another keel runs nearly parallel to the sinuous lower margin and not very distant from it. The sides of the carapace below the upper keel are strongly inflexed, so as to leave only a long narrow opening occupied by the maxillipeds. The stomach appeared to be dilated with food, including foraminifera and what looked like the dentate fingers of some crustacean, the horny nature of which had defied digestion. The second to the fifth pedigerous segments successively narrowed and depressed have the lateral angles more or less rounded. The pleon segments show faint serration of the front angles, the fifth segment the longest, the telsonic pentagonal, the two combined not quite as long as the peduncle of the uropods.

First antenna very small, flagellum three-jointed, its terminal joint and the one-jointed accessory flagellum minute. Second antennæ those of a male not fully adult.

Upper lip with obtuse-angled margin. Mandibles with the generic character.

First maxilla with bisetose palp; on the inner plate one of the

spines showed a tridentate apex. First maxilliped having very numerous branchial leaflets on the epipod, exopod very elongate; terminal joint extremely small, attached at inner front angle of the preceding laminar joint. Second maxilliped with short but very broad second joint, rather longer than the remaining joints, distally narrowed, carrying a long feathered seta; from the very short third joint projects nearly at right angles a spine with a distally widened spear-like end, microscopically ciliated, similar to that described by Sars for *C. macrophthalmus*; sixth joint not specially dilated, tipped with two spines and carrying a short curved seventh joint, which but for the attached muscles might pass for a spine. The third maxillipeds have the much-curved second joint about as long as the remaining serrate joints combined, the seventh joint very small.

The first peraeopods are very like the third maxillipeds, but with all the joints rather longer, and the fifth rather longer than the sixth instead of the reverse. Second peraeopods with second joint stout, not so long as the rest combined, the seventh rather longer than the fifth and thrice the sixth. Third peraeopods with second joint much narrowed distally, much longer than the rest combined, while in the fourth pair this joint about equals the others together. Fifth pair narrow throughout.

Peduncle of uropods serrate on both margins, more strongly on the inner, about twice and two-thirds as long as the endopod, which has five spines on the inner margin and a terminal spine; the slightly shorter exopod is almost unarmed.

The carapace, of immature male, measured 3.3 mm. long, by 2.5 mm. broad.

Locality. Cape Natal distant N. by E. 24 miles; depth 805m. No. 12605, sent by Dr. Péringuey.

CAMPYLASPIS PÆNEGLABER, n. sp.

Plate LXIV.

The specific name is applicable not only to the character of the carapace but also to the close affinity between this species and the *Campylaspis glaber*, described by Professor Sars, from Norway and the Mediterranean. The size, the shape, the mouth organs, and even so particular a feature as the arrangement of pellucid spots on the carapace seem to be in close agreement. On the other hand, against identification of the two species may be set the following differences. The South African species is rather larger, its carapace is not quite smooth, its eyelobe is differently shaped and without

any sign of lenses, its first antennæ have a geniculate bulb at the base, in the second peræopods the seventh joint is longer than the fifth and sixth joints combined, and the fifth peræopod, so far as can be judged from figures of the other species, is more slenderly built, with the second and fifth joints more elongate.

The female of the present species is at present unknown. The carapace of the male is somewhat compressed, narrowly oval, in dorsal view having what may be called a high-shouldered appearance. The pseudorostral lobes are somewhat upturned, meeting for a short distance in advance of the narrowly oval, slightly prominent eyeless eyelobe, and in lateral view showing a very shallow sinus. On the front part of the carapace are various pimples, one pair of marked importance, but all difficult to observe except by turning the opaque white carapace at different angles to the light. When the carapace is divested of its contents the pattern on it of pellucid spots comes clearly into view. The first pedigerous segment is almost concealed by the carapace, but the other four are distinct, with lateral ridges which are continued along the pleon. This is much shorter than the preceding part of the body, its last three segments together not much longer than the peduncle of the uropods.

Both mandibles have the principal cutting-plate divided into six teeth. The first maxilla shows ten spines on the outer plate and four on the inner, the palp is long, ending in a single seta. The second maxilla has four slender spines on its single plate. The first maxillipeds have the little terminal joint almost obsolete; the branchial epipod with a great number of leaflets. The terminal joint of the second maxillipeds appears to be bifid, as in the Norwegian *C. glaber*, not trifid as in the Mediterranean form. The figures will show the likeness of the third maxilliped and the first peræopod to those of *C. glaber*. The second peræopod has the seventh joint longer than the fifth and sixth joints combined and has four short setæ on each margin; the third and the shorter fourth peræopods have the second joint narrowed at the apex.

The peduncle of the uropod is about once and three-quarters the length of the endopod and twice as long as the exopod, with eight setæ on its inner margin; the endopod has nine spines on the inner margin and a long apical spine; the exopod has a still longer apical spine, but for most of its length is unarmed.

Length of specimen about 4.3 mm.

Locality. Cape Natal N. by E. 24 miles; depth 805 m.; No. 12605, sent by Dr. Péringuey.

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* Names printed in italics are such as are not accepted in the classification of the present treatise. A note of interrogation signifies that the name originally was or still is, of doubtful validity.

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The systematic position of *Pachystylis rotundatus*, Hansen, 1895, and of some other important species remains for the present indeterminate. For *Colurostylis* (?) *occidentalis*, Calman, the new generic name *Anchicolurus* is proposed, and Kröyer's *Cuma resima* is transferred from *Diastylopsis* to a new genus *Brachydiastylis* in the family Diastylidæ.

EXPLANATION OF PLATES.

PLATE XLIX.

Bathycuma natalensis, n. sp.

- n.s. Line indicating natural size of specimen figured below in lateral view.
- car., car., tels. Dorsal view of carapace and telsonic segment, the lower figure car. being a more highly magnified view of part of the carapace slightly flattened, showing distal portion of right pseudorostral lobe, the little triangular clypeus, and part of the frontal lobe.
- a.s., a.i., plp. First antenna, proximal part of second, and one of the pleopods, more highly magnified than the preceding figures, but less than the following figures which are to a uniform scale, except that the flagella of the first antenna, and some spines of the first maxilliped are more highly magnified than any of the other figures.
- m. Mandible.
- m.xp. 1, 2, 3. First, second, and third maxillipeds, the third without its exopod and ending with the third joint.
- prp. 1, 2, 5. First peraeopod, ending with the second joint; second peraeopod, without its exopod; fifth peraeopod.
- urp. Uropods, with second joint of endopod supplied from a separate specimen.



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West, Newman lith

PLATE L.

Sympodomma africanus, n. g. et sp.

n.s. Line indicating natural size of male specimen figured below.

car. Carapace and pedigerous segments in dorsal aspect.

oc. Ocular lobe and eye more highly magnified.

a.s. First antenna, with higher magnification of the small flagella.

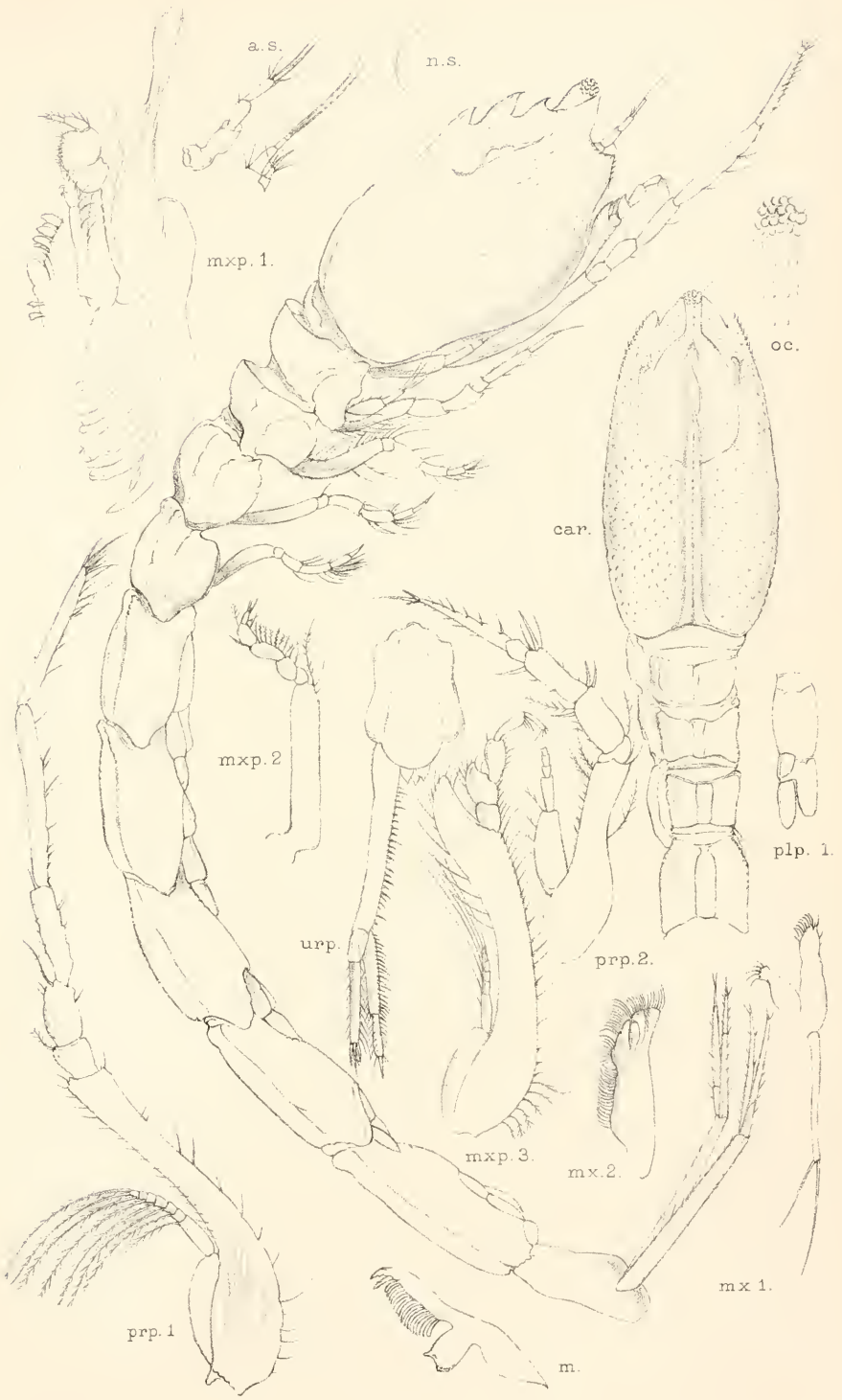
m., mx. 1, mx. 2, mxp. 1, 2, 3. Mandible, first and second maxillæ, first, second, and third maxillipeds, with higher magnification of spine-teeth on the first.

prp. 1, 2. First and second peræopods, exopod of second only partially figured.

plp. 1. First pleopod.

urp. Left uropod in connexion with telsonic segment dorsally viewed.

All the appendages are drawn to a uniform scale.



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West, Newman. imp.

SYMPODOMMA AFRICANUS, *n.g. et sp.*

PLATE LIA.

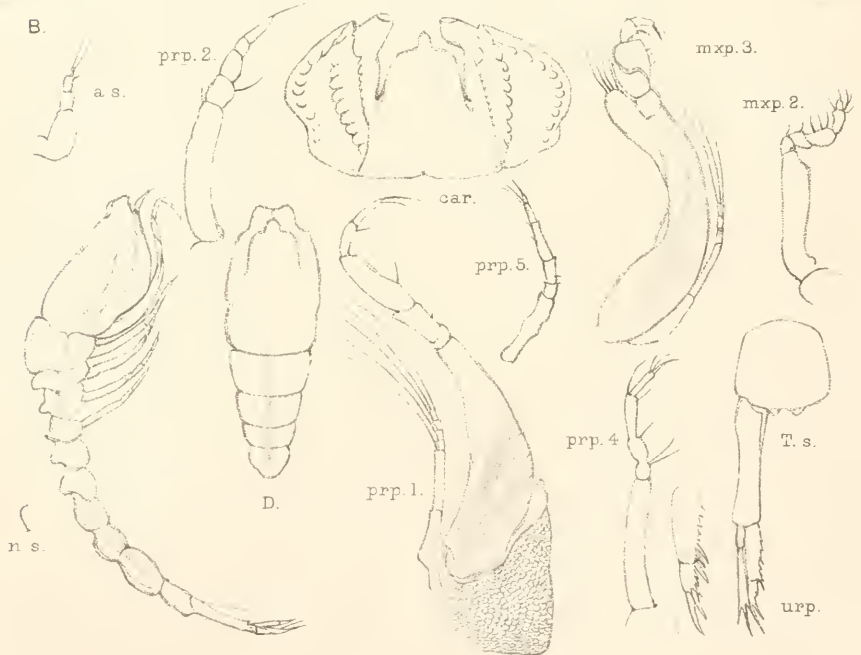
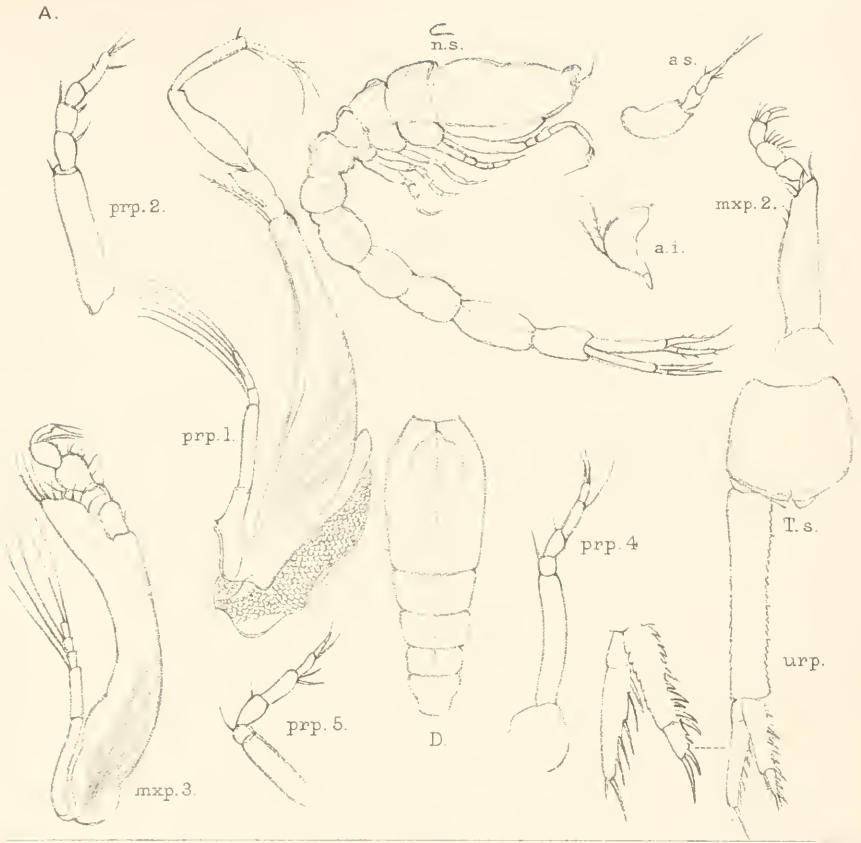
Bodotria montagui, n. sp.

- n.s. Line indicating natural size of female specimen figured below in lateral view.
D. Dorsal view of carapace and pedigerous segments.
T.s., urp. Telsonic segment, with left uropod, in dorsal view, on a higher scale than the preceding figures, but uniform with the rest, except for still higher magnification of the uropod's rami.
a.s., a.i. First and second antennæ.
mxp. 2, mxp. 3. Second and third maxillipeds.
prp. 1, 2, 4, 5. First, second, fourth, and fifth pereopods.

PLATE LII.

Bodotria australis, n. sp.

- n.s. Line indicating natural size of female specimen in the adjoining figure.
D. Dorsal view of carapace and pedigerous segments.
car. Carapace flattened out.
T.s., urp. Telsonic segment, with left uropod, in dorsal view, on a higher scale than the preceding figures, but uniform with the rest, except for still higher magnification of the uropod's inner ramus. All the figures of this species agree as to scale with those of the preceding species.
a.s. First antenna.
mxp. 2, mxp. 3. Second and third maxillipeds.
prp. 1, 2, 4, 5. First, second, fourth, and fifth pereopods.



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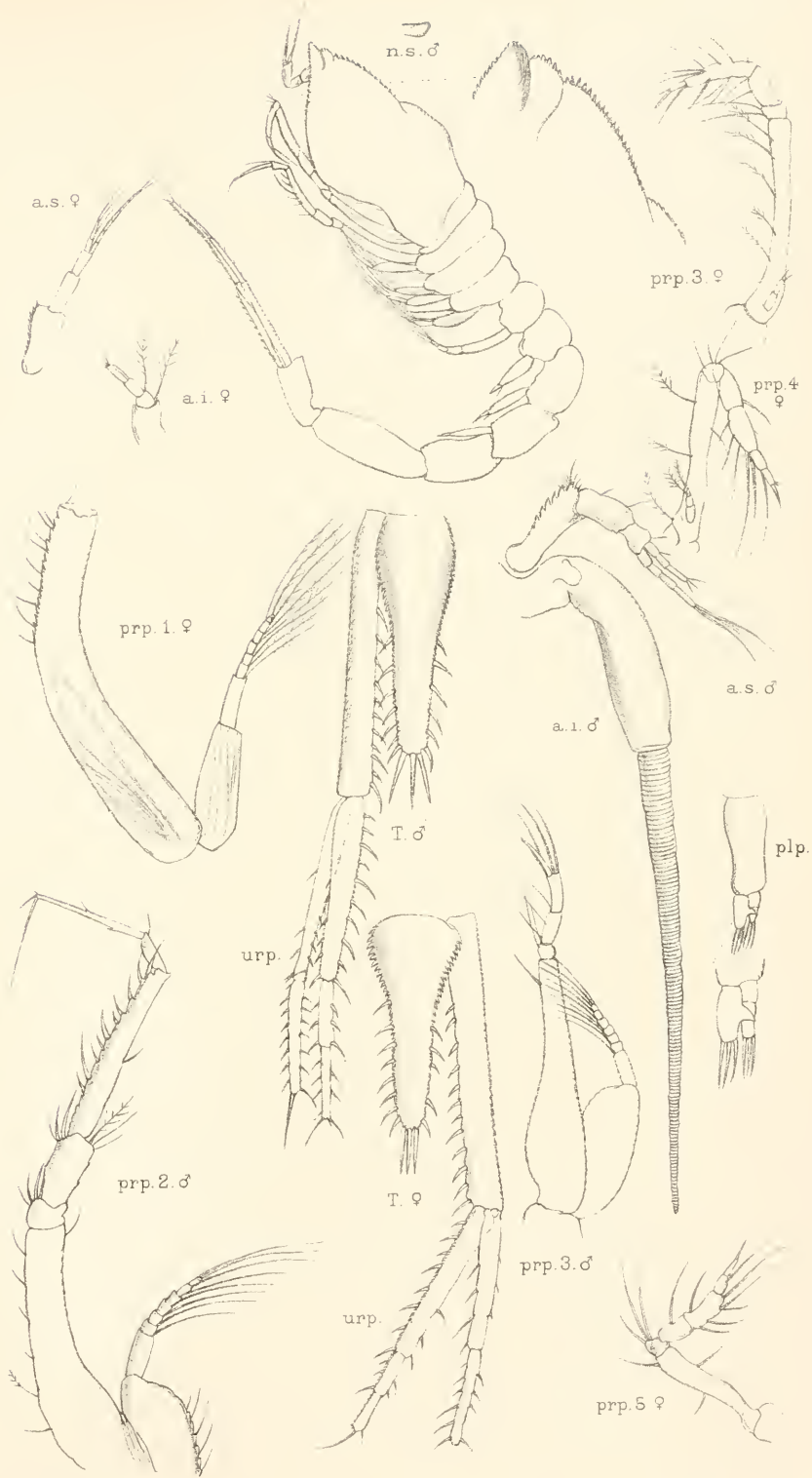
West, Newman lith.

A. *BODOTRIA MONTAGUI*, n. sp. B. *BODOTRIA AUSTRALIS*, n. sp.

PLATE LII.

Hemilamprops pellucidus, Zimmer.

- n.s. ♂. Line indicating natural size of male specimen figured below, with more highly magnified part of dorsal crest.
- T. ♂, urp., T. ♀, urp. Telson and left uropod of the male, and telson and right uropod of the female.
- a.s. ♂, a.i. ♂; a.s. ♀, a.i. ♀. First and second antennæ of the male, and of the female.
- prp. 2, ♂, prp. 3, ♂. Second and third peræopods of the male.
- prp. 1, 3, 4, 5, ♀. The first, third, fourth, and fifth peræopods of the female, the first shown only to end of second joint.
- plp. Pleopod of male, with higher magnification of the rami.



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HEMILAMPROS, PELLUCIDUS, *Zimmer.*

PLATE LIII.

Adiastylis acanthodes, n. sp.

- n.s. Line indicating natural size of male specimen figured below.
- car. Part of the carapace in flattened dorsal aspect, showing armature of the pseudo-rostral projection and indicating shape of the eyelobe and frontal lobe. The carapace was too much damaged to afford a satisfactory view of all its spines and spinules.
- ped. s. 1. Part of front margin of first pedigerous segment.
- T. urp. Dorsal view of pleon segments 4-6 and the telson with one of the uropods in position.
- a.s., a.i. First and second antennæ.
- l.s., m., m. Upper lip and mandibles, the distal half of one, the other complete, with higher magnification of the apical portions.
- mxp. 1-3. The three maxillipeds, omitting the branchial epipod of the first.
- ppp. 1-5. The five peræopods, the first defective after the second joint.
- plp. 1, 2. The first and second pleopods, each with higher magnification.
- All the parts are drawn to the same scale, with added figures on a higher scale for the mandibles and pleopods.



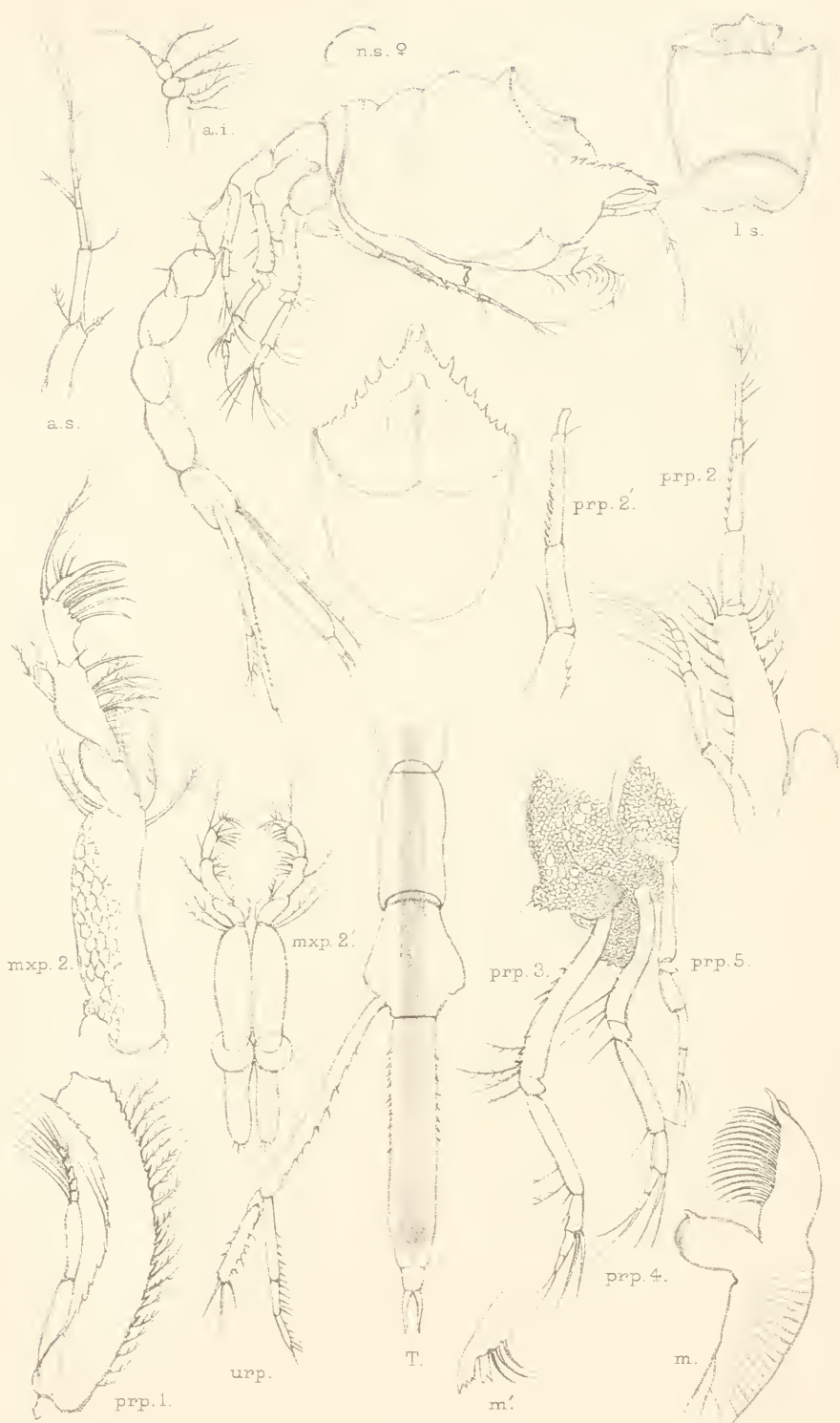
T.R.R. Stebbing.

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PLATE LIV.

Makrokyllindrus fragilis, n. g. et sp. ♀.

- n.s. ♀. Line indicating natural size of female specimen figured below.
- car. Carapace of the same specimen in dorsal view.
- T. urp. Telson in connexion with two preceding segments and one of the uropods more highly magnified, on the same scale as the antennæ and peræopods.
- a.s., a.i. First and second antennæ.
- l.s., m., mxp. 2. Upper lip, mandible, and second maxilliped, more highly magnified than the other appendages.
- m'. Apex of mandible with accessory plate from another specimen.
- mxp. 2'. Pair of second maxillipeds on the same scale as the peræopods.
- prp. 1-5. The five peræopods, the first defective from end of second joint.
- prp. 2. Part of second peræopod from another specimen.



Del. T.R.R. Stebbing.

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MAKROKYLLINDRUS FRAGILIS, n.g et sp.

PLATE LV.

Makrokyllindrus fragilis, n. g. et sp. ♂.

- r. ♂. Terminal lobes of male pseudorostrum; all the figures on this plate magnified to a uniform scale with the mouth organs on the preceding plate.
- a.s., a.i. First antenna and peduncle of second, with beginning of flagellum.
- mx. 1, mx. 2, mxp. 1, mxp. 3. First and second maxillæ, first maxilliped without the large branchial epipod; third maxilliped without its exopod.
- prp. 4. Fourth peræopod without its exopod.
- plp. 1. First pleopod.



Del. T. R. Stebbing

West. Newman

PLATE LVI.

Leptostylis macruroides, n. sp.

n.s. Line indicating length of the male specimen figured below.

car. Part of carapace more highly magnified.

T. Telson in dorsal view, in connexion with the sixth segment of the pleon.

a.s., a.i. The first antenna, and peduncle of the second.

l.s., l.i., m. Upper and lower lips and mandible, this last with apical plates more enlarged.

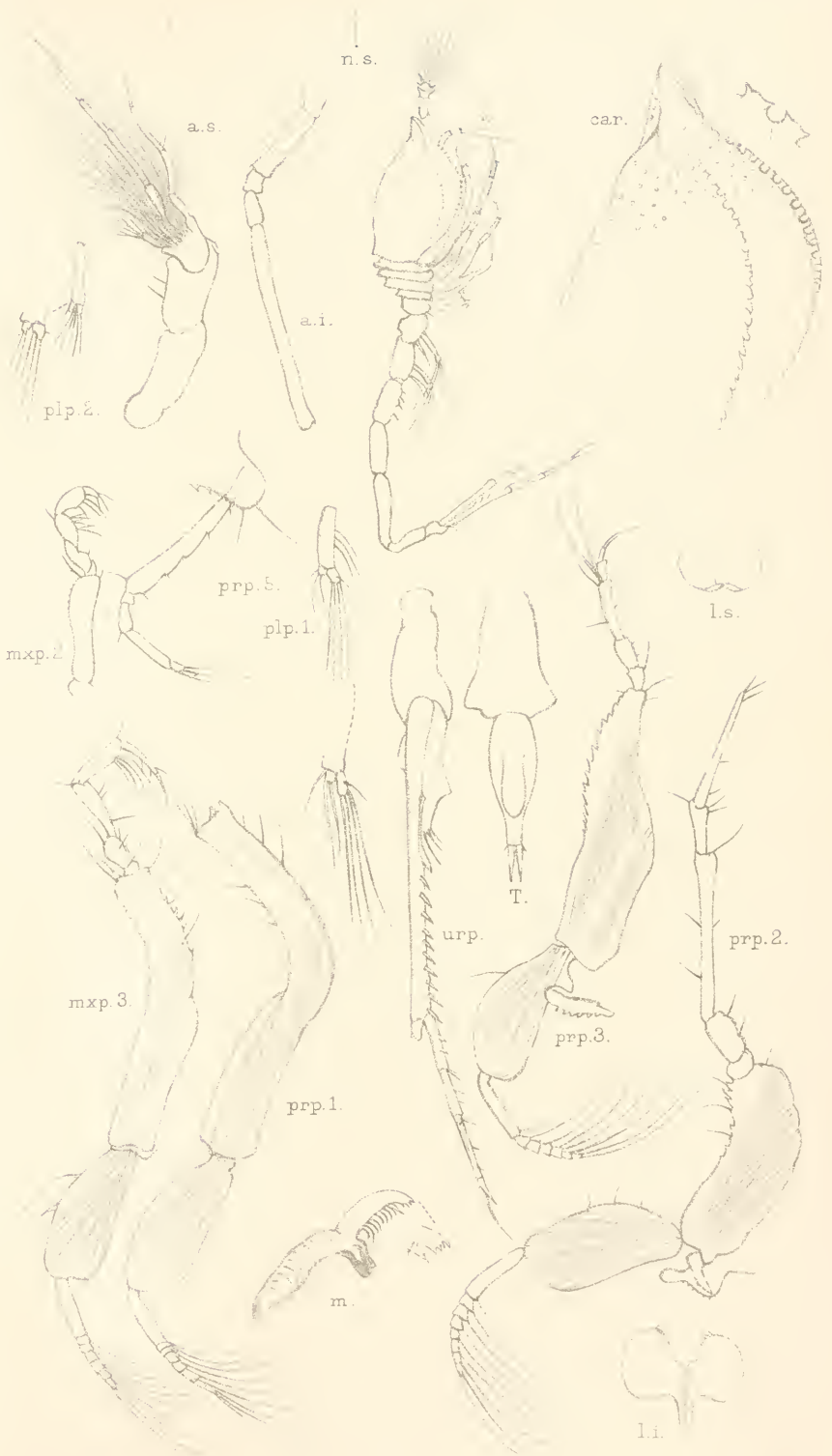
mxp. 2, mxp. 3. Second and third maxillipeds.

prp. 1, 2, 3, 5. First three and fifth pereopods, first only to end of second joint.

plp. 1, plp. 2. First and second pleopods, each with the rami in further magnification.

urp. The uropod (exopod broken) in attachment to the sixth pleon segment shown along with the telson in lateral view.

All the parts are drawn to the same scale, except the above-mentioned portions of the mandible and pleopods.



Del. T.R.R. Stebbing.

West New Zealand imp.

LEPTOSTYLIS MACRUROIDES, n. sp.

PLATE LVII.

Leucon kalluropus, n. sp.

n s. Line indicating length of male specimen figured below.

a.s., a.i. First and second antennæ more highly magnified.

l.s., m. Upper lip; mandible.

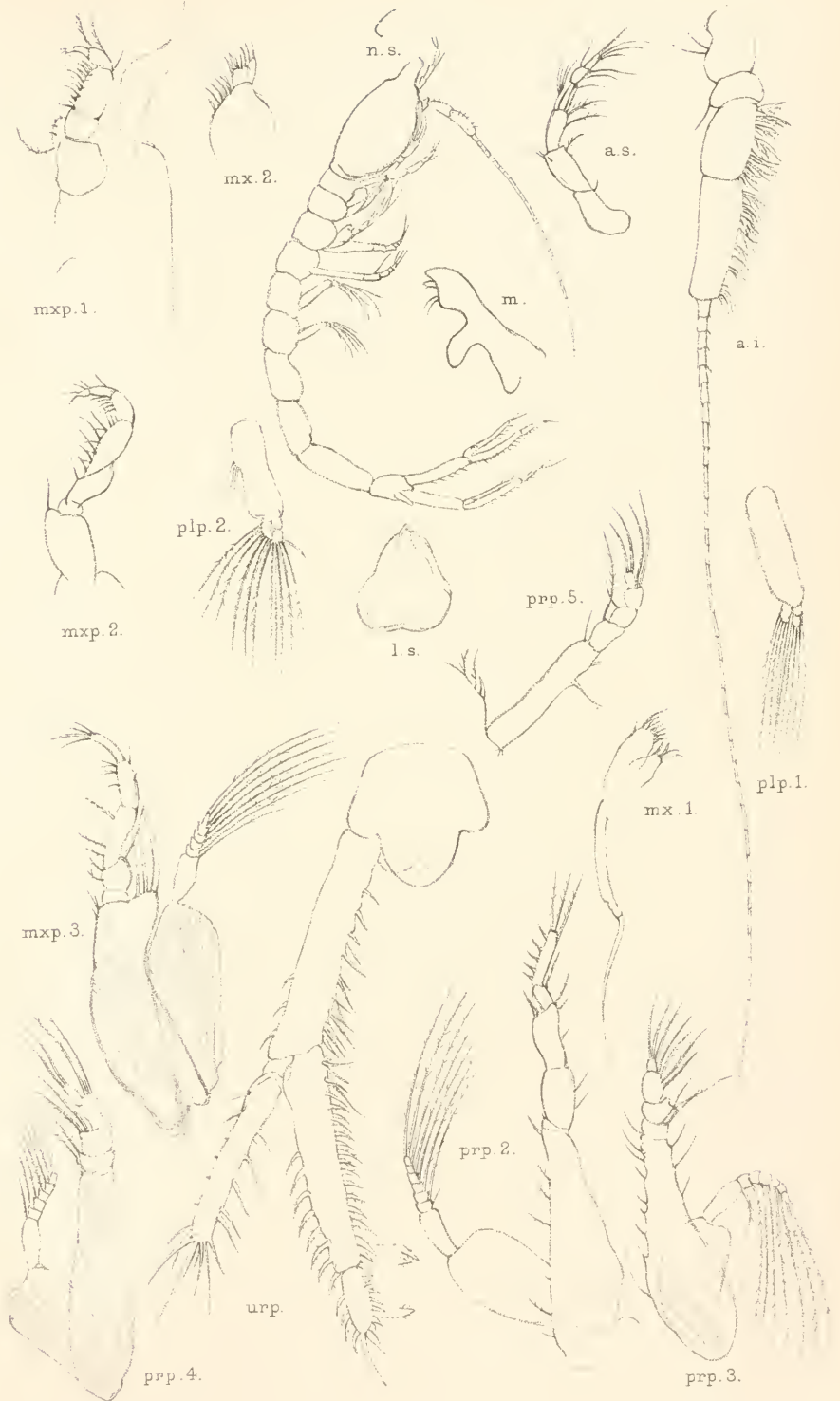
mx. 1, mx. 2, mxp. 1, 2, 3. First and second maxillæ; first, second, and third maxillipeds, the first with only fragments of its epipod and exopod.

ppp. 2, 3, 4, 5. Second, third, fourth, and fifth peræopods.

plp 1, 2. First and second pleopods.

urp. Left uropod in attachment to the telsonic segment, with further enlargement of spines on the endopod.

With exception of the last-mentioned spines, all the parts are magnified to a uniform scale.



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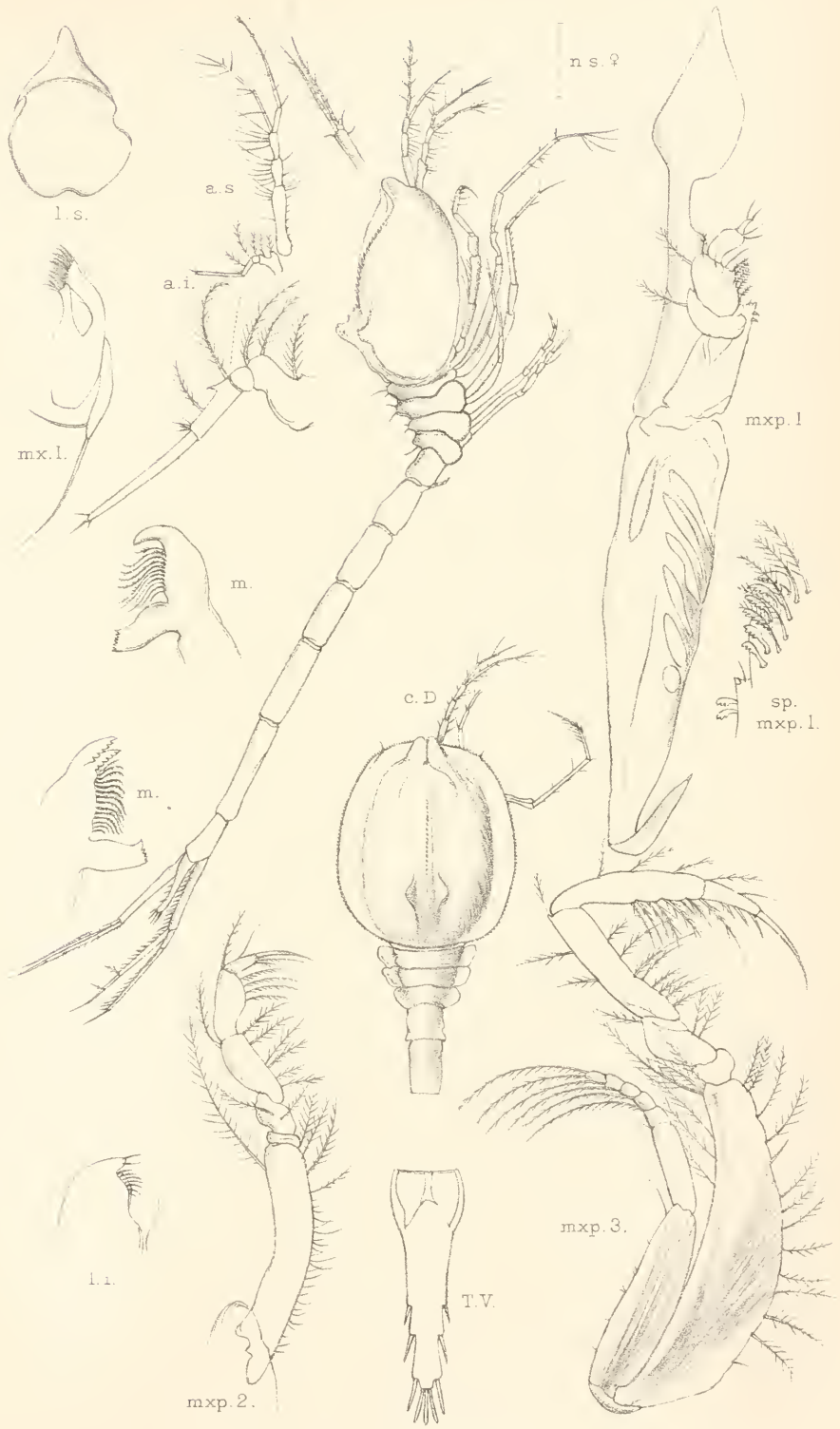
West, Newman lith.

LEUCON KALLUROPUS, n. sp.

PLATE LVIII.

Platytyphlops peringueyi, n. g. et sp.

- n.s. ♀. Line indicating actual length of female specimen figured in about three-quarter view, showing both of the first antennæ and of the uropods, but only one member of each pair for the third maxillipeds and the five peræopods.
- C.D. Dorsal view of the carapace followed by pedigerous segments and first pleon segment.
- T.V. Ventral view of telson, more highly magnified.
- a.s., a.i. First and second antennæ, with tip of first and whole of second much more highly magnified.
- l.s., l.i., m., mx. 1. Upper lip, half of lower lip, parts of the two mandibles, and first maxilla.
- mxp. 1, 2, 3. First, second, and third maxillipeds. All the mouth organs magnified to the same scale.
- sp. mxp. 1. Spines of first maxilliped more highly magnified.



Del. T.R.R. Stebbing.

West, Newman imp.

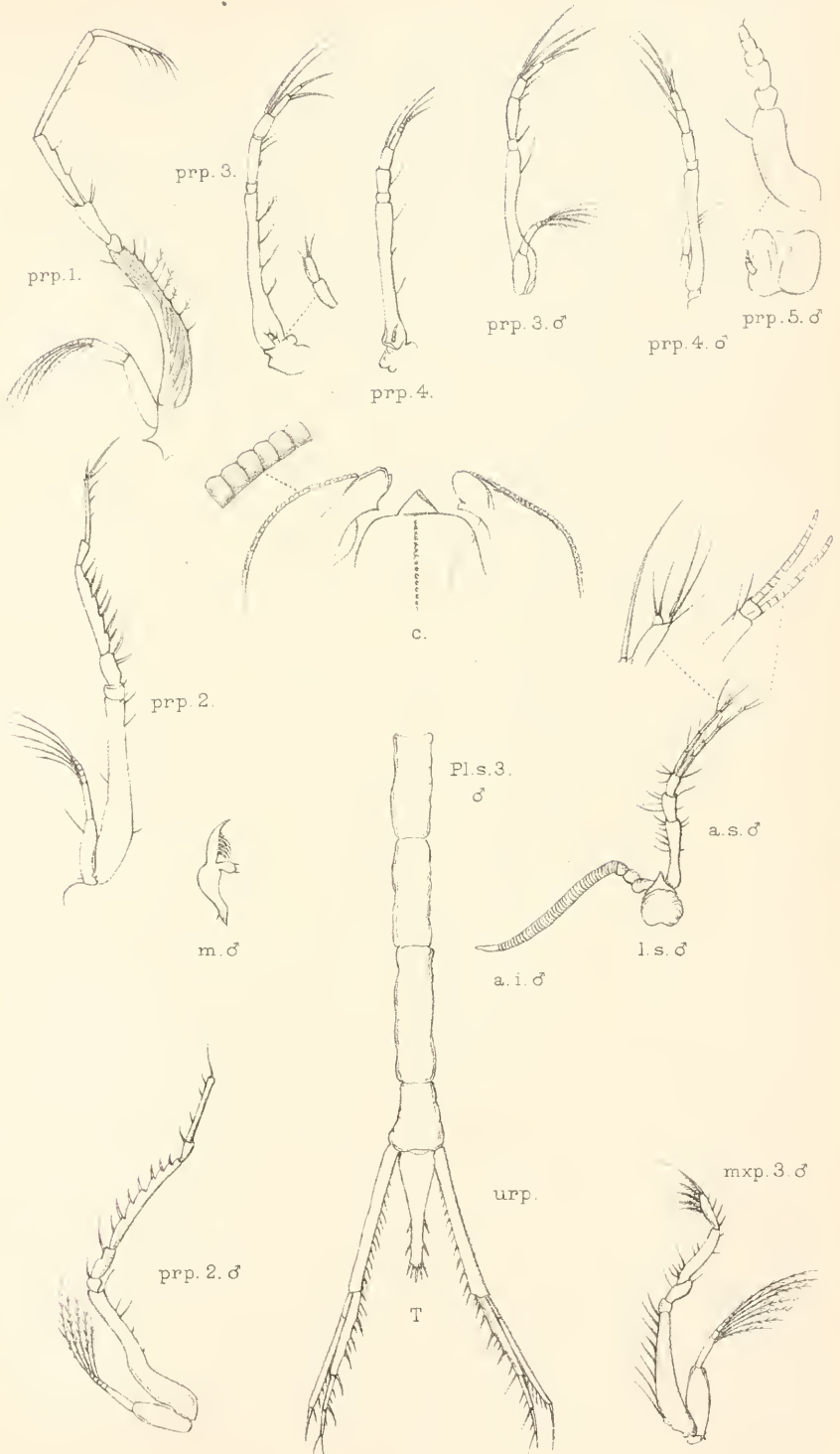
PLATYTYPHLOPS PERINGUEYI, n.g. et sp.

PLATE LIX.

Platytyphlops peringueyi, n.g. et sp.

- C. Front of carapace flattened, with high magnification of part of the margin.
prp. 1, 2, 3, 4. First four peræopods of the female, with rudimentary exopod of the third peræopod more highly magnified.
- Pl. s. 3, ♂, T., urp. Dorsal view of male pleon from third segment to the end including telson and uropods.
- a.s., a.i., l.s., ♂. First and second antennæ and upper lip of male, with much higher magnification of the tips of the flagella of the first antenna.
- m., mxp. 3, prp. 2, 3, 4, 5 ♂. Mandible, third maxilliped and last four peræopods of male, the fifth peræopod attached to its segment, and separately more highly magnified.

The appendages of male and female on this plate are all drawn to the same scale.



Del. T.R.R. Stebbing.

West, Newman imp.

PLATE LX.

Stenotyphlops spinulosus, n. g. et sp.

n.s. Line indicating natural size of female specimen figured below in dorsal view, with lateral view of carapace on the right.

a.s., a.i. First and second antennæ.

l.s., l.i. Upper and lower lips.

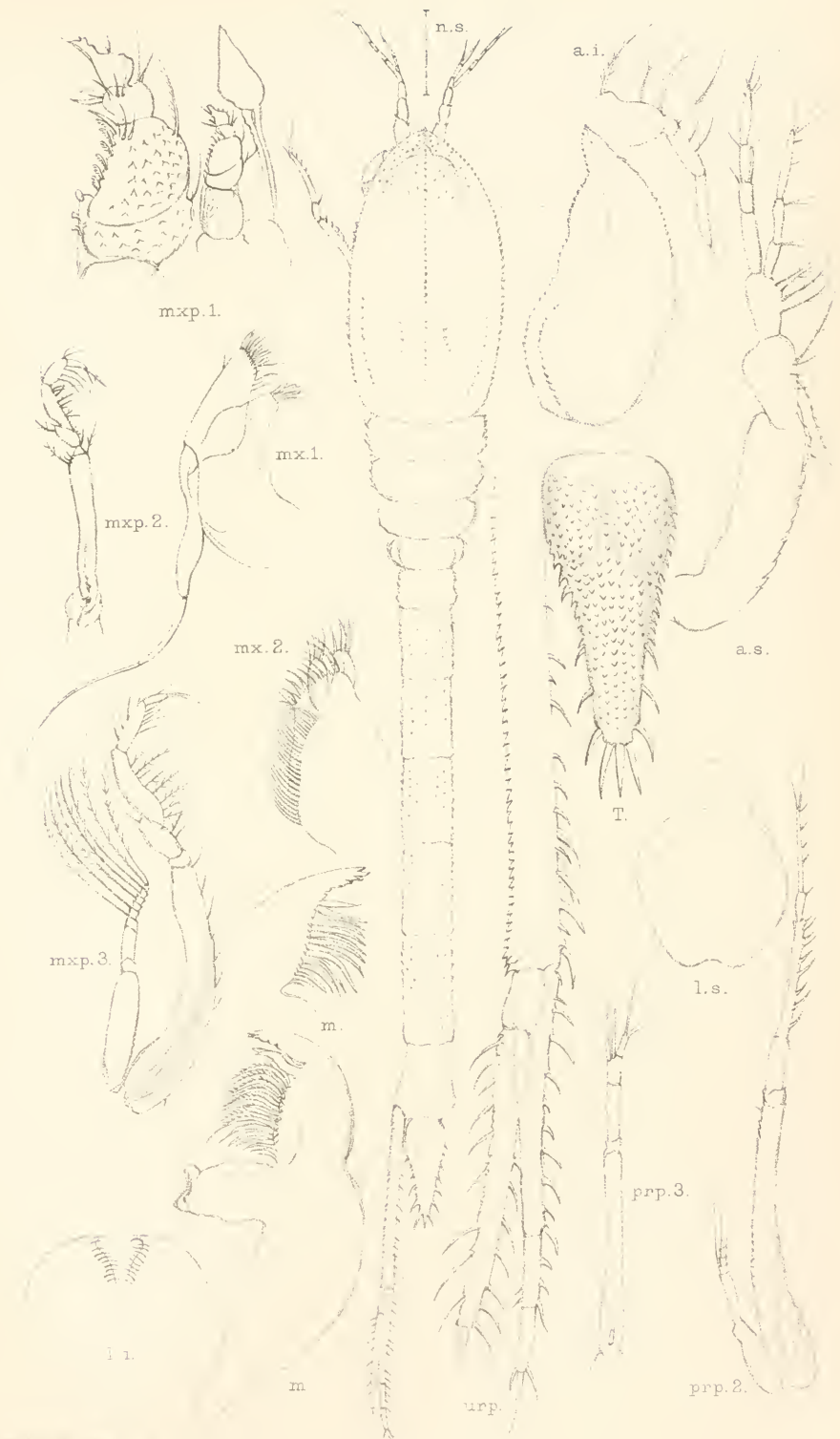
m., m. One of the mandibles complete and distal portion of the other.

mx. 1, mx. 2. mxp. 1, 2, 3. First and second maxillæ, and the three maxillipeds.

prp. 2, 3. The second and third pereopods.

T., urp. The telson and left uropod in dorsal view.

In this plate the lips, mandibles, the two maxillæ, and part of the first maxilliped are magnified on a uniform scale, more highly than the other figures. Again the first and second antennæ, the uropod and telson, are magnified to the same scale, more highly than the figures of the maxillipeds and pereopods.



Stebbing

West, Newman lith

STENCTYPHLOPS SPINULOSUS, n. g. et sp.

PLATE LXI.

Schizotrema calmani, n. sp.

n.s. ♂ Line indicating natural size of male specimen figured below in lateral view, with dorsal view (imperfectly made out) of the carapace and pedigerous segments.

car. More highly magnified view of a pseudorostral lobe.

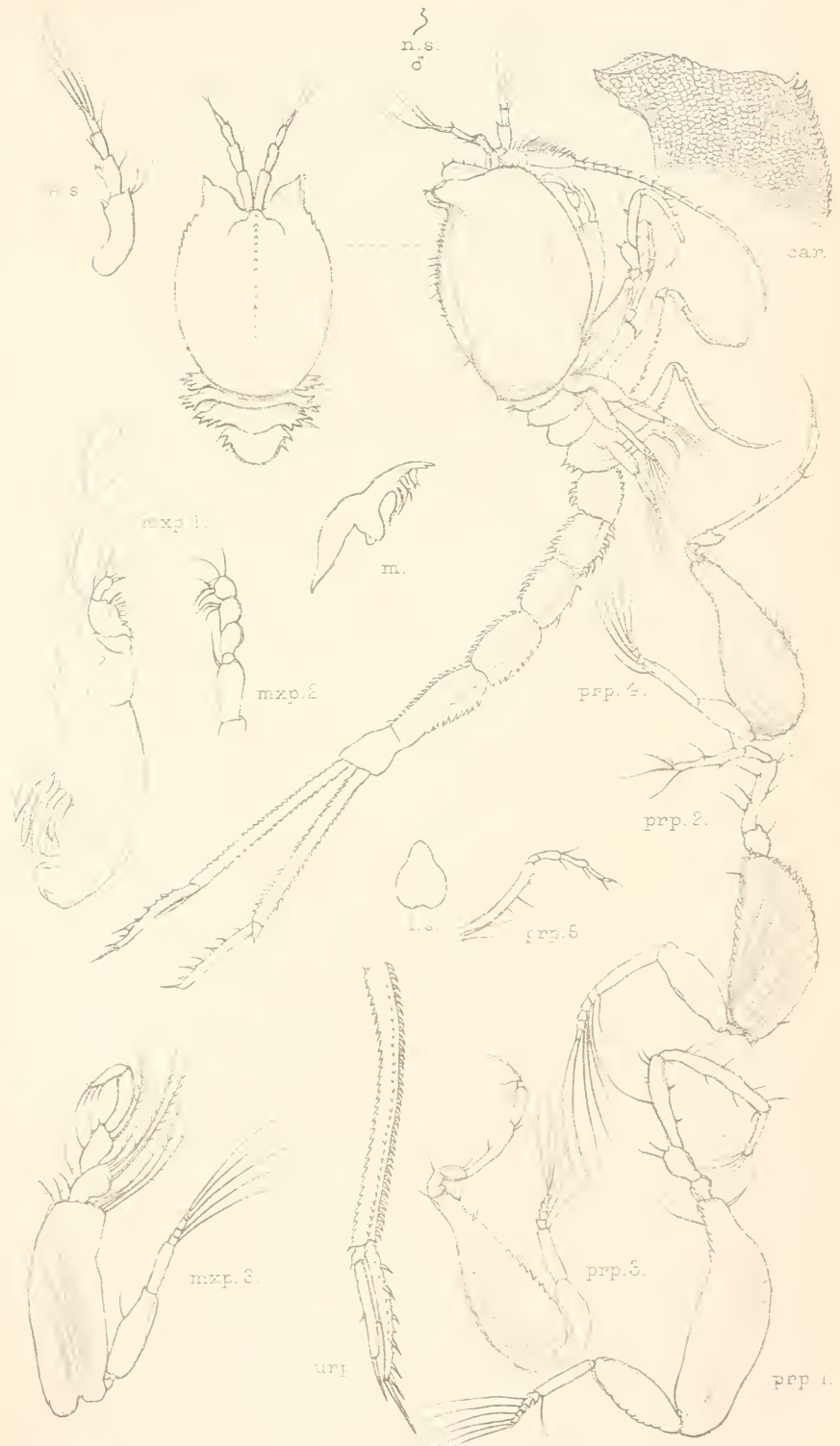
a.s. First antenna.

l.s., m., mxp. 1, 2, 3. Upper lip, mandible, first, second, and third maxillipeds.

pp. 1, 2, 3, 4, 5. First, second, third, fourth, and fifth pereopods.

urp. Left uropod.

All figures are magnified to the same scale except the lateral view of the whole specimen with the dorsal view of its carapace and pedigerous segments.



Del. T.R.R. Stebbing.

West, Newman lith.

SCHIZOTREMA CALMANI, n. sp.

PLATE LXII.

Procampylaspis tridentatus, n. sp.

- n.s. Line indicating length of male specimen figured below.
- car. Portion of carapace in dorsal view, more highly magnified, outline of eyelobe doubtful.
- a.s., a.i. First and second antennæ, flagellum of second incomplete.
- l.s. Upper lip.
- m. Mandible, with distal part more highly magnified.
- mx. 2. Second maxilla, with armature more highly magnified.
- mxp. 1, 2, 3. First, second, and third maxillipeds, with higher magnification of the extremities of the first and second.
- prp. 1, 2, 3, 4, 5. First to fifth peræopods.
- urp. Right uropod, in connexion with telsonic segment in dorsal view.
- All the separate parts are drawn to a uniform scale, with higher magnification of certain details as above mentioned.

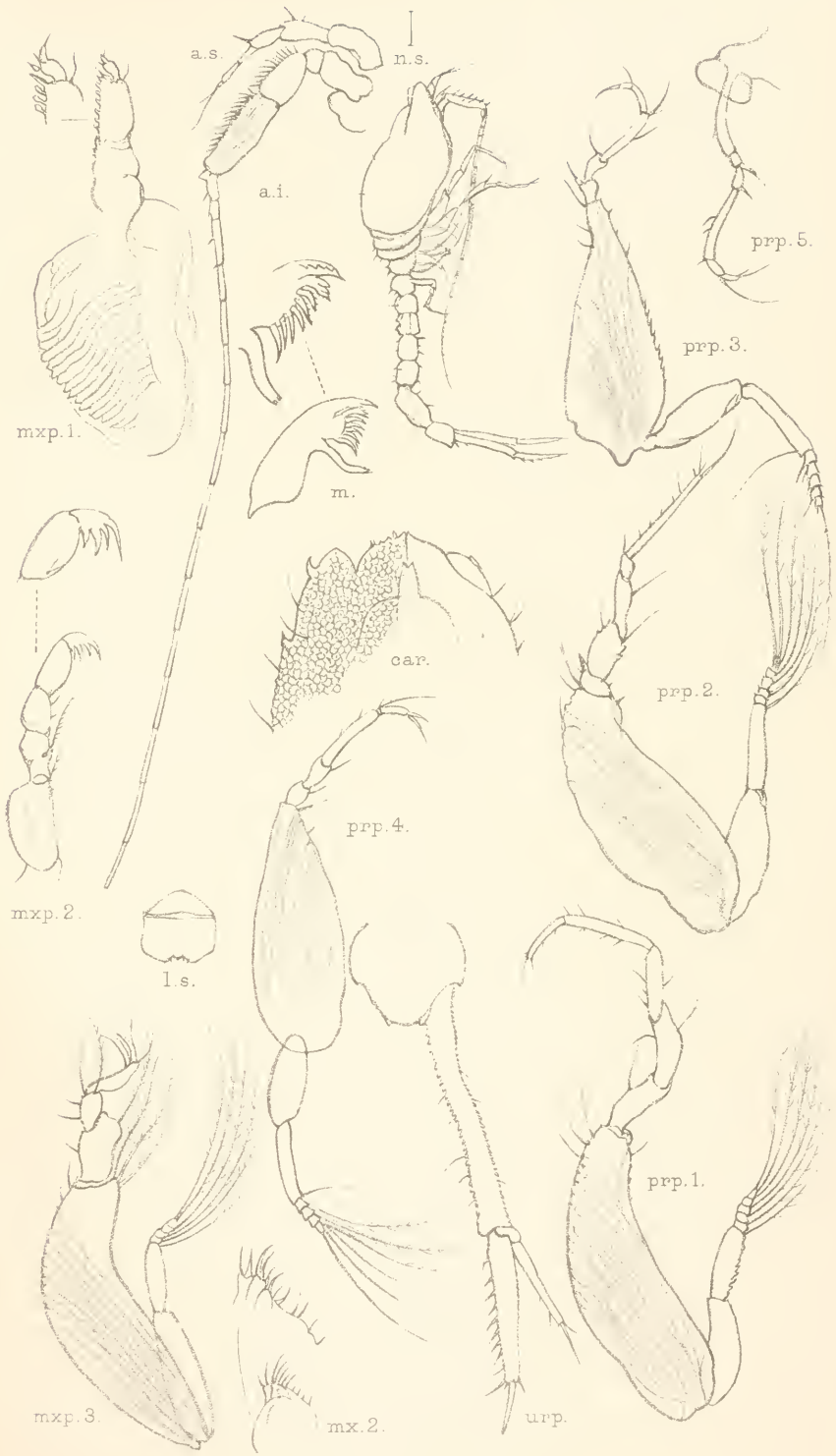
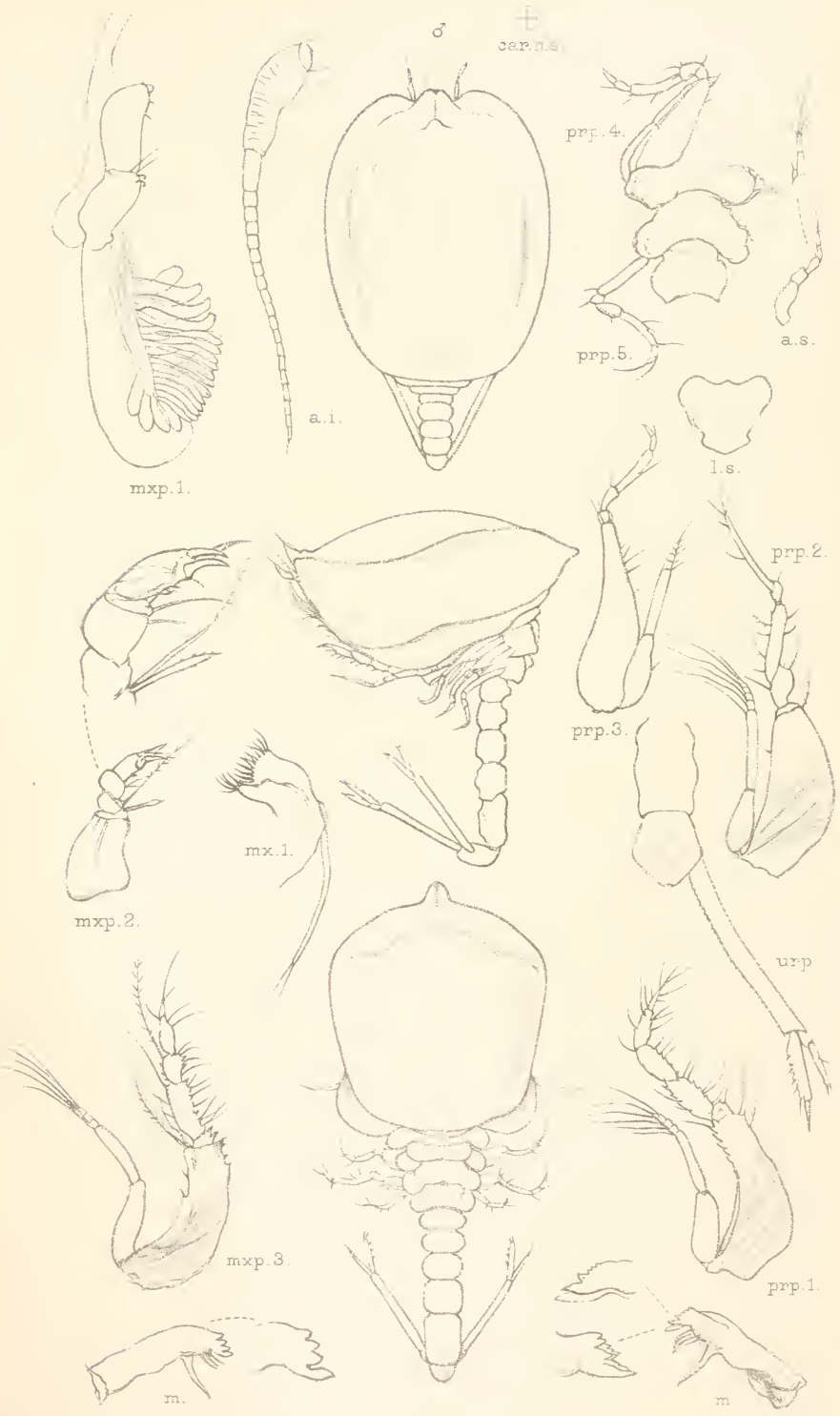


PLATE LXIII.

Campylaspis ovalis, n. sp.

- ♂. Male specimen figured below in three positions dorsally with surface of carapace horizontal, carapace from left side tilted to the right, and thirdly with surface of pedigerous segments and first six of pleon horizontal, but carapace foreshortened by its downward inclination.
- car. n.s. Lines indicating natural size of the carapace.
- a.s., a.i. First and second antennæ, with further enlargement of flagella of first antenna.
- l.s., m., m., mx. 1, mxp. 1-3. Upper lip, mandibles, first maxilla, first, second, and third maxillipeds, with further enlargement of the apices of the mandibles and of the distal joints of the second maxilliped.
- prp. 1-5. The five peræopods, the fourth and fifth in attachment to their respective segments.
- urp. Right uropod in attachment to the telsonic segment with the preceding fifth pleon segment.



Del. T.R.R. Stebbing.

West Newman Inc.

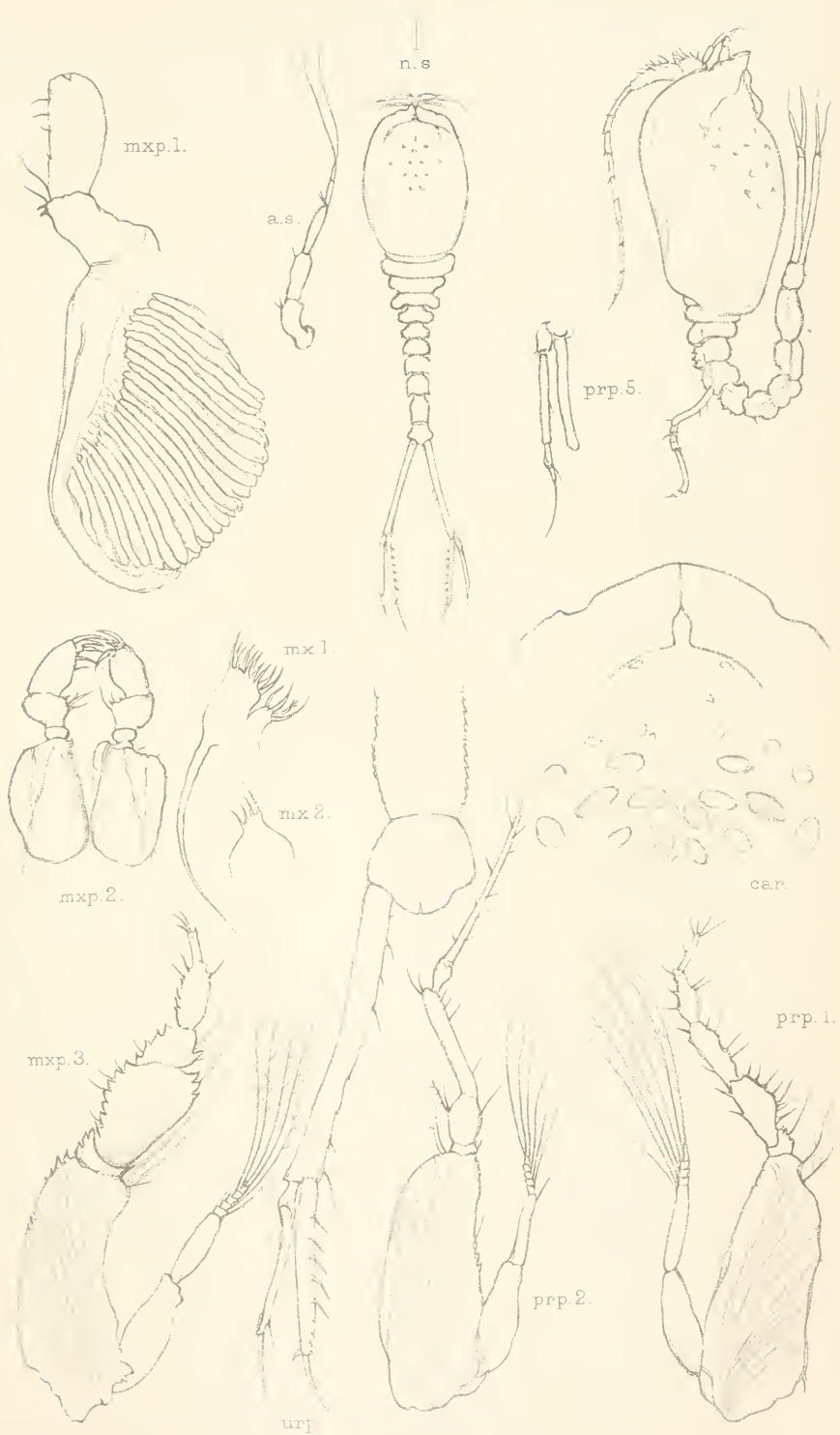
CAMPYLASPIS OVALIS, n. sp.

PLATE LXIV.

Campylaspis pœneglaber, n. sp.

- n.s. Line indicating length of male specimen figured below in dorsal aspect. On the right is the figure of a similar specimen from the left side more enlarged, from which are taken the parts marked car., prp. 2, prp. 5, the others being from the first-mentioned specimen.
- car. Upper portion of carapace slightly flattened, showing pseudorostral sinus, shape of eyelobe, and pellucid markings.
- a.s. First antenna. Second antenna incomplete in both specimens.
- mx. 1, mx. 2, mxp. 1, 2, 3. First and second maxillæ, first maxilliped without exopod, pair of second maxillipeds, third maxilliped.
- prp. 1, 2, 5. First, second, and fifth peræopods.
- urp. Left uropod, in attachment to the telsonic segment in dorsal view.

The separate parts are magnified to a uniform scale.



D. L. TRIPS, det. ang.

West, Newman litt.

CAMPYLASPIS PENEGLABER, n. sp.

8.—Ephemeridae from South Africa.—By ESBEN PETERSEN.

(With 12 Text Figures.)

ONLY a few species of *Ephemeridae* are known from South Africa, and therefore I hope that this small contribution to our knowledge of the fauna may be of some interest. The material reported on belongs, with a single exception, to the South African Museum.

List of the species known from South Africa:—

1. *Elassoneuria trimeniana*, MacLachlan.
2. *Polymitarcys capensis*, nov. sp.
3. *Hexagenia fulva*, nov. sp.
4. *Atalophlebia tabularis*, Eaton.
5. *Adenophlebia dislocans*, Walker.
6. *Adenophlebia westermanni*, nov. sp.
7. *Tricorythus discolor*, Burmeister.
8. *Caenis*, sp. A. E. Eaton mentions in his "Revisional Monograph of Recent Ephemeridae" (Trans. Linn. Soc., Lond., 1888, pp. 142 and 308) an undescribed species of that genus from Cape Town.
9. *Centroptilum bifasciatum*, nov. sp.
10. *Cloëon africanum*, nov. sp.
11. *Cloëon*, sp., undescribed. A. E. Eaton, Trans. Ent. Soc., Lond., 1871, p. 103; Trans. Linn. Soc., Lond., 1888, p. 186.
12. *Ecdyurus péringueyi*, nov. sp.
13. *Ecdyurus*, sp., undescribed. A. E. Eaton, Trans. Linn. Soc., Lond., 1888, p. 309.

GEN. ELASSONEURIA, Eat.

ELASSONEURIA TRIMENIANA, MacLachlan.

Oligoneuria trimeniana, MacLachlan, Ent. Monthl. Mag., vol. iv., 1868, p. 177-178; A. E. Eaton, Trans. Ent. Soc., Lond., 1871, p. 56, pl. iii., 9-9a.

Elassoneuria trimeniana, Eaton, Ent. Monthl. Mag., vol. xvii., 1881, p. 191; Trans. Linn. Soc., Lond., 1888, p. 32, pl. iii., 3.

Of this interesting species, of which only the female is known, there were six specimens in the Collection, all females. They were taken at M'fongosi, Zululand, March, 1911, by W. E. Jones.

As the descriptions given by MacLachlan and Eaton are very short, I add a few supplementary notes.

Head and thorax pale brown. Eyes black. Ocelli white, surrounded by black. The basal joint of the antennae pale brown, the bristle black. Abdomen white with a faint yellowish tinge. All the dorsal segments with a small purplish brown hind border and a lanceolate median spot, which does not touch the front or hind border of the segments. The underside white with a small yellow spot in the middle of each segment and with yellow lateral margins. Setae and legs white.

Length of body, 16-20 mm.; forewing, 17-22 mm.

GEN. POLYMITARCYS, Eat.

POLYMITARCYS CAPENSIS, sp. nov.

Subimago ♂. Head and thorax light violet-grey. The ocelli white, surrounded by a black circle; the eyes jet black. On the prothorax two dark spots near the front margin; front angles and lateral margins reddish violet. Meso- and metathorax yellowish brown, with a fine reddish violet median line. Abdomen ventrally white, dorsally whitish with a faint reddish tinge, which becomes strong reddish yellow on the last two segments. From the front border of each segment two lunate spots extend backwards a little farther than the middle of the segments. The two spots do not touch each other. Forceps white; penis yellow. Fore femora and tibiae greyish black; tarsi and underside of femora whitish. Intermediate and hindlegs pale yellowish. Wings white with a faint ash-grey tinge. Neuration opaque, and the costa, subcosta, and radius in forewing with violet-greyish tinge.

Subimago. ♀. Setae white and very pilose.

Length of body: ♂, 13 mm.; ♀, 14-15 mm. Setae: ♀, 13 mm
Wing: ♂, 13 mm.; ♀, 15 mm.

One male and five females (all subimagines).

M'fongosi, Zululand, December, 1911.

In "A Revisional Monograph of Recent Ephemeroidea or Mayflies" (Trans. Linn. Soc., Lond., 1888), p. 45, A. E. Eaton mentions a

species of *Polymitarcys* from South Africa, but without giving any description, and on Plate vi., 10*b*, he gives a drawing of the forewing. This figure agrees very well with the forewing of the above described species.

GEN. HEXAGENIA, Walsh.

HEXAGENIA FULVA, sp. nov.

Imago. ♀. Head pale yellow; eyes, a circle round each ocellus and two spots at the hind margin of head black. 1st joint of antennae light brown. Prothorax, above and beneath, pale yellow and with a broad yellowish brown lateral line. Meso- and meta-thorax yellowish brown; abdomen slightly paler, dorsally with a short curved blackish brown streak on the first six segments, extending from the middle of the lateral margin to the hind margin of each segment. Besides these short streaks there is on each side of the 1st-7th segments a comma-shaped blackish brown streak, the fore tip of which is broadest and touches the fore margin; the hind tip is curved inwards and does not touch the hind margin. On the dorsal surface of the 8th segment are found two dark brown longitudinal lines at each side and one along the front border; on the 9th segment one dark brown, and on the 10th two small lunate dark brown spots. Abdomen ventrally pale brown with the front angles of the segments blackish. Forelegs reddish brown, intermediate and hindlegs paler. Wings hyaline. Longitudinal nervures with the exception of the subcosta yellowish brown; the subcosta and the cross-veins blackish brown. Wing-roots yellowish. The marginal area of forewing yellowish brown.

Length of body, 22 mm.; forewing, 20 mm.

One example, ♀. The specimen has lost its setae. It was captured at M'fongosi, Zululand, December, 1911, by W. E. Jones. The species much resembles *Hexagenia limbata*, Pict., from North America, and it is the first species of the genus recorded from Africa.

GEN. ATALOPHLEBIA, Eat.

ATALOPHLEBIA TABULARIS, Eaton.

Atalophlebia tabularis, Eaton, Trans. Linn. Soc., Lond., 1888, p. 91, pl. x., 16*h*.

This South African species was not represented in the Collection. The only known example was found in 1874, floating on the streamlet at the Platteklip, Table Mountain, Cape of Good Hope. But amongst the material is a specimen, gummed on paper and

with the wings cleft together; it is in the subimaginal stage and collected at M'fongosi, Zululand, September, 1911, by W. E. Jones. With some hesitation I refer the specimen to a species of *Atalophlebia*.

GEN. ADENOPHLEBIA, Eat.

ADENOPHLEBIA DISLOCANS, Walker.

Ephemera dislocans, Walker, Trans. Ent. Soc., Lond., vol. v., 1860, p. 198.

Adenophlebia dislocans, Eaton, Ent. Monthl. Mag., vol. xvii., 1881, p. 194; "Rev. Monogr. of Recent Ephemeridae," 1888, p. 112.

In the Collection are 2 ♂♂ (imagines) and 1 ♂ (sub-imago), all mounted on cardboard and not in good condition. The specimens were collected at Barberton, Transvaal, by Miss H. Edwards, March, 1911.

To the excellent description of both sexes in the imaginal stage, given by Eaton, I have only to add that the pterostigmatal region has a violet-grey tinge. In the subimago the wings have a slight greyish tinge and blackish neuration. The cross-veins are shaded with blackish grey.

ADENOPHLEBIA WESTERMANNI, sp. nov.

Imago. ♂. Head and thorax blackish brown. The abdominal segments dorsally yellowish brown with the hind border and an oblique streak on each side dark brown. The ventral surface of abdomen yellowish brown with a median longitudinal brown streak.



FIG. 1.—Left Forewing of *Adenophlebia westermanni*. ♂.

The forceps brown, the last joint yellow. Three caudal setae, which are of equal length, brown at their base, paler towards their apex. Legs brown; femora with a broad black median band and with a small black band at the base and at the apex. The tarsal claws all narrow and uncinat. Femur, tibia, and tarsus of foreleg almost

of the same length. 1st tarsal joint of foreleg very short, 2nd the longest, 3rd, 4th, and 5th gradually shorter.

Forewing very elongated; hindwing oblong and oblique; its marginal area abbreviated and very broad. Membrane of wings hyaline; neuration brownish; a great part of the cross-veins in forewings clouded with brownish. Hindwings with many cross-veins.

Length, 7 mm.; forewing, 8 mm.; setae, 17 mm.

One specimen, a male, from Cape of Good Hope, January, 1817, in the Westermannian Collection in the Museum of Copenhagen.

The species differs from *Adenophlebia dislocans*, especially in the oblong form of forewings, and it is with some hesitation that I put the species in that genus; but as it agrees with the type species of the genus in neuration of wings, in form of hindwing, of the tarsal claws, as well as in the proportion of the length between femur, tibia, tarsus, and tarsal joints I place it provisionally in that genus.

GEN. TRICORYTHUS, Eat.

TRICORYTHUS DISCOLOR, Burm.

Oxycypta discolor, Burmeister, Handb. der Ent., ii., 1839, p. 797.

Cloëon discolor, Walker, Cat. Neur. Ins., Brit. Mus., iii., 1853, p. 577.

Caenis discolor, Eaton, Trans. Ent. Soc., Lond., 1871, p. 96.
Hagen, Trans. Ent. Soc., Lond., 1873, p. 399.

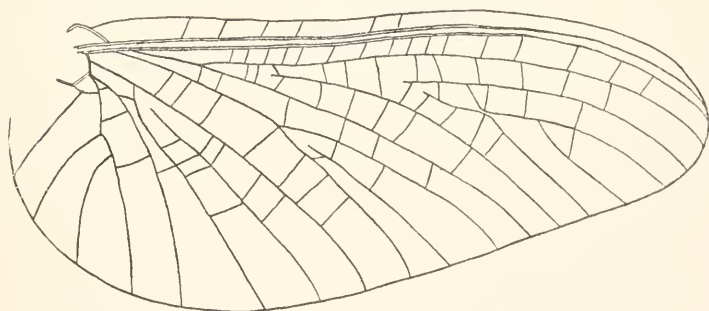


FIG. 2.—Forewing of *Tricorythus discolor*.

Tricorythus discolor, Eaton, "Rev. Monogr. of Recent Ephemeridae," London, 1884, p. 139.

Imago. ♂. Head black, pro-, meso-, and metathorax castaneous. Abdomen dorsally greyish yellow-brown, hind borders of the seg-

ments darker. Setae greyish white with very small black annulations. Legs greyish. Wings greyish brown; longitudinal nervures darker; costa and subcosta blackish; cross-veins not very distinct.

Length of body, 6 mm.; forewing, 7-7.5 mm.; setae, 12 mm.

Three males, imagines, mounted on cardboard from Tulbagh, April, 1892, and two females, subimagines (pinned), from M'fongosi, Zululand, October, 1911, taken by W. E. Jones.

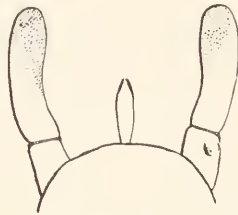


FIG. 3.—Forceps and Penis of *Tricorythus discolor*. ♂.

The species is described by Burmeister from a female, subimago, in Winthem's Collection, taken at Cape of Good Hope. The present two specimens of subimagines agree very well with the description, with the exception that the ventral surface of abdomen is more blackish, and that the legs are more greyish. I am undoubtedly right in referring the three males to the species. The neuration of wings is quite the same. The colour of wings in the subimago is blackish grey, in the imago brownish grey.

GEN. CENTROPTILUM, Eat.

CENTROPTILUM BIFASCIATUM, sp. nov.

Imago. ♂. Head and thorax light brown, darker at the sides. Abdomen vitreous in 2nd-7th segments; the last segments opaque,

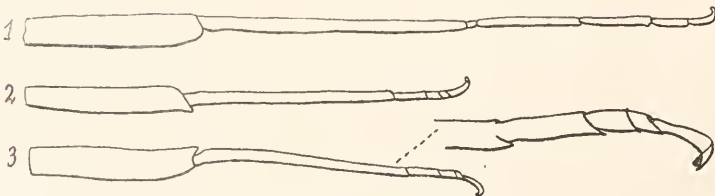


FIG. 4.—Fore (1), Intermediate (2), and Hindleg (3) of *Centroptilum bifasciatum*. ♂.

reddish yellow. The dorsal surface of the first-named segments with an oblong, reddish brown median spot, and an oblique spot

or streak of the same colour at each side; the side spots do not touch the front margin of the segments. On the underside of the 2nd-7th segments there are found the same markings as on the upper.

Limbs of the forceps yellowish, the basal joint with a greyish tint. Penis not visible. Femur of foreleg reddish brown, tibia dark reddish brown, yellowish at the base; all the tarsal joints yellowish,

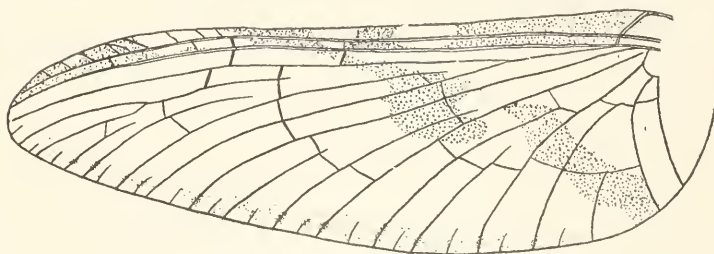


FIG. 5.—Forewing of *Centroptilum bifasciatum*. ♂.

reddish brown towards apex. Femora of intermediate and hind-legs reddish brown, yellowish at the base; tibiae and tarsi yellowish. Wings vitreous with the greater part of nervures light brown. Forewings with the marginal areas and an abrupt, oblique fascia brown coloured; along the hind border is found a faint brown shadow. A few cross-veins in the front and middle part of the wing blackish brown. Hindwing brown towards the apex.

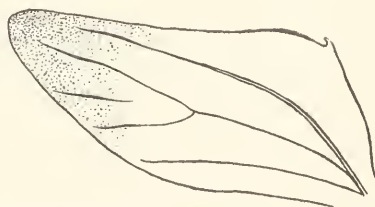


FIG. 6.—Hindwing of *Centroptilum bifasciatum*. ♂.

The female differs from the male in the colouring of the abdomen. 2nd-7th segments dorsally reddish with vitreous spots especially at the sides, ventrally with a reddish brown streak at the sides of the segments. In the forewing the abrupt fascia and the brown shadow along the hind margin are wanting. Hindwing without brown apex. Sub-imago (♂ and ♀). Thorax greyish brown. Abdomen light brown, ventrally paler. Setae greyish brown, paler in the male. Fore

femora brown, tibiae light brown, darker towards the apex. Tarsal joints light brown. Intermediate and hind femora yellowish red-brown; tibiae and tarsi yellowish. The greater part of the longitudinal nervures and all the cross-veins in the forewings brown, and with greyish brown shadow. The membrane of wings mostly greyish brown, and the colour forming cross-bands.

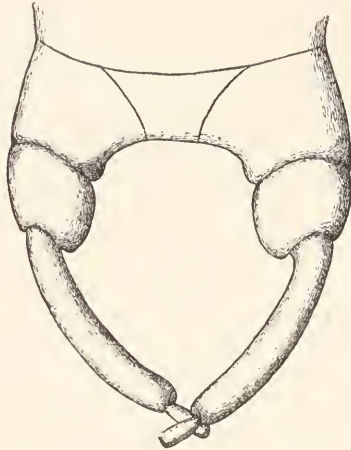


FIG. 7.—Forceps of *Centroptilum bifasciatum*. ♂.

Three imagines and three subimagines found at M'fongosi, Zululand, by W. E. Jones. Of the subimagines one male was captured in September, 1911, one female in October, 1911, and one in December, 1911. Of the imagines one female was captured in October, 1911, and two males in December, 1911.

Although the species does not agree with the other species in the genus in regard to the shape of the hindwing, I place it in the genus *Centroptilum*. Possibly a new genus ought to be established for the species, but I postpone doing so, because probably more allied species will also be found in South Africa. This species is the first *Centroptilum* recorded from this part of the world.

GEN. CLOËON, Sam.

CLOËON AFRICANUM, sp. nov.

Imago. ♂. Thorax castaneous. 2nd–6th segments of abdomen transparent, whitish and with a faint reddish tinge; the hind borders of the segments darker. The 7th–9th segments reddish brown on the dorsal surface, whitish on the ventral. Forceps yellow-

ish white. Setae white with darker annulations at the joints. Legs white with a yellowish brown tinge. Wings hyaline with a yellowish tinge in the marginal area. Longitudinal nervures yellowish brown; subcosta and radius mostly yellow. Cross-veins few in number, placed as in the typical *Cloëon*-wing, and only visible when the wing is held up to the light. The number of cross-veins in the pterostigmatal area is not visible owing to the forewings being compressed together. In the forelegs the tibia is longer than the femur and of the same length as all the tarsal joints together. 1st tarsal joint as long as the three others; the 2nd almost as long as the 3rd and the 4th together, and the 3rd is $\frac{1}{3}$ longer than the 4th.

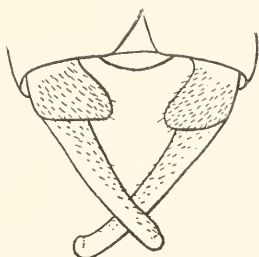


FIG. 8.—Forelegs of *Cloëon africanum*. ♂.

Length of body, 4.5 mm.; wing, 5 mm.; setae, about 10 mm.

One specimen, male, was captured at M'fongosi, Zululand, September, 1911, by W. E. Jones.

The species has much likeness to a small male of *Cloëon dipterum*, but it differs in the shape of the forceps and by its blackish red eyes (dried). In Trans. Ent. Soc., Lond., 1871, p. 103, A. E. Eaton mentions a female specimen of a species of *Cloëon* from Knysna, very closely allied to *Cloëon dipterum*.

GEN. ECDYURUS, Eat.

ECDYURUS PÉRINGUEYL, sp. nov.

Imago. ♂ Pro-, meso-, and metathorax light brown. Abdomen dorsally reddish brown, with the hind border of the segments a little darker, ventral surface yellow with exception of the last segment, which is reddish yellow. Forceps yellow. Femora light brown, tibiae and tarsi yellow, the last named with darker joints and with blackish claws. Setae brownish yellow with small brown annulations at the joints. Wings vitreous with a very faint yellowish tinge in the marginal area of forewing, which is mostly due to the yellow

subcosta and radius; the other longitudinal nervures only a little darker than the membrane. The cross-veins almost invisible.

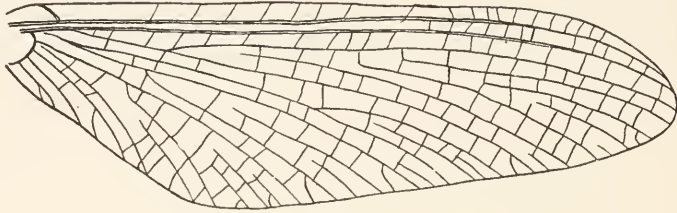


FIG. 9.—Forewing of *Ecdyurus pèringueyi*. ♂.

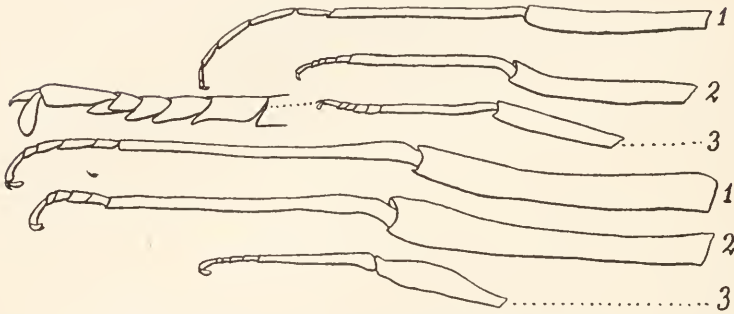


FIG. 10.—Legs of ♂ and ♀ of *Ecdyurus pèringueyi*.
(The legs of ♀ more enlarged than of ♂.)

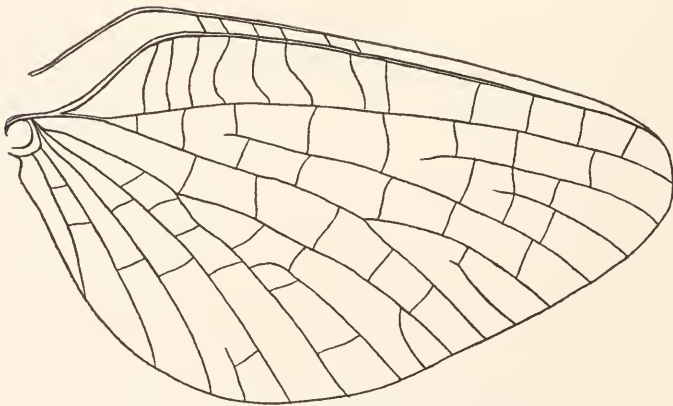


FIG. 11.—Hindwing of *Ecdyurus pèringueyi*.

♀. Pro-, meso-, and metathorax light brown, at the sides with some small blackish stripes and spots. 1st-6th abdominal segments

dark reddish brown above with black stigmata and with yellowish hind borders; 7th-9th segments reddish yellow with a reddish brown median stripe. Ventral surface yellowish with a reddish brown median stripe; the 9th segment with a long prolongation, having an incision at its apex. Setae reddish at the base and becoming yellowish towards the apex; all the joints with a darker annulation. Legs and wings as in the male.

Length of body: ♂, 7 mm.; ♀, 11 mm.; forewing: ♂, 8.5 mm.; ♀, 14-15 mm.; setae: ♂ ca., 15 mm.; ♀, 30 mm.

Three males, three females, all imagines, and one female, sub-imago, are present in the Collection; all collected at M'fongosi, Zululand, October, 1911, by W. E. Jones.

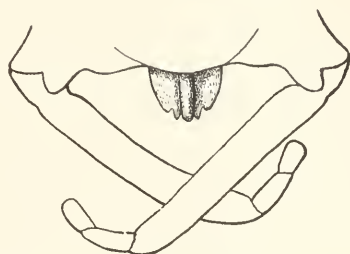


FIG. 12.—Forceps of *Ecdyurus péringueyi*. ♂.

I have placed the species in the genus *Ecdyurus*, although with some hesitation. The highly elongated and narrow forewings, the proportion between the length of the tarsi and tibiae and the shape of one of the claws, which is curved and plainly pointed, make in some degree the place of the species difficult to determine. The proportion between the length of tarsal joints is the same as in the genus *Ecdyurus*; but the pale colour gives the species much likeness to a species of *Heptagenia*. In "A Revisional Monograph of Recent Ephemeridae or Mayflies" (Trans. Linn. Soc., Lond., 1881), p. 309, A. E. Eaton mentions a specimen (♀) of *Ecdyurus*, taken by R. Trimen at Paarl. He says that the specimen "has a superficial likeness to species of *Heptagenia*, but differs therefrom in the proportion of its legs."

9.—*South African Trichoptera*.—By GEORG ULMER.

(With 1 Figure.)

THROUGH the friendly mediation of Mr. Esben Petersen I obtained a small number of *Trichoptera* from the South African Museum, Cape Town, for investigation. With one exception the specimens collected were already known, although six had hitherto not been proved to be South African, but had only been recorded from Equatorial Africa. Up to the present the following species from South Africa were known :—

1. *Dipseudopsis capensis*, Walk.
2. *Dipseudopsis fasciata*, Brau.
3. *Chloropsyche maxima*, Ulm.
4. *Polymorphanicus bipunctatus*, Brau.
5. *Aethaloptera dispar*, Brau.
6. *Macronema capense*, Walk.
7. *Molanna triangularis*, Hag. (case and larva only).

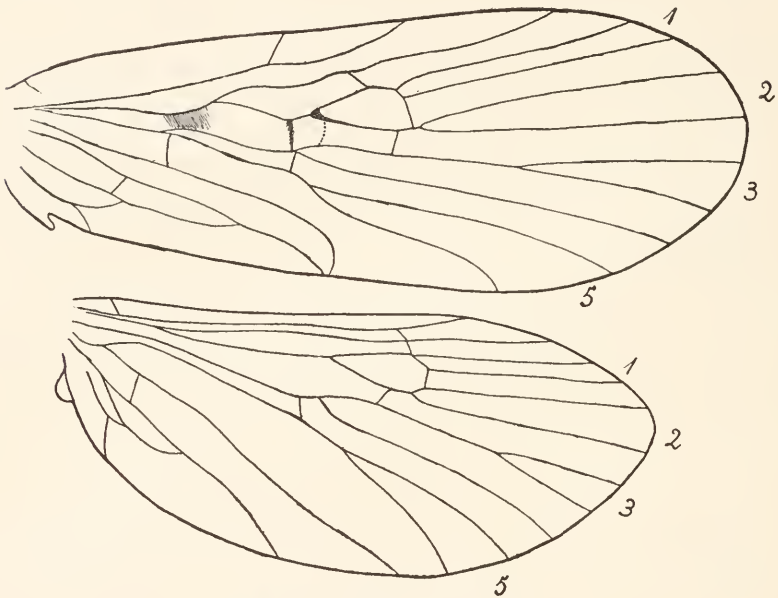
In addition to several specimens of the genera *Chimarrha*, *Hydropsyche*, and *Leptocerus*, which could not be specifically identified, the collection contains the following species :—

GEN. CHIMARRHA, Curt.

1. CHIMARRHA RUFICEPS, n. sp.

Head, pronotum, and mesonotum light red, with dense golden-red pubescence, metanotum blackish brown; under surface of head and of the whole sternum pale red. Abdomen black, dull, at the lateral line grey-black. Antennae incomplete, but probably shorter than the anterior wings, thin, black, with indistinct yellowish brown rings, the basal joint reddish yellow. Maxillary palps blackish, the first two joints and the base of the third greyish brown; first joint very short; second joint long, with a stiff bundle of grey-brownish bristles; third joint very long, almost twice as long as the second; fourth joint somewhat shorter than the second; fifth joint as long as

the third. Labial palps hidden, blackish, the first two joints fairly short, the third as long as the two together. Legs yellowish red, the tibiae and tarsi blackish (those of the posterior legs more brownish black). Wings (figured) with greyish brown membrane and greyish black, fairly dense pubescence; veins dark brown, marginal cilia blackish. The neuration is similar to that of *Wormaldia fallax*, Ulm. (cf. Deutsche Zentralafrika-Expedition, iv., 1912, p. 84, fig. 5), the veins in the region of the discoidal cell still



Chimarrha ruficeps, n.sp. Wings.

more strongly curved; subcosta behind the costal transverse vein little curved; radius already strongly bent before the junction of the sector, curved S-shaped behind it, and again curved at the point of junction of the transverse vein with the discoidal cell; thyridium cell likewise distinctly curved; between the subcosta and radius near the base a transverse vein; discoidal cell broad, blunt at the base (the veins there thickened); median cell as long as, but much narrower than, the discoidal cell; thyridium cell very narrow, nearly one and a half times as long as the latter; the naked cell very distinctly marked, bordered basally by a thickened vein-like ridge; the membrane more strongly chitinised between the radius and the base of the thyridium cell. Fork 1 sessile, fork 2 with very

short stalk (the stalk sometimes somewhat longer than in the figured example), fork 3 with long stalk, fork 5 with short stalk. Discoidal cell of hindwing (which is somewhat iridescent) as long as, but somewhat narrower than, in the front wing; forks 1 and 2 sessile, 3 and 5 stalked. ♀ without ovipositor, ♂ unknown. Length of body, 7 mm.; length of front wing, 10 mm.; span of wings thus about 22 mm.

Material: 3 ♀ ♀; M'fongosi, Zululand, W. E. Jones, November and December, 1911.

2. *POLYMORPHANISCUS BIPUNCTATUS*, Brau.

Material: 1 ♀; M'fongosi, Zululand, W. E. Jones, November, 1911.

3. *CHLOROPSYCHE MAXIMA*, Ulm.

Material: 1 ♂; Cape, Prieska, Miss Orpen.

4. *PROTOMACRONEMA PUBESCENS*, Ulm.

Material: 1 ♂; M'fongosi, Zululand, W. E. Jones, September, 1911.

5. *LEPTONEMA OCCIDENTALE*, Ulm.

Material: 3 ♂ ♂, 1 ♀; Barberton, Transvaal, Miss H. Edwards, November and December, 1911. These specimens appear to be somewhat darker than the Kamerun examples which I saw some years ago.

6. *HYDROPSYCHE PROPINQUA*, Ulm.

Material: 2 ♂ ♂ (one with injured abdomen); M'fongosi, Zululand, W. E. Jones, September, 1911.

7. *HYDROPSYCHODES DIMINUTA*, Walk.

Material: Numerous ♂ ♂ and ♀ ♀; Henkries, Bushmanland, R. M. Lightfoot, October, 1911; Smithfield, Orange Free State Province, Kannemeyer, 1910; St. Mathew's, King William's Town Division, Cape Province, R. M. Lightfoot, April, 1894; M'fongosi, Zululand, W. E. Jones, October, 1911. Some specimens show a strongly marked, light coloured, spotted design on the front wings, especially at the margins.

8. *TRIAENODES ELEGANTULA*, Ulm.

Material: 4 ♂ ♂, 3 ♀ ♀ (? the abdomens injured); M'fongosi, Zululand, W. E. Jones, March, September, and November, 1911.

- 10.—*Description of a New Species of Pselaphidae (Colcoptera) from South Africa.*—By A. RAFFRAY.

TRIBE UTENISTINI

GEN. EPICARIS, Reit.

EPICARIS CRASSICORNIS, sp. n.

OBLONG, attenuate in front, totally ferruginous red with broadly scattered whitish scales. Head narrow and long, convex, antennal tubercle large, cordiform, foveate at base, tempora fasciculate. Eyes large, prominent. Palpi large, joint 2 elongate, thickening towards the apex; 3 ovate; 4 thicker, slightly pyriform and rounded at tip; 3 and 4 have a long pencil of hairs. Antennae robust, gradually thickening, articles 2-8 moniliform, 9-10 ovoid, 10 nearly half again as thick as the 9. Prothorax larger than the head, convex, slightly conical, fasciculate on each side of the base. Elytra longer than broad, strongly attenuate towards the base, sides oblique, rounded before the apex, shoulders slightly raised, hind border fasciculate and depressed in the centre, raised at the suture, on each side there is a sutural stria and a dorsal, both nearly entire. Abdomen shorter and narrower than the elytra, with a very broad border, first and second tergites large, equal, convex, the first slightly obliquely impressed on each side. Femora thickened; tibiae straight, somewhat slender, suddenly thickened at apex. Metasternum furrowed.

Length, 3.20 mm.

This species differs from *E. ventralis*, Raffr., from Abyssinia, and occurring also in Senegal, in the following points: larger size; last joint of palps much thicker; antennae much thicker and not distinctly club-shaped; elytra shorter, much more rounded behind, and more attenuate in front.

Hab. Transvaal (Pretoria).

11.—*Contributions to the Crustacean Fauna of South Africa.*—
By K. H. BARNARD, M.A., Assistant.

(Plates XVII.—XXIV.)

NOTE.

In deference to Mr. Stebbing, I make the following alterations in the gender of the specific names so as to bring them into conformity with the names on the plates :—

p. 201, for *Gnathia africana*, n.sp., read *Gnathia africanus*, n.sp.

p. 203, for *Idotea metallica*, Bosc., read *Idotea metallicus*, Bosc.

p. 204, for *Engidotea lobata* (Miers) read *Engidotea lobatus* (Miers).

Where the gender of the generic name is doubtful, the uniform plan of making the specific name masculine is advantageous, but I do not bind myself to extend the principle to *all* specific names, whether the gender of the genus is doubtful or not; unless of course the principle be adopted generally by scientists in all branches of zoology.

I wish to express my thanks to Mr. Stebbing for kindly passing the plates through the press.

K. H. B.

5th February, 1914.

-
1896. ,, G. O. Sars, Crust. Norw. ii. pt. 1, p. 10.
1900. ,, Stebbing, in Willey's Zool. Res. pt. 5, p. 613.

11.—*Contributions to the Crustacean Fauna of South Africa.*—

By K. H. BARNARD, M.A., *Assistant.*

(Plates XVII.—XXIV.)

I.—ADDITIONS TO THE MARINE ISOPODA.

(Plates XVII.—XXIV.)

THE following paper contains descriptions of thirteen species and one variety of Marine Isopods, all from the collections in the South African Museum. One genus, ten species, and one variety are described as new. One species, known only from a dried specimen in the British Museum without locality, also requires the institution of a new genus. The males of two species, of which only the females were previously known, are described for the first time.

In addition the records of four species already known, but which were omitted from the General Catalogue of South African Crustacea (Stebbing, Ann. S.A.M. vol. vi. pt. 1, 1910) are inserted.

A note of the occurrence of *Iais pubescens* (Dana) and the description of the male will be incorporated in a future paper along with the notes on the Sphaeromid hosts which it inhabits.

To Rev. T. R. R. Stebbing, F.R.S., are due my very best thanks for his kindly advice on several points and the addition of references which I had overlooked.

FAMILY TANAIIDAE.

1853. *Tanaidæ* (part), Dana, U.S. Expl. Exp. vol. 13, p. 792.
1886. „ Norman and Stebbing, Tr. Zool. Soc. Lond.
12, p. 102.
1896. „ G. O. Sars, Crust. Norw. ii. pt. 1, p. 10.
1900. „ Stebbing, in Willey's Zool. Res. pt. 5, p. 613.

GEN. TANAIS, Audouin and M. Edwards.

1828. *Tanais*, Audouin and M. Edwards, Précis d'Entomologie, vol. 1, p. 46, pl. 29, fig. 1.
1832. *Anisocheirus*, Westwood, Ann. Sci. Nat. vol. 27.
1836. *Zeuxo*, Templeton, Tr. Entom. Soc. vol. 2, p. 201.
1843. *Crossurus*, Rathke, Fauna Norwegens, p. 35.
1886. *Tanais*, Beddard, Challenger Rep. vol. 17, pt. 48, p. 119.
1905. „ Stebbing, in Herdman's Ceylon Pearl Fish. Suppl. Rep. 23, p. 2.
1905. „ Richardson, Bull. U.S. Nat. Mus. No. 54, p. 7.

TANAIS SPONGICOLA, n. sp.

(Plate XVII. A.)

Body evenly cylindrical, smooth with the exception of a few hairs along the anterior margins of the peraeon segments.

Head longer than its greatest width, eyes small but distinct, situated on and forming the antero-lateral angles, front margin between them flatly angular.

First segment of peraeon visible only at sides, second (first free) segment narrow, the following ones gradually increasing in length, but in none of them does the length equal the breadth, none of the side-plates except the first as long as their respective segments, the first acutely produced anteriorly.

Pleon composed of 6 distinct segments, lateral margins rather densely setose, 4th and 5th segments not markedly narrower than 1st-3rd, 6th segment broader than long, apex rounded, with 3-4 setae, a median groove on postero-inferior face.

First antenna, 1st joint 5 times as long as broad, 2nd joint a little more than one-fourth length of 1st, 3rd joint one-third length of 2nd, 4th joint (= flagellum) minute, with strong brush of setae.

Second antenna about as long as first antenna, 1st joint a little longer than 3rd, its margins minutely serrulate, 2nd joint a little shorter than 4th, which is half the length of 3rd, 5th joint minute, with strong brush of setae.

Upper lip bluntly rounded, with thick fringe of setae, epistome narrow, strongly calcified.

Lower lip, outer lobes indented on exterior margin, lower portion spinulose on margin, apex with a minute setulose "palp," inner lobes as long as but not as broad as outer, evenly rounded, apices setulose.

Mandibles stout, apex bifid in the left mandible, in the right entire, with 2 minute spines on inner side a little below apex, molar prominent, denticulate.

First maxilla, masticatory lobe curved, outer margin serrulate, apex with ca. 9 non-serrate spines and a bunch of setae external to them, backward-bent "palp" ending in several setae (3-8).

Second maxilla tooth-like, apparently only 1-jointed, with broad basal portion, distal half suddenly narrowed, pointed.

Maxillipeds, 1st joint short with 3 long spines on inner margin, 2nd joint stout, $1\frac{1}{2}$ times as long as broad, outer margin distally serrulate, 3rd and 4th joints subequal, outer margin of 3rd joint serrulate, 5th joint a little longer, 6th joint narrow, with apical setae, inner plate reaching to middle of 4th joint, apex rounded, setose, inner apical angle with 1-2 long curved setae (coupling-hooks), epipod apparently absent (6 specimens were examined and no trace of it could be found).

First gnathopod ♂, thumb of propodos with incisive edge extending from apical tooth to hinge, where it ends in a prominent tubercle, at distal end a row of setae along its base, finger strongly curved, very slightly thickened before the apical tooth, which fits within that on the thumb.

First gnathopod ♀, not quite so stout as in ♂, thumb of propodos with the incisive edge extending from apical tooth half-way along thumb, a small setiferous tubercle near hinge, finger not much curved, slightly bulbous at base internally, with apical tooth fitting within that on the thumb.

Second gnathopod ♂, ambulatory, 2nd joint longest, 3rd joint shortest, 4th joint shorter than 5th, which is a little over half length of 2nd, 6th slender bearing a slender spiniform unguis as long as itself.

Second gnathopod ♀, similar but not so elongate.

First and second peraeopods, stouter and longer than second gnathopod, 2nd joint cylindrical, 3 times as long as broad, 3rd joint half length of 2nd, 4th joint a little shorter, with ca. 6 strong apical spines, 5th joint equal to 3rd, 6th joint with its slender nearly straight unguis half length of 5th, posterior margins of 3rd, 4th, and 5th joints serrulate.

Third-fifth peraeopods stouter than 1st and 2nd peraeopods, 2nd joint fusiform, twice as long as broad, 3rd and 4th joints subequal, shorter than 5th, 3rd joint with 1 apical spine on inner margin, 4th joint with ca. 6 strong apical spines, 6th joint rather more than half length of 2nd, with a strong falciform unguis.

Marsupial pouches arising from bases of peraeopods 3, and extending from segment 4 to segment 7.

First and second pleopods, outer margin of peduncle with 5 plumose setae, inner ramus smaller than outer with 3 plumose setae on its inner margin (away from outer ramus) and an apical spine-seta.

Third pleopods similar, but peduncle has only 2 setae, and inner ramus only 1 seta.

Uropods as long as last 3 pleon segments combined, 6-pointed, the 1st joint considerably stouter than the rest, 6th joint minute, with long terminal setae.

Length: 5.5 mm.

Colour: Whitish with slaty-grey mottlings, the head and a medio-dorsal spot on the peraeon segments markedly darker than the rest of the body.

Locality: St. James, False Bay. 29/4/12. (Coll. K.H.B.) In holes in encrusting sponges (*Halichondria*) and compound Ascidians, low tide. ♂♂ and ♀♀ (with ova). (S.A.M. No. A2105.)

This species belongs to *Tanais* sensu lato, in that it has 6 pleon segments and not 5 as in *Tanais* sensu stricto (Sars, 1896). In general shape and the possession of 6-jointed uropods it resembles most nearly *T. normani*, Richardson, 1905, but differs in the form of the first gnathopods of the male: *T. normani* has the finger and thumb not widely separated (*i.e.*, the finger is not strongly curved), whereas in *T. spongicola* they are widely separated, as is the case in *T. robustis*, Moore, 1894. The 6-jointed uropods distinguish it also from *T. gracilis*, Heller, 1866.

FAMILY GNATHIIDAE.

1880. *Gnathiidae*, Harger, Rep. U.S. Comm. Fish. pt. 6, p. 408.
 1886. *Anceidae*, Beddard, Challenger Rep. vol. 17, p. 135.
 1897(-1899). *Gnathiidae*, G. O. Sars, Crust. Norw. ii. p. 50.
 1901. *Gnathiidae*, Dollfus, Bull. Soc. Zool. France, xxvi. p. 240.
 1905. „ Richardson, Bull. U.S. Nat. Mus. No. 54, p. 55.
 1909. „ id. Proc. U.S. Nat. Mus. vol. 35, p. 483.
 1913. „ Stebbing, Trans. Zool. Soc. London, vol. 20, pt. 4, p. 231.

GEN. GNATHIA, Leach.

1814. *Gnathia*, Leach, Edinb. Encycl. vol. 7, p. 402.
1855. *Anceus*, Hesse, Comptes rendus, Novembre 26.
1858. ,, id. Ann. Sci. Nat. ser. 4, vol. 9, p. 93.
1863. ,, id. Mém. Savants étrangers, vol. 18, pp. 262, 268.
1874. *Ancaeus*, id. Ann. Sci. Nat. ser. 5, vol. 19, Art. 8, p. 8.
1885. *Anceus*, Haswell, Proc. Linn. Soc. N.S.W. vol. 9, pt. 4,
p. 1005.
1886. ,, Beddard, l.c. p. 135.
1900. *Gnathia*, Stebbing, in Willey's Zool. Res. pt. 5, p. 625 (with
synonymy).
1902. ,, Hodgson, Nat. Hist. of the "Southern Cross," p. 241.
1905. ,, Stebbing, in Herdman's Ceylon Pearl Fish. Suppl.
Rep. 23, p. 8.

GNATHIA AFRICANA, n. sp.

(Plate XVII. B.)

Head broader than long, with 2 diverging ridges running from the middle of posterior margin to the antero-lateral angles, having above the eyes one prominent tooth and some minor crenulations; in front of these ridges the head is concave, anterior margin slightly convex and divided apically into 2 bifid lobes with a tuft of setae at their base.

Peraeon, second segment not quite equalling the greatest breadth of head, laterally quadrate (viewed dorsally), third segment laterally rounded, posterior margin excavate, fourth segment separated from third by a marked constriction, divided dorsally into two halves by a longitudinal depression, fifth segment undivided, sixth segment nearly three times as long as any of the other segments, narrow at base and widening distally, deeply concave between the rounded postero-lateral angles, seventh segment inconspicuous.

Pleon almost equalling peraeon in length, telsonic segment as broad as long, apex pointed, with 2 setae.

Larva of the usual form, the fourth and sixth peraeon segments indicated dorsally and laterally on the enlarged portion by stronger and more deeply coloured cuticle, fifth segment only indicated at the sides.

First antenna ♂, 1st joint longer than 2nd, 3rd joint longer than 1st, flagellum with 1st joint very short, 2nd joint longest, last three small, inconspicuous, with sensory filaments.

Second antenna ♂, a little longer than first antenna, 3rd and 4th joints longest, setose, flagellum 7-jointed, sparsely setose.

Mandibles ♂, arcuate, inner margin below the smooth upturned apex with about 5 blunt teeth, a well-marked notch on outer margin.

Maxillipeds ♂, 2nd joint not produced distally, 4th joint of palp not incurved, outer margin with stiff setae.

Gnathopod ♂, 1st joint tapering, inner margin setose, 2nd joint small with apical tuft of setae.

Peraeopods all similar, rather stout, 4th and 5th joints expanded on front margin, 4th joint more so than the 5th; 3rd, 4th, and 5th joints have prominent tubercles on posterior margin, 6th joint as long as 3rd, with 2 groups of 3 blunt tubercles and 1 blunt spine on inner margin, 7th joint half length of 6th with minute tooth at the base of the prominent unguis.

Pleopods, rami longer than peduncle, rami of first pleopods narrower than the others, all tipped with long setae.

Uropods, outer ramus a little shorter and narrower than inner, both with long setae.

In the larva the mandibles are rather pointed, inner margin straight with the denticulations increasing in size proximally.

First and second maxillae are simple curved appendages, the first shorter than the second.

Maxillipeds well developed, half-way along inner margin of the large basal joint is a narrow blunt lobe, and at the apex two small lobes, the outer blunt and tipped with setae, the inner pointed, with three minute teeth on its inner margin.

Gnathopod short, apparently only 3-jointed with a strong falciform unguis; the 1st, 2nd, and 3rd joints are denticulated on inner margin, the points of the denticulations facing proximally, those on 2nd joint sharper and more distinct than the others.

Length: ♂ 4 mm.; larva 3.5 mm.

Colour: Yellowish grey, with darker mottlings along margins of head and on dorsal parts of peraeon and pleon.

Locality: St. James, False Bay. 29/4/12. (Coll. K.H.B.) One ♂ and 2 larvae on Holothurians in rock-pools, low tide. (S.A.M. No. A2553.)

Mr. Stebbing has favoured me with the following note on the affinities of this species:—

“*Anceus forficularius*, Risso, 1816, *Anceus rapax*, Milne Edwards, 1840, and *Anceus vorax*, Lucas, 1849, all make a near approach to the present form, but offer more or less trustworthy marks of distinction.”

FAMILY IDOTEIDAE.

For synonymy see Stebbing, S. Afr. Crust. pt. 1, p. 51, 1900, and pt. 2, p. 55, 1902.

GEN. IDOTEA, J. C. Fabricius.

1798. *Idotea*, Fabricius, Suppl. Ent. Syst. p. 302.
1881. „ Miers, Journ. L. S. Lond. vol. 16, p. 19. (Synonymy.)
1910. „ Stebbing, Gen. Cat. S. Afr. Crust. Ann. S.A. Mus. vol. vi. pt. 4, p. 432.

IDOTEA METALLICA, Bosc.

1802. *Idotea metallica*, Bosc. Hist. Nat. Crust. vol. 2, p. 179, pl. 15, fig. 6.
1840. „ *rugosa*, M. Edw. Hist. Nat. Crust. vol. 3, p. 131.
1846. „ *robusta*, Kröyer, Naturh. Tidsskr. (2) vol. 2, p. 108.
1847. „ *compacta*, White, List. Crust. Brit. Mus. p. 95.
1853. „ *argentea*, Dana, U.S. Expl. Exp. vol. 14, p. 698, pl. 46, fig. 1.
1881. „ *metallica*, Miers, Journ. L. S. Lond. vol. 16, p. 35. (Further synonymy.)
1905. *Idothea metallica*, Richardson, Bull. U.S. Nat. Mus. No. 54, p. 362, figs. 392, 393.

(Omitted from the Gen. Cat. S. Afr. Crust. 1910.)

A cosmopolitan species. The Paris Museum possesses a series from the Cape of Good Hope (teste Miers).

Cape Point NE. 28 miles. Surface. Flesh Point W. by N. $\frac{1}{2}$ N. distant $4\frac{1}{2}$ miles. Surface. s.s. "Pieter Faure." 24/6/03 and 30/12/03.

One specimen cast on beach at Chinde, mouth of the Zambezi. 29/10/12. (Coll. K.H.B.)

ENGIDOTEA, n. g.

Side-plates distinct in all peraeon segments except the first, and as long as their respective segments. Pleon consisting of two segments with two pairs of lateral sutures. Second antennae with multiarticulate flagellum. Maxillipeds 7-jointed. Inner plate of first maxilla with two plumose setae. Uropods with only one branch.

Resembles *Glyptidotca* in the character of the side-plates, and

Paridotea as regards the composition of the pleon; but differs from both in having only two plumose setae on the inner plate of the first maxilla.

ENGIDOTEA LOBATA (Miers).

(Plate XVII. C.)

1847. *Idotea lobata*, White, List. Cr. Brit. Mus. p. 95, *descript. nulla.*

1881. „ „ Miers, J. Linn. Soc. Lond. vol. 16, p. 57, plate ii.
figs. 8, 9.

Described from one dry specimen in the British Museum, without locality.

Two specimens, 1 ♂ and 1 immature (♀?), in the South African Museum (No. 8824) agree with Miers' description, except in a few minor details, which may be due to their larger size.

First antenna reaches only to the extremity of the ante-penultimate pedunculär joint of second antenna, flagellum with ca. 15 groups of setae.

Second antenna extends only to the posterior margin of second peraeon segment; flagellum in the smaller specimen 10-jointed, in the larger 12-jointed.

The mouth parts, not described by Miers, are as follows:—

Epistome transverse, hardly flanking the labrum, which is twice as broad as long, with hairs on the rounded angles but not in the centre.

Lower lip, lobes quadrate, inner angles rounded, with stout setae and smaller setules.

Mandibles, short and stout, cutting edge with 4 teeth, secondary cutting edge with 3 teeth, molar denticulate, spine-row with ca. 5 plumose spines.

First maxilla, outer plate with 10 spines, inner plate with 2 plumose setae and a minute setule.

Second maxilla is remarkable in having only 2 lobes (in both specimens), the outer with 5–6 minutely serrate spines, the inner with about 12 spines and, on the inner apical angle, 2 long stout plumose setae.

Maxillipeds 7-jointed, 7th joint much smaller than 6th, inner plate with about 10 apical spines and one strong coupling-hook, epipod lanceolate, slightly curved inwards.

First peraeopods (gnathopods), 6th joint with 2 stout serrate spines on inner margin; 6th joint of the other peraeopods with one serrate spine before the middle. Seventh joint in all the peraeopods strongly biunguiculate.

Male stylets on 7th peraeon segment contiguous, straight, slightly narrowed distally, with blunt apices.

First and second pleopods with 6 hooked setae on inner apex of peduncle.

Penial filament on the second pleopod nearly half as long again as rami.

No plumose seta representing the outer ramus of the uropod.

Length: 17 and 13 mm.; *breadth*: 6 and 5 mm.

Colour: In spirit, straw-colour, with minute dots, chiefly visible on the side-plates and pleon. A dark narrow medio-dorsal streak on peraeon, dividing on segments 1, 4, 7 to enclose an oval space rather lighter than the rest of the ground-colour.

Locality: St. James, False Bay, on seaweed in rock-pools. (Dr. W. F. Purcell and Mrs. Purcell, Feb.-April, 1901.)

GEN: SYNIDOTEA, Harger.

For synonymy see Stebbing, S. Afr. Crust. pt. 2, p. 59, 1902.

SYNIDOTEA SETIFER, n. sp.

(Plate XVIII. A.)

Body nearly parallel-sided, but tapering posteriorly, smooth. Head with prominent antero-lateral angles, the margin between them deeply excavate.

Eyes large, prominent.

Side-plates completely fused with their segments; inferior margin of 2nd and 3rd segments strongly angular, of 4th-7th segments straight.

Pleon of two segments, the terminal one slightly narrower than the first, sides slightly convex and converging distally, apex emarginate, lateral angles acute.

First antenna stout, 2nd and 3rd joints not very much more slender than 1st, 4th joint a little longer than 2nd and 3rd combined, narrowing distally and fringed with about 9 tufts of setae, with a longer terminal seta.

Second antenna, ultimate joint of peduncle rather shorter than the two preceding joints combined, flagellum 17-jointed, peduncle with long scattered setae.

Epistome not broader distally than upper lip, which is rather asymmetrically bilobed at the apex and fringed with long setae.

Lower lip as in *S. hirtipes*, inner margin strongly fringed.

Mandibles, cutting-edge in the left 4-toothed, in the right 3-toothed, secondary cutting-edge 3-toothed, stronger in the left than in the right, spine-row with 7 serrate spines in both mandibles, molar prominent, denticulate, with setae on posterior margin.

First maxilla, outer plate with 10 not very stout, serrate spines, inner plate with 2 long plumose setae.

Second maxilla as in *S. hirtipes*.

Maxillipeds as in *S. hirtipes*, but the epipod is symmetrically bevelled off on both inner and outer margins, instead of having an inward sloping apical margin.

Peraeopods with long scattered setae, uniunguiculate. First peraeopods (gnathopods) rather stouter than the others, 5th joint with two small and indistinct tubercles on anterior margin, 6th joint expanded. Peraeopods 2-7, 5th and 6th joints with 3-4 tubercles on anterior margin. Peraeopods 6 and 7, 6th joint with 2 strongly serrate spine-setae at the apex of inner margin.

Uropods, peduncle without oblique ridge, ramus not more than one-third length of peduncle, as broad as long, apex transversely truncate, outer angle rounded, 3 long plumose setae at outer apical angle of peduncle.

Length: 15 mm.; *breadth*: 4 mm.

Colour: In spirit, dull pinkish.

Locality: 33° 3' S. lat. 27° 57' E. long. 32 fathoms. s.s. "Pieter Faure." 28/12/98.

One specimen, apparently an immature ♀. (S.A.M. No. A20.)

FAMILY ASTACILLIDAE.

To the list of references given by Stebbing: S. Afr. Crust. pt. 4, p. 50, 1908 (Ann. S.A.M. vol. vi. pt. 1), may be added:—

1911. *Arcturidae*, Koehler, Bull. Inst. océan. Monaco, No. 214, p. 1.

GEN. ARCTURUS, Latreille.

1829. *Arcturus*, Latreille, in Cuvier, Règne Animal, 2nd ed. iv. p. 139.
 1886. „ Beddard, Challenger Rep. vol. 17, p. 85.
 1893. „ Stebbing, Hist. Crust. p. 370.
 1904. „ Whitelegge, Sci. Res. Exp. "Thetis," pt. 7, p. 406.
 1905. „ Richardson, Bull. U.S. Nat. Mus. No. 54, p. 327.
 1910. „ id. Proc. U.S. Nat. Mus. vol. 37, p. 97.

ARCTURUS (?) CORNIGER, Stebbing.

1873. *Arcturus corniger*, Stebbing, Ann. Mag. Nat. Hist. (4), xii.
p. 96, pl. 3a, fig. 2.

1908. „ „ id. S. Afr. Crust. pt. 4, p. 51.

Locality: Port Elizabeth.

This species (which was omitted from the General Catalogue of S.A. Crustacea, Stebbing, 1910) bears a strong likeness to the species of *Arctuopsis* as regards the relative size of the 4th peraeon segment. The "marsupial pouch of the fourth segment has a row of tubercles below the hinge-line," but the number of pairs of marsupial pouches is not given.

The pleon, judging from the figure, consists of one segment with lateral indications of another fused with it.

The male is unknown, unless it is perhaps the following species, which was taken at same place and time.

Stebbing (l.c.) remarks that this species should probably be referred to *Arcturella*, but this was before Koehler instituted *Arctuopsis*. Its true position can therefore only be ascertained by the discovery of the male and the determination of the absence or presence of the ♂ appendage on the 3rd (or 5th) peraeon segment.

ARCTURUS (?) LINEATUS, Stebbing.

1873. *Arcturus lineatus*, Stebbing, Ann. Mag. Nat. Hist. (4), xii.
p. 97, pl. 3a, Fig. 3.

1875. „ „ id. ibid. (4), xv. p. 187.

Locality: Port Elizabeth.

(This species was also omitted from the Catalogue).

The sex is not stated. If a female it can hardly belong to the genus *Arctuopsis*, owing to the absence of lateral protuberances on the 4th peraeon segment.

GEN. ARCTUOPSIS, Koehler.

1911. *Arctuopsis*, Koehler, l.c. p. 8.

ARCTUOPSIS HIRSUTUS, n. sp.

(Plate XIX. A.)

Sexual dimorphism, as usual in this genus, well marked. Head smooth in ♂, in ♀ with 2 setiferous tubercles between the eyes and

2 rather larger ones just behind these, anterior margin semicircularly excavate, antero-lateral angles subtruncate, eyes prominent, subtriangular, dark.

Peraeon segments 1-3 subequal in length, smooth in ♂, in ♀ with 1 median setiferous tubercle. The first segment has the antero-lateral angles produced almost to the vertical from the hind margin of the eyes, where it meets a downward projection of the head (cheek).

Fourth peraeon segment in ♂ 6 times as long as 3rd, cylindrical, smooth with low inconspicuous median tubercle on posterior margin, in ♀ not quite 6 times as long as 3rd, broadest in front where the lateral margins are expanded to form a tubercle, posteriorly the margin forms an expanded denticulated wing, dorsum with 2 large setiferous bosses in front, behind these a blunt median spine and on the posterior margin 2 longer blunt spines. These spines are usually very feebly setose, especially the median one, but in the single specimen from False Bay all three bear strong tufts of setae.

Peraeon segments 5-7 larger than the first three, the 5th rather larger than 6th or 7th, smooth in ♂ with low median tubercles, in ♀ with stronger setiferous tubercles.

Side-plates not marked on first segment, on the 2nd and 3rd small in ♂ but large and tubercular in ♀, on the 4th small and indistinct in both sexes, on 5th 6th and 7th large and tubercular in both sexes.

The above applies to the ovigerous ♀. The young ♀ has less prominent non-setose dorsal tubercles.

Pleon composed of 3 short basal segments and the long telson, all completely fused, the junctions being marked by furrows only, smooth and glabrous in both sexes.

First antenna, reaching almost to the middle of 3rd joint of second antenna, 1st joint broad, bluntly produced on inner margin, 2nd and 3rd joints subequal, flagellum as long as peduncle, broadest a little way from base, then tapering to a blunt apex, with apical tuft of setules, and long marginal sensory filaments ca. 15 in ♂, ca. 10 in ♀.

Second antenna, 1st and 2nd joints short, 3rd joint equal to 1st and 2nd together, 5th joint equal to 2nd and 3rd together, 4th joint a little longer, inner and lower surfaces of 3rd and, to a less extent, 4th joints with short blunt tubercles in ♂, smooth in ♀, flagellum half length of 5th peduncular joint, its 1st joint long, 2nd joint one-quarter length of 1st, 3rd joint one-third length of 2nd, junction between 2nd and 3rd obscure, 3rd joint bearing a strong apical

tooth, inner margins of all 3 joints with close-set sharp teeth and a few scattered setae.

Epistome not broader than upper lip, which is twice as broad as long and asymmetrically bilobed, with fringe of setae.

Lower lip, lobes short and stout, apices rounded truncate. Mandibles, cutting-edge quadridentate, secondary cutting-edge tridentate in left, bidentate in right, spine-row with 3 spines in left, 2 in right, molar prominent, bifid and strongly denticulate in right, entire in left.

First maxilla, inner plate with 3 stout plumose setae and a minute spinule, outer plate with 9 spines serrate on their outer edges.

Second maxilla, outer plate with 4 serrate spines, narrower than middle plate which has 5 serrate spines, inner plate nearly twice as broad as other two plates together, with numerous plumose setae.

Maxillipeds ♂, 4th 5th and 6th joints expanded internally, 7th joint short and stout, inner plate truncate, with 1 strong coupling-hook set a little within the inner margin, inner margins when in situ are bent inwards, and fringed with stout plumose setae, epipod ovate, reaching to middle of 4th joint. In the female similar, but 4th 5th and 6th joints are less expanded, the epipod very large, irregular rectangular, reaching to middle of 5th joint, basal joint has a laminar expansion pointing posteriorly and helping perhaps to produce a current of water in the brood chamber. It is present also in the young ♀, but not so strongly developed.

First peraeopod (gnathopod) similar in both sexes, 2nd joint longest, curved, 3rd and 4th joints short with few setae, 5th joint as long as 3rd and 4th together, 6th joint not so long, 7th joint short, blunt, as long as width of 6th, 5th 6th and 7th joints with thick fringe of long setae, some doubly serrate, others simple. Unguis longer than 7th joint.

Second, third and fourth peraeopods, 3rd joint shortest, 4th and 5th joints subequal, 6th longest, no trace of a 7th joint, all joints, especially 4th 5th and 6th, with long simple setae on inner margin.

Fifth, sixth and seventh peraeopods, 2nd joint longest, 4th and 5th joints subequal, 6th joint equal to 3rd, 7th joint half as long as 6th with strong apical tooth, unguis as long as width of 7th joint.

Marsupial plates developed on 1st 2nd 3rd and 4th peraeopods, 1st pair distinct in young ♀ as well as in ovigerous ♀, lanceolate, 2nd and 3rd pairs shorter and broader, 4th pair large, posterior margin with short inset lobe, 2 or 3 setiferous tubercles below hinge-line. The young ♀ has shorter marsupial plates, the 4th pair being

very shallow and not expanded. In the specimen from False Bay the tubercles are absent.

The male appendage on 3rd peraeon segment in both young and adult takes the form of a low button-like protuberance, posteriorly bilobed.

The male stylet on 7th peraeon segment only slightly tapering, with blunt apex.

First pleopod, peduncle with obliquely transverse row of 5 plumose spine-setae near base, rami a little longer than peduncle, broadest distally, outer ramus with 3 strong plumose setae near base, both margins and apex with long plumose setae, outer margin (next outer ramus) of inner ramus without setae. In ♀ only the apices are setose.

Second pleopod ♂, peduncle stouter than in first pleopod, with transverse row of ca. 5 spines at about the middle, rami longer than peduncle, penial filament longer than ramus, very narrow and deeply bifurcate at apex. (This seems to be more correct than describing it as ending in 2 long setae.)

Third-fifth pleopods ovate-lanceolate.

Uropods, elongate lanceolate, proximal end rounded, distal end tapering, distal part of hinge margin fringed with plumose setae, exposed ramus triangular, longer than broad, minutely setulose all round, without spine, concealed ramus two-thirds length of exposed ramus, and rather over one-third its width, with 2 long apical setae.

Length ♂ : 12 mm.; ♀ : 10 mm. Second antennae ♂ : 8 mm.; ♀ : 6 mm.

Length of ♀ from False Bay : 8 mm.

Colour : In spirit, yellowish white.

Locality : 10 miles N. of Robben Island, Table Bay. 28 fathoms. ♂♂ and ♀♀ (with ova and embryos). 28/10/97. False Bay (Seal Island, SW. $\frac{1}{2}$ S. distant $\frac{3}{4}$ mile). 11 fathoms. 1 ♀ with embryos. 12/11/02. s.s. "Pieter Faure." (S.A.M. Nos. A54 and A53.)

This species is very near *Arcturus corniger*, Stebbing. This latter, however, has 6 tubercles (2 median, 1 anterior pair and 1 posterior pair) instead of 5 on the 4th peraeon segment; the body is not setose; and the marsupial plate on the 4th segment has a row of tubercles (6 in the figure) below the hinge-line.

I have placed this species in the genus *Arcturopsis* on account of its general shape and the presence of an appendage on the 3rd peraeon segment in the ♂. This last feature Koehler says is

absolutely characteristic of his genus. He is also equally positive that the 4 species which he assigns to it have only 3 pairs of marsupial plates in the ♀. But the present species has 4 pairs distinct both in the ovigerous and the young females.

It would seem that this character by itself is not enough to delimit the genera of *Astacillidae*; for in *Astacilla* it is stated that there is only 1 pair, attached to the 4th segment (Stebbing, 1893, Sars, 1897, Richardson, 1905), while in 1910 Richardson corrects her previous statement and says there are 2 pairs in *A. granulata*, *caeca* and *dilatata*; and in 1911 Koehler maintains that *A. granulata*, *longicornis*, *deshayesii* and his own *mediterranea* have 3 pairs.

ARCTUOPSIS HIRSUTUS, var. SUBGLABER.

Very similar to the female of *A. hirsutus*, differing only in the following points.

Body less setose. Head with only two tubercles. Peraeon segments 1-3 and 5-7 without medio-dorsal tubercles, the side-plates only being tubercular. Fourth segment with an anterior pair of bosses and a posterior pair of tubercles, lateral tubercles not very prominent, postero-lateral margin not much expanded, not denticulate.

There are four pairs of marsupial plates, of which the fourth has a row of 4 inconspicuous tubercles below the hinge-line.

Uropods, concealed ramus bears 3 long apical spines and 1 short one.

The second antennae are incomplete.

Length: 17 mm.

Colour: In spirit, whitish.

Locality: St. Helena Bay (Paternoster Point SE. $\frac{3}{4}$ S. distant 9 miles). 80 fathoms. 1 ♀ with ova. s.s. "Pieter Faure." 7/3/02. (S.A.M. No. A52.)

I am unwilling to make this a new species in the absence of more material, though the distinguishing characters seem to have more than varietal value. The smaller size and thicker coating of setae of *A. hirsutus* may possibly be due to the warmer water of Table Bay. As noted above, the specimen of *A. hirsutus* from False Bay (*i.e.* from the warm Agulhas current) is smaller and more strongly setose than those specimens from Table Bay. These three forms therefore constitute a series, with a rather wide gap between the Table Bay form and the St. Helena Bay form.

GEN. ANTARCTURUS, zur Strassen.

ANTARCTURUS KLADOPHOROS, Stebbing.

(Plate XVIII. B.)

1908. *Antarcturus kladophoros*, Stebbing, S.A. Crust. pt. 4, p. 53, pl. 32 (where also a discussion of the genus will be found).

Stebbing's description was based on a single female. The following is a description of the male.

Body narrow and cylindrical, without setae.

Head, anterior margin with semicircular excavation, antero-lateral angles blunt, shorter than diameter of the large and prominent eye, inferior margin straight, without cheeks but with 2 small teeth, 2 low blunt tubercles between the eyes and behind these 2 long spines, knobbed at ends and standing on broad boss-like bases. Peraeon segments 1-3 not quite as long as head, subequal, covered with scattered granules, 1st not produced downwards and forwards. Fourth segment as long as head and first 3 peraeon segments together, granular dorsally and ventrally, the largest of the granules tooth-like and pointing backwards, 2 large teeth on posterior margin curving backwards, postero-lateral angles produced into rounded lobes. Sixth and seventh segments rather shorter than fifth, all three granulate.

Side-plates distinct, 5th 6th and 7th triangular, 2nd and 3rd small and not prominent, 1st and 4th forming downwardly produced rounded lobes.

First antenna, 1st joint without spine, flagellum longer than peduncle, with apical setae and 20 marginal filaments in pairs.

Second antenna, 1st joint with 1 blunt tubercle, 2nd joint with 3 on upper surface, 3rd joint with 3 on upper surface and 6-7 on lower surface, 4th joint shorter than 5th, both long and slender with a few setules, flagellum two-thirds fifth joint, 6-jointed, last joint with small apical tooth.

Upper and lower lips as in ♀.

Mandibles as in ♀, spine-row with 3 spines, molar strongly denticulate. First maxilla, outer plate with 11 spines, inner with 3 (2 long and 1 short) plumose setae.

Second maxilla, outer plate with 5 plumose setae, middle one with 3, inner plate with numerous plumose setae.

Maxillipeds as in ♀, inner plate squarely truncate, with plumose setae but no coupling-hook, epipod obovate reaching to end of 2nd joint.

First peraeopod (gnathopod), 5th 6th 7th joints with long doubly serrate setae, distal third of 7th joint suddenly narrowed, unguis one-third length of 7th joint, otherwise as in ♀.

Peraeopods 2, 3, 4 becoming successively longer. In second peraeopod 2nd joint equals 4th, 3rd joint twice length of 5th, all with blunt spines, 6th joint not quite as long as 5th, 7th joint one-quarter length of 6th, tipped with exceedingly long unguis and a much shorter spine, finger and unguis together equal to 6th joint.

Third peraeopod, 2nd joint longer than 2nd joint of peraeopod 2, 3rd and 4th joints subequal, both shorter than 2nd, 5th joint equals 2nd and 3rd together, 6th joint a little shorter, 7th joint and unguis as in peraeopod 2.

Fourth peraeopod, 2nd joint longer than 3rd and 4th together and equal to 5th, 6th joint shorter than 6th in 2nd and 3rd peraeopods, unguis also shorter.

Peraeopods 5, 6, 7 decreasing in length and stoutness, as in ♀, but armature is not so strong, especially on 3rd joint, on which joint in peraeopods 6 and 7 it is obsolete.

Male stylet on 7th peraeon segment lanceolate, sides straight, apex blunt, slightly incurved. There is no appendage on the third or fifth segments.

First pleopod, inner margin peduncle has ca. 12 hooked spines, otherwise as in ♀, except that distal end of exopod is produced outwards, and apex is shallowly trifid.

Second pleopod, peduncle short, rami long obovate, penial filament narrow, strongly curved at base, distally tapering to a single long point reaching to end of the plumose setae on apices of the rami.

Third-fifth pleopods, rami elongate lanceolate.

Uropods as in ♀, but the denticles on the surface are blunter and more granular.

Length: 18 mm.; *breadth*: 1.75 mm.; *depth*: 1.5 mm. Second antenna: 20 mm.

Colour: In spirit, pinkish.

Locality: Cape St. Francis NE. distant 29 miles. 75 fathoms. 2 ♂♂. s.s. "Pieter Faure." 19/2/02. (S.A.M. No. A51.)

NEOARCTURUS, n. g.

Body cylindrical, without bend between 4th and 5th peraeon segments.

Fourth peraeon segment not longer than the third.

Side-plates distinct on all segments (except first?).

Pleon of 4 fused segments.

Second antennae with 3-jointed flagellum.

NEOARCTURUS OUDOPS, n. sp.

(Plates XVIII. C and XIX. B.)

Body granular, without bend between 4th and 5th peraeon segments; head longer than broad, anterior margin excavate, antero-lateral angles blunt, no cheeks, a transverse groove dividing two low rounded and granular dorsal ridges, no eyes.

Peraeon, all the segments about equal in length, the anterior ones being a little longer than the posterior ones, antero-lateral angles of the 1st segment not much produced, the first four segments with two transverse angular dorsal ridges, the anterior of which is smaller than the posterior, the three last segments with one large transverse ridge.

Side-plates distinct on all the segments (including the first?). Pleon of four fused segments, the dividing grooves being distinct, first segment small and short, second large and swollen, the fourth (telson) with lateral subapical wings.

First antenna, 1st joint stout, 3rd joint short and geniculate, flagellum a little longer than 2nd joint, with 6 pairs of sensory filaments and 2 apical setae.

Second antenna, 1st and 2nd joints short, 3rd 4th and 5th becoming gradually more slender, 4th a little longer than 3rd and 5th a little longer than 4th, flagellum as long as 5th joint, 3-jointed, the 2nd joint being the longest.

Upper lip shallow, semicircular, very minutely hirsute.

Lower lip, lobes broad, inner angles excised.

Mandibles, the left strongly angular, cutting-edge tridentate, secondary cutting-edge bidentate, spine-row with 3 spines, molar prominent, quadrate; the right straight, both cutting-edges entire and rather feeble, spine-row with one feeble spine, molar strong, oblique, with setae on posterior surface.

First maxilla, outer plate with 9-10 spines, inner plate with 2 spines and some setules.

Second maxilla, outer and middle plates with 3 spines, inner with numerous spines.

Maxillipeds, 1st joint strong, 3rd joint short, 7th joint short and blunt, 5th 6th and 7th joints with pectinate setae, inner plate with rather sharp inner angle, setose but without coupling-hooks, epipod

lanceolate, reaching to middle of 4th joint, margins smooth. First peraeopod (gnathopod), 3rd 4th and 5th joints short, 6th joint ovate-fusiform, posterior margins of 5th and 6th joints with pectinate setae, 7th joint two-thirds length of 6th, setose, biunguiculate.

Second, third and fourth peraeopods similar to one another except that the 2nd joint is barely longer than 3rd in peraeopod 2, longer in peraeopod 3 and twice as long in peraeopod 4, 3rd and 4th joints short in all three peraeopods, 5th and 6th joints subequal, 7th joint three-quarters as long as 6th, bearing in peraeopods 2 and 3 1 very long and 1 shorter unguis, the longer one nearly twice length of 7th joint, and in peraeopod 4 2 short unguis, the longer of which is not half the length of 7th joint, inner margins of 2nd-6th joints with long setae.

Fifth, sixth and seventh peraeopods similar to one another except that 2nd joint is long and narrow in peraeopod 5, shorter and somewhat ovate in peraeopod 6 and still shorter, strongly ovate and equal to the 3rd joint in peraeopod 7, 4th and 5th joints short, 6th joint with 4 curved spines on hind margin, each spine bearing a little tuft of setules on its outer edge, 3rd and 6th joints subequal, 7th joint shorter than 6th, setose, biunguiculate.

Male stylet on seventh peraeon segment, margins sinuous, apex deeply bifid, the lobes blunt.

No appendage on the 3rd or 5th peraeon segment.

First pleopod, peduncle with ca. 10 teeth on outer margin and 3 hooked spines on inner margin, endopod a little longer than peduncle, with plumose setae, exopod nearly twice length of peduncle, outer margin bearing 5 simple setae followed by 6 plumose setae, after which is a deep incision, the apex is bifid, the outer and longer lobe spoon-shaped, with strong teeth on inner margin and apically hirsute, inner lobe with plumose setae, a setose ridge runs nearly whole length of exopod, ending on the inner margin of the outer lobe.

Second pleopod, peduncle short and broad, outer margin with 2 plumose setae, inner with 3 hooked spines, rami equal, with plumose setae, penial filament rather longer than rami, broadened and bilobed distally, the inner lobe longer and narrower than the outer. Third, fourth and fifth pleopods lanceolate, the endopods of the third and fourth pairs shorter than the exopods.

Uropods elongate lanceolate, proximally rounded, minutely setulose on both margins, outer margin distally with long plumose setae and a short stout spine at the junction with the exposed lobe,

which is triangular and has a minute setule on either side of the terminal spine, concealed lobe very small ending in one long seta.

Length : 5 mm.

Colour : In spirit, whitish.

Locality : Cape Point NE. by E. $\frac{1}{4}$ E., distant $38\frac{1}{2}$ miles. 755 fathoms. 1 ♂. s.s. "Pieter Faure." 23/6/05. (S.A.M. No. A69.)

This form seems to require the institution of a new genus, though the absence of the female is greatly to be regretted.

The composition of the pleon separates *Neoarcturus* from all the other genera except *Arcturoopsis*, *Arcturella* and *Arcturina*; from these it differs in the fourth peraeon segment not being longer than the third, thus resembling *Arcturus*. The latter, however, has more than four joints in the flagellum of the second antennae, whereas this species has only three. *Arcturina* is distinguished by the aberrant structure of the 2nd, 3rd and 4th peraeopods and *Arcturoopsis* by the presence of an appendage on the 3rd (or 5th) peraeon segment in the male.

Lastly, it approaches *Antarcturus* in the absence of coupling-hooks on the maxillipeds and the peculiar first pleopods in the male. The shape of the apex of the exopod of the latter in *N. oudops* can be regarded as an exaggerated and ornate development of that found in *A. kladophoros*.

GEN. PLEUROPRION, zur Strassen.

1902. *Antares*, zur Strassen, Zool. Anz. xxv. p. 687 (nom. preocc.).

1903. *Pleuroprion*, id. ibid. xxvi. p. 31.

1905. ,, Richardson, Bull. U.S. Nat. Mus. No. 54, p. 342.

1908. ,, Stebbing, S. Afr. Crust. pt. 4, pp. 51, 52.

PLEUROPRION CHUNI, zur Strassen.

1902. *Antares chuni*, zur Strassen, Zool. Anz. xxv. p. 687, text-fig. 4.

1903. *Pleuroprion chuni*, id. ibid. xxvi. p. 31.

One ♂ and one ♀ from the Agulhas Bank, 156 metres ("Valdivia") (omitted from the General Catalogue, 1910).

FAMILY STENETRIIDAE.

1905. *Stenetriidae*, Hansen, Proc. Zool. Soc. Lond. 1904, ii. 2. p. 315.

1905. ,, Richardson, Bull. U.S. Nat. Mus. No. 54, p. 439.

GEN. STENETRIUM, Haswell.

1881. *Stenetrium*, Haswell, Proc. Linn. Soc. N.S.W. vol. 5, p. 478.
1886. „ Beddard, Challenger Rep. vol. 17, p. 8.
1905. „ Hansen, l.c. pp. 303, 316. (Conspectus specierum.)
1905. „ Stebbing, in Herdman's Ceylon Pearl Fish. Suppl.
Rep. xxiii. pp. 48, 53 (where previous references
are given).
1906. „ Nobili, Bull. Mus. Paris, 12, p. 266.
1910. „ Richardson, Proc. Biol. Soc. Washington, 23.
p. 110.

STENETRIUM CRASSIMANUS, n. sp.

(Plate XX. A.)

Whole body, in ♂ more so than ♀, covered with rather long hairs, which are especially numerous on the pleon.

Antero-lateral angles of the head slightly bent inwards, teeth forming the inner angles of the sockets for the second antennae fairly prominent, rostrum longer than broad with blunt apex. Eyes kidney-shaped. First segment of the peraeon rather longer than the rest, its antero-lateral angles strongly produced.

Lateral margin of pleon with one tooth.

First antenna, 1st joint largest, 2nd joint shorter than 3rd, much shorter than 1st, flagellum not quite as long as peduncle, composed of ca. 12 joints very indistinctly separated.

Second antenna, 1st joint acutely produced externally, apex with 1 tooth and 4 setae, 3rd joint rather longer than 1st and 2nd combined, exopod widening distally, 4th joint the shortest, 6th joint a little shorter than 5th, flagellum a little longer than peduncle, with many short scarcely separated joints.

Upper lip apically rounded; epistome with distal margin bidentate in the centre.

Lower lip, lobes with inner margin straight, outer strongly sinuous, apices setose.

Mandibles, cutting-edge 4-toothed, secondary cutting-edge in left mandible 3-toothed, in the right probably represented by 4 serrate spines, spine-row in left mandible with 6 serrate spines and one arising from base of secondary cutting-plate, in the right with 5 serrate spines; molar strong and prominent, with tufts of setae on posterior margin; palp strong, 2nd joint with 2 long serrate

spines and several shorter ones, 3rd joint falciform, with short marginal spines and longer serrate apical ones.

First maxilla, inner lobe with 3 strong spines, 1 weaker one between the bases of the two inner spines, a small tooth and some fine setules, outer lobe with 11 more or less serrate spines.

Second maxilla, outer and middle lobes with 4 spines, inner plate broader, with several serrate spines on inner margin.

Maxillipeds, epipod reaches to apex of 4th joint, apex of inner plate with blunt teeth and serrate spines, three very short and broad coupling-hooks.

First paraeopod (gnathopod) male, 3rd joint strongly and acutely produced on upper margin, 4th joint subacutely produced, 5th joint not produced on lower margin, 6th joint as broad as long, thick and convex above, with a thin laminar process below forming the palm and hind margin, front margin convex, setose, hind margin densely setose, about as long as the palm, which is transverse, setose, and has 2 strong teeth in the centre and a third tooth at its junction with the hind margin, finger curved, longer than palm, finely setulose.

First peraeopod (gnathopod) female, much smaller than in ♂, 3rd joint strongly and acutely produced on front margin, 4th joint likewise produced in front and also less strongly on hind margin, 5th joint larger proportionately and squarer than in ♂, 6th joint half as long again as broad, margins nearly parallel, front margin with a few isolated setae, hinder densely setose, palm shorter than hind margin, transverse, defined by a strong spine and bearing a row of pectinate spines decreasing in length towards the hinge of the finger, where there is a bunch of longer setae, finger stout, only a little longer than palm, with spinulose inner margin.

Second peraeopod (gnathopod) slender, 2nd joint as long as or a little longer than 3rd and 4th combined, 3rd joint a little longer than 4th, with 1 spine in centre of front margin, 4th joint produced in front, with 1 apical spine, 6th joint a little shorter than 2nd, 5th joint a little shorter than 6th, 7th joint one-third length of 6th, biunguiculate.

Third-seventh peraeopods do not differ from the second peraeopods.

First pleopod, male, peduncle with 2 submedian spines, each ramus with a long seta in the centre and a row of marginal setae.

First pleopod, female, tapering distally with bifid apex.

Second pleopod, male, as figured by Hansen but apex of penial filament is acutely pointed.

Third pleopod as figured by Hansen.

Fourth pleopod. Hansen in his description of the genus *Stenotrium*, loc. cit. p. 305, says: ". . . a two-jointed exopod, which is slightly longer and somewhat broader than the unjointed endopod. . . ." This conflicts somewhat with his figure, pl. xx. fig. 2k. Stebbing describes and figures the exopod of the fourth pleopod of *S. chiltoni* as narrower than the endopod, and this is also the case in the present species.

Fifth pleopod, short and broad, distal end obliquely truncate, apex setulose.

Uropod, peduncle shorter than rami, of which the inner is rather longer than the outer, apical setae long and slightly plumose, the others shorter and simple.

Length: 7 mm.; breadth: 2 mm. Second antennae: 5 mm.

Colour: Greyish white, peraeon with faint indications of a darker median line, most marked on the last three segments.

Locality: St. James, False Bay, under rocks, low tide. 29/4/12. (Coll. K.H.B.) One ♂, one ♀ with ova. (S.A.M. No. A2261.)

The distribution of the genus is cosmopolitan, species having been recorded from shallow water in New Zealand, Australia, Siam, Ceylon, the West Indies, and the "Challenger" obtained a deep-water form off the Rio de la Plata in S. America. With the possible exception of *S. mediterraneum*, Hansen, 1905, which Richardson, 1910, says is synonymous with *Jaera longicornis*, the genus seems absent from European waters.

FAMILY JAERIDAE.

1897. *Ianiridae*, G. O. Sars, Crust. Norw. ii. p. 98.

1905. *Parasellidae* (part), Hansen, Proc. Zool. Soc. Lond. 1904, ii. pt. 2, p. 315.

1905. *Janiridae*, Stebbing, in Herdman's Ceylon Pearl Fish. Suppl. Rep. 23, p. 48.

1905. ,, Richardson, Bull. U.S. Nat. Mus. No. 54, p. 448.

1910. *Jaeridae*, Stebbing, J. Linn. Soc. Lond. vol. 31, p. 224.

GEN. JANIRA, Leach.

1814. *Janira*, Leach, Edinb. Encycl. vii. p. 434.

1829. *Oniscoda*, Latrielle, Cuv. Règne Anim. 2nd ed. iv. p. 141.

1840. ,, M. Edwards, Hist. Nat. Crust. iii. p. 151.

1847. *Henopomus*, Kröyer, Naturh. Tidskr. (2) ii. p. 366.

1853. *Asellodes*, Stimpson, Mar. Invert. Grand Manan. p. 41.
 1886. *Janira*, Beddard, Challenger Rep. vol. 17, pt. 48, p. 5.
 1898. „ A. O. Walker, Tr. Biol. Soc. Liverp. vol. 12, p. 280.
 1905. „ Stebbing, in Herdman's Ceylon Pearl Fish. Suppl.
 Rep. 23, p. 49.
 1910. „ Stebbing, J. Linn. Soc. Lond. vol. 31, p. 224.

JANIRA CAPENSIS, n. sp.

(Plate XX. B.)

Body nearly parallel-sided, greatest width in the middle, covered with small slender spines which are strongest on the lateral margins of the peraeon.

Head, anterior margin somewhat produced, straight in centre, slightly concave in front of the eyes, which are large, oval, black, near the lateral margin. Peraeon, antero-lateral angles of the segments produced as small spiniferous lobes, side-plates 1-4 bilobed, side-plates 5-7 extending beyond postero-lateral angles of the segments, notched.

Pleon nearly circular, lateral margins minutely denticulated, surface spiniferous, about 7 rather long slender spines on lateral margin and a row of close-set spines at the apex between the uropods.

First antenna reaches to apex of 5th peduncular joint of second antenna, basal joint of peduncle strongest, 3rd joint shorter than 2nd, 4th joint very small, flagellum $1\frac{1}{2}$ times length of peduncle, 17-jointed, setose and with sensory filaments.

Second antenna longer than body, exopod on 3rd joint well developed, with apical tuft of spines, 5th joint rather shorter than 6th, flagellum a little longer than peduncle, multiarticulate, rather feebly setose.

Upper lip a little broader than long, apex rounded, with short fine setules.

Lower lip, lobes broad and stout, outer margin very convex, inner apical angles setose.

Mandibles, cutting-edge with (4 or) 5 teeth, secondary cutting-edge in the left mandible similar, spine-row with 6 spines in the left, 8 in the right mandible, palp 1st joint shortest, 2nd joint longest, with a row of ca. 7 spines near apex, 3rd joint gently curved with marginal and apical spines.

First maxilla, outer plate with ca. 9 spines, most of them serrate on their inner margins, inner plate half as wide as outer, apex rounded, with 4 strong spine-setae and numerous setules.

Second maxilla, outer and middle plates with 3 long spines, inner plate nearly twice as wide, with numerous setae.

Maxillipeds, 2nd joint stout, width equals outer margin, 3rd joint twice as broad as long, 4th joint and proximal half of 5th broad, 5th joint narrowing rapidly distally, 6th joint not very slender, 7th joint shorter than 6th, inner plate with rounded-truncate spinose apex, inner margin with 2-3 short stout coupling-hooks, epipod reaching to the 4th joint, oblong, outer distal margin obliquely truncate, not setose.

First peraeopod (gnathopod) ♂, 3rd joint two-thirds length of 2nd, 4th joint half length of 3rd and shortly produced in front, 5th joint equal to 2nd, hind margin slightly expanded, with one long stout apical spine and one shorter subapical one, 6th joint slender, equal to the 5th, setose on both margins, 7th joint very short, biunguiculate with small tooth at base of ungues.

Second and following peraeopods similar to first but stouter and rather shorter, expansion on 5th joint not so marked, apical and subapical spines small, inner margin of 6th joint with solitary spines, outer margin setose, triunguiculate.

First pleopods ♂, peduncles fused basally, diverging distally, with well-developed rami.

Second pleopod ♂, peduncle longer than broad, narrowing distally, exopod arising at apex of peduncle, distal portion of penial filament a little longer than peduncle.

Third pleopod, outer ramus stout, longer than and nearly as broad as inner, 2-jointed, inner ramus with 3 apical plumose setae.

Fourth pleopod, widest portion of outer ramus only half the width of inner, 2nd joint tapering, with apical setae.

Uropods, both rami longer than peduncle, outer shorter than inner, both margins undulate and with groups of spines, apices also with spines.

Length : 4 mm. ; *breadth* : 2 mm. Second antennae : 6 mm.

Colour : Whitish, with minute stellate specks of dark pigment.

Locality : Sea Point, Cape Town. 25/4/98. (Dr. W. F. Purcell.) 1 ♂. St. James, False Bay. 11/8/12. (Coll. K.H.B.) 5 ♂ ♂. Under stones at low tide. (S.A.M. No. A2263.)

GEN. IANIOPSIS, G. O. Sars.

1897. *Ianiopsis*, G. O. Sars, Crust. Norw. ii. p. 102.

1904. *Janiopsis*, Richardson, Harriman Alaska Exp. Crust. 10, p. 221.

1904. *Janiropsis*, Richardson, Proc. U.S. Nat. Mus. 27, p. 665.

1910. „ Thielemann, Abh. Ak. Wiss. München. Suppl. 2,
Abh. 3, p. 70.

IANIROPSIS PALPALIS, n. sp.

(Plate XXI. A.)

Body nearly parallel-sided; surface smooth, only a few short setae on the lateral margins.

Head, anterior margin not very produced, front slightly concave, antero-lateral angles obsolete, eyes small, oblong, dark, some little distance from the lateral margin.

Peraeon, antero-lateral angles not much produced, side-plates bilobed.

Pleon rather longer than broad, tapering very gently, apex flatly rounded, with a row of setae, postero-lateral angles not prominent, with a row of setae, margins entire.

First antenna reaches to middle of 5th peduncular joint of second antenna, basal joint strongest, 3rd joint a little longer but more slender than 2nd, 4th joint very small, flagellum 10-jointed in ♂, 7-jointed in ♀, with only a few sensory filaments.

Second antenna longer than body, exopod on 3rd joint well developed, setiferous, 5th joint a little shorter than 6th, flagellum about as long as peduncle, multiarticulate, feebly setose.

Upper lip as broad as long, with fine apical setae.

Lower lip, lobes broad, inner and outer margins equally convex, so that inner angle becomes an apical angle, beset with setae.

Mandibles, cutting-edge with 5 teeth, secondary cutting-edge in left mandible with 5 teeth, spine-row with 6 spines and a blunt tooth below them, molar prominent, denticulate, 2nd joint of palp slightly the longest, with 2 long stout setae, 3rd joint curved, with apical and marginal setae.

First maxilla, outer plate with ca. 10 serrate spines, inner plate with 4 spines and several setules.

Second maxilla, outer and middle plates with 3 spines, inner plate not quite twice as broad, with several spines and setules.

Maxillipeds ♂, width of 2nd joint equal to inner margin, 4th joint very broad, expanded on both margins, 5th joint as long as 1, 2, 3 combined, 6th joint slender and a little shorter than 5th, 7th joint still more slender and a little shorter than 6th, inner plate rounded-truncate, with apical spines and 2 stout coupling-hooks near its base,

epipod small, reaching apex of 3rd joint, outer margin strongly angular.

Maxillipeds ♀, 4th joint not so much expanded as in ♂, as long as broad, 5th joint half as long as 4th, 6th joint a little shorter than 4th, 7th joint equal to 5th, epipod scarcely reaching apex of 3rd joint.

First peraeopod (gnathopod) similar in both sexes, 2nd joint longest, 5th joint equal to 3rd, fusiform, not expanded, outer margin with a few setae, inner margin with shorter and more numerous setae, 6th joint not quite as long as 5th, 7th joint minute, biunguiculate.

Second and following peraeopods stouter and rather shorter, 2nd and 3rd joints both shorter than 5th, 7th joint triunguiculate.

Marsupial plates on segments 2, 3, 4.

First pleopod ♂, distally expanded, without rami.

First pleopod ♀ (operculum) broader than long, rounded; distal margin concave.

Second pleopod ♂, peduncle apically pointed, exopod arising some distance from apex, penial filament not projecting much beyond apex of peduncle.

Third pleopod, outer ramus apically blunt, with 3 strong plumose setae, one on outer angle, two on inner, inner ramus almost straight, suture between its 2 joints oblique, 2nd joint not projecting much beyond apex of outer ramus.

Fourth pleopod, inner ramus 1-jointed, half as long as outer ramus, narrow and tapering to an acute point, outer margin (away from outer ramus) setulose.

Uropods two-thirds length of pleon, peduncle nearly one-third length of pleon, rami longer than peduncle, inner ramus longer than outer, with apical and marginal groups of setae.

Length: 4 mm.; *breadth*: 1 mm. Second antennae: 6 mm.

Colour: In spirit, whitish, with dark pigment specks, circular (more or less) in the adult, stellate in younger specimens.

Locality: Sea Point, Cape Town. 19/5/96. (R. M. Lightfoot.) Several ♂♂ and 2 ♀♀ (one with ova). (S.A.M. No. A252.)

Kalk Bay, False Bay. 26/5/96. (R. M. Lightfoot.) Several ♂♂ and young. (S.A.M. No. A251.)

This species closely resembles *I. longiantennata*, Thielemann. The second antennae, however, are even longer proportionately than in that species, the shape of the head is different, the maxillipeds in the ♂ differ in the 4, 5, 6, 7 joints, and the epipod in both sexes does not extend beyond the apex of 3rd joint.

The genus contains only 4 other species, viz. : *I. breviremus*, G. O. Sars, 1897, from Norway, *I. californica*, Richardson, 1904, from California, *I. kincaidi*, Richardson 1904, from Alaska, and *I. longiantennata*, Thielemann 1910, from Japan.

GEN. JAEROPSIS, Koehler.

1885. *Jaeropsis*, Koehler, Ann. Sci. Nat. ser. 6, vol. 19, art. 1, p. 2.
 1886. ,, Beddard, Challenger Rep. vol. 17, p. 20.
 1893. ,, Stebbing, Hist. Crust. p. 379.
 1905. ,, id. in Herdman's Ceylon Pearl Fish. Suppl. Rep. 23,
 p. 50.
 1909. ,, Richardson, Proc. U.S. Nat. Mus. vol. 36, p. 421.

JAEROPSIS CURVICORNIS, (Nicolet).

(Plate XX. C.)

1849. *Jaera curvicornis*, Nicolet, in Gay's Hist. de Chile. Zool. vol. 3
 p. 263. pl. 3, fig. 10.
 1891. *Jaeropsis neo-zelanica*, Chilton, Tr. N.Z. Inst. vol. 24, p. 267.
 1902. ,, *curvicornis*, Richardson, Tr. Conn. Acad. Sci. vol. ii.
 p. 298.
 1905. ,, ,, Stebbing, l.c. p. 51, pl. xi. (C).

The single specimen differs only in details from the descriptions of Chilton and Stebbing; both the latter, like Nicolet's, were based on females, whereas this specimen is a male.

The head is broader than long, the antero-lateral angles not so produced as in Stebbing's figure; the eyes are dark.

Second antenna, 5th joint not denticulate on inner (front) margin as in Stebbing's figure.

Mandibles, the spine-row has 10 spines.

The apex of the pleon between bases of the uropods is convex; in Stebbing's figure it is emarginate. The lateral margins have 3 teeth on one side, 4 on the other.

First pleopods very little expanded distally, with rami.

Second pleopods, peduncle lanceolate, exopod arising some distance from apex, male stylet hardly projecting beyond its apex.

Third pleopods, inner ramus with 3 apical strong plumose setae, outer ramus very little longer than inner, 2-jointed, 2nd joint apically pointed.

Fourth pleopods, outer ramus minute.

The uropods have a tooth at the apex of the peduncle.

Length : 3.5 mm. ; *breadth* : 0.75 mm.

Colour : Whitish.

Locality : St. James, False Bay. 29/4/12. (Coll. K.H.B.) 1 ♂.
(S.A.M. No. A2262).

Distribution : Chile, New Zealand, and Ceylon.

FAMILY MUNNOPSIDAE.

1861. *Munnopsidae*, M. Sars, Chr. Vid. Selsk. Forh. 1860, p. 84.
1893. ,, Stebbing, Hist. Crust. p. 383.
1897. ,, G. O. Sars. Crust. Norw. vol. 2, p. 132.
1905. ,, Richardson, Bull. U.S. Nat. Mus. No. 54, p. 485.
1905. *Parasellidae* (part), Hansen, Proc. Zool. Soc. Lond. 1904, ii. 2,
p. 315.
1912. *Munnopsidae*, Richardson, Bull. Inst. océan. Monaco. No. 227,
p. 1.

GEN. : MUNNOPSURUS, Richardson.

1912. *Munnopsurus*, Richardson, l.c. p. 1.

MUNNOPSURUS MIMUS, n. sp.

(Plate XXI. B.)

Body smooth, head broader than long, widest in front, more strongly calcified than any other part, anterior margin excavate.

Peraeon, first segment as wide as head, lateral portions produced forwards, scabrous, second, third and fourth segments wider than head, third and fourth rather wider than second, antero-lateral angles scabrous and bearing 1 small spine each, fifth, sixth and seventh segments separated from anterior segments by a marked gap and not separated from one another as are the latter, with shallow median groove but no tubercles, lateral portions quadrate.

Side-plates 1-4 bilobed, scabrous, 5-7 entire, not so angular as in *M. arcticus*, scabrous but less so than the 4 anterior ones.

Pleon as long as broad, evenly rounded without median lobe.

First antenna, 1st joint very stout, 2nd joint acutely produced internally, with 1 strong and 2 smaller spines, 3rd joint equal to 2nd with one small spine on outer apical angle, 4th joint one-quarter as long, flagellum in ♂ 4 times, in ♀ 1½ times as long as peduncle, with long setae on lower edge.

Second antenna, 1st joint small and developed chiefly on outside,

2nd joint broader than long, 3rd joint with acute projection on upper side covering the junction of the 4th joint, which consequently appears to be sunk in the 3rd, outer margin of 3rd joint with small but distinct and movable scale bearing 2-3 apical spines, inner margin slightly convex with 1 strong outstanding spine, 4th joint also hollowed out beneath to receive the 5th joint, 5th and 6th joints and the flagellum not preserved intact on any of the specimens, 5th joint measures 17 mm., the 6th joint 14 mm., and the flagellum 30 mm., 6th joint about as slender as peraeopods 2-4, 5th joint a little stouter.

Upper lip as broad as long, proximal portion triangular and forming a low blunt tubercle, distal margin evenly and rather flatly rounded, minutely hirsute. Epistome strongly calcified, semicircular, embracing the proximal half of labrum.

Lower lip, outer lobes broad, apices bluntly rounded, inner margin densely fringed, inner lobes well developed.

Mandibles, cutting-edge bilobed in left, entire in right, molar stronger than in *M. arcticus*, with small brush of setae.

First maxilla, outer lobe with 12 spines, some of them minutely serrate on outer margins, inner lobe with incurved apex bearing 2 long spine-setae and numerous fine setules.

Second maxilla, outer and middle lobes similar, bearing long curved spine-setae, serrate on inner margins, inner lobe twice as broad with 16-18 rather shorter doubly-serrate spine-setae.

Maxillipeds, 4th joint largest, 5th joint with outer margins short, inner margin expanded but not sharply produced, 6th joint strongly expanded internally, 7th joint slender and a little shorter than 6th, inner plate squarely truncate, with apical plumose setae and 8 coupling-hooks near the base, epipod reaching half-way along 4th joint, lanceolate, apically pointed, inner margin nearly straight, outer convex and distally oblique.

First peraeopods a little longer than body, 5th joint the longest, 6th joint two-thirds length of 5th, 7th joint about one-seventh length of 6th.

Second, third and fourth peraeopods very long, about $2\frac{1}{2}$ times length of body, 6th joint twice length of 5th, 7th joint one-quarter length of 6th, biunguiculate.

Marsupial plates developed on peraeopods 1-4, not meeting in the middle line, except in the ovigerous ♀, where the 2nd 3rd and 4th pairs are greatly enlarged.

Fifth, sixth and seventh peraeopods, 5th joint strongly expanded posteriorly, narrowing rapidly distally, 6th joint symmetrically ovate,

less strongly expanded, both 5th and 6th joints with plumose setae on both margins, 3rd joint with a few plumose setae on posterior margin, 7th joint as long as width of 6th, very slender, margins minutely setulose, apex with 2-3 setae.

Male appendages on 7th segment narrow, slender, distal three-quarters thread-like, not extending beyond the first pleopods.

First pleopods ♂, long and narrow, not apically expanded, rami projecting a little beyond the apices of peduncles.

Operculum ♀ evenly rounded and without (or with very indistinct) keel.

Second pleopods ♂, strongly contracted near the apex, male stylet barely longer than peduncle.

Third pleopods, outer lobe 2-jointed, narrow, strongly curved but hardly reaching beyond apex of broad inner lobe.

Fourth pleopod consists of 2 broad rather wrinkled lamellae, the anterior one being smaller and fitting within the posterior one, which fits within the still larger and similarly wrinkled fifth pleopod, which consists of only a single lamella.

Uropods small, peduncle barely projecting beyond margin of pleon, inner ramus as long as peduncle, with 2 apical spines, outer ramus a little longer, with 3 apical spines and a few setae.

Length: ♂ 11 mm. ♀ 14 mm.; *breadth*: ♂ 4 mm. ♀ 5 mm.

Colour: In spirit, whitish or faintly pinkish.

Locality: Lion's Head SE. $\frac{1}{4}$ S. distant 50 miles, 230 fathoms; 24 ♀ ♀ (some with ova) and 4 ♂ ♂. 2/4/02. Cape Point NE. distant 40 miles, 560-700 fathoms; 1 mutilated specimen. 17/9/03, s.s. "Pieter Faure." (S.A.M. Nos. A1614 and A2458.)

This species is very near to the type species *M. arcticus*, Richardson, but differs in the following characters:—

There are no dorsal tubercles on pereaeon segments 5-7 and the pleon is evenly rounded, not produced into a median lobe.

The mandibles have more strongly developed molars and the left cutting-edge is bilobed.

Inner lobe of the first maxilla has 2, not 3, spines; and the spines on outer and middle lobes of the second maxilla are long and pointed, not short and blunt.

The sixth joint of the maxilliped is strongly expanded, not parallel-sided as represented in Richardson's figure.

The second pleopod in the male is distally narrowed, the outer margin not being evenly convex.

The uropods have apical spines instead of being rounded. *M. arcticus* is recorded from Nova Zembla.

FAMILY DAJIDAE.

1887. *Dajidae*, Giard and Bonnier, Travaux de l'Inst. Zool. Lille, vol. 5.
 1893. „ Stebbing, Hist. Crust. p. 398.
 1895. *Dajinae*, Hansen, Isopoden d. Plankton Exp. p. 22.
 1897 (-1899). *Dajidae*, G. O. Sars Crust. Norw. ii. p. 221.
 1905. *Dajidae*, Richardson, Bull. U.S. Nat. Mus. No. 54, p. 572.

GEN. ZONOPHRYXUS, Richardson.

1903. *Zonophryxus*, Richardson, Bull. U.S. Fish. Comm. p. 51.
 1904. „ id. Proc. U.S. Nat. Mus. vol. 27, p. 677.
 1910. „ id. Washington Bur. Fish. Doc. 736, p. 41.
 1911. „ Koehler, Bull. Inst. océan. Monaco, No. 196, p. 16.

ZONOPHRYXUS QUINQUEDENS, n. sp.

(Plate XXII.)

Body of ♀ oval. The dorsal surface shows four thoracic segments marked by indistinct sutures and four abdominal segments of which the sutures are very clear and deep in the middle line but indistinct laterally. The thoracic segments are more marked ventro-laterally. The margin which surrounds the body ventrally has 4 small notches in the thoracic region and posteriorly is produced into 10 triangular teeth, 5 on each side without a median one.

The external antennae are apparently 1-jointed (not 2-jointed as in *Z. grimaldii*). The internal antennae are large and laminar, indistinctly divided into two portions, of which the posterior embraces the upper and lower lips (rostrum).

Upper lip broad, margin entire, very slightly emarginate on either side of a central convexity.

Lower lip narrower, tapering, with distal end deeply indented. Both lips are curved towards one another at the sides so as to form a cone. Through the opening at the apex of this cone project the narrow gouge-shaped mandibles.

Maxilla. In one specimen there were two appendages lying beneath the maxillipeds and about in the same position, the "palp" pointing outwards as does the epipod of the maxillipeds. Both the palp and the outer margin of the basal plate are minutely serrulate. In two other specimens I have failed to find any trace of these appendages. Koehler (l.c.) makes no mention of them, but says he

refrained from dissecting the single specimen at his disposal; and they cannot be seen until the maxillipeds have been removed.

Maxillipeds indistinctly 2-jointed, with well-developed epipod. All five pairs of peraeopods are similar, consisting of four stout joints and a curved unguis with 2 setae on its inner margin.

Marsupial plates, 1st pair elongate, composed of a short outer lobe and a longer inner lobe, almost completely covering the maxillipeds, 2nd and 3rd pairs very small, 4th pair larger but not equalling the 1st pair, 2nd-4th pairs completely hidden under 1st pair, 5th pair very large, extending to hinder end of body.

When the marsupial plates are folded back the ventral surface of the body shows a wrinkled (this is perhaps due to preservation) median ridge and four transverse ridges; the first transverse ridge is just below the opercular plate (sternite); at the sides of the third ridge is a pair of 2-jointed appendages, representing the single pair of pleopods. At the extreme end of the body are three raised pads, apparently representing the last three pleon segments. If so, the segment below the opercular plate is the seventh peraeon segment.

A single specimen of a young female shows a transverse head with which the 1st peraeon segment is fused, and 5 free peraeon segments. The 7th peraeon segment is fused with the abdomen, which is composed of a single segment. There are 7 papillae along the medio-ventral line. The rostral cone shows no differentiation into upper and lower lips, and there is no trace of the mandibles. There are 7 pairs of peraeopods, each consisting of 5 joints and a curved unguis; they appear hammer-shaped owing to the 5th joint being very much larger than the small 3rd and 4th joints and being much expanded behind.

Between the 3rd and 4th (free) segments of the right side a cryptoniscan male was attached.

The male is similar in shape to that of *Z. retrodens*, Richardson (Proc. U.S.N.M. vol. 27, 1904, p. 679, fig. 33). On each of the 6 free peraeon segments there is a rounded median ventral papilla.

The oval pleon shows three indistinct furrows.

Mandibles minute, styliform, with broadened bases.

Peraeopods 5-jointed, hammer-shaped, first 2 joints large, stout, 2nd and 3rd joints small, 5th joint large, transversely oval, with curved unguis.

The single specimen was found under the right 5th marsupial plate of a female measuring 8 mm. by 4.5 mm.

Cryptoniscus stage. The peraeon and pleon show the full complement of segments, the postero-lateral angles being acutely produced

backwards. First antenna has 2 large basal joints and 2 minute terminal lobes, both lobes and the posterior apical angle of 2nd basal joint with thick tufts of setae.

Second antenna, peduncle 4-jointed, basal joint large, flagellum 5-jointed.

Peraeopods 1 and 2 stout, 3-jointed, 3rd joint with ill-developed unguis.

Peraeopods 3-5 long, slender, 6-jointed, 2nd joint distally expanded on front margin, 3rd and 4th joints small, 5th joint almost as long as 1st, elongate oval, with short oblique palm defined by one spine and bearing 2 others in the middle, finger longer than palm but not half as long as 5th joint.

Peraeopods 6 and 7 similar to peraeopods 3-5 but 5th joint is slender and tapering, the finger as long as 5th joint, very slender and tapering, nearly straight.

Pleopods, peduncle short, broad, with 2 setae on inner apical angle, rami subequal, set rather far apart on peduncle, tipped with long plumose setae.

Uropods, peduncle very short, outer ramus minute, tipped with setae, inner ramus nearly as long as 6th pleon segment and not clearly distinguished from peduncle, tapering gradually, tipped with setae.

Length ♀ : 22 mm. ; ♂ : 2.5 mm. ; *breadth* ♀ : 14 mm. ; ♂ : 1 mm.

Length of young female with same form as adult and with attached male : 8 mm. ; of younger female with attached cryptoniscid male : 5 mm.

With the exception of *Holophryxus giardi*, Richardson (39 mm.), this is the largest member of the family.

Colour : In spirit, yellowish.

Locality : Cape Point NE. by E. distant 36 miles, 650-700 fathoms. 2 ♀ ♀, 1 ♀ juv. and 3 Cryptoniscus larvae. 8/7/03. Cape Point ENE., distant 36 miles, 660 fathoms. 1 ♀. 22/7/03. Cape Point NE. $\frac{3}{4}$ E., distant 29 miles, 470 fathoms. 1 ♀ with ♂. 11/6/03. s.s. "Pieter Faure." (S.A.M. Nos. A270-1, A2276.)

The host is unknown ; but in the same bottles were numbers of a deep-red Decapod allied to *Nematocarcinus* (at present awaiting identification), as well as a few specimens of *Acanthephyra purpurea*, *Glyphocrangon sculptus* and *Polycheles beaumontii*. The presence of one *Zonophryxus* in a bottle containing only *Nematocarcinus* may justify the view that this latter Decapod is the only host.

Only three other species of the genus are known : *Z. retrodens*, Richardson, 1904, from Hawaiian Islands ; *Z. trilobus*, Richardson, 1910, from Philippine Islands ; and *Z. grimaldii*, Koehler, 1911, off the coast of Portugal.

PLATE XVII. A.

Tanaïs spongicola, n. sp.

- ep. + l.s. Epistome and upper lip.
l.i. Lower lip.
mx. 1, 2. First and second maxillae.
gn. 1 ♂. First gnathopod male.
gn. 1 ♀. First gnathopod female.
pl. 4, 5, 6 + urop. Pleon segments 4, 5 and 6 with uropods.

PLATE XVII. B.

Guathia africana, n. sp.

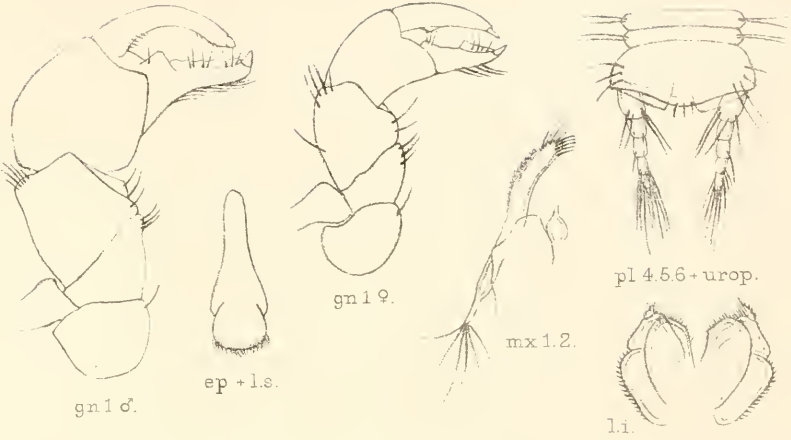
- n.s. ♂. Natural size male, peraeopods omitted.
profile ♂. Profile of head of male.
ppp. Peraeopod of male.
mand. mx. 1, 2, juv. Mandible and first and second maxillae of larva
mxp. juv. Maxilliped of larva, with portion further enlarged.

PLATE XVII. C.

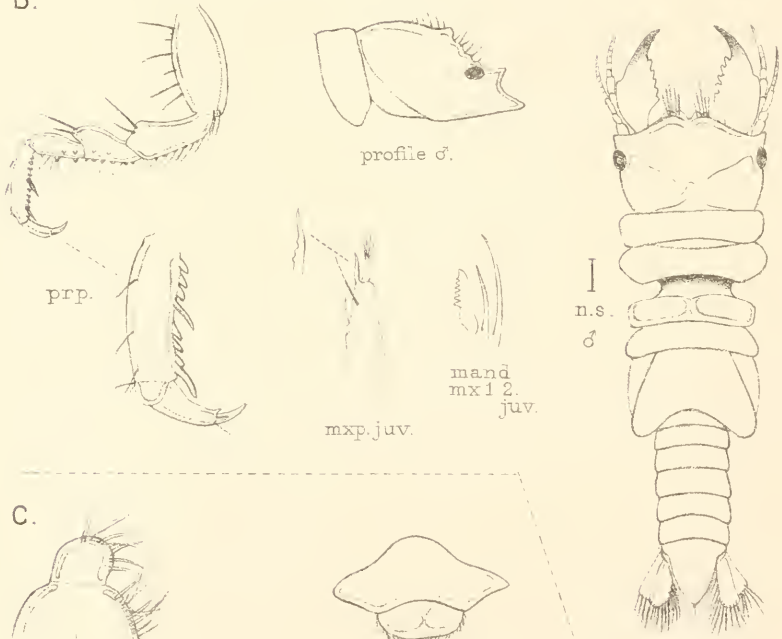
Engidotea lobata (Miers).

- ant. 1. Upper antenna, with a group of setae further enlarged.
ep. + l.s. Epistome and upper lip.
l.i. Lower lip with marginal setae further enlarged.
mx. 2. Second maxilla.
mxp. Maxilliped with portion of 6th and 7th joints further enlarged.

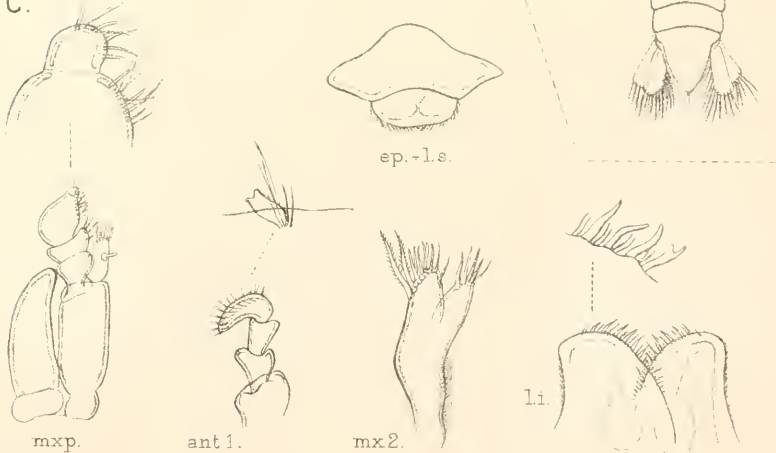
A.



B.



C.



K.H.B. del.

West, Newman lith.

A. TANAIS SPONGICOLA, n. sp. B. GNATHIA AFRICANUS. n. sp. C. ENGIDOTEA LOBATUS (Miers)

PLATE XVIII. A.

Syuidotea setifer, n. sp.

- n.s. Natural size of specimen, peraeopods omitted.
- ant. 1. First antenna.
- ant. 2. Second antenna.
- mand. Mandible with molar further enlarged.
- mxp. Maxilliped.
- prp. 1 (gn.). First peraeopod (gnathopod).

PLATE XVIII. B.

Antarcturus cladophoros, Stebbing.

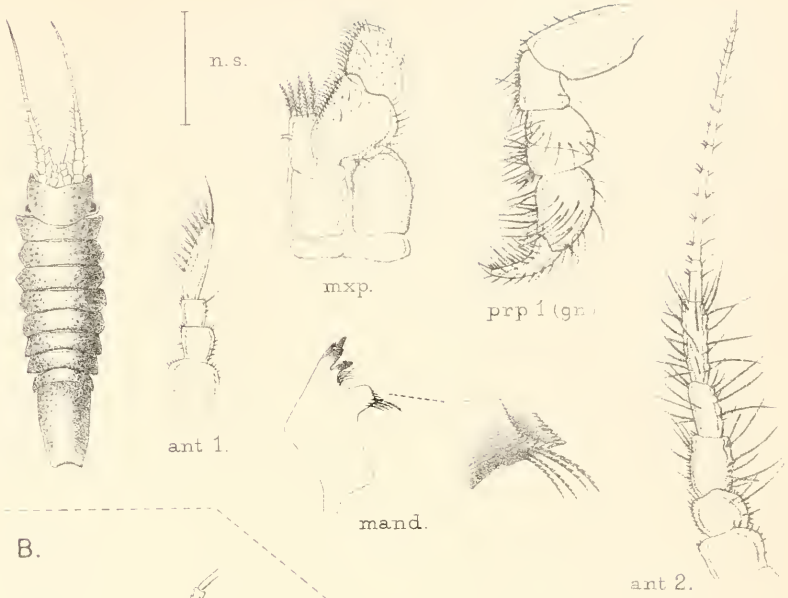
- n.s. ♂. Natural size of male, peraeopods not completely drawn in.
- ant. 2. First three joints of second antenna.
- l. mand. rt. mand. Left and right mandibles.
- prp. 1 (gn.). Seventh joint of first peraeopod (gnathopod), setae omitted, but one drawn on a larger scale.
- pen. Male stylet on 7th peraeon segment.
- plp. 1. First pleopod.
- plp. 2 ♂. Second pleopod of male.

PLATE XVIII. C.

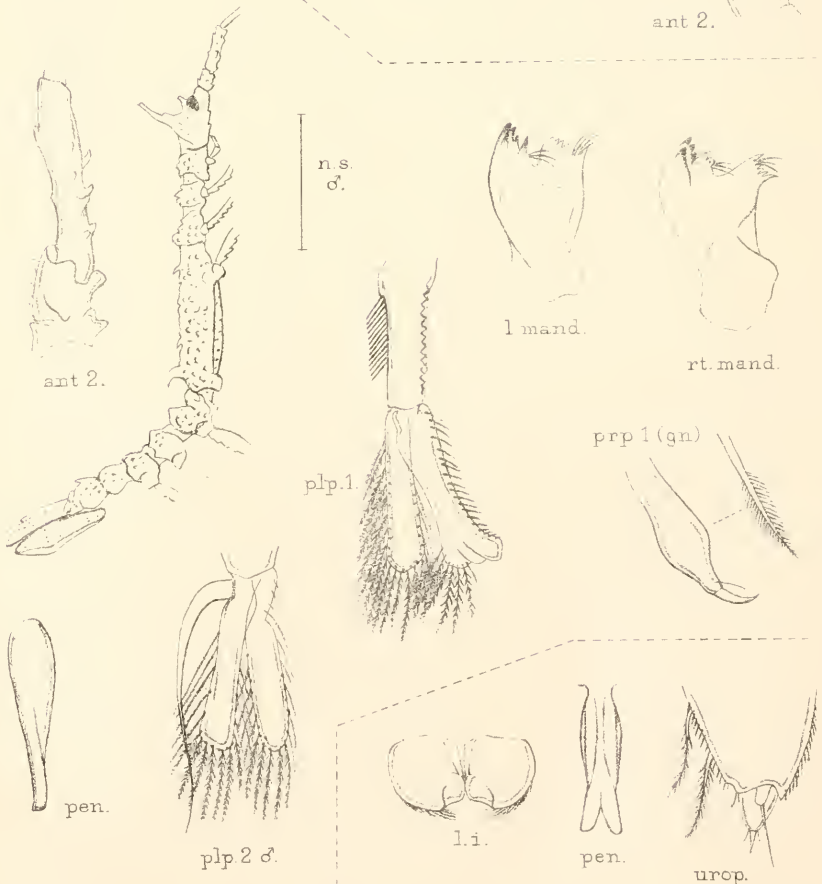
Neoarcturus oudops, n. g. et sp.

- l.i. Lower lip.
- pen. Male stylet on 7th peraeon segment.
- urop. Terminal portion of uropod.

A.



B.



K.H.B.del.

West, Newman lith

A. SYNIDOTEA SETIFER, *n.sp.* B. ANTARCTURUS KLADOPHOROS, *Stebb*
 C. NEOARCTURUS OUDOPS, *n.g. et sp.*

PLATE XIX. A.

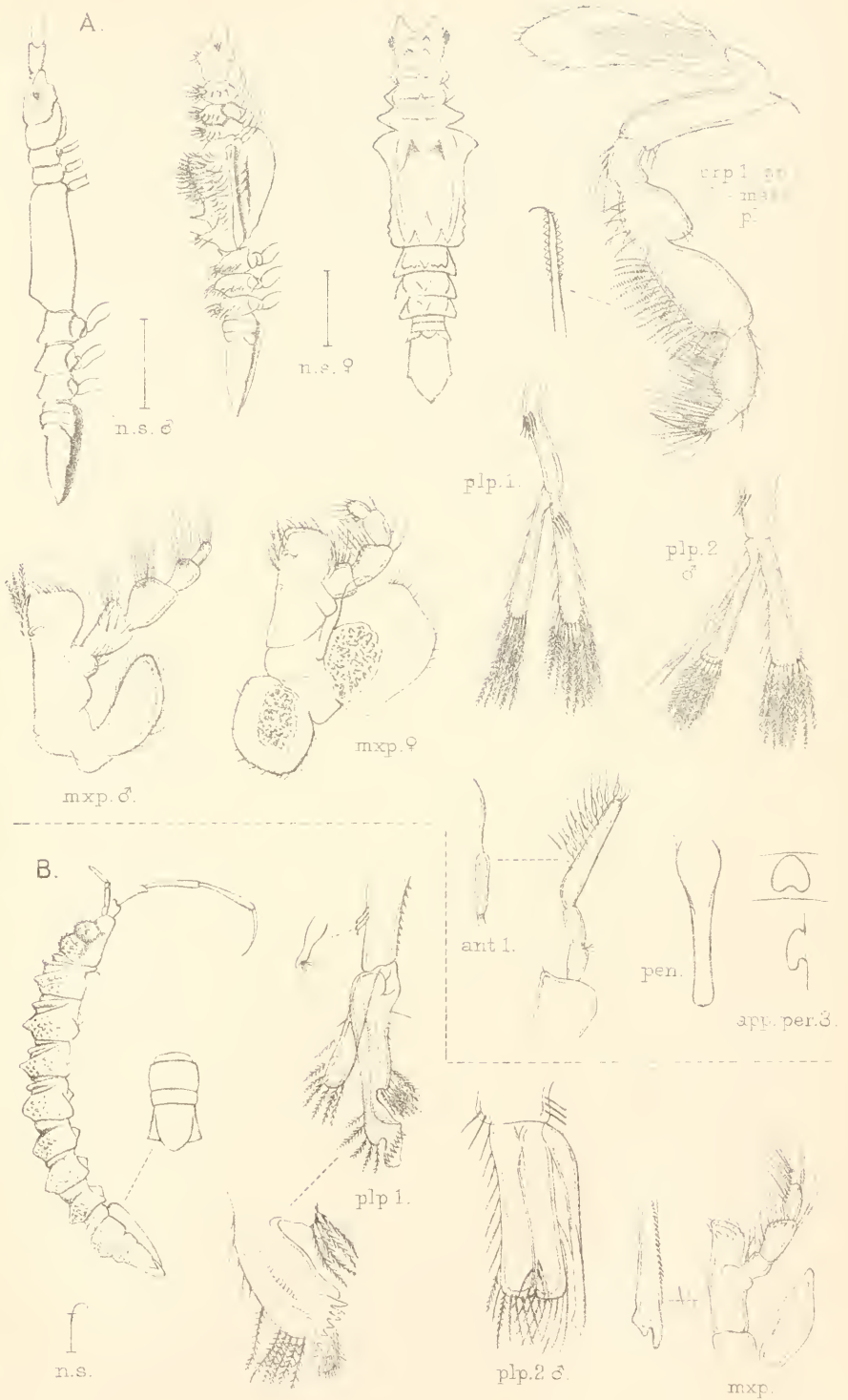
Arcturopsis hirsutus, n. sp.

- n.s. ♂, n.s. ♀. Natural size of male and female respectively, the latter drawn in lateral and dorsal views, bases only of peracopods indicated.
- ant. 1. First antenna with sensory filament further enlarged.
- mxp. ♂, mxp. ♀. Maxilliped of male and female.
- prp. 1 (gn.) ♀ + mars. pl. First peracopod of female with marsupial plate. One seta from 5th joint further enlarged.
- pen. Male stylet on 7th peracoon segment.
- app. per. 3. Male appendage on 3rd peracoon segment.
- plp. 1. First pleopod.
- plp. 2 ♂. Second pleopod of male.

PLATE XIX. B.

Neoarcturus oudops, n. g. et sp.

- n.s. Natural size of specimen, in lateral view; pleon and telson in dorsal view; peracopods omitted.
- mxp. Maxilliped.
- plp. 1. First pleopod with hooked seta from peduncle and the terminal portion of exopod further enlarged.
- plp. 2 ♂. Second pleopod of male with apex of penial filament further enlarged.



K.H.B. del.

West. Newman lith.

A. ARCTUROPSIS HIRSUTUS n.sp. B. NEOARCTURUS OUDOPS. n.sp. et sy.

PLATE XX. A.

Stenotrium crassimanus, n. sp.

n.s. Natural size of specimen, peraeopods omitted.

li. Lower lip.

mxp. Maxilliped with coupling-hooks and apical armature of inner plate further enlarged.

prp. 1 (gn.) ♂. First peraeopod (gnathopod) of male.

prp. 1 (gn.) ♀. First peraeopod (gnathopod) of female, magnification twice that of male.

plp. 1 ♂. First pleopod of male.

plp. 2 ♂. Second pleopod of male.

plp. 4. Fourth pleopod.

PLATE XX. B.

Janira capensis, n. sp.

mxp. Maxilliped.

prp. 1 (gn.) ♂. First peraeopod (gnathopod) of male, with 7th and terminal portion of 6th joints enlarged.

plp. 1 ♂. First pleopod of male.

plp. 2 ♂. Second pleopod of male.

plp. 3, plp. 4. Third and fourth pleopods.

tels. + urop. Portion of telson with one of the uropods.

PLATE XX. C.

Jaeropsis curvicornis, (Nicolet).

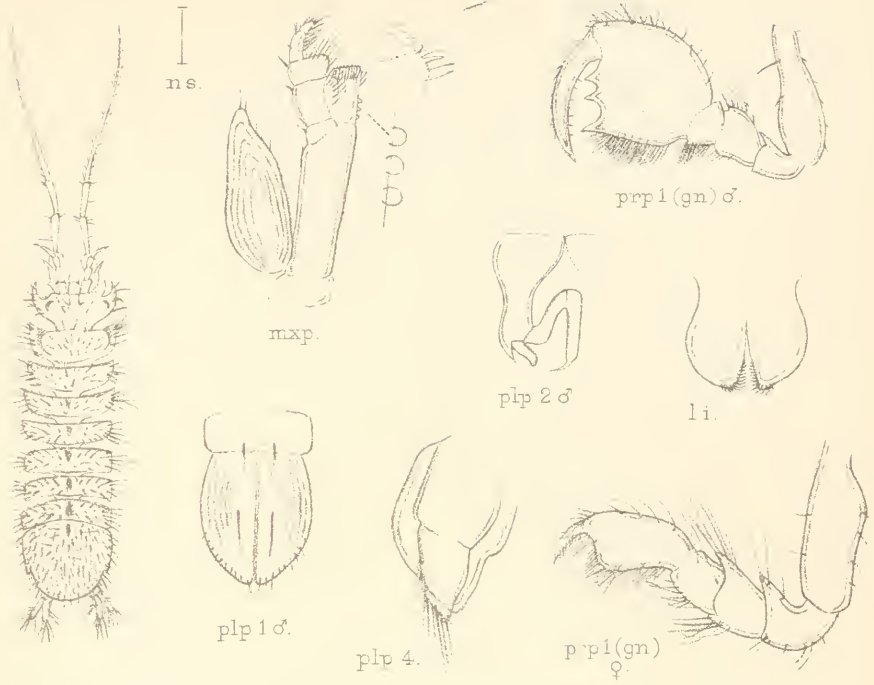
plp. 1 ♂. First pleopod of male.

plp. 2 ♂. Second pleopod of male.

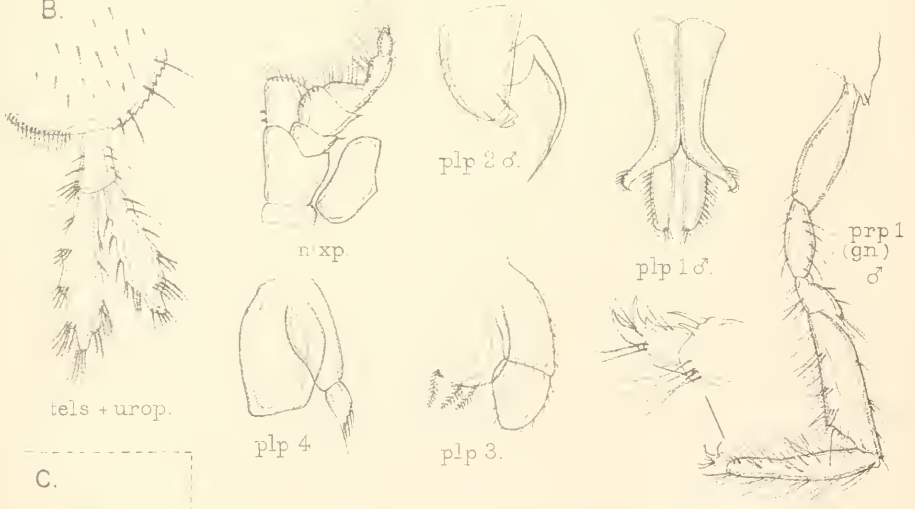
plp. 3, plp. 4. Third and fourth pleopods.

urop. Uropod.

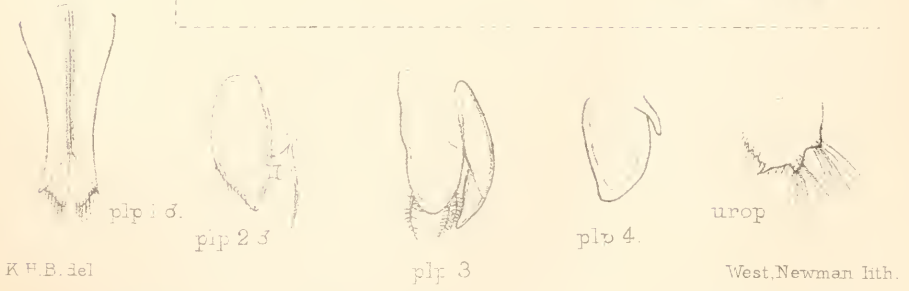
A



B.



C.



A. STENETRIUM CRASSIMANUS, n. sp. B. JANIRA CAPENSIS, n. sp.

C. JAEROPSIS CURVICORNIS, (Nicolet.)

PLATE XXI. A.

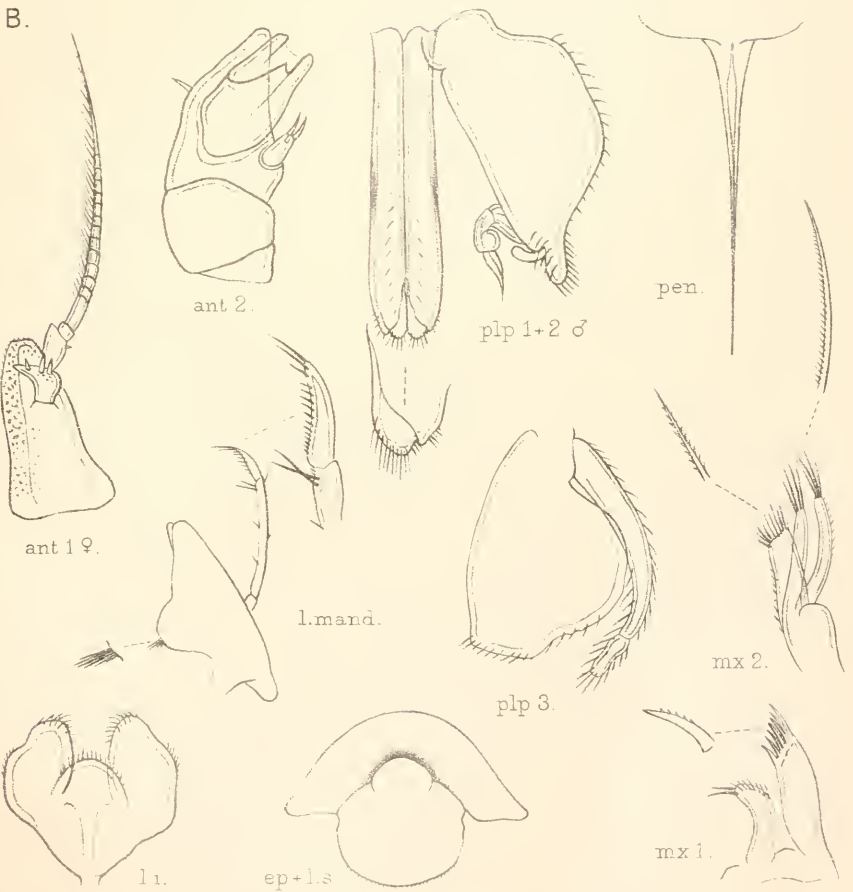
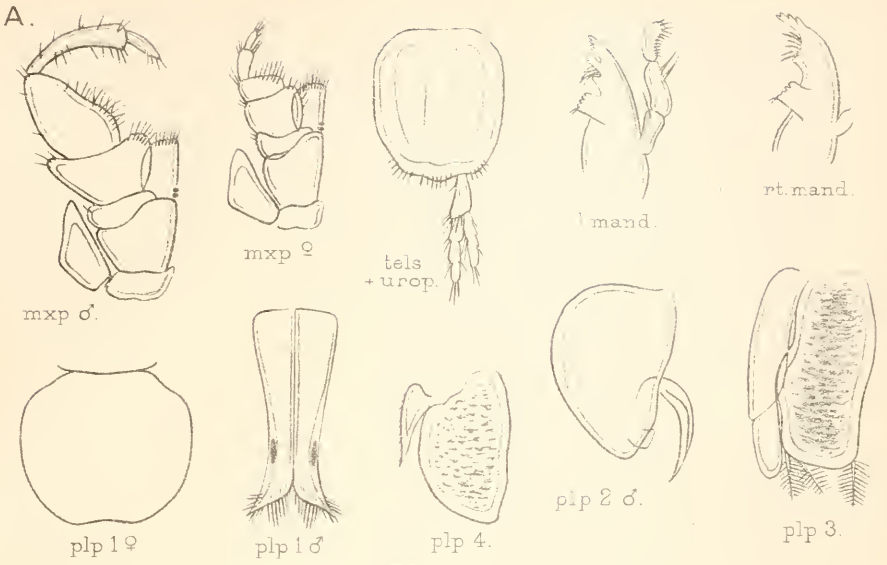
Lauropsis palpalis, n. sp.

- l. mand. rt. mand. Left and right mandibles.
mxp. ♂, mxp. ♀. Maxillipeds of male and female respectively.
plp. 1 ♂. First pleopod of male.
plp. 1 ♀. First pleopod (operculum) of female.
plp. 2 ♂. Second pleopod of male.
plp. 3, plp. 4. Third and fourth pleopods.
tels. + urop. Telson with one of the uropods.

PLATE XXI. B.

Munnopsurus minus, n. sp.

- ant. 1 ♀. Right first antenna of female viewed from above.
ant. 2. First four joints of peduncle of left second antenna, viewed from below.
ep. + l.s. Epistome with upper lip.
l.i. Lower lip.
l mand. Left mandible with brush on molar and terminal portion of palp further enlarged.
mx. 1. First maxilla.
mx. 2. Second maxilla with setae from outer and inner plates further enlarged.
pen. Male stylet on 7th peraeon segment.
plp. 1 + 2 ♂. First and second pleopods of male, with apex of first pleopod further enlarged.
plp. 3. Third pleopod.



K.H.B.del.

West, Newman lith.

A. IANIROPSIS PALPALIS, n.sp. B. MUNNOPSURUS MIMUS, n.sp.

PLATE XXII.

Zonophryxus quinquedens, n. sp.

- n.s. Natural size of adult female, drawn in dorsal and ventral views
n s. ♀ juv. Natural size of young female with Cryptoniscan male attached
n s. ♂. Natural size of male.
ant. 1 + 2 ♀. Left first and second antennae of female.
l s ♀. Upper lip of female.
l.i. ♀. Lower lip of female.
mand. ♀. Mandible of female.
l. mx. ♀. Left maxilla of female.
rt. mxp. ♀. Right maxilliped of female.
prp. ♀. Peraeopod of female.
prp. ♀ juv. Peraeopod of young female.
plp. ♀. Pleopod of female.
mand. ♂. Mandible of male.
prp. ♂. Peraeopod of male.
head + app. Crypt. Head of Cryptoniscus larva with first and second antennae and rostral cone.
prp. 3. Crypt. Third peraeopod of Cryptoniscus larva.
pl. 6 + urop Crypt. Sixth pleon segment with uropods of Cryptoniscus larva.



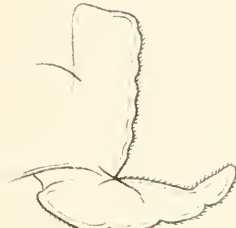
n.s. ♀.



n.s.
♀ juv.



ant 1+2 ♀



i.mx ♀.



prp ♂.



mand ♂.

n.s.
♂ I



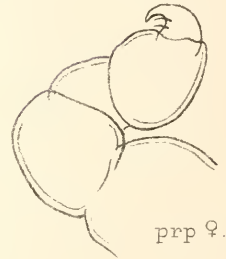
rt.mxp ♀.



mand ♀.



plp ♀.



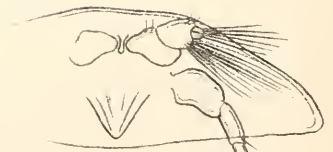
prp ♀.



1.s. ♀



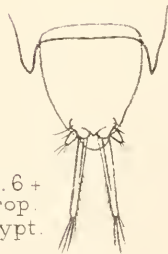
1.i. ♀



head + app.
Crypt.



prp ♀ juv.



pl. 6 +
urop.
Crypt.



prp 3.
Crypt

2.—DESCRIPTION OF A NEW SPECIES OF PHREATOICUS (ISOPODA)
FROM SOUTH AFRICA.

(Plates XXIII. and XXIV.)

The tribe *Phreatoicidea*, Stebbing, was instituted to receive some peculiar Isopods resembling most nearly the *Asellota*, but differing from them in certain respects and possessing also an external likeness to the Amphipoda. It contains a single family, comprising, besides the typical genus with eight species, three other genera each with only one species.

The following is a list of all the hitherto known species.

TRIBE PHREATOICIDEA, Stebbing, 1893.

FAMILY PHREATOICIDAE, Chilton, 1891.

1. GEN. PHREATOICUS, Chilton, 1882.

1. *P. typicus*, Chilton, 1882. A blind species, from wells near Canterbury, New Zealand.
2. *P. australis*, Chilton, 1891. With eyes, from Mt. Kosciusko, 5,700 ft., Victoria, Australia.

Thompson, 1892, reported this species from Mt. Wellington, Tasmania, but subsequently (1894) referred his original specimen to the young of his species *P. tasmaniae*. Since then Smith, 1909, has recorded *P. australis* from several localities in Tasmania, from sea-level to the top of Mt. Wellington, 4,000 ft. According to the arrangement of spines on the uropods he distinguishes three varieties, to which, however, he does not give separate names.

3. *P. assimilis*, Chilton, 1894. Blind, from wells near Canterbury, New Zealand.
4. *P. tasmaniae*, Thomson, 1894. With eyes, from the Great Lake, 3,000 ft., Tasmania.

5. *P. shephardi*, Sayce, 1900a. Blind, from a surface spring at 2,000 ft., near Melbourne, Australia.
6. *P. kirki*, Chilton, 1906. Blind, from fresh-water lagoon, New Zealand.
- 6a. *P. k.* var. *dunedinensis*, Chilton, 1906. Blind, from streams near Dunedin, New Zealand.
7. *P. spinosus*, G. Smith, 1909. With eyes, from the Great Lake, 3,000 ft., Tasmania.

This species is very similar to *P. tasmaniae*, especially as regards the telson and uropods. *P. tasmaniae* was described from a dried specimen, and Smith apparently has not seen this paper, since he quotes Thomson's record of *P. australis* from Mt. Wellington and makes no reference to Thomson's own correction in 1894. According to Thomson the young of *P. tasmaniae* differs from older specimens ($\frac{1}{2}$ inch) as regards the spines on the body, so that it is possible that *P. spinosus* (Smith gives its length as 15–25 mm.) is only a larger form of *P. tasmaniae*, though the 5th pleon segments differ.

8. *P. brevicaudatus*, G. Smith, 1909. With eyes, from the Great Lake, 3,000 ft., Tasmania.

2. GEN. PHREATOICOPSIS, Spencer and Hall, 1897.

1. *P. terricola*, Sp. and Hall, 1897. With eyes, burrowing in the banks of the Upper Gellibrand River, Victoria, Australia.

3. GEN. PHREATOICOIDES, Sayce, 1900.

1. *P. gracilis*, Sayce, 1900. Blind, from surface runnels, Gippsland, Victoria, Australia.

4. GEN. HYPsimETOPUS, Sayce, 1902.

1. *H. intrusor*, Sayce, 1902. Blind, in the burrows of the land-crayfish *Engaeus*, Tasmania.

From the above it will be seen that the family is distributed thus : New Zealand 3 species (1 genus) ; Australia 4 species (3 genera) ; and Tasmania 5 species (2 genera). Only one species is common to any two regions, namely, *P. australis* from Australia and Tasmania. The distribution of the family is thus a very narrow one. Sayce, 1902, remarks that it would be interesting to know

if any representatives were found in South America. The discovery of a species on Table Mountain, South Africa, is therefore of great interest, as being one more fact in support of the existence of an ancient land-mass connecting the Southern continents (Gondwanaland).

PHREATOICUS CAPENSIS, n. sp.

(Plates XXIII. and XXIV.)

Specific diagnosis. Body rather stout, surface with short scattered hairs, eyes well developed, head not as long as first and second peraeon segments together, first and second peraeon segments subequal in length, penultimate joint of first antenna as long as the preceding three joints together, second antenna four-sevenths of the total length, right mandible with secondary cutting-edge, sixth joint of first peraeopod (gnathopod) with the palm not well defined, fifth pleon segment as long as third and fourth together, with the posterior margin notched, pleopods 3-5 with epipodites, telson deeply concave above the terminal projection, lower margin straight, uropods not extending beyond end of telson.

Colour: Slaty-grey with lighter crescentic mottlings on sides of the peraeon and pleon; they are large on the anterior segments, but become smaller posteriorly.

Length: Up to 14 mm.

Habitat: Four specimens from near the reservoir on the top of Table Mountain (C. J. French, March 4, 1913). On May 1, 1913, Mr. S. H. Haughton and myself found numerous specimens under the moss growing on the stones in the bed of a swiftly running stream, near the reservoir at an altitude of about 3,000 ft. Several of them were pairing; the males are slightly larger than the females.

Prof. E. Goddard tells me he found the species some years ago on Table Mountain, but did not describe it. I have to express my thanks to him for permitting me to do this, and also for giving me Tasmanian specimens of *P. australis* for comparison.

The following detailed description is taken from the three largest specimens (11-14 mm.), 2 ♂♂ and 1 ♀; these specimens are in the South African Museum (No. A2257).

The *Body* is rather stout, the pleon long in proportion to the rest of the body. Using Sayce's method and reckoning the cephalon and peraeon as 100, then the pleon measures 70-75. The greatest depth of the pleon is equal to the breadth of the peraeon segments and a little more than twice their depth. The surface of the head

and anterior peraeon segments with irregular shallow depressions, which become obsolete on the posterior peraeon segments and pleon. Hairs on the peraeon and pleon short and scattered, most abundant on the 6th pleon segment.

The *Head* in profile is subtriangular, convex in front. Longer than the 1st peraeon segment but shorter than the 1st and 2nd segments together. Eyes well developed. Below the eyes is a small notch from which a groove runs backwards parallel with the inferior margin and defining the cheek. Frontal and inferior margins emarginate. Near the posterior margin is a groove running out to the rounded intero-posterior angle of the head.

The *Peraeon*. First segment rather closely attached to the head, a little longer in the centre than at the sides. Inferior angles rounded, not produced, inferior margin convex. Segments 2, 3, 4 nearly as long as and a little deeper than the first; inferior margins emarginate, infero-anterior angles rather pointed. Segments 5, 6, 7 a little deeper than the preceding ones; 5 and 6 a little shorter than 4, 7 half the length of 1. Inferior margins, especially of 5 and 6, excavate.

Epimera of segments 1-4 bilobed, the lobes rounded with a few hairs on each. Epimeron 1 nearly as long as its segment, epimera 2, 3, 4 distinctly shorter than their respective segments. Epimera 5, 6, 7 subtriangular, anterior angles rounded, posterior angles pointed, with a few hairs.

The *Pleon*. Its length (with telson) is twice its depth. Pleura well developed, concealing the pleopods in their natural position. Pleuron 1 nearly as deep as its segment, pleura 2, 3, 4 equal to or slightly longer than their respective segments, pleuron 5 nearly twice as long as its segment. Inferior margins rounded, beset with numerous hairs. Segment 1 not quite as long as peraeon segment 7, segments 2, 3, 4 gradually increasing in length; the fifth as long as the third and fourth together, posterior margin deeply notched where pleuron joins the segment; the sixth segment and telson together as long as the fourth and fifth together, infero-anterior angle rounded with 3 strong setae and a few hairs. No groove or ridge defining the junction of telson with the 6th pleon segment.

The *Telson* in profile is strongly convex above with a deep concavity above the terminal projection. This is bluntly tridentate with two strong spines and a few hairs; one strong spine in a slight notch on either side of the terminal projection and another strong spine further back and some little way within the inferior

margin. Inferior margin straight, both from below and from the side, fringed with hairs.

The *First Antenna* reaches to the middle of the 5th joint of peduncle of second antenna. Its peduncle consists of 3 joints: the first stout, the second subequal but narrower, the third a little longer and more slender than the second. Apices of each joint with setae. The flagellum equals in length the peduncle and consists of 5 joints, of which the first three are subequal in length and little more than half the length of the last joint of the peduncle; the fourth is as long as the three preceding ones together; the fifth minute. All the apices with fine hairs.

The *Second Antenna* reaches to the end of the peraeon and is four-sevenths of the total length. Peduncle of 5 joints; first two short and stout, next two longer and more slender and subequal in length; the fifth half as long again as fourth. The flagellum is $2\frac{1}{2}$ times as long as the peduncle and consists of about 30 joints; the first is composed of 2 or 3 incompletely fused joints, the remaining joints become longer and more slender towards the end. Apices of all with fine setae, but without calceoli.

The *Upper Lip* is evenly rounded, with terminal and lateral patches of hairs. The epistome is notched in the centre of the anterior margin.

The *Mandibles*. The left mandible is of the normal form, main cutting-edge with 4 obliquely set teeth, inner cutting-edge (lacinia mobilis) with 3 teeth; both edges strongly chitinized. The right mandible is unusual in having also two cutting-edges; the outer with 4 teeth, the inner with 3, but the inner edge is less strongly chitinized than that in the left mandible, being quite pale in colour. First joint of the palp the shortest, third a little longer, second half as long again as first. Anterior margin of third joint with a thick fringe of stout and simple (not plumose) setae.

The *Lower Lip*. Lobes oblong, apically rounded, the outer margin oblique distally, straight towards the base. Outer margin distally with a dense fringe of long hairs, inner margin with shorter hairs.

The *First Maxilla* has the outer lobe gently curved, margins parallel, apex with 12-13 teeth, some of the inner ones being dentate. Inner lobe shorter and a little narrower, apex with 4 strongly plumose setae, and 2 which arise from the bases of the first and third plumose setae and are plumose only at the tips.

The *Second Maxilla* has the outer articulated lobe half as broad again as the inner; outer margins of both convex, extremities

obliquely truncated, the outer with 19, the inner with 15 long setae denticulated on their inner edges. Inner fixed lobe rounded at apex, with a number of fine setae, the innermost ones being plumose. Inner margin slightly concave with a thick row of simple setae.

The *Maxillipeds*. Epipodite almost rectangular, very slightly longer than broad, the angles rounded, reaching to end of the second joint of exopodite. The basos a little more than twice as long as broad; ischios very short; meros produced externally for three-quarters the length of the carpus; carpus rather sunk in meros with external margin straight and internal margin convex; propodos ovate longer than broad; dactylos narrow lanceolate, as long as propodos. Endopodite arises from the basos and reaches to the middle of the carpus, bearing externally long plumose setae and internally 2 coupling spines.

The *First Peraeopod (Gnathopod)*. In the first as in all the legs the coxos is fused with the epimeron. The basos is twice as long as broad; ischios two-thirds length of basos and narrower; meros sub-triangular broader than long, anteriorly produced into a pointed process; carpus as long as broad, broader than third; propodos obovate, proximally twice as broad as distally, anterior margin evenly rounded, palm not well defined, slightly concave, beset with numerous setae and about 7 spines. These spines are tubercular in shape at the distal end, but towards the base of the palm gradually approximate to the ordinary form of setae, and eventually are indistinguishable from the setae fringing the base of the hand. The dactylos is strongly curved at the base, but distally nearly straight; a minute secondary unguis at base of the terminal one, and behind that some very minute denticulations.

The gnathopod of the female differs hardly at all from that of the male; the hand is equally developed and of the same form. The spines on the palm, however, are bicuspid and more slender.

The *Second and Third Peraeopods*. The basos is twice as long as broad; ischios two-thirds length of basos and also twice as long as broad; meros as long as ischios, subtriangular, anterior margin expanded distally; carpus a little shorter than meros; propodos as long as ischios; both the carpus and propodos have strong spines on the posterior margins; dactylos a little more than half the length of the propodos, with secondary unguis and an apical tuft of setae.

The *Fourth Peraeopod* is a little shorter than the preceding ones. The basos $2\frac{1}{2}$ times as long as broad; ischios two-thirds length of basos; meros a little shorter and expanded distally; carpus as long as meros, rather swollen, anterior margin with 3 apical setae and one further back, posterior margin with 6 very stout and long spines and a few finer setae; propodos a little longer than and at right angles to carpus, distal end prolonged externally beyond the articulation with the dactylos, anterior margin with an apical tuft and a few setae behind, posterior margin with 3 stout spines on a slightly convex palm and a few fine setae; dactylos shorter than and at right angles to propodos, curved, with secondary unguis, an outer apical tuft of setae and a few very fine ones on inner margin. The female differs from the male in the following points: the carpus is less swollen; the propodos more slender, the length being 3 times the breadth instead of twice; the dactylos less curved; the convex palm is hardly developed and the spines on both carpus and propodos are more slender.

The *Brood-pouches* in the female are developed on the 2nd, 3rd and 4th peraeon segments.

The *Fifth, Sixth and Seventh Peraeopods*. The fifth is slightly longer than the preceding ones and the sixth and seventh are longer than the fifth. They agree with each other except in the width of the basos; this in the 5th and 6th legs is one-half the length, in the 7th two-thirds. The ischios joint is three times as long as broad; the meros a little more than two-thirds the length of the ischios, with a distal prolongation on posterior margin; carpus joint nearly as long as ischios, its length nearly 4 times its breadth; propodos as long as carpus but more slender; dactylos half as long as propodos, with secondary unguis, apical tuft of setae and a few fine ones on the inner margin.

The setae of all the legs, but especially those of the last three pairs, are covered with numerous short-stalked Infusoria.

The *Male appendages* on the seventh peraeon segment are curved towards one another, not swollen at the base, with blunt apices and a few hairs, chiefly on the inner margin.

The *First Pleopod*. Protopodite rectangular; exopodite and endopodite lanceolate, the former rather narrower and more pointed than the latter, both with a few plumose setae on outer margins and apices.

The *Second Pleopod*. Protopodite subtriangular with 2 setae on its inner distal apex. First joint of exopodite produced proximally into a rounded lobe; both margins gently convex, the inner with

fine simple setae, the outer with plumose setae; apex oblique, scarcely hollowed to receive the second joint, which is more than twice as long as broad, with long plumose setae. Endopodite as long as first joint of exopodite, outer margin strongly curved, with a few setae becoming plumose distally, inner margin straight, apex rounded. These parts are similar in both sexes. The penial filament of the male extends to the end of the endopodite, with which it is fused for about one-half its length. The fused portion bears very minute hairs, the free portion on outer margin (*i.e.*, away from endopodite) small setae at regular distances apart, and becoming longer towards the apex, which is slightly bent over. In another specimen the penial filament is a little shorter than the endopodite with which only the basal third is fused.

The *Third Pleopod*. Protopodite triangular with internal apical tuft of setae. First joint of exopodite shorter and stouter than that of the second pleopod; length about $1\frac{1}{2}$ times its breadth, apex oblique and slightly hollowed to receive the second joint, which is $1\frac{1}{2}$ times as long as broad, obovate. Endopodite reaching to the middle of the second joint of exopodite, external margin very convex, inner straight. Epipodite subtriangular, external margin strongly rounded, inner slightly convex. Setae on the epipodite, inner and proximal portion of outer margin of 1st joint of exopodite simple, those on distal portion of the first joint and on the 2nd joint of exopodite and apex of endopodite plumose.

The *Fourth Pleopod* is very similar to the third, but apex of the 1st joint of exopodite is less oblique and more hollowed out for the 2nd joint, which is proportionately broader. Epipodite more semicircular in shape.

The *Fifth Pleopod*. First joint of exopodite larger than in any of the preceding pleopods, proximally rather bulging; breadth of the 2nd joint two-thirds its length. Endopodite does not reach the middle of the 2nd joint, and the inner margin is convex. Epipodite semicircular.

The *Uropods* reach to the end of the telson, but not beyond. Peduncle stout, twice as long as broad, grooved on its upper surface. Both of the upper margins with 3 spines and a few smaller setae, inferior margin with 4 spines increasing in length distally and shorter ones at the apex. Inner ramus a little longer than the peduncle, straight, upper margin with 3 spines in the middle and one near the apex, as well as a few small setae, lower margin with a small spine near the apex and 2-3 fine setae. Outer ramus not quite as long as peduncle, upper margin with 2 spines and a few

setae, lower margin with a small spine near the apex and 2-3 fine setae.

Affinities. As regards the shape of the telson this species bears most resemblance to *P. brevicaudatus*, except that the lower margin of the telson in the latter is convex and not straight as in the former. *P. capensis* is further distinguished by the notched 5th pleon segment and the longer second antennae, with a flagellum of 30 joints; that of *P. brevicaudatus* having only 19. A comparison with the mouth-parts and pleopods of *P. brevicaudatus* or *P. spinosus* is unfortunately impossible owing to the brevity of Smith's descriptions.

In the proportional length of pleon plus telson to cephalon plus peraeon *P. capensis* is near to *P. tasmaniae*, $\frac{7.0}{10.0}$ — $\frac{7.5}{10.0}$ in both species; this proportion is a good deal higher than in any other species and is only exceeded in *P. spinosus*, where it is $\frac{9.0}{10.0}$. From *P. spinosus* *P. capensis* differs in having a notched 5th pleon segment, and from *P. tasmaniae* by the absence of a well-defined palm on gnathopod and in the shape of the ischios and meros of the maxillipeds; they agree, however, in having simple setae on the inner margin of the fixed lobe of the second maxillae.

The only other species which *P. capensis* somewhat resembles in the shape of the telson is *P. australis*; they agree also as regards the 1st and 2nd maxillae, the maxillipeds and the palm of the gnathopod. The differences are these: in *P. australis* the upper lip has no lateral as well as terminal patches of hairs, the epistome has an entire distal margin, the lower lip is slightly different in shape, the spine-row on the left mandible is far more conspicuous, the basos of the peraeopods is more expanded and the uropod has 2 very stout spines at the apex of the lower margin.

The most distinctive feature of *P. capensis* is the secondary cutting-edge in the right mandible. Hitherto the only member of the family in which this has been found is *Phreatoicopsis terricola*. In *Phreatoicus typicus*, *australis* and *assimilis* it is described as absent in the right mandible; in Tasmanian specimens of *australis* I have myself failed to find it. In the descriptions of the other species of *Phreatoicus* the right mandible has not been specially mentioned, so that it is possible that some or all of these species may be found to possess a secondary cutting-edge in the right as well as the left mandible.

P. capensis has no other characters in common with *Phreatoicopsis*, but agrees perfectly with *Phreatoicus*. It would, however, be interesting to know whether the penial filament on the 2nd

pleopod in *Phreatoicopsis* is free or fused in part with the endopodite. It is free in both *Phreatoicooides* and *Hypsimetopus*, but fused in *Phreatoicus*.

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PLATE XXIII.

Phreatoicus capensis, n. sp.

Whole animal enlarged nearly 5 times; n.s. natural size. The pleopods in their natural position do not project beyond the pleura, as shown in the figure.

a. 1. Upper antenna, with tip further enlarged.

a. 2. Lower antenna.

l.s. Upper lip.

l.i. Lower lip.

l mand. Left mandible from within, the two cutting-edges further enlarged.

mx. 1. First maxilla, apices of the lobes further enlarged, and one of the dentate spines from the outer lobe.

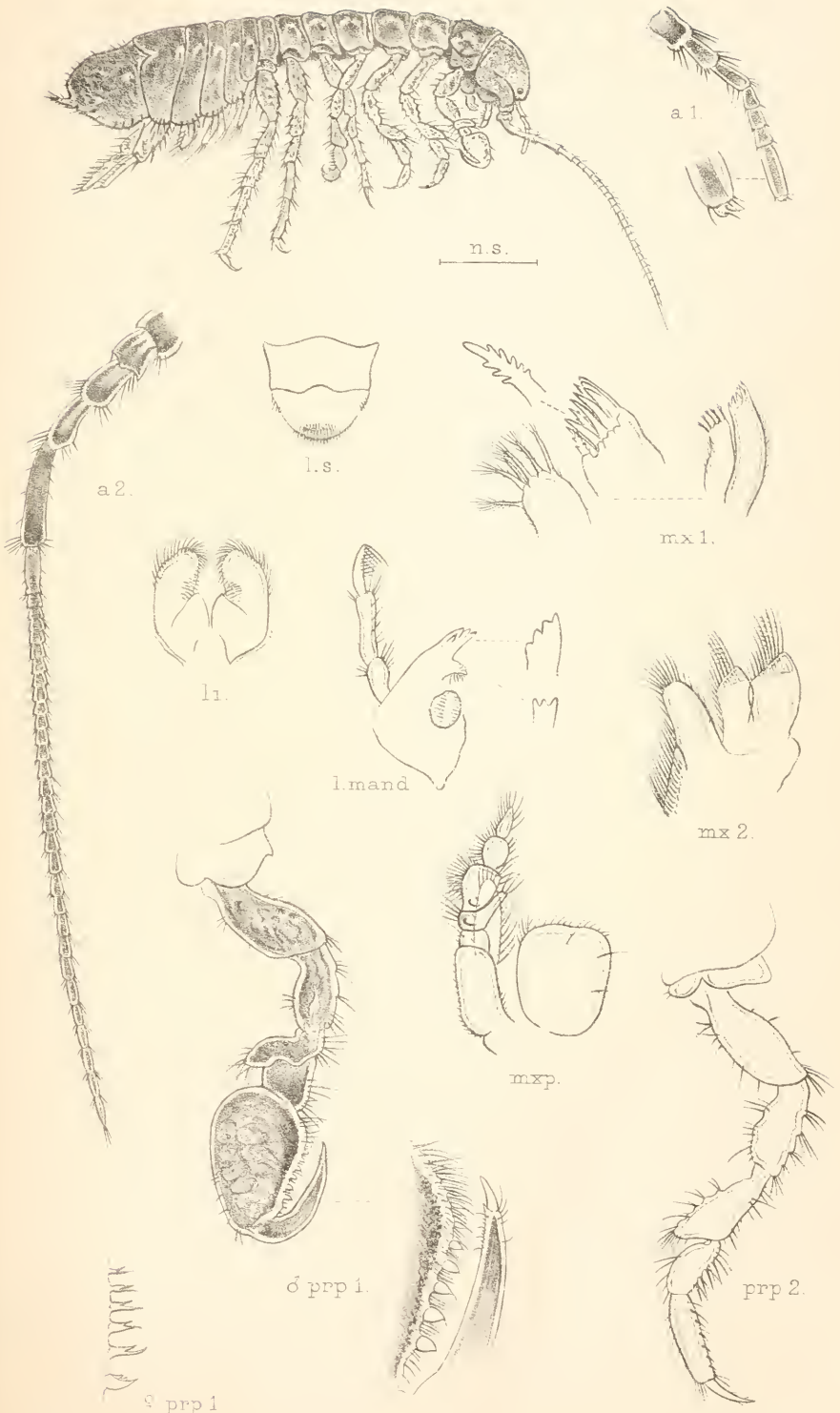
mx. 2. Second maxilla.

mxp. Maxilliped.

♂, prp. 1. Left first peraeopod of male, with palm and finger further enlarged.

♀, prp. 1. Left first peraeopod of female, with spines from the palm enlarged.

prp. 2. Left second peraeopod.



K.H.B. del.

West Newman lith.

PHREATOICUS CAPENSIS, n.sp

PLATE XXIV.

Phreatoicus capensis, n. sp.

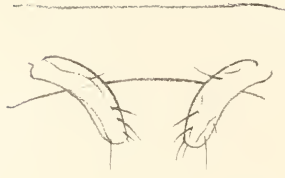
- ♂, prp. 4. Left fourth peraeopod of male, with last three joints further enlarged.
♀, prp. 4. Left fourth peraeopod of female, last three joints.
prp. 5. Left fifth peraeopod.
pen. Male appendages on 7th pleon segment.
plp. 1. Right first pleopod.
♂, plp. 2. Right second pleopod of male with apex of penial filament further enlarged.
♀, plp. 2. Right second pleopod of female.
plp. 3, plp. 4, plp. 5. Third, fourth and fifth pleopods of the right side.
tels. Telson, showing anus and articulation of uropods (urp) with 6th pleon segment.
urop. Left uropod.



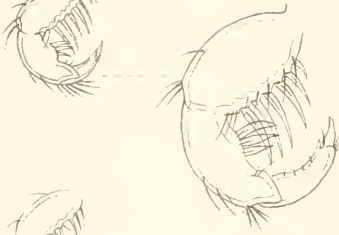
prp 5.



♂ prp 4



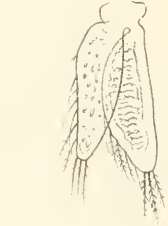
pen.



plp 1.



♀ prp 1.



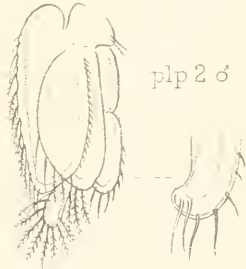
plp 2 ♂



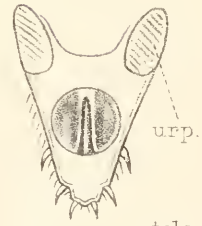
plp 3.



plp 2 ♀



plp 5.



urop.

tels.



plp 4.



urop.

K.H.B.del

West, Newman lith.

12.—*Descriptions of South African Micro-Lepidoptera.*—By E. MEYRICK, B.A., F.R.S.

THE following species have been communicated to me for study through the kindness of Dr. L. Péringuey, and the types are in the South African Museum.

FAMILY TORTRICIDAE.

GEN. EPICHORISTA, Meyr.

EPICHORISTA VESTIGIALIS, n. sp.

♀. 16 mm. Head, palpi, thorax, and abdomen whitish-ochreous. Forewings elongate, rather narrow, costa gently arched, apex round-pointed, termen straight, oblique; whitish-ochreous, veins slightly deeper in colour; a dark fuscous dot in disc at $\frac{2}{3}$: cilia whitish-ochreous, on termen light brownish with an indistinct fuscous line. Hindwings ochreous-whitish tinged with grey, towards apex infuscated; cilia ochreous-whitish tinged with grey.

TRANSVAAL, Barberton, in February (H. Edwards); one specimen.

FAMILY EUCOSMIDAE.

GEN. ARGYROPLOCE, Hubn.

ARGYROPLOCE GLOBIGERA, n. sp.

♂ ♀. 17–19 mm. Head and thorax light brownish, crest mixed with dark fuscous. Palpi moderate ($2\frac{1}{4}$ – $2\frac{1}{2}$), porrected, pale brownish, suffused with whitish towards base. Antennae in ♂ minutely ciliated. Abdomen rather dark fuscous. Posterior tibiae without tuft. Forewings elongate, moderate, rather dilated posteriorly, costa gently arched, apex obtuse, termen rounded, somewhat oblique; light brownish, finely irrorated with whitish; costa and dorsum with some fine black strigulae or dots; outer edge of basal patch indicated by a narrow triangular dark fuscous spot from dorsum,

reaching half across wing; central fascia oblique, rather dark fuscous, becoming obsolete towards dorsum but with margins indicated by some black scales, moderate on upper half, broader on lower, posterior edge prominent below middle, finely edged with white on upper $\frac{2}{3}$; a rounded rather dark fuscous blotch near before upper part of termen, anteriorly mixed with blackish and finely edged with white; four minute black dots on upper part of termen: cilia brownish sprinkled with whitish. Hindwings rather dark fuscous, in ♂ somewhat lighter: cilia whitish-fuscous, with darker fuscous subbasal line.

NATAL, Victoria district (Gooch), one specimen; also one in my collection from Durban, in March (Leigh). Nearest the Chinese *archimedioides*, which is a smaller and more neatly marked insect.

FAMILY GELECHIADAE.

GEE. EPITHECTIS, Meyr.

EPITHECTIS PTYCHOPHORA, n. sp.

♂ ♀. 8-11 mm. Head pearly ochreous-white, crown sprinkled with dark fuscous. Palpi white, somewhat sprinkled with dark fuscous, second and terminal joints each with two blackish bands. Thorax white, finely irrorated with dark fuscous. Abdomen whitish mixed with dark grey. Forewings elongate-lanceolate; rather dark fuscous irrorated with white; a costal fold in ♂ extending from base to middle; an ochreous subbasal dot in middle; in ♀ an ochreous longitudinal mark beneath costa towards base; two blackish dots obliquely placed above and below fold at $\frac{1}{4}$, lower sometimes centred with ochreous; a small ochreous spot towards costa before middle; a black dot above middle of disc, edged beneath with ochreous; two small ochreous spots transversely placed at end of cell, partially edged or connected with black; a few scattered black scales posteriorly: cilia dark grey irrorated with whitish. Hindwings grey, in ♂ irrorated with darker except in disc and towards base; cilia light grey.

CAPE COLONY, Dunbrody, in June (Fath. A. Vogt); four specimens.

THYMOSOPHA, n. g.

Head smooth; ocelli present; tongue developed. Antennae $\frac{3}{4}$, in ♂ minutely ciliated, basal joint elongate, without pecten. Labial palpi long, recurved, second joint thickened with scales, slightly

roughened anteriorly, terminal joint shorter than second, thickened with scales projecting posteriorly above middle, apex slender, acute. Maxillary palpi very short. Posterior tibiae with scanty appressed hairs above. Forewings with 1b furcate, 2 from towards angle, 7 and 8 stalked, 7 to costa, 11 from middle. Hindwings 1, trapezoidal, apex tolerably pointed, termen slightly sinuate beneath it, cilia 1, 3 and 4 connate, 5 slightly approximated, 6 and 7 parallel.

THYMOSOPHA ANTILEUCA, n. sp.

♂ ♀. 14–15 mm. Head white. Palpi dark fuscous, tips white. Thorax white, posterior extremity dark fuscous. Abdomen grey. Forewings elongate-lanceolate; dark fuscous, with slight purple gloss; a triangular white blotch on dorsum before middle, its apex almost touching costa at $\frac{1}{4}$; a smaller triangular white blotch on costa at $\frac{3}{4}$, reaching half across wing: cilia dark fuscous. Hindwings and cilia grey.

CAPE COLONY, Dunbrody, in June (Fath. A. Vogt); two specimens.

GEN. PHTHORIMAEA, Meyr.

PHTHORIMAEA ERICNISTA, n. sp.

♂ ♀. 8–10 mm. Head and thorax whitish sprinkled with dark fuscous, shoulders with a blackish spot. Palpi whitish sprinkled with grey, second and terminal joints each with basal ring and supra-median band of dark fuscous suffusion. Abdomen whitish-grey, anal tuft ochreous-whitish. Forewings elongate-lanceolate; whitish-fuscous or whitish-grey, irrorated with dark fuscous or blackish, mixed with brown in disc; spots of darker suffusion on costa at base, $\frac{1}{3}$, middle, and $\frac{2}{3}$; black dots on fold near base and at $\frac{1}{4}$; stigmata black, somewhat raised, plical somewhat before first discal, an additional dot beneath and somewhat beyond second discal: cilia whitish-fuscous sprinkled with blackish. Hindwings and cilia light grey.

CAPE COLONY, Capetown (Lightfoot); four specimens. Allied to *synecta*, which, together with the whole of the *Lita* group of *Gelechia*, are now attributed to *Phthorimaea*.

GEN. BRACHMIA, Hubn.

BRACHMIA TORREFACTA, n. sp.

♂. 14–15 mm. Head and thorax pale yellow-ochreous, shoulders grey. Palpi ochreous-yellowish, second joint rather dark grey.

Antennal ciliations 2. Abdomen whitish-grey, anal tuft whitish-ochreous. Forewings elongate, narrow, costa slightly arched, apex tolerably pointed, termen somewhat sinuate, rather strongly oblique; 2 and 3 stalked, 8 and 9 out of 7, 7 to apex; ochreous-yellow suffused throughout with brownish-ferruginous: cilia ochreous-yellow tinged with ferruginous. Hindwings grey; cilia pale grey.

TRANSVAAL, Johannesburg, in January and February (H. Feltham); two specimens.

GEN. CHELARIA, Haw.

CHELARIA MELANECTA, n. sp.

♂. 15 mm. Head and thorax white speckled with grey. Palpi white speckled with grey, second joint with long acute triangular apical tuft beneath, blackish except along apical edge, terminal joint thickened towards middle, with black subbasal ring and median band. Abdomen pale grey. Forewings elongate, narrow, costa slightly arched, apex obtuse, termen very obliquely rounded; 6 separate; fuscous finely irrorated with whitish, all veins marked with fine dark fuscous lines, with a few black scales, vein 6 marked with a fine black streak; a grey streak along median third of costa; a darker line from $\frac{2}{5}$ of costa, running near costa to apex: cilia fuscous irrorated with whitish, round apex with three or four darker lines. Hindwings and cilia light grey.

TRANSVAAL, Johannesburg, in January (H. Feltham); one specimen.

FAMILY SCYTHRIDAE.

GEN. SCYTHRIS, Hubn.

SCYTHRIS MELANOPLEURA, n. sp.

♂ ♀. 15-18 mm. Head and thorax whitish-ochreous tinged with grey. Palpi ochreous-whitish, suffused with grey anteriorly. Antennal ciliations of ♂ $\frac{2}{3}$. Abdomen whitish-ochreous, tinged with yellowish, with a thick black lateral streak on basal half. Forewings elongate-lanceolate, acute; pale ochreous mixed with whitish, with scattered dark fuscous scales, especially in disc; plical and second discal stigmata dark fuscous, widely remote: cilia whitish-ochreous, towards tornus more or less suffused with pale greyish-fulvous. Hindwings with 4 and 5 stalked; pale greyish-ochreous tinged with fulvous, in ♂ suffused with grey, darker towards apex, in ♀ some-

what suffused with grey towards apex; cilia greyish-ochreous tinged with fulvous.

MATABELELAND, Bulawayo, in February (H. C. Pead); four specimens. Allied to *justifica*.

FAMILY OECOPHORIDAE.

GEN. BORKHAUSENIA, Hubn.

BORKHAUSENIA ENDOCENTRA, n. sp.

♂. 18 mm. Head and palpi whitish-ochreous sprinkled with dark fuscous. Antennal ciliations 1. Thorax whitish-ochreous, anterior margin suffused with dark fuscous. Abdomen whitish-ochreous. Forewings elongate, costa gently arched; apex obtuse, termen very obliquely rounded; pale greyish-ochreous, with scattered fuscous specks; costal edge dark fuscous towards base; a black linear dot towards costa near base; stigmata black, plical obliquely beyond first discal, an additional dot between discal; some indistinct dark fuscous dots round posterior part of costa and termen: cilia whitish-ochreous tinged with grey. Hindwings grey-whitish irrorated with grey; cilia grey-whitish.

TRANSVAAL, Johannesburg, in January (H. Feltham); one specimen.

GEN. OCYSTOLA, Meyr.

OCYSTOLA (?) PROXENA, n. sp.

♀. 17 mm. Head and thorax light yellowish, shoulders rather dark fuscous. Palpi rather short, dark fuscous, apex yellow-whitish. Abdomen yellow-whitish, with ochreous-yellow segmental bands. Forewings elongate, costa moderately arched, apex round-pointed, termen very obliquely rounded; light ochreous-yellowish; a rather suffused dark fuscous streak along costa from base to near apex: cilia light yellowish. Hindwings with 3 and 4 nearly approximated at base; whitish-ochreous; cilia whitish-ochreous.

TRANSVAAL, Johannesburg, in February (H. Feltham); one specimen.

GEN. COESYRA, Meyr.

COESYRA CENTROBOLA, n. sp.

♂. 18 mm. Head whitish-ochreous mixed with pale grey. Palpi ochreous-whitish irrorated with grey. Antennae serrate, ciliations $\frac{2}{3}$. Thorax pale grey mixed with dark fuscous. Abdomen

whitish-ochreous, with deeper segmental bands. Forewings elongate, rather narrow, costa moderately arched, apex pointed, termen very obliquely rounded; greyish, sprinkled with fuscous and blackish, suffused with whitish in disc and towards dorsum anteriorly; a small black linear dot on fold at $\frac{1}{5}$; stigmata black, plical rather obliquely before first discal, an additional dot beyond and rather above first discal, and another midway between this and second discal, second discal large, transverse: cilia whitish-fuscous. Hindwings ochreous-whitish; cilia whitish-ochreous.

CAPE COLONY, Capetown (Lightfoot); one specimen.

COESYRA CAMPYLOTIS, n. sp.

♀. 12 mm. Head, palpi, and thorax light yellowish. Abdomen light grey. Forewings elongate, costa gently arched, apex obtuse, termen obliquely rounded; yellow; a triangular pale fuscous blotch on dorsum beyond middle, edged anteriorly with black and then with whitish, its apex formed by black second discal stigma, whence a strongly outwards-curved fine line of black and brown scales runs to a spot of dark brown irroration on costa at $\frac{3}{4}$; some minute dark fuscous dots along termen: cilia yellow. Hindwings and cilia grey.

ZULULAND, Mfongosi, in February (W. E. Jones); one specimen. Allied to *balantias*, but smaller and more marked, and distinguished by grey hindwings.

GEN. PHILOBOTA, Meyr.

PHILOBOTA DRYINOTA, n. sp.

♀. 17-18 mm. Head and thorax pale brownish, somewhat whitish-mixed. Palpi whitish-rosy-brownish, second joint suffused with dark fuscous except towards apex. Abdomen pale greyish-ochreous, with ochreous segmental bands. Forewings elongate, costa gently arched, apex obtuse, termen nearly straight, oblique; light brownish, irregularly mixed with deeper brown, with a few scattered dark fuscous scales; plical stigma moderate, dark fuscous, second discal represented by a rather oblique blackish mark on transverse vein: cilia pale brownish mixed with darker, at base on termen mixed with dark fuscous and blackish scales. Hindwings pale fuscous; cilia whitish-fuscous.

CAPE COLONY, Dunbrody, in June (Fath. A. Vogt); two specimens.

GEN. DEPRESSARIA, Haw.

DEPRESSARIA PROSPICUA, n. sp.

♀. 19–20 mm. Head and thorax whitish-ochreous somewhat tinged with brownish, shoulders narrowly blackish-grey. Palpi whitish-ochreous, second joint except apex, and a suprmedian band of terminal joint sprinkled with dark fuscous. Abdomen whitish-ochreous. Forewings elongate, costa slightly arched, apex obtuse, termen slightly rounded, oblique; 2 and 3 stalked; whitish-ochreous, tinged here and there with brownish, with some scattered blackish specks; a blackish-grey spot on base of costa, its edge marked with a black dot above middle of wing, corresponding dorsal space whitish; first discal stigma black, with an additional dot obliquely before and rather above it, both these surrounded with white suffusion; second discal stigma white edged with dark fuscous, sometimes with an indistinct white dot before and slightly above it; all these dots are more or less surrounded with ochreous-brown suffusion, sometimes forming a longitudinal streak; an undefined angulated subterminal fascia of brownish suffusion; some dots formed of two or three black specks each round posterior part of costa and termen: cilia whitish-ochreous, partially tinged with brownish. Hindwings ochreous-whitish slightly tinged with grey; cilia ochreous-whitish.

CAPE COLONY, Capetown (Lightfoot); three specimens.

DEPRESSARIA COMPACTA, n. sp.

♂. 17–19 mm. Head whitish-ochreous. Palpi whitish-ochreous, second joint and basal and suprmedian bands of terminal joint sprinkled or irrorated with dark fuscous. Thorax whitish-ochreous suffused with purplish-fuscous, patagia dark fuscous. Abdomen whitish-ochreous tinged with fuscous. Forewings elongate, costa gently arched, apex obtuse, termen slightly rounded, rather oblique; 2 and 3 stalked; whitish-ochreous, with scattered dark fuscous scales; base narrowly dark fuscous; discal stigmata white edged with dark fuscous, space between them tinged with pale brownish, first preceded by a black dot somewhat above it; a series of black elongate dots round posterior part of costa and termen: cilia whitish-ochreous. Hindwings ochreous-grey-whitish, greyer posteriorly; cilia ochreous-grey-whitish.

CAPE COLONY, Capetown (Lightfoot); two specimens.

FAMILY XYLORYCTIDAE.

GEN. XYLORYCTA, Meyr.

XYLORYCTA ARTIGENA, n. sp.

♂. 13–14 mm. Head and thorax white. Palpi white, towards base with a blackish streak above, extreme tip black. Antennae serrate, ciliations $\frac{1}{2}$. Forewings moderate, somewhat dilated posteriorly, costa moderately arched, apex obtuse, termen somewhat rounded, little oblique; 7 to apex; white; costal edge blackish towards base; a patch of faint whitish-ochreous suffusion on basal portion of dorsum; black dots at both angles of cell, followed by a brown patch, and connected with tornus by an irregular interrupted line of brown suffusion sprinkled with black; a faint irregular line of brownish suffusion with some dots of black irroration running near margin round posterior $\frac{2}{5}$ of costa and termen; a terminal row of small black dots: cilia white. Hindwings with 6 and 7 stalked; white, with a faint ochreous tinge; cilia white.

NATAL, Victoria district (Gooch), one specimen; also one in my collection from Pinetown in February (Leigh).

GEN. ODITES, Wals.

ODITES OBVIA, n. sp.

♂ ♀. 14–15 mm. Head, thorax, and abdomen whitish-ochreous. Palpi whitish-ochreous, second joint suffused with dark fuscous except apex. Antennal ciliations of ♂ nearly 1. Forewings elongate, posteriorly slightly dilated, costa gently arched, apex obtuse, termen slightly rounded, somewhat oblique; whitish-ochreous; stigmata blackish, plical rather obliquely before first discal; a series of small blackish almost marginal dots round apex and termen: cilia whitish-ochreous. Hindwings ochreous-whitish, slightly greyish-tinged towards apex; cilia whitish-ochreous.

ZULULAND, Mfongosi, in October and November (W. E. Jones); seven specimens.

ODITES INVERSA, n. sp.

♂. 11–13 mm. Head and thorax light ochreous-yellowish. Palpi whitish, second joint suffused with grey except towards apex. Abdomen whitish-yellowish. Forewings elongate, costa gently arched, apex tolerably pointed, termen rounded, rather strongly oblique; ochreous-yellow, with a few scattered dark fuscous specks; stigmata blackish, plical obliquely beyond first discal; an almost

marginal row of blackish dots round posterior part of costa and termen: cilia ochreous-yellowish. Hindwings and cilia ochreous-whitish.

ZULULAND, Mfongosi (W. E. Jones), one specimen; also one in my collection from NATAL, Pinetown, in February (Leigh).

FAMILY HYPONOMEUTIDAE.

GEN. HYPONOMEUTA, Latr.

HYPONOMEUTA AFRICANA, Staint.

♀. 21 mm. Head white, with a blackish dot on each side of forehead. Palpi white, terminal joint with blackish basal ring. Thorax white, with blackish dot on each shoulder, and two on back posteriorly (probably also two anteriorly, defaced). Abdomen light greyish. Forewings white, with nearly 50 rather large black dots, viz., seven immediately beneath costa on anterior half, ten beneath these from $\frac{1}{4}$ to apex, ten irregularly placed beneath these, five in a median series on posterior half, a submedian series of ten and subdorsal of seven; a suffused grey spot on fold beneath middle, touching another in disc beyond middle; a third on tornus: cilia white, at base with some faint grey dots or small spots. Hindwings light grey; a hyaline elongate patch beneath cell at base; cilia pale grey.

I have redescribed above what is presumably Stainton's original type, which has been sent me for examination, bearing his label; it is a very distinct species, but the original description is brief.

GEN. ISOCRITA, Meyr.

ISOCRITA EREMASTA, n. sp.

♀. 18 mm. Head, palpi, and thorax whitish-ochreous sprinkled with light grey. Basal joint of antennae with scales above forming a short apical projection. Abdomen whitish-ochreous. Forewings elongate, costa gently arched, apex obtuse-pointed, termen rounded, rather strongly oblique; whitish-ochreous irrorated with light fuscous; stigmata very small, fuscous, indistinct, plical rather obliquely before first discal: cilia whitish-ochreous. Hindwings whitish-ochreous, faintly tinged with grey posteriorly; cilia whitish-ochreous.

CAPE COLONY, Capetown (Lightfoot); one specimen.

GEN. EPIPHRACTIS, Meyr.

EPIPHRACTIS IMBELLIS, n. sp.

♂. 19 mm. Head, palpi, thorax, and abdomen whitish. Forewings elongate, costa gently arched, apex obtuse, termen somewhat sinuate, rather oblique; ochreous-whitish; a brown-reddish mark above dorsum near base; a brown-reddish streak from $\frac{1}{4}$ of disc to $\frac{2}{3}$ of dorsum, posteriorly triangularly dilated below middle and sending a branch hence to lower angle of cell; a triangular patch of scattered light brown-reddish suffusion resting on termen, with a few dark fuscous scales, its apex indicating second discal stigma: cilia whitish, outer half sprinkled with brown-reddish. Hindwing and cilia ochreous-whitish; costal hairpencil whitish.

NATAL, Durban; one specimen.

FAMILY TINEIDAE.

GEN. MELASINA, Boisd.

MELASINA PETRODES, n. sp.

♂. 19-24 mm. Head and thorax white sometimes partly tinged with ochreous, face and front of thorax mixed with grey. Palpi moderate, slender, loosely scaled, white. Antennal pectinations 3. Abdomen whitish-grey. Forewings elongate, narrow at base, costa slightly arched, apex obtuse, termen slightly rounded rather strongly oblique; all veins separate; pale fuscous, suffusedly irrorated with white: costal edge suffusedly dark fuscous from base to $\frac{2}{3}$; some fuscous suffusion towards costa at base; two undefined angulated fuscous fasciae before and beyond middle, edged with some black scales, sometimes forming dots or strigulae, connected together by a broad bar in middle, preceded and separated by undefined blotches of white suffusion in disc above and below middle, both fasciae more or less distinctly interrupted beneath costa; five small rather dark fuscous spots on costa posteriorly; some irregular black scales or dots towards apex, sometimes forming a subterminal series of dots and strigulae; a series of cloudy fuscous dots along termen: cilia light grey mixed with whitish. Hindwings grey or dark grey; cilia grey-whitish.

CAPE COLONY, Kimberley, in March (Bro. J. H. Power); five specimens. Near *sisyraea*, but forewings less elongate, more strongly marked, termen less oblique.

MELASINA MICROCTENIS, n. sp.

♂. 24 mm. Head whitish-ochreous. Palpi moderately long, loosely haired, whitish-ochreous sprinkled with dark fuscous. Antennal pectinations 1, moderately ciliated. Thorax pale ochreous, somewhat sprinkled with dark fuscous. Abdomen pale ochreous tinged with fuscous. Forewings elongate, costa gently arched, apex rounded-obtuse, termen obliquely rounded; all veins separate; pale ochreous, with some scattered undefined strigulae of brownish and black specks, especially in disc and on anterior portion of costa: cilia pale ochreous. Hindwings grey; cilia whitish-ochreous.

MATABELELAND, Bulawayo, in February (H. C. Pead); one specimen. Specially characterised by the unusually short pectinations of antennae, which, however, are normal in form.

MELASINA DERMATODES, n. sp.

♂. 22-24 mm. Head pale ochreous. Palpi moderate, smooth-scaled, light brownish-ochreous. Antennal pectinations 4. Thorax light brownish-ochreous. Abdomen grey, anal tuft pale ochreous. Forewings elongate, costa slightly arched, apex obtuse, termen rounded, rather strongly oblique; all veins separate; light brownish-ochreous, indistinctly strigulated with brownish, sometimes slightly mixed with whitish between the strigulae; a fuscous dot on end of cell: cilia pale brownish-ochreous, somewhat sprinkled with brownish. Hindwings dark fuscous; cilia light greyish-ochreous, with dark fuscous subbasal line.

MATABELELAND, Bulawayo, in February (H. C. Pead); four specimens.

MELASINA AUTODERMA, n. sp.

♂. 18-21 mm. Head pale yellowish. Palpi moderate, loosely scaled, fuscous, apex pale yellowish. Antennal pectinations 3. Thorax and abdomen fuscous. Forewings elongate, moderate, costa moderately arched, apex obtuse, termen obliquely rounded; all veins separate; fuscous, or brownish-ochreous tinged with fuscous, especially towards base of costa, usually with very indistinct scattered darker fuscous strigulae; a very indistinct darker fuscous transverse mark on upper angle of cell: cilia light fuscous, with two darker shades. Hindwings dark fuscous; cilia pale fuscous, with darker subbasal shade.

MATABELELAND, Bulawayo, in February (H. C. Pead); seven specimens. Very like *dermatodes*, but smaller, darker, forewings relatively broader and costa more strongly arched.

GEN. PSEUDURGIS, Meyr.

PSEUDURGIS SCIOCOLONA, n. sp.

♂. 18 mm. Head yellow-whitish. (Palpi broken.) Thorax pale grey-yellowish, mixed with white posteriorly. Abdomen grey. Forewings elongate, moderate, slightly dilated posteriorly, costa slightly arched, apex obtuse, termen hardly rounded, oblique; pale yellowish irrorated and faintly strigulated with light grey; a median streak of white suffusion from near base to near middle; dorsum towards base suffused with white; a light grey subtriangular blotch occupying posterior half of dorsum and reaching half across wing, edged on sides with white suffusion: cilia whitish with rows of grey points. Hindwings grey; cilia pale grey, with darker subbasal shade.

ZULULAND, Mfongosi, in January (Fath. A. Vogt); one specimen.

PSEUDURGIS LEUCOSEMA, n. sp.

♂. 18 mm. Head and thorax fuscous somewhat mixed with white, shoulders mixed with dark fuscous. Palpi moderate, porrected, fuscous, darker towards base, second joint rough-scaled beneath, terminal joint short. Abdomen fuscous. Forewings elongate, costa slightly arched, apex obtuse, termen rounded, rather strongly oblique; white, somewhat strigulated with fuscous and black; a median fuscous fascia, sprinkled with black, and marked with black above and below middle, anterior edge straight, posterior irregularly convex; posterior half beyond this suffused with grey and spotted with brown, with scattered black scales, except a white blotch in disc at $\frac{3}{4}$, its posterior margin slightly convex and edged by a triangular brown blotch crossed longitudinally by three thick black marks: cilia whitish, with fuscous subbasal shade, and two posterior darker lines. Hindwings light fuscous, costa on posterior half strigulated and spotted with darker; cilia whitish-fuscous, round apex whitish with two darker fuscous lines.

CAPE COLONY, Dunbrody (Fath. A. Vogt); one specimen.

PSEUDURGIS OCHROLYCHNA, n. sp.

♂. 13-14 mm. Head and thorax white sprinkled with dark fuscous. Palpi long, porrected, second joint with long projecting hairscales beneath, terminal joint resting in these, whitish irrorated with dark fuscous. Abdomen whitish-ochreous tinged with grey. Forewings elongate, rather narrow, costa hardly arched, slightly sinuate in middle, apex obtuse, termen rounded, rather strongly oblique; grey-whitish, the rounded tips of all scales finely edged

with black; a slightly oblique ochreous-brown fascia from dorsum before middle, reaching $\frac{2}{3}$ across wing; a somewhat oblique-oval ochreous-brown spot on dorsum at $\frac{3}{4}$; a brown transverse fascia from costa at $\frac{2}{3}$, terminating in a round blotch in disc edged with black posteriorly, and with anterior half yellow-ochreous; a brownish spot on costa towards apex; some more or less developed pale yellow-ochreous suffusion towards termen, and several small brownish terminal spots more or less indicated: cilia white irrorated with black, more or less barred with light brownish. Hindwings grey, darker towards termen; cilia pale greyish-ochreous, basal third sprinkled with dark fuscous and limited by a line of dark fuscous points.

TRANSVAAL, Barberton, in February (H. Edwards); three specimens.

GEN. AMYDRIA, Clem.

AMYDRIA LOXOPA, n. sp.

♂. 17-18 mm. Head ochreous-white. Palpi whitish, second joint dark fuscous except apex, beneath with dense tuft of scales towards apex, laterally with three or four long bristles. Thorax ochreous-whitish, sometimes sprinkled with dark fuscous, shoulders dark fuscous. Abdomen whitish-fuscous. Forewings elongate, costa moderately arched, apex obtuse, termen very obliquely rounded; whitish-fuscous or pale greyish-ochreous, somewhat sprinkled with dark fuscous; a blackish spot on base of costa; sometimes a row of several blackish dots beneath anterior half of cost; stigmata blackish, first discal small, second large, triangular, plical large, round, beyond first discal, an additional similar spot midway between plical and base, all these tending to be preceded and followed by more or less distinct spots of white suffusion; some cloudy dark fuscous dots or strigulae on costa posteriorly and along termen: cilia whitish-fuscous sprinkled with black, obscurely barred with whitish. Hindwings pale greyish; cilia fuscous-whitish, with faint fuscous subbasal shade.

CAPE COLONY, Dunbrody, in June (Fath. A. Vogt.), Kimberley, in March (Bro. Power); five specimens.

ACOROSTOMA, n. g.

Head with long loose hairs; ocelli present; tongue short. Antennae $\frac{1}{2}$, in ♂ shortly ciliated, basal joint moderately long, with slight pecten of long scales. Labial palpi long, somewhat arched,

porrected, clothed throughout with very dense long loose hairscales, terminal joint shorter than second. Maxillary palpi obsolete. Posterior tibiae clothed with long hairs above. Forewings with 1b furcate, 2 from angle, 7 to termen, 8-10 approximated, 11 from middle. Hindwings almost 1, elongate-ovate, cilia $\frac{1}{5}$; veins all separate, 2 remote, 5 and 6 somewhat approximated towards base.

Allied to *Picrospora*, but characterized by the peculiar palpi.

ACOROSTOMA MEDICATA, n. sp.

♂. 14-15 mm. Head, palpi, and thorax white densely irrorated with dark fuscous. Abdomen dark grey. Forewings elongate, costa gently arched, apex obtuse, termen nearly straight, rather strongly oblique; white, densely irrorated with dark fuscous and somewhat mixed irregularly with yellow-ochreous, with scattered black scales sometimes forming undefined strigulae; submedian fold and terminal area suffused with clear white; stigmata yellow-ochreous irrorated or suffused with black, discal connected by a white streak extended to terminal suffusion, plical rather beyond first discal, sometimes connected with it, a similar dot beneath fold at $\frac{1}{4}$; an irregular more or less defined transverse ochreous-yellow streak parallel to termen at $\frac{1}{5}$, not reaching margins: cilia white sprinkled with fuscous, towards base with one or two lines of black points. Hindwings dark grey; cilia grey, with darker subbasal line.

CAPE COLONY, Saldanha Bay, in October (Dr. L. Péringuey); seven specimens.

FAMILY ADELIDAE.

GEN. *CEROMITIA*, Zell.

CEROMITIA GEMINATA, n. sp.

♂. 10-11 mm. Head and thorax white, somewhat mixed with light grey. Forewings elongate, costa gently arched, apex obtuse, termen very obliquely rounded; light grey mixed with white, and strewn with scattered dark fuscous scales; two large cloudy dark fuscous dots transversely placed on end of cell; sometimes small dark fuscous dots round posterior part of costa and termen: cilia grey-whitish. Hindwings iridescent grey-whitish; cilia grey-whitish.

CAPE COLONY, Dunbrody, in June (Fath. A. Vogt); five specimens.

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13.—*South African Chironomidae (Diptera)*.—By ABBÉ J. J. KIEFFER, Ph.D.

No representative of the Family *Chironomidae* was hitherto known from South Africa. This paper is therefore the first contribution to the knowledge of the Chironomid flies of this region. Owing to the interest displayed by the Director of the Cape Town Museum, Dr. L. Péringuey, in obtaining the species here described, one has a right to expect that other contributions will follow.

1. SUB-FAMILY CLUNIONINÆ, Kieff.

GEN. PARACLUNIO, Kieff.

This genus included one species only, viz., *P. trilobatus*, Kieff., whose larva lives amid the rocks on the shore of California. The two Cape species differ from the Californian by having the femora and tibiae free from scales, by the absence of fasciculate hairs on the tarsi, by the sublinear femora, and lastly by the shape of the anal segment.

PARACLUNIO FUSCIPENNIS, n. sp.

♂ ♀. Black, opaque and glabrous. Halteres yellowish white, antennae brownish, apices whitish, legs whitish, under side of abdomen yellowish, forceps and oviduct brownish yellow. Eyes glabrous, subcircular, large, distant, the distance almost equal to their diameter, the median border with a longitudinal raised line. Palpi very short, consisting of 2 moderately large joints not quite as long as thick. Antennae similar in both sexes, 7-jointed, 1st joint elongated, longer by one-half than broad, and much thicker than the others following; the 2nd elongated, twice as long as broad, slightly narrowed towards the middle, subcylindrical, the 4 joints following slightly transverse, the apex strongly transverse, 7th larger than the 5 preceding it, but less thick than the scape, and 3 times as long as the 6th, ovoid except that the distal 3rd part is suddenly narrowed in the shape of a black, obtuse, subcylindrical style. All the joints

are finely pubescent, with the apex (neck) glabrous, the 6 joints of the flagellum have verticillate caducous setae, not longer than the thickness of a joint, the ultimate joint bears a similar seta at apex. Thorax hood-like, mesonotum with a greyish, pruinose stain on each side in front. Scutellum with long, vertical, and moderately dense setae. Wings glabrous, longer than the body, brownish black, neuration of *Chironomus*, cubitus reaching almost the alary point, the costal not projecting beyond it, the double nervule of the radius transverse, oblique, the discoidal prolonging the direction of its basal part and ending at the alar point, the bifurcation of the postical hardly proximal to the transversal, the 2 rami as in *Chironomus*; the auxiliary produced beyond the transversal, the second longitudinal indistinct. Legs long, hardly thick, the setae very short, much shorter than the thickness of the legs; femora widened, thong-like, anterior tibia longer by one-half than the metatarsus, all the tibiae without a pecten and crenulate ring; fore metatarsus twice as long as the 2nd joint; joints 2-4 slightly and gradually shortened, all of them weakly dilated at the distal end, the 4th cordiform, hardly twice as long as thick, 5th longer than the 4th on every leg, trilobate at apex; median lobe longest, rounded at tip, the other 2 lobes lateral, empodium long, almost as long as the hooks, ramose, the rami several times divided, all tarsal hooks slender and simple in the female, thick, black, and bilobate in the male, the outer lobe obtuse and very finely denticulate at apex, the inner lobe ending in a point. Abdomen weakly depressed in the male, basal joints of forceps long and thick, the terminal short, pubescent, club-like. Abdomen of the female more strongly depressed, the first 7 segments very transverse, 8th compressed, gradually attenuate into a point half the length of the 7th at its anterior part, but longer than the 7th, and ending in 2 long, straight juxtaposed laminae.

Length: 5 mm. Cape Town. Flits on the sea-shore in dark nights. (L. Péringuey.)

PARACLUNIO MINOR, n. sp.

♂ ♀. Brown, antennae and legs brownish yellow. Antennae shaped as in the preceding species, except that the 7th joint in both sexes is not narrowed in a slight stiletto point at apex, but is conical and concolorous; the verticillate setae have doubtless dropped, because I detected one only on the 2nd and another on the 7th. Wings less fuscous than in the preceding species. Fore tibia almost twice as long as the metatarsus, the latter a little longer than the 4 preceding taken together, 2nd equal to the 3rd and 4th also taken

together, these latter a little longer than thick and cordiform, hind tibiae almost treble the length of the metatarsus, 3rd and 4th joints hardly longer than thick. Anal segment of ♀ as long as the 2 preceding taken together, gradually thinned into a point curving upwards. Basal joints of the forceps thick and long, more than twice as long as the terminal which is pubescent with some more elongate setae and is widest in the centre. The other characters are similar to those of the preceding species.

Length: 3 mm. Cape Town. (L. Péringuey.)

2. SUB-FAMILY CHIRONOMINAE, Kieff.

GEN. CAMPTOCLADIUS, v.d. Wulp.

CAMPTOCLADIUS NATALENSIS, n. sp.

♂. Totally black, including the halteres, antennae and legs brownish black. Antennae 13-jointed, 3rd and 4th joints hardly longer than wide, 5th twice as long as wide, the following joints gradually elongated, 12th 3 times as long as wide, joints 2-12 united longer by one-half than the 13th. Wings microscopically setulose, cubitus projecting slightly less than the costal, approaching the alar point much nearer than the upper ramus of the postical, bifurcation of the postical situated under the proximal 3rd of the radius, distal 3rd of the lower ramus strongly arcuate. Legs almost glabrous, anterior tibiae twice as long as the metatarsus, 4th joint a little longer than the 5th, empodium as long as the hooks. Basal joint of the forceps thick, terminal joint slender, pubescent, slightly thinned at the distal end which is void of style, and is almost cylindrical and straight.

Length: 1.5 mm. Stellenbosch. (L. Péringuey.)

CAMPTOCLADIUS CAPENSIS, n. sp.

♂. Totally black. Antennae 14-jointed, the apical joint once and a half as long as the 12 preceding ones united, 3-4 transverse, 11-13 as long as, or a little longer than thick. Wings punctate, without minute setae, costal not prolonged beyond the cubitus, which is a little more distant from the alar point than the upper ramus of the postical, bifurcation of the postical distal from the middle of the radius, lower ramus arcuate in its distal half. Legs with long hairs, anterior tarsi broken, empodium as long as the claws.

Length: 2.2 mm. Cape Town. (L. Péringuey.)

GEN. DICROTENDIPES.

DICROTENDIPES PILOSIMANUS, n. sp.

♂ ♀. The female is yellowish with the mesonotum, scutellum, and halteres pure white, 3 short bands on the mesonotum, the outer two acuminate behind and connected with a black dot, metanotum and mesosternum brownish yellow, legs yellowish, 5th joint of all tarsi, and in addition also the 4th tarsal joint, the end of the femur and tibia and of the 3 first tarsal joints brownish black, antennae whitish, the 6th joint brown. The colour of the male is similar to that of the female except that the abdomen is greenish in its anterior part with a spot or transverse band darker and covering the anterior half of the tergites, the apical half of the abdomen and the forceps are brownish, scape black, flagellum whitish, the white of the mesonotum a little pruinose, the scutellum greenish white. Palpi pale, long, consisting of 4 joints. Antennae of male 12-jointed, the last joint from $2\frac{1}{2}$ to 3 times as long as the preceding 10 united, 3-11 very transverse, plume grey. Antennae of female 6-jointed, last joint nearly twice as long as the penultimate, 2-4 with long verticils, neck a little shorter than the nodose part. Wings white with sub-circular deep dark stains, 1 on the transversal and the neighbouring part of the discoidal, 3 forming approximately an open arc, the inferior situated at the central part of the two rami of the postical vein, the median between the upper ramus and the discoidal; the geminate upper one is situated between the discoidal and the cubitus; lastly there are two spots between the stem of the postical and the inferior border of the wing, the one proximal the other distal, the 2 rami of both the postical and the discoidal are slightly bordered with fuscous, nervures pale. Fore metatarsus of the male longer by half than the tibia, its distal 3rd and the joints 2-4 with erect hairs and 5-6 times as long as the thickness of the joints, 1st joint more than twice as long as the 2nd, 4th double the length of the 5th, pulvilli large and broad as in *Chironomus*; in the female the fore metatarsus is longer by two-thirds than the tibia. Terminal joint of the forceps strongly arcuate, glabrous in its distal end which is gradually narrowed, apex provided on the median side with 8 seriate setae of short length but as long as the thickness of this part of the joint, lower appendix slender, pubescent, arcuate outwardly, reaching almost to the middle of the terminal joint, bifurcate a little beyond the middle, the proximal branch almost at right angles with the basal part, linear, glabrous, bearing 5 or 6 setae disposed in a median

longitudinal line, distal branch a little wider, glabrous on the external border where it bears strong seriate setae.

Length: ♂, 6 mm.; ♀, 3.5-4 mm. Cape Town. (L. Péringuey.)

GEN. CHIRONOMUS, Meig. (TENDIPES, Meig.).

The following is a synoptic table of the characters of the six species here described:—

1. Antennae 14-jointed, forceps with the terminal joints non-arcuate, but in an elongated ellipse, and without rows of setae at the end, fore tarsus not hairy *lamprogaster*, n. sp.
- Antennae 12-jointed, forceps with the terminal joints arcuate and provided with seriate setae on the median side of the apex. 2.
2. Fore tarsus hairy, that is to say provided with long erect hairs. 3.
3. Hairs of the fore tarsus long and thick, tergites brown with 4 white dorsal spots *tetraleucus*, n. sp.
- Hairs of the fore tarsus long but not dense, tergites of a different colour. 4.
4. Wings slightly smoky and iridescent, with numerous hyaline spots. *iricolor*, n. sp.
- Wings hyaline, without spots. 5.
5. Bands on mesonotum brownish black, upper appendages of the forceps widest at the middle *cafferarius*, n. sp.
- Bands of the mesonotum ferruginous, upper appendages of the forceps sub-linear *capensis*, n. sp.

CHIRONOMUS (TENDIPES) TETRALEUCUS, n. sp.

♂ ♀. Whitish, palpi brown black, long, scape black, flagellum fulvous, 6th joint in the female brown black, mesonotum pruinose with 3 shortened fulvous bands, the lateral ones end behind in a large spot situated against the hind border, 1st abdominal segment yellowish, the following segments brown, all with 4 dorsal opaque white patches, the 2 smaller of which are set against the anterior border, the other 2 are behind, 1 on each side of the median line, they reach the hind border on segments 4 and 5, but they are confluent on the other segments, the whole of the 7th and 8th tergite is opaque white and pruinose, forceps yellowish; in the female the spots on the abdomen are less well defined. Frontal lobes distinct. Antennae 10-jointed in the male, the ultimate joint more than 4 times the whole of the preceding joints, 3-11 four times as thick as long, plume fulvous. Antennae in the female 6-jointed, the ultimate one more than twice as long as the antepenultimate, narrowed in the centre, 3-5 elliptical with the neck slightly longer than thick. Pronotum bilobate. Mesonotum glabrous. Scutellum with dense whitish hairs. Wings hyaline, transversal black, the bifurcation of the postical situated under the transversal. Fore metatarsus of the

male hardly longer than the tibia, its distal half and also the 3 following joints with dense brown hairs,* 5 or 6 times as long as the thickness of the tarsus, 2nd joint equal in length to half the 1st, 4th not twice the length of the 5th, pulvilli broad; in the 4 hind legs the tibia and the tarsus, but the femur much less, are provided with long, dense, erect hairs. Terminal joint of the forceps arcuate, the distal third part glabrous, suddenly thinned, the end provided on the median side with 5 or 6 setae as long as the thickness of that part of the joint, upper appendage not projecting beyond the basal joint, glabrous, pubescent on the inner side, elliptically enlarged in its distal middle and ending in a small hooked appendage, the widened part bearing 2 short setae, lower appendage almost linear, pubescent, narrow, reaching the distal 3rd part of the terminal joint, bearing in its terminal half very long, incurved hairs.

Length: ♂, 11-12 mm.; ♀, 8-9 mm. Smithfield, O.F.S. (D. R. Kannemeyer.)

CHIRONOMUS (TENDIPES) TRICOLOR, n. sp.

♂ ♀. Yellow, scape and flagellum fulvous in the male, yellowish in the female, except the 6th joint which is brownish black, 3 shortened bands on the mesonotum, metanotum and mesosternum rufescent, tergites 2-5 with a small brownish black spot, sometimes elongated, sublinear and situated on the anterior half, sometimes in the shape of a subcircular or oval patch; on the tergites 6-8 this patch is replaced by a large brown space not reaching the edges; in the female the abdomen is entirely brownish. Frontal lobes small. Antennae 12-jointed in the male, the last joint 4 times as long as the preceding 10 united and fusiform at tip, joints 3-11 three times as thick as long, plume fulvous. Antennae 6-jointed in the female, the 12th strongly narrowed in the centre, 3-5 elliptical with the neck a little longer than broad, 6 three times as long as 5, with fairly numerous arcuate setae, longer than the thickness of the joint. Thorax glabrous. Scutellum with long hairs. Wings weakly infusate, iridescent, with numerous hyaline non-iridescent spots especially along the lower border and also on the alar base, the transverse nervure black. Fore metatarsus of male one-third longer than the tibia, its distal half and the 3 following joints with long hairs but not densely hairy as in the preceding species, 4th joint hardly twice as long as the 5th, pulvilli large, femur and tibia of the 4 hind legs slightly hirtose. Abdomen with long hairs. Terminal joint of the forceps strongly arcuate, suddenly narrowed and

* This species differs in this characteristic from all its congeneric species.

glabrous, a little short of the distal middle, the apex bears on the median side 8 or 9 seriate setae, and is as long as thick, upper appendage very thin, almost straight, incurvate and pointed at apex, glabrous and projecting beyond the basal joint, lower appendage wide, rounded at apex, projecting beyond the middle of the terminal joint, pubescent, its distal 3rd with the usual long bent hairs, lamina with a long beak incurvate at tip.

In one of the males the colour of the mesonotum and of the scutellum turned from yellow to greenish, and the black bands of the tergites extended over two-thirds or three-fourths of the anterior part of the tergites.

Length: ♂, 8-9 mm.; ♀, 8 mm. Cape Town (L. Péringuey); Smithfield, O.F.S. (D. R. Kannemeyer).

CHIRONOMUS (TENDIPES) CAFFRARIUS, n. sp.

♂ ♀. Greenish yellow or only yellowish, scape of male brownish black, flagellum brown; scape of female yellow, flagellum brownish black; mesonotum opaque, pruinose, with 3 shortened bands, metanotum and mesosternum pruinose brownish black, tergites of male brown on half or two-thirds of the anterior parts, the following portions nearly entirely brown; in the female all the upper part of abdomen is brownish; distal half of the metatarsus and the 4 joints following brownish black in all the tarsi. Palpi long, brownish black. Frontal lobes small. Antennae of male 12-jointed, the last one $3\frac{1}{2}$ times as long as the 10 preceding taken together, 3-11 3 times as thick as long. Antennae of the female 6-jointed, the 2nd narrowed in the centre, 3-5 fusiform, 6 hardly double the size of 5. Wings hyaline, transversal black, bifurcation of the postical situated under the transversal. Anterior metatarsus of the male almost two-thirds longer than the tibia, the distal two-thirds, and the 3 following joints set with long hairs, joint 2 hardly longer than the half of 1, 2-4 gradually shortened, 4 nearly double the length of 5, pulvilli broad. Terminal joint of the forceps arcuate, glabrous and gradually thinned for a little more than the distal 3rd, median side of the apex with 6 seriate long setae, longer than the thickness of this part of the joint, upper appendix barely projecting beyond the basal joint, glabrous, wider at the middle, nearly straight, apical part thin and incurved, inferior appendage broad, rounded at end, reaching the middle of the terminal joint, pilose as usual, lamina with an obtuse beak.

Length: 7-8 mm. Cape Town. (L. Péringuey.)

CHIRONOMUS (TENDIPES) CAPENSIS, n. sp.

♂ ♀. Yellowish white; antennae of male brown with the scape brownish black; antennae of the female yellowish, with joint 6 brownish black. Three short bands on the mesonotum and mesosternum ferruginous red, tergites 1-4 in the male brownish in the anterior parts, the following portions almost entirely brownish, the 2nd or 3rd last joint of the tarsi infusate; in the female the upper part of the abdomen is brownish. Antennae of male 12-jointed, the last joint 3 times as thick as long, plume fulvous. Antennae of the female 6-jointed, 2nd narrowed in the centre, 3-5 with the neck as long as the nodose part, 6 double the length of 5. Mesonotum not pruinose. Fore metatarsus in the male longer by one-half than the tibia, but not half the length of joint 2, its distal two-thirds and the 3 following joints with long hairs, 4 not twice as long as 5, pulvilli broad; fore metatarsus in the female one-third longer than the tibia. Wings hyaline, transversal black, bifurcation of the postical situate under the transversal. Terminal joint of the forceps arcuate, glabrous for a little less than the distal half, which is gradually thinned and which bears on the median side of the apex 7 or 8 long seriate setae, longer than the thickness of the apex, upper appendage glabrous, straight, thin, almost linear, reaching to half the length of the terminal joint, straight and pilose as usual.

Length: 8 mm. Duubrody. (Father J. O'Neil.)

CHIRONOMUS (TENDIPES) LAMPROGASTER, n. sp.

♂ ♀. Head brownish, palpi black, scape of male brownish rufous, shiny, flagellum brownish and opaque, scape and 2nd joint of the female yellow, 3-6 brownish black, halteres white, thorax whitish and shiny, 3 rufescent shortened bands on the mesonotum, metanotum and mesosternum dark brown, legs yellowish, anterior tarsus (except the basal half of the metatarsus), the basal 3rd and the apex of the anterior tibia, and the 2 ultimate joints of the 4 hind tarsi brownish black; abdomen shiny, that of the male light yellow with brownish black transverse bands occupying half or two-thirds of the tergites, the centre of these bands is a little prolonged backwards, nearly the whole of the tergites 6-8 and also the forceps brown; abdomen brown in the female with the hind border of the tergites yellowish. No frontal lobes. Palpi long. Antennae 14-jointed in the male, the last one twice as long as the 12 preceding ones united, joints 3-12 a little transverse, plume brown. Antennae of the female 6-jointed, the 2nd joint narrowed in the centre, its neck not longer than broad, 3-5 subfusiform, the neck a little longer

than thick, 6 two and a half times as long as 5, with a moderately long terminal seta. Wings hyaline, transversal pale, bifurcation of the postical distal from the transversal, basal lobe ending in an acute angle. Fore tarsus of male not hairy, very slender, the metatarsus longer by one-fourth than the tibia, nearly double the length of the 2nd joint, 4th double the length of the 5th, pulvilli moderately wide, reaching only to the median part of the hooks, empodium hardly reaching the hooks. Terminal joint of the forceps not arcuate, in the shape of an elongated ellipse, hairy all over, upper appendage glabrous, thin, arcuate, sharp, sublinear, rounded at tip, reaching almost to the middle of the terminal joint, pilose as usual, lamina ending in a gradually thinned point.

Length: ♂, 5-6 mm. Cape Town, September, 1913. (L. Péringuey).

CHIRONOMUS (TENDIPES) SENSUALIS, n. sp.

♂ ♀. Scape of the male reddish, flagellum pale, scape and flagellum of female reddish brown, thorax dark yellow or brown, mesonotum white, 3 shortened, fulvous bands opaque not pruinose; scutellum whitish, with long hairs; legs yellowish, end of joints 1-4 in the fore tarsus, and the whole of 5 infuscate; abdomen yellow, tergites 2-5 of the male with a transverse spot gradually narrowing laterally and occupying the anterior half, 6-8 brownish like the forceps; in the female the tergites 2-4 or 2-5 have the half of the anterior part brown. Frontal lobes very small. Antennae of male 12-jointed, the last joint $2\frac{1}{2}$ times as long as the 10 preceding taken together, fusiform at tip, joints 3-11 a little transverse, plume fulvous. Antennae in the female 6-jointed, the ultimate joint longer by one-half than the penultimate, gradually thinned and remarkable for the long sensorial appendages, the latter thick and 4 or 5 times as long as the greatest thickness of the joint, joints 3-5 remarkable for their long neck which is slender and longer than the ellipsoidal nodosity, the 2nd joint is narrowed in the centre and the neck is twice as long as wide. Wings hyaline, transversal, brown, cubitus arcuate reaching almost the alar apex, bifurcation of the postical a little distal from the transversal. Anterior tarsus of male not hairy, very slender, the metatarsus at least half as long again as the tibia, 4th joint hardly longer than the 3rd; in the female the fore metatarsus is longer by one-half than the tibia, 4th joint distinctly longer than the third, more than twice as long as the 5th, pulvilli large, reaching the centre of the hooks. Terminal joints of the forceps arcuate, distal half glabrous and gradually thinned into

a beak, transparent, bearing at the apex on the median side 5 seriate setae, a little longer than thick, upper appendage thin, lower broad, straight, linear, not much longer than the upper, lamina with an obtuse point slightly expanding at tip.

Length: 6 mm. Cape Town. (R. M. Lightfoot.)

3. SUB-FAMILY PELOPIINAE, Kieff.

GEN. PELOPIA, Meig.

PELOPIA MONILIS, L., var.

♀. Rufescent and opaque, antennae, halteres and legs white, a black ring at the distal end of the femora, two at the distal end of the tibiae, one at the distal end of the metatarsus, distal end of the tarsal joints also black, fore tarsus broken. Eyes emarginate, very much narrowed above where they are separated by twice their terminal length; this narrowed part is a little longer than wide. Antennae 12-jointed, 3rd joint one-half longer than thick, 11th twice as long as thick, the verticil $2\frac{1}{2}$ times as long as the joint itself, 12 three times as long as 11, gradually narrowing to a point. Mesonotum with a trace of 3 rufous confluent bands. Wings hairy, white with a transverse black spot on the two transversals, 3 black spots situated at the end of the radius of the 2nd longitudinal and of the cubitus, numerous infusate, indistinctly defined spots situated in a little more than the distal 3rd of the wing, some of these are between the postical and the lower border, these infusate spots are small and elongated, cubitus not shorter than the costal.

Length: 3.5 mm. Cape Town. (L. Péringuey.)

4. SUB-FAMILY CULICOIDINAE, Kieff.

GEN. SERROMYIA, Megerle.

SERROMYIA NOCTICOLOR, n. sp.

♂. Brownish black, legs dark rufous, tarsi and halteres black. Antennae 14-jointed, the joints cylindrical, 3-11 sessile, gradually longer, the first ones hardly as long as thick, 11 twice as long as thick, the last 3 very long and sub-equal, each one double the length of 11, but, taken together, shorter than 2-10 united, 14 without style. Wings hyaline, cubitus reaching nearly the

last alar 3rd, almost adjoining the radius for more than its proximal half, then united with it at one point, and diverging thence, bifurcation of the discoidal proximal to the transversal, bifurcation of the postical situated under the transversal. Thorax convex, not hooded. Anterior femur with some weak spinules, anterior tibia more strongly spinulose, similar in this respect to the 4 hind ones, provided with a simple pecten, anterior metatarsus as long as the 2 following joints taken together, intermediate legs similar to the anterior except that the tibia has no pecten, in the posterior legs the femur is as long as the tibia and 3 or 4 times as thick, subcylindrical and with black numerous spinules, the tibia is as thick as the 4 anterior femora, with the spinules longer than its thickness and bearing a double pecten, metatarsus as long as half the tibia or the 3 following joints united, provided on the ventral side with short, thick, dense setae, 5th joint a little longer than the 4th, none of the tarsal joints cordiform, claws simple, without distinct empodium. Abdomen elongated, sublinear.

Length: 2.5 mm. Stellenbosch. (L. Péringuey.)

GEN. FORCIPOMYIA, Megerle.

FORCIPOMYIA INDECORA, n. sp.

♂. Brown black, mouth, palpi, antennae, and legs yellow, halteres whitish, mouth acuminate, as long as the height of the head. Eyes separated by a line. Second joint of palpi as long as the 3rd and 4th united, thickened at the proximal 3rd, 3rd longer than the 4th and little separated from it. Antennae 14-jointed with a very dense plume, joints 3-10 subglobular, a little transverse, 11-14 taken together as long as 2-10 united, 11 arcuate at base, then cylindrical, as long as 12 and 13 taken together, 12 longer than 13 by one-half, both cylindrical and having the base swollen and globular, 14 a little longer than 13, subcylindrical, 4 times as long as thick, ending in a style. Wings pointed. Cubitus not reaching the middle of the wing, soldered to the radius in its three proximal quarters, bifurcation of the discoidal hardly distal from the transversal, bifurcation of the postical plainly distal from the end of the cubitus. Legs with very long erect, sparse hairs, all the metatarsi a little shorter than the second tarsal joint, hooks very long and strongly falcate, empodium a little shorter than the claws, slender but with long hairs. Terminal joint of the forceps as long as the basal, slender, nearly straight, subcylindrical, a little thinned at the distal end.

Length: 3 mm. Stellenbosch. (L. Péringuey.)

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14.—*On Some Ectoparasites in the South African Museum, Cape Town.*
—By JAMES WATERSTON, B.D., B.Sc.

(Plates XXV. and XXVI.)

THE present paper owes its inception to a correspondence between the writer and Dr. Péringuey, who, in 1912, submitted for identification a small but important collection of ectoparasites belonging to the South African Museum. A valuable portion of this material consisted of *Mallophaga*, taken mainly on tubinarian hosts in Tristan d'Acunha by P. Bonomi in 1904. But the collection as a whole proved so interesting that Dr. Péringuey arranged for a more systematic examination of birds and mammals in the taxidermist's room of the Museum. Thus during the last two years there have accumulated in all some 5,000 examples belonging to 80–90 species of the orders *Siphonaptera*, *Anoplura*, and *Mallophaga*, and the gathering is still in progress. Partly for this reason and partly because doubt still attaches to a few determinations, the whole collection is not now reported upon. The residue will form the nucleus of a second instalment to be published whenever sufficient material has been brought together. Ultimately also Dr. Péringuey hopes there may be evoked sufficient interest in the *Mallophaga* of South Africa to justify a detailed account with figures of each species. At present one must be content to notice fully only those forms that appear to be new, and in other cases to add critical remarks when necessary.

Only two notes of a general nature require to be added :—

(1) The writer has had impressed upon him forcibly, in going over the *Mallophaga*, the cosmopolitan distribution of many species of that order. This fact has been often before commented upon, but it is certainly vividly illustrated when, as has happened in the writer's experience, to one collecting *Mallophaga* from a bird shot at one's door in Shetland, there arrives a consignment of precisely

the same species from South Africa, but from a different host. The greatest care, therefore, requires to be exercised in erecting new species.

Where the numbers of a species have permitted dissections have been made to facilitate examination of certain internal features—chiefly in the genitalia—on which experience has shown reliance may be placed for specific determinations. In this way one not infrequently finds that the claims of an insect to specific rank vanish, but conversely the critical test of the genitalia show that many so-called varieties are distinct species. There is often a wonderful resemblance in general facies, colour, dimensions, and chaetotaxy in the latter cases, and it is never really safe to give an opinion as to the status of two closely similar Philopterid forms from different hosts till the ♂ genitalia have been dissected.

(2) As every student of the *Mallophaga* knows, the phenomenon of “straggling” exhibited in this order affords most fascinating problems. It may seem that many of the following records are unusual, but much weight cannot be attached to such occurrences owing to the conditions under which the bulk of the collections have been made. When, from notes supplied by Dr. Péringuey, it is evident that the parasites of one host have been accidentally transferred to another in the taxidermist’s room, the labelling has been corrected without remark.

No special order has been followed for the *Siphonaptera* and the *Anoplura*, as there is comparatively little material (10 spp. in all) from these groups. The *Mallophaga* have been arranged mainly according to Kellogg in Wytsman’s *Genera Insectorum*, 66 me Fascicule “*Mallophaga*” (1908). At the same time most of Mjöberg’s (1910) sub-divisions into families have been adopted. The species of *Lipeurus* recorded in the following pages will ultimately occupy several genera, but at present it seems premature to essay the difficult task of division.

We desire to thank the Carnegie Research Trust for the use of a dissecting microscope. Professor V. L. Kellogg, Stanford University, Cal., has supplied valuable material for comparison, and to him also we would express our indebtedness. In one or two special points—particularly in verifying certain references which could not be attempted by one so far from the centre—the assistance of Mr. B. F. Cummings, British Museum, and the Hon. N. Charles Rothschild, M.A., has been invoked and cordially given. All these friends we have pleasure in thanking now.

SIPHONAPTERA.

GEN. PULEX, L.

Pulex, Linnæus, Syst. Nat. Ed. x. p. 614 (1758).

PULEX IRRITANS, L. (1758).

Pulex irritans, Linnæus, Syst. Nat. Ed. x. p. 614, No. 1 (1758).

♂. *Proteles cristatus*.

5 ♂♂, ♀. "Alleged to have come off a field mouse, Cape Town."

Jordan and Rothschild (Revis. Non-combed Eyed *Siphonaptera*, p. 12, 1908) have already recorded this cosmopolitan satellite of man from Deelfontein (Cape Colony) off *Felis caracal* and *Tinamus* spec.; also from Kingwilliamstown, where it occurs freely in Kaffir kraals (Godfrey).

GEN. ECHIDNOPHAGA, Olliff.

Echidnophaga, Olliff, Pr. Linn. Soc. N.S.W. (2) i. p. 172 (1886).

ECHIDNOPHAGA GALLINACEUS, Westwood (1875).

Sarcopsyllus gallinaceus, Westwood, Ent. Mo. Mag. xi. p. 246 (1875).

2 ♀♀. *Homo*. Taxidermist's room, Cape Town Museum.

About 50 examples, many mutilated. *Strix flammea*, in box which had been occupied by a "dassie" (*Procapra capensis*).

20 ♀♀. On Bluebok (*Cephalophus monticola*).

50 ♂♂, 10 ♀♀. Domestic Fowls.

10 ♂♂, 35 ♀♀. Dog. Livingstone, N.W. Rhodesia.

This pest is apparently common over South Africa, occurring on a variety of hosts, but particularly on animals of the farmyard—fowls, ducks, dogs, and cats, rats, and sometimes on man. Dr. Péringuey remarks that the fleas taken at Livingstone were "making the dog's life a perfect misery." For some S.A. records, see Jordan and Rothschild, Revis. of the Sarcopsyllidæ, p. 54, Liverpool, 1906.

ECHIDNOPHAGA LARINA, Jord. and Rothsch. (1906).

Echidnophaga larina, Jordan and Rothschild, Revision of the Sarcopsyllidæ, Thomps. Yates and Johnst. Lab. Report, vol. vii. pt. i. pp. 49–51, pl. i. f. 12, pl. ii. f. 18, pl. iii. f. 25 (1906).

2 ♂♂, 8 ♀♀. *Orycteropus capensis* (Ant-eater).

Mr. Rothschild has kindly confirmed this identification. *E. larina* has occurred in Cape Colony, German East Africa, Somaliland, and

Abyssinia. For detailed records see Jordan and Rothschild, *loc. cit.* p. 51, also by the same authors *Kat. der Siphonapt. des Königl. Zoolog. Mus. in Berlin. Novitates Zoologicae*, vol. xviii. p. 61, June, 1911.

Unlike *E. gallinaceus* this species occurs only on mammals.

GEN. CTENOCEPHALUS, Kolenati.

Ctenocephalus, Kolenati, *Fauna d. Altvat.* p. 65 (1859).

CTENOCEPHALUS CANIS, Curt. (1826).

Pulex canis, Curtis, *Brit. Ent.* iii. No. 114, figs. A–E fig. 8 (1826).

6 ♂♂, 13 ♀♀. *Cephalophus monticola*.

CTENOCEPHALUS FELIS, Bouché (1835).

Pulex felis, Bouché, *Nova Acta Acad. Leop. Carol.* xvii. i. p. 505 (1835).

3 ♀♀. *Homo*. Taxidermist's Room, Cape Town Museum.

♂, 3 ♀♀. *Cephalophus monticola*.

GEN. DINOPSYLLUS, Jordan and Rothschild.

Dinopsyllus, Jordan and Rothschild, *Zool. Novit.* xx. 3. p. 561 (1913).

DINOPSYLLUS INGENS, Rothschild. (1900).

Typhlopsylla ingens, Rothschild, *Ent. Rec.* xii. p. 37, pl. 2, f. 4, 1900. 4 ♂♂, ♀. "Probably from porcupine."

A full revision of the known species of *Dinopsyllus*—a genus requiring careful discrimination—will be found in *Novitates Zoologicae*, vol. xx. Oct., 1913, p. 561 ff. *D. ingens* is the most isolated of the species, as the vertical comb along the front edge of the antennal groove is absent or vestigial. The 5th tarsal segment bears 5 pairs of bristles also, instead of the normal 4. But Dr. Jordan and Mr. Rothschild do not think it is advisable at present to place *ingens* in a separate genus.

ANOPLURA.

GEN. POLYPLAX, Enderlein.

Polyplax, Enderlein, *Zool. Anz.* xxviii. p. 142 (1904).

POLYPLAX OTOMYDIS, Cummings (1912).

Polyplax otomydis, Cummings, Bull. Ent. Res. vol. iii. pp. 395, 397, fig. 2 (1912).

32 ♂♂, 60 ♀♀, 32 imm. *Otomys brantsi luteolus*.

We believed these to represent a new species, and were about to draw up a description when our friend's excellent and beautifully illustrated paper came to hand. Mr. Cummings notes that *P. otomydis* stands close to *P. suturalis*, Osborn (Bull. 5. N.S., U.S. Dept. Agric. p. 185, 1896). It is distinguished, however, by its larger size, the shape of the abdomen, etc. Cummings' types in Brit. Mus. Coll. (♀♀ only) were taken on *Otomys irroratus tropicalis*, Thos., in British East Africa, northern slopes of Mt. Kenya, 7,200 ft. (S.A. Neave). The insect, however, does not appear to vary.

One of the above ♂♂ has been added to the national collection, from which a duplicate ♀ has been presented by the trustees to the S.A. Museum.

GEN. LINOGNATHUS, Enderlein.

Linognathus, Enderlein, Zool. Anz. xxix. p. 194 (1905).

LINOGNATHUS TIBIALIS, Piaget (1880).

Haematopinus tibialis, Piaget, Les Pédiculines, p. 646, pl. lii. f. 8 (1880).

L. TIBIALIS EUCHORE, var. nov.

44 ♂♂, 156 ♀♀. *Antilope euchore*.

Although evidently belonging to the *tibialis* type of *Linognathus* these specimens seem worth separating as a variety of Piaget's unfortunately not too clearly defined species. We have thought it best to describe this form with some detail, indicating where it seems to differ from Piaget's description of his types which were taken from *Antilope maori* (Jardin Zool. de Rotterdam). In the same "Zoo" Piaget also found two forms which he considered to be varieties of his *tibialis*, viz.:—

1. var. *antennata* on *Antilope*, sp.

2. var. *appendiculata* on *Antilope subgutturosa*.

Mr. Cummings writes that he has not yet seen what he considers to be typical *tibialis*.

We have evidently on *Antilope*, spp., a series of slightly differing forms whose precise status is probably to be determined only by a critical examination of the chaetotaxy and ♂ genitalia.

♂. *Head*. Before antennae, moderately produced, triangular,

with slightly blunt apex. About half a dozen minute bristles round mouth. One short hair at side of head anteriorly, a second midway between oral edge and antennae, and a third slightly behind the second. At $\frac{1}{3}$ from oral edge and line connecting the antennae row of 4 short hairs dorsally placed. At $\frac{1}{3}$ from antennae, but below, a row of 4 hairs, of which the middle two are long. Still below and symmetrically placed with the 2 hairs just mentioned there are 2 long hairs. Row of 4 short dorsal hairs at level of antennae, viz., 1 at anterior edge of 1st antennal joint and

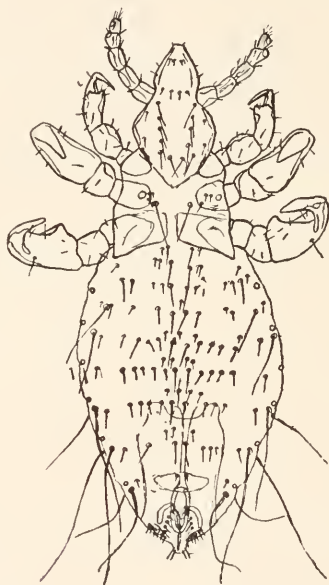


FIG. 1.—*L. TIBIALIS EUCHORE* ♂.

1 medianly at side of sucking apparatus. On the dorsum of the head, between the antennae and the angular occiput, a double row of long, strong, median hairs—6 pairs in all, of which the last pair are displaced more into the middle line. Between each row and the edge, and nearer the latter, an anterior and a posterior short bristle, *i.e.* 4 in all. The lateral bands of the head are elongate before the antennae—broad near the base of the 1st joint, and coming to a fine point near the oral edge, where there is a clear region. Behind the antennae the bands are broad above, slightly narrower beneath, where they are sharply excised medianly. Antennae rather long; 5-jointed, last 2 joints with sensoria.

Thorax. Sub-quadrangular, anteriorly angularly emarginate, 3 minute hairs near spiracle, and inside and posterior to these the usual pair of long hairs, under surface entirely bare.

Abdomen. Without distinct segmentation. Integument rugose. The limits of the segments, however, may be fairly judged by the spiracles. In general each tergite bears a row of hairs, of which the median pair and one below the spiracle on each side are stronger. The spiracular hair is wanting on segment 4. Before the main row of hairs there is another of fewer and weaker elements. The chaetotaxy of tergites I.-VII. is:—

Tergites.	I.	II.	III.	IV.	V.	VI.	VII.
1st row double ...	{ (a) 4	—	—	—	—	—	—
	{ (b) 6	4	4	4	4	4	2
2nd row	12	10-12	14	13	13	10	4

On the 8th and 9th tergites there are altogether some 26 small hairs disposed as in figure.

Under surface. First sternite 2 rows only, 8th and 9th bare.

Long sub-spiracular hairs occur only on sternites 5-7.

In the middle sternites 2-7 agree closely with the corresponding tergites.

The genital mark is dark, quadrate, 2 slight blunt anterior cornua and a clear post-median oval space. Dorsally there are on each side of the genital opening two chitinized plaques—the anterior curved, the posterior straight and almost at right angles to the first. The genitalia reach back to the level of the 4th pair of stigmata.

The anterior pair of legs are much slighter than the posterior pair whose tibiae are unusually thick.

♀. Similar in chaetotaxy and shape to ♂, but with a more pointed head before the antennae. Abdomen more truncated posteriorly. Gonopods with 8-10 terminal bristles, of which one is very strong. Genital mark like a hand looking-glass in shape. 9th sternite not markedly chitinized, with two slanting edges towards the gonopods. These edges are fringed with soft hairs. On the posterior edge there are a few backwardly directed hairs. The last segment is almost entirely surmounted by a chitinous ring. Piaget's description of the chaetotaxy is too incomplete, and his figure of *L. tibialis* too diagrammatic for comparison. From the measurements one sees that the present variety is a broader insect in the head, thorax, and abdomen. It is also slightly larger in the ♂, but the ♀ appears to be shorter. We do not understand some of Piaget's figures.

Measurements of *L. TIBIALIS EUCHORE*.

	♂		♀		
	Length.	Breadth.	Length.	Breadth.	
Head	·357	·257	·400	·271	
Thorax	·242	·357	·257	·385	
Abdomen	·900	·614	1·057	·714	
Total ...	1·46 mm.		Total 1·7 mm.		
Antennae	1	·053	·063	·060	·063
	2	·076	·046	·070	·050
	3	·063	·046	·053	·046
	4	·043	·043	·043	·043
	5	·040	·033	·043	·033

LINOGNATHUS PILIFERUS, Burm. (1888).

Pediculus piliferus, Burmeister, Gen. *Rhynchota*, N., 13 (1838).

10 ♀ ♀, 2 mm. Dog. Cape Town, 28: vi: 11. R. Lightfoot, coll.

GEN. *HYBOPHTHIRIUS*, Enderlein.

Hybophthirius, Enderlein, Jena Deutschr. xiv. p. 79 (1909).

HYBOPHTHIRIUS NOTOPHALLUS, Neumann (1909).

Haematopinus notophallus, Neumann, Jahrb. des Nassauisch. Vereins f. Naturk. in Wiesbaden, p. 2 (1909).

37 ♂ ♂, 41 ♀ ♀, 45 mm. and 25 ova. *Orycteropus capensis* (Ant-eater).

Bruce F. Cummings states (Bull. Ent. Res. vol. iv. p. 44, 1913), on the authority of Gustav Fischer, that *notophallus*, Neumann, has one month's priority over *orycteropodis*, Enderlein, who, however, rightly founded a new genus for this extraordinary louse. With his customary kindness, Mr. Cummings has ascertained from the publisher (J. F. Bergman in Wiesbaden) that the Nassauische Jahrbucher (containing W. Neumann's paper) Jahrg. 62 (1909)-- "Am 5th November 1909 Zur Versendung gelangte." There is no date on the Journal itself except the year.

MALLOPHAGA.

A considerable literature exists dealing incidentally or more specially with the *Mallophaga* of Africa. In the great Monographs of Giebel (1874), Piaget (1880-5), and Taschenberg (1881) many species are described from African hosts. More recently Enderlein (1909), Glinkiewicz (1912), Harms (1912), Cummings (1912), Mjöberg (1910-11), Kellogg and Paine, Neumann, and others

have reported on collections made in certain regions of the continent. Any necessary references are given under the species treated in the following pages. It has not seemed advisable to attempt to offer a complete Bibliography.

As the genitalia ♂ have been referred to frequently, the descriptive terms used may be briefly explained. The sexual apparatus of the ♂ in what we believe to be its primitive Philopterid form consists of 9 parts in two regions. These are illustrated in the figures of *N. opacus* and *N. macrocephalus*. (Pl. XXV., figs. 2-4.)

1. There is a broad laterally thickened chitinized lamina, which is wholly internal and to which numerous strong muscles are attached.

2. Externally there are 6 parts placed symmetrically about the tubular penis and one additional below. This last is often hard to make out, and may look like a swollen base to the penis. The penis, however, seems to take constantly the form of a simple tube. Snodgrass (1899) has already figured and described several examples of this type, and Mjöberg (1910) refers constantly to the genitalia. But it has not yet been sufficiently grasped that the apparatus gives by far the best characters for the discrimination of species. Snodgrass calls the portion inside the abdomen the "internal plate"; Mjöberg speaks of the "basal plate," a name we personally prefer. To the distal end of the plate at each side, and articulating distinctly with the plate, are two broad curved chitinous blades provided with a sub-terminal outwardly directed lateral hair and one median or post-median ventral hair. These "blades" Mjöberg calls "paramera." The paramera can move freely upwards, and may be completely reversed to lie parallel with tergites 7-9. They can also move scissor-like towards one another. As no names appear to have been given to the parts within the area circumscribed by the paramera, we propose the following:—

(a) Endomera for the two appendages lying next the paramera. The endomera are feebly movable distally from one another, but are fused proximally. The paramera articulate both with the endomera and the basal plate. The endomera bear, generally medianly or post-medianly and sometimes laterally, ventral hairs whose position may have specific value.

(b) Appearing inside the endomera and at either side of the penis are two smaller *telomera*. They are best seen in those species where they project far beyond the endomera.

(c) The hypomeron is the unpaired process beneath the penis.

(d) The *endomera* are above the penis. The *telomera* alongside and above the penis and the *hypomeron* below. All five parts may be

collectively referred to as the *mesosome*. It is sometimes convenient to do so when the parts in association have a characteristic shape. It should be noted that occasionally the telomera are parted by the penis, which appears above them, also that the penis is enveloped proximally by the bases of the telomera and by the endomera as well. The above notes of position refer to the free distal portion of the penis.

SUB-ORDER ISCHNOCERA.

FAMILY DOCOPHORIDAE.

GEN. DOCOPHORUS, Nitzsch.

Docophorus, Nitzsch, in Germar's Mag. f. Insekt. vol. 3, p. 289 (1818).

DOCOPHORUS BASSANAE, Denny (1842).

Docophorus bassanae, Denny, Monogr. Anopl. Brit. p. 110, pl. vi. f. 3, pl. viii. f. 3 (1842).

This represents the ♀ (ad. and imm.) of *Lipeurus pullatus*, N.

We mention the form simply from its occurrence in Kellogg's "List." For discussion see Waterston, Proc. Roy. Phys. Soc. Edin., vol. xviii. No. 4, p. 248 (1912).

DOCOPHORUS BIFRONS, N.

Docophorus bifrons, Nitzsch, in Giebel, Ins. Epiz. p. 61 (1874).

♂, ♀, 2 imm. examples. *Merops apiaster* (European Bee-cater).
♀, imm. *Merops apiaster*. Philipstown, C.P.

DOCOPHORUS CORDICEPS, Piaget (1880).

Docophorus cordiceps, Piaget, Les Pédiculines, p. 80. pl. vi. f. 2 (1880).

On three species of *Aegialitis* as follows:—

♂. *A. marginata*, 1912.

7 ♂♂, 5 ♀♀. *A. marginata*. Sept., 1913.

♂, 13 ♀♀, imm. *A. pecuaria*. 1912.

8 imm. *A. pecuaria*. 1912.

3 ♂♂, 3 ♀♀, imm. *A. tricollaris*. Sept., 1913.

Our present impression is that the variation exhibited by this species is mainly in dimensions. The above examples belong to the slightly smaller form found regularly on *Aegialitis* spp. and to it possibly Giebel's name *semivittatus* should be applied. Typical *cordiceps*, P., occurs, we think, on *Totanus*, *Tringa*, and *Strepsilas*,

while on *Vanellus* there is a larger race for which *temporalis*, G., may meantime be retained. We have looked hitherto in vain for structural differences, but we have not yet had an opportunity of dissecting var. *temporalis*. We have, in fact, seen but one adult ♂ of this form. The problem of separating the races of *cordiceps* is complicated not merely by the evident fineness of the distinctions (if they really exist) but also by the sociable nature of the hosts, which facilitates transmission of the parasites in a confusing way.

DOCOPHORUS CURSOR, N.

D. cursor, Nitzsch, in Giebel, Ins. Epiz. p. 75, pl. x. figs. 5, 6 (1874).

3 ♂ ♂, 3 ♀ ♀. *Bubo capensis*.

15 ♂ ♂, 14 ♀ ♀, 10 imm. *Bubo maculosus* (Spotted Eagle Owl).
Philipstown, C.P.

With regard to the *Docophori* of the owls, we find ourselves at present in substantial agreement with the position taken up by Professor Kellogg in a suggestive short paper in Science, N.S. vol. xxxvii. No. 943, p. 154 (1913). We have seen *Docophori* from about a dozen species of owl from various localities—Canada, Iceland?, Great Britain, East Prussia, and South Africa—and think with Kellogg that three types—*celebrachys*, N., *cursor*, N., and *rostratus*, N.—will cover most of the species (about a dozen) hitherto reported from owls. This at least should be a satisfactory position to adopt until the ♂ genitalia have been compared.

The case of the owl *Docophori* is, however, but a special instance of a condition occurring frequently among the *Mallophaga*, viz. the attachment of what seems, superficially at least, the same species (or group of species) to similar hosts (*i.e.* of the same or allied genera) over a wide geographical area. It should be insisted upon that each series of parasites is to be discussed on its merits. The genus *Docophorus* seems little given to variation other than in size and colour; but *Nirmus* and *Lipeurus* are full of surprises. It would be hard to say, *e.g.*, how many absolutely distinct species are at present confused under the name *N. furvus*, N. The ♀ ♀ offer such slight differences that one would never imagine they were of specific value apart from the confirmatory evidence supplied by the other sex. The ♂ ♂ too are very similar, but by the genitalia are sharply separated from one another. We are, of course, here at the margin of a wide question, viz. what characters are to be regarded as specific in the group *Mallophaga*. We only wish to state our opinion that while similar

Philopterid forms from a wide range of hosts may truly enough, as in the present case, represent one species, there is nothing unnatural or unlikely in their being referable to distinct species. Both conditions in fact do, we believe, occur. The even more improbable case of two extremely similar* species occurring on the same host species, is found in the genus *Nirmus* on so common a British bird as *Turdus merula*.

DOCOPHORUS EXCISUS, N. (1818).

Docophorus excisus, Nitzsch, in Giebel, Ins. Epiz. p. 88, pl. ix. figs. 1, 2, 3 (1874).
♀. *Hirundo rustica*.

DOCOPHORUS LARI, Denny (1842).

Docophorus lari, Denny, Monogr. Anopl. Brit. p. 89, pl. v. p. 9 (1842).

♂. *Tringa subarquata*.

5 ♂♂. *Diomedea melanophrys*.

2 ♂♂, 4 ♀♀, 4 imm. *Larus dominicanus*.

2 ♂♂, 3 ♀♀. *Larus hartlaubi*.

17 ♂♂, 16 ♀♀, 27 imm. *Larus hartlaubi*. Table Bay, July, 1913.

8 ♂♂, 5 ♀♀. *Larus hartlaubi*. Table Bay, Sept., 1913.

Piaget (Les Pédiculines, p. 112, 1880) reports a var. *parva* from *Larus dominicanus* (Valdivia), but we prefer to leave the discussion of varieties over till we have seen material from more species of South African *Larus*.

DOCOPHORUS LEUCOGASTER, Giebel (1874).

Docophorus leucogaster, Giebel, Ins. Epiz. p. 300 (1874).

13 ♂♂, 11 ♀♀, 6 imm. *Buteo jakal*. 1912-1913.

Not having seen examples of *D. platyrrynchus*, N., we are unable to say from examination of the genitalia how the insects compare. But there is every reason to believe on general grounds that *D. leucogaster*, G., is a synonym or at most a variety of Nitzsch's species.

DOCOPHORUS MELANOCEPHALUS, N. (1818).

Docophorus melanocephalus, Nitzsch, in Giebel, Ins. Epiz. p. 110, pl. xi. fig. 8 (1874).

2 ♀♀. *Sterna bergii*. May, 1913.

* Analogous to the occurrence of, say, two *cursor*-like *Docophori* on the same species of owl.

DOCOPHORUS ROSTRATUS, N.

D. rostratus, Nitzsch, in Giebel, Ins. Epiz. p. 76, pl. x. fig. 4 (1874).
2 ♀ ♀. *Bubo capensis*.

See remarks under *cursor*. Apparently a scarcer species.

GEN. NIRMUS, Nitzsch.

Nirmus, Nitzsch, in Germar's Mag. f. Insekt. vol. 3, p. 291 (1818).

NIRMUS ACTOPHILUS, Kell. and Chap. (1899).

N. actophilus, Kellogg and Chapman, New Mallophaga, iii. p. 78,
pl. vi. fig. 4 (1899).

See also *N. holophaeus*, Nitzsch, in Giebel, Ins. Epiz. p. 158, pl. v.
fig. 1 (1874).

N. subcingulatus, Nitzsch, in Giebel, Ins. Epiz. p. 158 (1874).

♀. *Tringa subarquata*.

This is a *Nirmus* of the *holophaeus*, N., type (*Machetes*). But *holophaeus* is only one member of a very bewildering series of which *actophilus* is perhaps the smallest term. Possibly *N. subcingulatus*, N. (*Strepsilas interpres*), denotes the present insect, but we prefer in the meantime to use Kellogg and Chapman's name as their figure and description more recognizably apply to the above ♀ and similar material in our own collection.

NIRMUS DECIPIENS, N. (1818).

Nirmus decipiens, Nitzsch, in Giebel, Ins. Epiz. p. 162, pl. xv. fig. 4
(1874).

8 ♂ ♂, 9 ♀ ♀, 3 imm. *Recurvirostra avocetta* (Avocet). Dec.,
1912. Philipstown, C.P.

Three species of *Nirmus* appear to be peculiar to the Avocet, and Dr. Péringuey has fortunately secured all (see in addition under *N. pileus*, N., and *N. signatus*, P.). Dr. Yngve Sjöstedt collected the two last-named from *R. avocetta*, Natron Lakes, Kilimandjaro-Meru, but did not take the present insect. (See Kellogg, Wissenschaft. Ergeb. der Schwedisch., Zoolog. Exped. Nachdem Kilimandjaro, etc. Deutsch. Ostafrikes, 1905-1906, 15 Corrodentia, 4 Mallophaga, p. 47. Uppsala (1908).)

NIRMUS GRACILIS, N. (1818).

Nirmus gracilis, Nitzsch, in Giebel, Ins. Epiz. p. 143, pl. v.
figs. 11, 12 (1874).

♂. *Hirundo rustica*.

NIRMUS MACROCEPHALUS, spec. nov. (Pl. XXV., figs. 2 and 5.)

10 ♂♂, 14 ♀♀. *Aegialitis pecuaria*.

7 ♂♂, 8 ♀♀. *Aegialitis tricollaris*. Sept., 1913.

13 ♂♂, 8 ♀♀. *Aegialitis marginata*. Sept., 1913.

This is a very characteristic *Nirmus* of the *bicuspis*, N., type. [Giebel, Ins. Epiz. p. 155, pl. v. figs. 11, 12 (1874).] We do not give a detailed description of the chaetotaxy, since such differences as we have noted between the South African insect and *N. hiaticulae*, D. [Monogr. Anopl. Brit. p. 136, pl. xi. f. 10 (1842)], (which we take to be *bicuspis*, N.), and *N. opacus*, Kell. and Chap. [New Mallophaga, iii. p. 83, pl. vi. fig. 6 (1899)], are probably immaterial. We have *hiaticulae* from Britain, and Professor Kellogg has very generously presented for dissection one of the three extant ♂♂ of *opacus*.

The chief distinguishing feature externally is the long head, which is also extremely narrow, viz. ♂ length .4 mm., breadth .27 mm. (*opacus* .4 and .31). In *macrocephalus* the signature is short and broad, in *opacus* more elongated with a backwardly produced apex. Length *macrocephalus* ♂, 1.35 mm.; *opacus* ♂, 1.11 mm.

The genitalia of *macrocephalus* are distinct. The basal plate is posteriorly (as it lies in the insect "anteriorly") expanded. The paramera are evenly curved almost their whole length, and bear the ventral hair far forward, apically the paramera contract rather suddenly. The meosome is long with parallel sides. The V-shaped ventral pattern extends to the articulation of the paramera with the basal plate. Each endomer is slightly contracted near the apex, where there are in side-view one or two rugose papillae which may bear minute sensory hairs. Ventrally 3 or 4 hairs on each endomer. The penis with the telomers distinctly fails to reach the level of the endomers. In *hiaticulae*, D., and *opacus*, Kell. and Chap., the basal plate is small and narrowed posteriorly. The paramera bend more abruptly than in *macrocephalus*, and at a greater distance from the apex. The ventral hair is thus placed not so far forward. The paramera are considerably narrowed on the apical third in both forms, but they are more slender near the basal plate in *opacus* than in *hiaticulae*. In both the penis, the endomers, and the telomers reach the same level. The penis is thicker than in the form described. The sides of the mesosome are in *opacus* curved from base to apex, in *hiaticulae* sub-parallel for the greater part of their length. The minute hairs are also more numerous in *opacus* than in *hiaticulae*. All three forms are close to one another,

however. Yet it is impossible, we think, till more of this type have been investigated to say what value is to be assigned to the differences between members of the *bicuspis* group. They are not, we imagine, varieties in the sense that *atrimarginatus*, K. and C., is a var. of *Nirmus lineolatus*. It may be advisable ultimately to arrange them in a trinomial series.

Dimensions of MACROCEPHALUS ♀.

	Length.	Breadth.
Head	·430	·300
Prothorax	·116	·200
Metathorax	·183	·290
Abdomen.....	·971	·470

Total length of ♀ 1·68 mm.

The *bicuspis* type of *Nirmus* though occasionally found on other *Limicolae* is probably specially attached to the genus *Aegialitis*.

NIRMUS MELANOPHRYS, N.

N. melanophrys, Nitzsch, in Giebel, Ins. Epiz. p. 146 (1874).

2 ♂ ♂, ♀. *Upupa africanus* (South African Hoopoe). Philipstown, C.P.

Imm. *Upupa africanus*. April, 1913.

NIRMUS NEBULOSUS, Denny (1842).

Nirmus nebulosus, Denny, Monogr. Anopl. Brit. p. 132, pl. xi. f. 13 (1842).

♂, 9 ♀ ♀. *Sturnus vulgaris*. Sept., 1913.

♂, 4 ♀ ♀, 4 imm. *Sturnus vulgaris*.

This host—the common starling of Europe—has been introduced into South Africa.

NIRMUS PILEUS, N. (1818).

Nirmus pileus, Nitzsch, in Giebel, Ins. Epiz. p. 162 (1874).

For note see under *N. decipiens*, N.

2 ♂ ♂, 25 imm. *Recurvirostra avocetta* (Avocet). Dec., 1912. Philipstown, C.P.

NIRMUS PUNCTATUS, N. (1818).

N. punctatus, Nitzsch, in Giebel, Ins. Epiz. p. 176, pl. iv. figs. 1, 2 (1874).

N. PUNCTATUS LINGULATUS, var. nov.

30 ♂ ♂, 27 ♀ ♀, 6 imm. *Larus hartlaubi*. Table Bay, July, 1913.

An interesting series representing one of the good colour varieties to which the larvae *Nirmi* give rise. An excellent example of such variation is *N. lineolatus*, *N. var. atrimarginatus*, Kellogg and Chapman, New Mallophaga, pt. iii. p. 75 (1899). The present variety of *punctatus* is more ornately marked than the type. Its position can best be understood by considering it along with the typical form and *N. felix*, Giebel (Ins. Epiz. p. 175, 1894), between which it is evidently intermediate. In doing this, while we are completely satisfied that the South African insects merit only varietal rank, we have no desire to express an opinion on the status of *N. felix*, which Kellogg considers a valid species. We wish only to state the evidence in so far as it is available.

With regard to the markings:—

(a) *N. punctatus* of typical ♂ form shows on the head a moderate spot at the eye, a second, often faint and not infrequently wanting, a short distance in front of the antennae, and a third not far from the clypeal edge. These six with the pair on the occiput (which really shine through from the inserted portion of the prothorax) make up the 8 spots of which Piaget (Les Pédiculines, p. 200) speaks. Two pairs of spots on prothorax at anterior and posterior angles respectively. The metathoracic margin is really clear, but there are below 4 spots which shine through. In the abdomen the lateral bands are clear. At their broadest region (at the suture) each is crossed by an elongated spot which does not project inwards beyond the band.

There is on segments 2–7 a median elongated spot.

(b) *N. punctatus lingulatus*. ♂. The spots of the head are all invariably present, being very dark and slightly larger than in the preceding. The temples are still uncoloured. The transverse abdominal spots have become *narrow* bands projecting inwardly far beyond the chitinized lateral band, especially on segments 3–5. The inner end of these transverse black bands is upturned towards the head of the insect. The median elongated spots are more extensive.

(c) *N. felix*, G. ♂. From Kellogg's figures one sees that the spots of the head are still larger and denser: that in the clypeus the anterior portion of the antennal band is now also darkened; that the temporal margin is also coloured uniformly and in the same way the metathoracic sides. The transverse abdominal bands are broader, and the lateral bands are partly coloured besides; while on segments 7–8 the whole lateral band is darkened.

The under surface (♂) of the three forms may be compared in a sentence. In *punctatus* there are on each of sternites 4–6 a pair of

narrow elongated black spots. These are often defective. In *lingulatus* all 6 are present—the median pair (st. 5) being broader and showing as well in some specimens on inwardly projecting anterior angle. In *felix* all 6 are moderately broad—the median pair being wider than the others and connected at the inner anterior angles by a dark linear band. As regards markings, then, *punctatus*, *lingulatus*, and *felix* form undoubtedly a graduated series.

It is desirable that, when possible, specific definitions should be based on morphological characters. In the *Mallophaga* we believe the best characters are to be found in (a) the head, and (c) the ♂ genitalia, and occasionally, too, those of the ♀. The characters to be relied on in these regions are the shape and chaetotaxy.

We have critically examined typical *punctatus* and var. *lingulatus*, and find their agreement very complete. Professor Kellogg beautifully illustrates *N. felix*, G. (New Mallophaga, pt. i. pl. vi. figs. 3, 4, 1896), and though no details of the genitalia are alluded to in the corresponding text (p. 110), we think that two remarks may be safely ventured.

I. That *felix* is more closely related to *punctatus* than to any other of the gull *Nirmi*. This is seen in the shape of the head and in the figure of the genitalia which, though drawn on a small scale, are easily seen to be of the *punctatus* type. The genitalia of *punctatus* are unique so far as we know in the group to which the species belongs. The paramera are broad and abruptly bent at a little beyond half-way from the base. The extreme top of each paramer is darkened and the rest of the apparatus consists of a delicate hyaline chitin. Thus the species may be said to maintain its "*punctatus*" character throughout. In *lineolatus* the paramera are evenly bent, dark and of moderate breadth. This is a common type (see Kellogg, *loc. cit.* pl. vi. figs. 7–8). The paramera of *felix* are of the peculiar "*punctatus*" type, being, according to Kellogg's figure, broad and sharply bent. They differ, however, in being completely darkened, which would incline one to expect some concomitant structural difference indicating a valid species. These facts, together with what has been said about the markings, reinforce the view of the affinities of *felix* suggested above.

II. Piaget (1880) (Les Pédiculines, p. 201) held that *felix* is a variety of *punctatus*. Kellogg holds the contrary view. The following, then, would seem to be the alternatives.

(a) That *felix* is a richly marked variety of *punctatus* in which the dark coloration at first in spots has assumed the form of bands, invading also finally the lateral bands and the usually colourless genitalia.

(b) That it is a species closely approached by a variety, *lingulatus*, of its nearest congener.

NIRMUS SIGNATUS, Piaget (1880).

Nirmus signatus, Piaget, Les Pédiculines, p. 186, pl. xv. fig. 8 (1880).

See also under *N. decipiens*, N.

♂, ♀. *Recurvirostra avocetta* (Avocet). Dec., 1912. Philipstown, C.P.

NIRMUS VARIUS, N.

N. varius, Nitzsch, in Giebel, Ins. Epiz. p. 130, pl. vii. figs. 2, 3 (1874).

[Kellogg and Paine have already (Bull. Ent. Res. ii. p. 147, pl. v. figs. 5, 5a, July, 1911) recorded this species from Oshogbo, S. Nigeria (*Corvultur albicollis*) and from Malachal, Egyptian Sudan, on starling.]

13 ♂♂, 6 ♀♀, 5 imm. Host unknown,

18 ♂♂, 16 ♀♀, 50 imm. *Corvus capensis*.

We have not sufficient material from European hosts for comparison with the above, and cannot say how far they are typical. The *Docophorus* of *Corvus capensis* (not reported on in this instalment) taken with the above *Nirmus* does not seem referable strictly to any of the usual corvine types. Much more, therefore, one might expect the accompanying *Nirmus* to vary. So far as descriptions carry one this does not seem to be the case. It must be remembered that the corvine *Docophori* are a very plastic group—at least as regards markings.

NIRMUS VITTATUS, G. (1874).

N. vittatus, Giebel, Ins. Epiz. p. 127 (1874).

By using this name we mean the raptorial *Nirmus* in which the first abdominal band is medianly excised opposite a point-like mark on the posterior margin of the metathorax. Most of the following examples are referable to this well-defined type.

35 ♂♂, 20 ♀♀, 5 imm. No date.

From *Buteo jakal* 14 ♂♂, 16 ♀♀, 40 imm. 1912.

82 ♂♂, 83 ♀♀, 55 imm. 9:iv:13.

18 ♂♂, 12 ♀♀, 6 imm. March, 1913.

9 ♂♂, 9 ♀♀, 4 imm. Philipstown, C.P.

14 ♂♂, 15 ♀♀, 9 imm. *Eutomaetus spilogaster*.

4 ♀♀, 10 imm. *Eutomaetus pennatus* (Booted Eagle).

The last lot are much shrivelled.

- 3 ♂ ♂, 5 ♀ ♀, 5 imm. *Melierax canorus* (Chanting Goshawk).
Philipstown, C.P.
7 ♂ ♂, 10 ♀ ♀, 3 imm. *Circus macrurus* (Pale Harrier). Philipstown, C.P.

NIRMUS VULGATUS, Kellogg (1896).

Nirmus vulgatus, Kellogg, New Mallophaga, ii. pp. 496-498, pl. lxxvii.
f. 5 (1896).

♂, 2 ♀ ♀, 2 imm. *Passer arcuatus*. Cape Town, x: 12.

2 ♂ ♂, 2 ♀ ♀, 2 imm. *Passer arcuatus*. March, 1913.

♂. *Amadina erythrocephala* (Red-headed Weaver Bird). Philipstown, C.P.

Kellogg and Paine (Bull. Ent. Res. vol. ii. p. 148, July, 1911) record "numerous specimens from the starling and one from an owl, Malachal, Egyptian Sudan (H. H. King). This is the first record of this American species, which is found widely distributed on American passerine birds, from a host in the Old World."

But the species also occurs on Palaearctic passerines; when therefore the synonymy of the group is better understood it will not be surprising to find *vulgatus* give way to an older name.

NIRMUS ZONARIUS, N.

♂. *Nirmus zonarius*, Nitzsch, in Giebel, Ins. Epiz. p. 166 (1874).

♂, 2 ♀ ♀. *Tringa subarquata*.

We use the name *zonarius* for the *Nirmus* of the general type *cingulatus*, got on a variety of small waders. *Zonarius*, though a good species, is extraordinarily like its larger congener; but the genitalia are different.

FAMILY GONIODIDAE.

GEN. GONIOCOTES, Burmeister.

Goniocotes, Burmeister, Handb. Ent. vol. 2, p. 431 (1835).

GONIOCOTES BIFASCIATUS, Piaget (1885).

Goniocotes bifasciatus, Piaget, Les Pédiculines, Suppl. p. 47, pl. v.
f. 6 (1885).

Four lots from *Spheniscus demersus*—

(a) ♀, (d) Table Bay, 1913.

(b) 58 ♂ ♂, 81 ♀ ♀.

(c) 62 ♂ ♂, 56 ♀ ♀, 15 imm.

(e) 34 ♂ ♂, 40 ♀ ♀, 10 imm.

This peculiar species, as the above records show, is abundant on its special host. A new genus will ultimately be required for its reception.

Eric Mjöberg, "Studien über Mallophagen and Anopluren" (Archiv for Zoologi. Band. 6, N:O. 13, p. 108, Upsala and Stockholm, 1910), remarks, "Von dieser sehr charakteristischen Art, die nur einmal und zwar Von Piaget, in der Literatur Erwähnung gefunden hat, liegen mir einige Exemplare von demselben Vogel, *Sphaeniscus magellanicus*, vor, (Afrika, Kaudern)."

[*Sphaeniscus magellanicus*, specifically different from *S. demersus* is not found on the African coast. Either Mjöberg's specimen was badly identified, or the locality "Afrika" is wrongly given.—EDITOR.]

GEN. GONIODES, Nitzsch.

Goniodes, Nitzsch, in Germar's Mag. f. Insekt. vol. 3, p. 293 (1818).

GONIODES FALCICORNIS, N. (1818).

Goniodes, falcicornis, Nitzsch, in Giebel, Ins. Epiz. p. 198, pl. xii. figs. 14, 15 (1874).

9 ♂♂, 13 ♀♀, 23 imm. *Pavo cristatus* (Peacock).

In some of the above reckoned as adult the markings are not fully established but the sex is plainly indicated.

GONIODES MINOR, Piaget (1880).

Goniodes minor, Piaget, Les Pédiculines, p. 256, pl. xxi. fig. 3 (1880).

♀. *Turtur capicola*.

♂. *Vinago delalandi*, Port St. Johns, C.C., Nov., 1901. Shortridge.

GIEBELIIDAE, fam. nov.

We erect this division for these forms, hitherto included amongst the Philopteridae, which are furnished with a broad transverse flap on the under side of the clypeus. This flap projects to form characteristic horns or knobs at the sides of the clypeus.

Only three genera are certainly to be placed here at present—*Gibelia*, Kellogg, *Mackayia*, Waterst., and *Philoceanus*, Kellogg; *Gibelia* and *Mackayia* apparently represent a line of direct development, of which three stages are to be seen in *G. mirabilis*, *M. dimorpha*, and *M. heteracanthus*; *Philoceanus* is a more isolated form which we have not seen.

It may be possible later to diagnose this family more fully. Probably the definition should include the peculiar banding and chaetotaxy of the head, etc. Meanwhile the membranous folded

flap is sufficiently characteristic of this small but remarkable group of parasites.

GEN. GIEBELIA, Kellogg.

Giebelia, Kellogg, New Malloph. pt. 1, p. 137 (1896).

GIEBELIA HEXAKON, spec. nov.

(Pl. XXV., figs. 7 and 11; Pl. XXVI., fig. 14.)

♂, 4 ♀ ♀. *Majaqueus aequinoctialis* (Cape Hen).

One of these ♀ ♀ is merely a skin.

The occurrence of a species of *Giebelia* in the Atlantic is interesting. Hitherto known as a *Puffinus* parasite from the Pacific only, this genus proves to have a wider range both in hosts and in distribution.

A larger paler form than *G. mirabilis*, Kell., with which at first we were inclined to identify Dr. Péringuey's material. On comparison with a pair of paratypes forwarded by Professor Kellogg some interesting differences, undoubtedly of specific value, appear. These are to be found (*a*) in the head, (*b*) genitalia ♂, and (*c*) in the shape of the marginal bands of the abdomen. In general chaetotaxy these Giebeliid forms are practically identical (see under *Mackayia heteracanthus*). We therefore draw attention merely to the following features.

♂. The head is proportionately broader behind in *hexakon* than in *mirabilis*. The antennae are quite simple. In fact the general facies of the head is reminiscent of ♀ *mirabilis* rather than the ♂. The projecting knobs of the membranous fold are large. A unique feature, reminiscent also of the ♀ ♀ of this group, is the presence in the ♂ of a short backwardly curved branch of the antennal band which bears terminally just above the base of the antennal joint a heavy spine. The 4 similar spines of *mirabilis* are also present, and from these 6 pike-like outgrowths the species is named.

On the inferior aspect of the head the eye is produced into a short blunt hooked process directed forwards. The eye itself, as in *mirabilis*, is extremely prominent. The greatest width of the head lies between the eyes. In the allies of *hexakon* the greatest width is just below the eyes. There is almost no difference in shape or dimensions between the heads of the sexes in this species (see tables), but the ♀ temples swell out slightly beyond the eye. The genitalia ♂ are quite distinct from those of *mirabilis*. The basal plate is longer and narrower. The paramera are bent only at their articulation with the plate. Thereafter they run with parallel sides to near the apex. The penis is longer than in *mirabilis*.

♀. The head is longer and broader than in *mirabilis*. The internal incassations of the lateral bands of the abdomen are also more pronounced.

Dimensions of GIEBELIA HEXAKON.

	♂		♀		
	Length.	Breadth.	Length.	Breadth.	
Head	·570	·570	·585	·585	
Prothorax	·185	·400	·185	·406	
Metathorax	·185	·514	·171	·471	
Abdomen	·785	—	1·040	—	
Segment 4	—	·7	—	·75	
Total ...	1·77	—	1·97	—	
Antennae {	1	·076	·05	·076	·050
	2	·060	·036	·056	·030
	3	·036	·033	·030	·030
	4	·026	·026	·026	·026
	5	·040	·026	·040	·023
Length of Antennae	·23	—	·22	—	

GEN. MACKAYIA, Waterston.

Mackayia, Waterston, Ann. Scott. Nat. Hist. p. 251 (1913).

MACKAYIA HETERACANTHUS, Waterst. (1912).

(Pl. XXV., fig. 8; Pl. XXVI., figs. 13, 16, 18.)

Mackayia heteracanthus, Waterston, The Scottish Naturalist, p. 258 (1912).

♂, ♀. Types *Procellaria (Ossifraga) gigantea* (Giant Petrel).

2 ♂♂. *Oceanites oceanicus* (Wilson's Storm Petrel). 26:iii:04.

P. Bonomi, coll.

Description of M. HETERACANTHUS.

In general facies and chaetotaxy very similar to *M. dimorpha*, Waterst. (The Scottish Naturalist, pp. 251-7, figs. 1-6, 1913), from which, however, it may be separated by the head and ♂ genitalia.

♂. *Head*. Clypeus straight with rounded angles. Bands curved towards one another, anteriorly each bears three short hairs—one above, one at the edge, and a third below and somewhat behind the first two. There rises also from below, but farther back, a longer hair which projects beyond the edge. On the upper surface of the clypeus there is a longish hair between the band and the edge of the signature, at about the level of the peculiar labral folding. Signature reaching back to the mandibles, where it fuses broadly with a transverse internal band connecting the antennals. The pre-sutural portion of the signature bears apparently two hairs, but careful

focusing shows that these rise on the under side of the head. On either side of the apex of the signature is a short strong bristle directed backwards.

The antennal bands (cf. *M. dimorpha*), connected by a medianly swollen transverse internal band, advance anteriorly to the somewhat indefinite suture, while posteriorly they curve very distinctly inwards, each bearing terminally a heavy peg-like spine. At the outer edge above the first antennal joint there is a minute bristle. In front of the peg-like spines referred to and before the band connecting the antennals are two short bristles.

The ocular band, especially on the inferior surface of the head, is more strongly developed than in *M. dimorpha*. Besides the dark spot before the eye there is a distinct branch running towards the posterior region of the antennal band (this is more apparent below). The occipital bands have a strong dark basal spot. They are set widely apart and diverge considerably in their outwardly curved course till they practically join with the ocular bands. There is, as in *M. dimorpha*, a tendency to branching on the inner aspect of the bands.

Antennae deeply inset in the head; 1st joint as long as the succeeding 4 together, with a large appendage near the base. The upper posterior median region with a deep excavation from which rise 2 hairs. First joint a triangle with truncated apex, broad at the base and appreciably narrowed where it gives rise to the 3rd joint, which bears a broad sinuous appendage, furnished near the apex with a relatively strong hair. Fourth joint very short; 5th joint nearly twice as long as the 4th. Trabeculae long, reaching to about the middle of the 1st joint. Eye prominent, large, with 1 bristle. Across the middle of the post-ocular region of the head runs a row of 4 bristles, lying 1, 2, 1, in the three regions separated by the occipital bands. In front of each of the median pair is an extremely minute hair, while behind near the occiput are 2 longer hairs.

Between the eye and the base of the occipital band are the following: 2 very short bristles, 2 long strong hairs, 1 long weaker hair, 1 short bristle. The occiput itself is bare.

The margin of the head from the eye to a little beyond the base of the occipital band is incrassated, while the middle of the occiput is bare.

On the ventral surface of the head, at about the level of the clypeal suture, is an entire transverse membranous flap folded on itself at the sides to form there knotted triangular processes distinctly seen from above. Between these projections the clypeus

is apparently hinged along a narrow transverse crease. This interpretation is supported by the presence on the inner anterior aspect of the antennal bands of a curious knot-like projection which fits into a socket-like modification of the signature. The signature is thus characteristically hollowed on both sides (cf. *Giebelia* and *M. dimorpha*).

Thorax. *Prothorax* much broader than long, sides rounded and heavily thickened, 2 minute bristles anteriorly on the dorsum.

Metathorax bears, like the prothorax, 2 minute bristles anteriorly on dorsum; sides divergent, much thickened; posterior margin rounded over abdomen. At the posterior angle and for some distance along the edge a row of pustulated hairs—6 in all on each side. The pustules are regularly disposed, but from its position the hair at the corner diverges more than the others, which thus come to form a row by themselves. Median region of hind margin clear. On the sternum the chitinous ribs between the coxae are strongly developed. Prosternum bare, metasternum 4 hairs, 2 between mid-coxae, 2 between hind coxae.

Abdomen. The dorsal bands are continuous on all the segments, being broad on 1, 2, 3-8, and narrowed medianly on the others. The minute terminal segment is uniformly brown. In shape the abdomen is elongated oval. The margin is distinctly toothed from the overlapping of the segments.

The lateral bands, except on the first segment, are strongly developed; on the under surface they are clearly defined, but above they are less plainly limited owing to fusion with the transverse markings of the tergites. Each band shows an almost rectangular median appendage. There is also a thickening of the band along the inner anterior edge to form a second minor appendage which more or less enters the previous segment. The number of hairs on the lateral bands ranges up to 4 (below) and 2 (above), reckoning, as on the band, all hairs outside the stigma. The maximum of 6 is found on segment 7; 1-2 of these hairs project at the angle.

The first abdominal segment differs from the others (2-7) in being slightly narrower ($\frac{1}{7}$ less), in the presence of 2 minute hairs anteriorly in the middle of the tergite (cf. thorax) and of 1 hair on each side at about $\frac{1}{3}$ from the posterior angle, and also in the reduced thickening of the sides which show no median appendage. Two median hairs on hind border.

Tergites 2-8 are sub-equal in length, with large stigmata on 2-7.

The 2nd tergite bears 2 median hairs on hind border. The 3rd-5th bear 3-4 median hairs and 1 on each side before the

stigma. The 6th-7th bear 2 median hairs, 1 before the stigma and 1 immediately below, *i.e.* 6 in all.

The 8th tergite bears 6 hairs (3, 3) above the emergence of the genitalia. The 9th tergite bears at the sides 2 patches of minute bristles.

On the under surface the segmental bands are sharply limited and do not join the laterals. The 1st sternite bears 4 hairs, 2nd st.-5th st. bear 6 hairs, 6th st. bears 4, 7th st. bears 2, and there are a few terminal hairs on the indistinct genital mark. The genitalia are large and peculiar. The paramera are broadly curved near their origin and again at the apex, so that the exerted apparatus is lyre-shaped. The first upper pair of appendages are here broad, leaf-like structures with underneath 2 strong chitinous rods. The homology of these rods is uncertain, and there is unfortunately not enough material to permit of dissection. The genital mark is very similar to that of *M. dimorpha*.

♀ The main differences between the sexes are to be found in the head. *M. heteracanthus*, like *M. dimorpha*, is distinctly dimorphic. The occipital bands are sharply defined. They are curved *towards* one another, and not outwardly, as they run forward. Anteriorly each fuses with the ocular and antennal bands. The transverse band connecting the antennae in the ♂ is medianly incomplete in the ♀. Thus the apex of the signature is clearly seen. Antennae simple, trabeculae as long as the swollen 1st joint. For details see table.

In neither sex do the *legs* call for remark. They are moderately stout and Docophoroid in structure, but the large coxae of the ♂ show rather a Lipeuroid feature.

Measurements of MACKAYIA HETERACANTHUS in mm.

	♂		♀	
	Length.	Breadth.	Length.	Breadth.
Head	·500	·457	·542	·442
Prothorax	·135	·335	·128	·342
Metathorax	·185	·464	·185	·485
Abdomen	·907	—	·928	—
Segment 1.....	—	·40	—	·457
Segment 4.....	—	·57	—	·685
Total ...	1·727	—	1·783	—
Antennae {	1	·14	·063	·05
	2	·07	·036	·03
	3	·03	·073	·026
	4	·02	·028	·026
	5	·036	·026	·035
Length of Antennae	·3	—	·2	—

NOTES ON *Giebelia* and *Mackayia*.

Having all the known forms of these peculiar parasites before us, we have drawn up the following tables for their differentiation.

Key to Genera.

The sexes with similar simple antennae which are carried gently recurved. Anterior edge of trabecula, measured from the apex to the hair at the junction with the edge of the head, distinctly longer than the 1st antennal joint .. *Giebelia*.

The sexes with dissimilar antennae which are carried in the σ bent sharply back. One or more joints with an appendage. Basal joint (σ) with a distinct fovea on upper surface, edge of trabecula markedly less than length of 1st antennal joint ($\frac{2}{3}$ to $\frac{1}{2}$) *Mackayia*.

Key to Species of GIEBELIIDAE.

(For the more convenient handling of the $\varphi \varphi$ we treat all the species together).

$\sigma \sigma$.

A. Antennae simple.

a. Six peg-like spines on head, 1 on each side of signature, 1 on an extension of the antennal band above the 1st antennal joint and 1 at the end of another band which curves inwards from the base of the antennae. (We may refer to these 3 parts as "anterior," "lateral," and "posterior" respectively.) Paramera straight with parallel sides. Basal plate narrow *Giebelia hexakon*, n. sp.

b. Four peg-like spines, 2 anterior, 2 posterior, the lateral pair represented by minute spines. Paramera distinctly curved. Sides not parallel, there being a sudden concavity on the inner edge near the base. Basal plate short and broad *Giebelia mirabilis*.

AA. Antennae with appendages.

a'. Antennae with 1 appendage on 3rd joint. Anterior edge of trabecula $\frac{2}{3}$ 1st antennal joint. Spines as in *G. mirabilis* σ , eye prominent and round. Paramera short, broad, and once curved *Mackayia dimorpha*.

b'. Antennae with appendages on 1st and 3rd joints. Anterior edge of trabecula $\frac{1}{2}$ 1st antennal joint, anterior spines bristle-like, eye not prominent, paramera twice bent *Mackayia heteracanthus*.

$\varphi \varphi$. In describing *M. dimorpha* and *M. heteracanthus* $\varphi \varphi$ we have mentioned that the transverse band between the antennals, which is so conspicuous a feature of the $\sigma \sigma$ forehead, is interrupted near the signature. In both $\varphi \varphi$ of the *Giebelia* spp. this band is conspicuous though uncoloured and very narrow on either side of the apex of the signature. By this feature we find it very easy to separate the $\varphi \varphi$ actually before us. We do not care to use this character, however, in the following table, as on recurring to our $\varphi \varphi$ *Mackayia* we find that there are membranous creases

connecting the closely approximated points of the long transverse bands stretching inwards from the antennals.

A. Anterior pair of spines thin *Mackayia heteracanthus*.

A.A. Anterior spines peg-like B.

B. Lateral bands with distinct median projecting incassation on segments 6 and 7 only; on 4 and 5 the bands are merely swollen on the inner median aspect

Giebelia mirabilis.

B.B. Lateral bands on segments 2-7 with projections on the inner middle aspect C.

C. Larger species (1-97) all over especially in the breadth of the prothorax and abdomen. The central marginal pair of bristles on tergites 6-8 forming two

divergent lines . . . each bristle or hair being nearer to the marginal bristle

before and below the stigma than to its neighbour *Giebelia hexakon*.

Smaller species (1-81). The central marginal pair of bristles on tergites 6-8 in

parallel rows . . . each bristle nearer its neighbour than to the stigmatic bristle

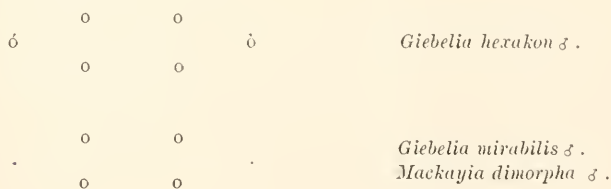
Mackayia dimorpha.

There are other very slight and possibly inconstant differences between *dimorpha* and *hexakon* ♀ ♀, e.g. in the 1st antennal joint (longer in *hexakon*). Again the entrant heads of the abdominal lateral bands are more angled on their outer aspect in *dimorpha*. In *hexakon* they are almost round.

The most remarkable differences are probably in the dimensions of the head.

These ♀ ♀ are, however, somewhat difficult to separate. It does not seem advisable to enumerate minute comparative differences as their significance can be estimated only when more species are known. We venture to think that many species of *Giebelia* and *Mackayia* will yet be found on Tubinarial hosts.

Special reference has been made in the above tables to six spines or pegs on the head. As these are probably important throughout the group, their arrangement in the four species now dealt with may be graphically put thus:—



	o	o		<i>Giebelia mirabilis</i> ♀ .
ó	.	.	ò	<i>Giebelia hexakon</i> ♀ .
	.	.		<i>Mackayia dimorpha</i> ♀ .
.	.	.	.	<i>Mackayia heteracanthus</i> ♂ .
	o	o		
ó	.	.	ò	<i>Mackayia heteracanthus</i> ♀ .
	.	.		

In the above o = peg-like spine, ó = do. on special branch of antennal band, and . = short spine.

The marginal bands have been used in discriminating between the ♀ ♀. If the specimen of this sex of *G. mirabilis* supplied by Kellogg is thoroughly typical it may be set aside at once by the simplicity of the bands on segments 2 and 3. The ♀ ♀ of the 4 spp. do not quite agree in these bands, and some of these are figured for comparison.

The ♂ eye of the 4 species shows minute modifications which we think of some importance. In *hexakon* (which is probably the most primitive of all) and *mirabilis* the eye is exceedingly prominent, and at it the temple bends rectangularly. In *dimorpha* the eye is still prominent and large, but the angle is blunter. In *heteracanthus* the whole temple from the base of the occipital band to the insertion of the first antennal joint is evenly rounded, and the eye has become elongate and comparatively inconspicuous. In *hexakon*, as noted in the description, there is a curious short process from the under side of the eye. We imagine this feature is less pronounced in *mirabilis*. We cannot certainly say it is present in *dimorpha*, and it seems to be wholly absent in *heteracanthus*.

The gradual disappearance of this projection and the diminution in the prominence of the eye are, we believe, to be correlated as compensatory for the rise of the heterocerous condition. The ♂ antennae are, we believe, accessory organs of copulation. In the more primitive forms the female is held somehow between the warped back antennae and the angle of the eye. Later the grasp is made securer by the development of an appendage to the 3rd joint. Finally a completely fast lock is established by (1) the processes from joints 1 and 3, and (2) joints 1 and 2. There is only one weak spot in this lock, viz. where the appendages touch one another, but if the whole antennae is pressed back, as it doubtless is, against the head, there can be no possibility of escape.

The significant point in the development of these insects is apparently when an appendage is produced on the 3rd antennal

joint. The rise of another appendage on the 1st joint has not the same value, as the latter modification is dependent on the presence of a modified 3rd joint. It is the whole 3rd joint which is altered, and only a small portion of the 1st which is produced. The 2nd appendage therefore seems to be only an elaboration of the original departure, and forms whether with one or with two appendages should be grouped together.

It is extremely interesting, though it is no more than the peculiar life conditions of the *Mallophaga* would lead one to expect, to find apparently primitive and much more advanced forms existing side by side. The ♀♀ are all primitive in facies. No good generic character separates them so far as we know. The same condition is found in the ♀♀ of *Lipeurus* spp. and *Nirmus* spp., of *Goniocotes* spp. and *Goniodes* spp. It is further to be noted that not quite mature ♀♀ of this group may be confused with *Docophorus*, as the clypeal modification is evidently late in development. The single specimen attributed to *Docophorus* mentioned by us in The Scottish Naturalist, Nov., 1912, p. 251, now seems to us to be only an immature ♀ of *Mackayia dimorpha*. By a clerical slip the example was referred to as a ♂.

There are evidently two lines of development in this order. I. Looking at such groups as the *Docophori latitemporalis*, the *Goniodes* of pigeons, the *Lipeuri* of herons, bitterns, and storks, or the *Nirmi* "*nigropicti*," one concludes that such groups have arisen by the modification of one ancestral type in each case. The archetype has split up into many new species, disappearing itself in the process. II. But in other cases development appears to have been intensive not extensive. *Lipeurus mutabilis* is in almost every detail, except colour and size, identical with *L. grandis*, but the latter bears highly modified antennæ with a large appendage on the 1st joint. *Giebelia* stands in a similar relation to *Mackayia*.

FAMILY EURYMETOPIDAE.

GEN. EURYMETOPUS, Taschenberg.

Eurymetopus, Taschenberg, Die Malloph. p. 183 (1882).

In his Studien über Mallophagen, etc. (1910), Mjöberg very properly, it seems to us, erects this Family for the reception of *Eurymetopus taurus* and its allies. Ultimately, we believe, many species

will be included in this group, which is imperfectly understood. In general build *Eurymetopus* recalls now *Docophorus*, now *Lipeurus*, and again *Giebelia*. But the anchor-shaped genital apparatus of the male is unique, so far as we know, in the order. The specific characters of the group are apparently to be found (a) in the dimensions, (b) in the chaetotaxy of special regions, (c) in the 9th segment ♂, (d) in the genital apparatus of the ♂. This apparatus consists essentially of two main pieces: (1) the usual basal plate, (2) a solid portion which is near the junction with the basal plate broad, thereafter contracting into a neck and expanding terminally into an anchor or arrow-shaped head. Through the middle of this free solid piece from base to tip or near it runs the seminal channel. Under a moderate power the surface of this arrow-like head and part of the expanded base appear to be striated or set with minute papillæ. Under an oil immersion these streaks resolve themselves into minute sensory channels circular in bore and slightly wider near the surface where each is connected with a minute bristle. The function of these sensory hairs is probably directive.

The whole apparatus is heavily chitinized. On the ventral surface there is placed basally a re-curved almost solid chitinous appendage. The homology of this apparatus is perplexing. Mjöberg (p. 248) regards the inferior appendage as the true penis, and takes the solid part lying in the genital chamber to be the fused paramera. He rejects Snodgrass's view (New Mallophaga, iii. p. 188, pl. xiv. fig. 5, pl. xv. fig. 1, 1899) that the terminal portion of the apparatus is the true "penis." As regards the first contention, the inferior appendage may be homologically the penis though we know no evidence for this, but it is practically solid and exhibits no aperture that we can discover. The *functional* penis, as Snodgrass has already shown, is the free portion of the apparatus with its anchor-shaped head, whose lumen is directly continuous with the ductus ejaculatorius. We do not think that any portion of this entrant body should be homologized with the normal Philopterid paramera. It is equivalent, apparently, with what we have called the mesosome. True paramera are apparently absent, though traces of them remain in a notch on each side of the mesosome near the base. These notches we interpret as indications of the former articulation of the paramera there, and they have persisted when the paramera themselves become obsolete, because they facilitated the upturning of the apparatus in the preliminary stages of copulation. The function of the paramera seems to be to find and elevate the lip-like ♀ valvule. This work is now probably performed by the greatly strengthened meso-

some. In some cases, we believe, the normal flat paramera after levering up the valvule establish a hold below that sclerite. The arrow-shaped head very likely acts similarly as an anchor also for a time, as just below each flange or fluke there is a directive bristle on a sensory area, much stronger than those already referred to.

In this ♂ apparatus the most useful characters are the shape of the basal plate and the relative proportions as well as the shape of base, neck, and head of the free portion.

We have seen at least three distinct species of *Eurymetopus*. The great bulk of Dr. Péringuey's material seemed referable to the form figured and described by Piaget as *taurus* (Les Pédiculines, p. 332, pl. xxxi. fig. 3, 1850). In New Mallophaga, i. p. 135, pl. xi. figs. 3-6 (1896) Kellogg recorded and excellently figured a species of *Eurymetopus* slightly smaller than true *taurus* with which, however, he at the time identified his captures from various Californian *Tubinares*. Through the kindness of Mr. Wm. Evans, Edinburgh, we have recently had an opportunity of examining an apparent ♂ of the Californian species, taken in the Pacific by the *Challenger* Expedition in the 70's of last century. And still more recently Professor Kellogg writes he is now of our opinion, having had both species from the Pacific and the Antarctic. The form he has already figured will thus soon receive a name from one best entitled to bestow it.

In Dr. Péringuey's gatherings there is a still smaller and more primitive species of the genus for which the name *Eurymetopus simplex* is here proposed. In almost every respect it appears to be a phylogenetic understudy of Kellogg's unnamed species. The antennae ♂ are simple in so far as they show no expansion terminally on the 3rd joint. But they have the extremely long 2nd joint so characteristic of the genus. The antennae, moreover, differ sexually. The presence of an appendage on the 3rd joint in *Eurymetopus* is, we may remark, more apparent than real. The joint as a whole is not much modified, but is merely a little wider terminally. But the distal edge being slanted, not transverse, and the 4th joint minute and placed back from the end of the 3rd joint somewhat, produce the impression of a considerable modification. The difference between the antennae of *simplex* and those of *taurus* is only comparative. These curious ♂ antennae, Lipeuroid in facies, are carried curved forward, and how they are applied is not plain.

We believe that in addition to the 3 species now noticed Mjöberg's diagram (Fig. 141) represents a valid 4th.

NOTES ON *Eurymetopus* spp. ♂.

i. *Eurymetopus simplex*, n. sp. Small size, 2.8 mm.

Head with distinct anterior clypeal angles; antennae simple in so far that the small 4th joint makes no appreciable angle with the 3rd; about 14 hairs in two rows on the temples; prothorax with 2 hairs at postero-lateral angles; postero-lateral angles of metathorax decidedly hooked with 7 hairs and 1 spine in transverse row. Abdomen, first 5 segments with 5-7 hairs in middle and 2 on each side at angles; 9th tergite with straight sides; 9th sternite far underlapping, with rounded angles and slightly concave, almost straight posterior edge; genital apparatus at rest not exposed. Basal plate with concave sides near junction with terminal piece; inferior appendage small. Base of mesosome moderate, notched near middle; neck short and broad; head arrow-shaped and longer than neck; seminal channel broad opening terminally.

iv. The *Eurymetopus* figured by Mjöberg (*loc. cit.*) can be told at once by the parallel-sided basal plate, the extremely small base of the mesosome, the large head and much reduced neck.

ii. *Eurymetopus*, sp. ———, Kellogg. Medium size, 3.12 mm.

Head, metathorax and 9th segment much as in *simplex*. Genitalia with tip exposed (?) similar to those of *simplex*, but the base of the mesosome is broader and rounder; the neck is more slender and longer than the head, or as long. Antennae, 4th joint rising not quite terminally from the 3rd. About 24 hairs on the temple. Four hairs at prothoracic angles. Abdomen, first 4 segments with 8 median hairs, and at the angles of all the abdominal segments a row of 4.

iii. *Eurymetopus taurus*, N. Large species, 4.28 mm. Head with short clypeus and reduced angles owing to the great development of the antennae, of which the 4th joint rises at a sharp angle from the 3rd. Temples and prothorax as in the preceding species. The meta-thoracic angles are only very slightly hooked and bear transversely 9 hairs and a spine. The sides of the abdomen bear at each angle 4 hairs as in the preceding. First and 2nd tergite with row of 9-10 hairs. The rest with 3-2 hairs. This form also agrees with Kellogg's in having 8 hairs on each half of the 9th tergite. This tergite, however, is scarcely triangular. It is rather continuously rounded and medianly slightly concave. The 9th sternite underlaps very little, medianly it shows a notch differing thus from both the others described.

Genitalia. Basal plate with straight edges and no appendages for attachment of muscles. Inferior appendage to mesosome, very large, base broad, neck slender, head much rounder than in the preceding species. Genital opening apparently not terminal. The whole apparatus is very large, and at rest the anchor-like tip regularly protrudes behind somewhat. In the more primitive *simplex* the genitalia are carried quite concealed, and in Kellogg's fig. of the ♂ of his species the same feature is observable. Snodgrass, however, discussing *taurus* (*op. cit.* p. 118), describes the tip of the penis as "projecting a little beyond the end of the tergum." It is difficult to know whether to follow the figure or the text. Possibly two forms were present in the material.

We use *taurus* for the large form got constantly on *Diomedea exulans*. Our measurements agree best with Taschenberg's. Piaget's seem too small.

Though they can serve only a transient purpose, the following notes on the ♂ ♂ of these four forms are offered. The ♀ ♀ can best be separated by their size (see p. 302).

Description of E. SIMPLEX, spec. nov.

♂. *Head.* Clypeus slightly rounded in front but with distinct lateral angles. Signature reaching the edge of clypeus, its surface anteriorly with parallel furrows. Anteriorly the sides of the shield-shaped signature are concave. The apex of signature posteriorly considerably produced. Below at edge exactly of signature one hair on each side. Two hairs at anterior angle of clypeus, one at end of band, and the other midway thence to edge of signature, one hair below near end of clypeal band. One hair at edge midway to suture. No sutural hair. Suture slanted forward to lateral angle of signature, its posterior margin very clearly defined by inner branch of antennal band. This branch sharply bent back at level of lateral angle of the signature. One post-antennal hair from below and the usual dorsal hair at angle of trabecula with head. One short spine between basal trabecular hair and the point of the signature.

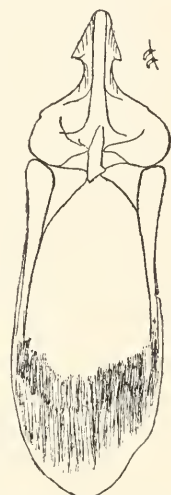


FIG. 2.—*E. SIMPLEX.*

Trabecula long, not reaching quite to the end of the 1st antennal joint. Above the insertion of the 1st joint 1 moderate bristle. First antennal joint moderately long. Short dorsal spine near base and 2 strong dorsal hairs placed distally in the middle line. One very strong antero-ventral distal hair, which sometimes appears to come from the apex of the trabecula. Second joint extremely long, 1 short dorsal hair near base. Joint medianly constricted somewhat and then distally expanded. Third joint short—1 dorsal hair. Fourth joint very short, not inset into the 3rd, but rising freely from its distal surface. Fifth joint long with 6-7 terminal bristles. Ocular band distinct. Eye moderate, prominent rounded, with spine.

Below the eye 1 spine, posterior angle of temple with 2 short spines. Between these and the eye 15 hairs in 2 rows—7 strong at the edge and 7-8 weaker on the dorsal surface of the head at a short distance from edge and parallel with it.

Occiput markedly re-entrant and medianly swollen. Occipital

margin slightly incrassated. Bands stretching forward indefinitely to ocular bands. Near and between the occipital bands at the level of the hypopharynx, 2 stronger hairs and 2 minute hairs on each side. One short hair base of occipital band. One short hair between ocular spot and posterior incurved end of antennal band.

Thorax. Prothorax. One or two locking bristles below occiput. Two hairs at postero-lateral angle.

Metathorax. Expanded at the sides posteriorly. Posterior margin straight till near postero-lateral angle where it curves back making a hooked corner, across which is a row of 7 long hairs (4 before and 3 behind the angle), one spine (short) anteriorly in front of the row of long hairs.

On the metasternum are two long straight chitinous incrassations.

Metathorax pointed over abdomen.

Abdomen.—Band in two spots on segment 1, on others entire. Chaetotaxy as follows (Tergites only detailed):—

	1	2	3	4	5	6	7
Lateral angle	1	2	2	2	2	2	4
Post-median	6	7	7	6	5	2	2
Lateral angle	1	2	2	2	2	2	4

The 8th segment not definitely separated from 9th by sutures. Eighth tergite with 4 hairs at postero-lateral angle. The 9th tergite triangular with the apex distinctly bilobed. On each lateral edge 6 hairs.

Ninth sternite underlapping greatly—its posterior edge slightly concave merely—almost straight. On the under surface bearing numerous long hairs, of which about 18 appear at or beyond the edge on each side.

The arrow-shaped "penis" has a short, thick neck and a triangular head not evenly rounded apically.

In the ♀ the 1st, 2nd, and 3rd joints of the antennae are considerably shorter than in the ♂.

The bands of the hind region of the head differ also. In the ♂ the occipital bands run indefinitely from the occipital spot towards the eye. In the ♀ a narrow band commences at each of the posterior temporal angles. It runs slightly inwards but at the level of the occipital spot is still almost at the edge. A little farther in the two narrow bands form an extremely broad connection, from the



FIG. 3.—E. TAURUS.

anterior angles of which issue two well-marked bands which sweep forward, coming to the edge of the head at the base of the 1st antennal joint and thence continuing merged with the antennals to the suture.

Measurements of *E. SIMPLEX*.

	♂		♀		
	Length.	Breadth.	Length.	Breadth.	
Head	·828	·914	·942	1·028	
Prothorax	·285	·571	·357	·685	
Metathorax	·371	·742	·435	·871	
Abdomen	1·342	—	1·685	—	
Segment 4	—	1·028	—	1·400	
Total ...	2·828	—	3·42	—	
Antennae {	1	·140	·086	·100	·053
	2	·196	·046	·133	·043
	3	·093	·053	·066	·050
	4	·056	·040	·050	·043
	5	·066	·026	·063	·033

3 adult and 1 nearly adult ♂♂, 5 ♀♀, 11 (?) imm. *Diomedea melanophrys* (Mollymawk).

♂. *Majaqueus aequinoctialis* (Cape Hen). 1901. Bonomi, coll.

EURYMETOPUS TAURUS, N.

Eurymetopus taurus, Nitzsch, in Giebel, Zeitschr. f. ges. Naturiv. vol. xxviii. p. 385 (1866).

Diomedea sp.? Tristan d'Acunha, 1904. P. Bonomi, coll.

The following from *Diomedea exulans*:—

(a) 2 ♂♂, ♀, 5 imm. Inaccessible Island (Tristan d'Acunha), 1904. P. Bonomi, coll.

(b) 9 ♂♂, 21 ♀♀, 51 imm.

(c) 3 ♀♀, 6 imm.

(d) ♂, 2 ♀♀, 6 imm.

(b-d were sent from separate hosts 1912-1913.)

4 ♂♂, ♀, 6 imm. *Thalassogeron chlororrhynchus* (Yellow-billed Albatross). Inaccessible Island, 1904.

♂, and imm. *Majaqueus aequinoctialis* (Cape Hen). 1901. Bonomi, coll.

FAMILY LIPEURIDAE.

GEN. LIPEURUS, Nitzsch.

Lipeurus, Nitzsch, in Germar's Mag. f. Insekt. vol. 3, p. 292 (1818).

LIPEURUS ACUTIFRONS, Rudow (1870). (Pl. XXV., fig. 1.)

L. acutifrons, Rudow, Zeitsch. f. d. ges. nat. xxxvi. p. 138 (1870).

♂, ♀. *Phalacrocorax capensis* (Trek Duiker). Table Bay, 1913.

♂, 4 ♀ ♀, 4 imm. *Phalacrocorax capensis*.

This is the true host.

2 ♂ ♂, 2 ♀ ♀. *Sula capensis*.

♂ and ♀. *Larus hartlaubi*.

2 ♂ ♂. "Probably ex porcupine."

All the above, we believe, came from the cormorant. It is noteworthy that the parasites of *Sula capensis* and *Phalacrocorax capensis* (*L. pullatus*, *M. pustulosum* *L. acutifrons*, *M. brevipalpe*) have been completely mixed (see records). This probably took place in collecting the hosts. A similar explanation will apply to the *Larus hartlaubi* record. As for the occurrence of *L. acutifrons* on the porcupine, contact in the laboratory may account for it, or more likely two lots were inadvertently put into one tube. We do not think any real "stragglings" is to be inferred.

We go back to Rudow's name for the distinct species of *Lipeurus* infesting *Phalacrocorax capensis*. Perhaps this decision requires justification, as many workers will probably be of opinion that not a few (some will say most) of Rudow's names are too vaguely defined for recognition. Personally we are quite opposed to dealing with an author's descriptions *en bloc* or according to any one principle. A description deemed sufficient at one stage of the study of a group may be quite inadequate later. To reject a name because of its "insufficiency" would destroy much of the historical continuity of the study of the *Mallophaga* besides producing periodical outcroppings of new names. No one, of course, would plead that the same leniency should be shown to Rudow as is extended to founders like Nitzsch and Denny, whose work was accomplished with instruments inferior to those that every student now commands. Granted that Rudow's text is often unrecognizable *per se*, there may yet be no reasonable doubt as to the insect to which his names refer. Not to go beyond the genus *Lipeurus*—any one who has examined series of the ruddy "jejunos" type found on *Somateria mollissima* will not hesitate to use for this form "*rubromaculatus*, Rudow." On the other hand, in the case of a name like *L. nigricans*,

(*Procellaria mollis*), where the host may be expected to harbour regularly more than one *Lipeurus* form, it would be rash to quote Rudow's authority. The final appeal must doubtless be to the type, but one is supposing for the nonce that this is impracticable. We briefly state our reasons for retaining "*acutifrons*."

1. There appears to be great variety in the series of *Lipeurus* infesting cormorants, duikers, etc. It seems reasonable to expect that each host species has a fairly constant parasite in attendance. "Stragglings" may of course occur, but we have examined several cormorants (*P. carbo*) and an immense number of shags (*P. graculus*) without finding their *Lipeurus* species mixed.

2. This material is from the same host as "*acutifrons*."

3. The clypeus of these ♀ examples is angled more sharply than in other species we have seen. This may well have suggested the name.

4. Unless we use "*acutifrons*" the synonymy of the group will be further burdened. Dr. Péringuey's gatherings correspond very closely to the species Piaget figures as *gyricornis*, Denny. At first we were inclined to quote them as "*gyricornis*, var.," but on going into the matter we are far from being satisfied that Piaget was right in identifying his material from *Sula australis* (Muséum de Leide) with Denny's species. Piaget remarks (Les Pédiculines, pp. 338-339): "Denny a rencontré un mâle sur une *Sterna hirundo*; malgré ce qu'il y a d'incomplet dans sa description, je n'hésite pas à adopter le nom qu'il a choisi pour l'espèce qui vient d'être caractérisée." The grounds for this confidence seem slender indeed. Nor is it certain that *Sula australis* is the genuine host of the insect Piaget had under consideration. His figure indicates a true *Phalacrocorax* parasite. If Piaget, then, had not the real "*gyricornis*, D.," before him, and if "*acutifrons*" is rejected, we should have possibly two unnamed species to deal with. Are we to erect two new names because of this uncertainty? It seems better to adopt Rudow's designation for the *Lipeurus* of *Phalacrocorax capensis*, and to leave unsettled the identity of Piaget's insect, which may be a var. of *acutifrons* or a good species.

LIPEURUS AFER, Kellogg (1908).

L. afer, Kellogg, Results Sjöstedts Kilimandjaro-meru Expedition 15:4. Mallophaga, p. 47, pl. vii. fig. 5, Upsala (1908).

6 ♂♂, 27 ♀♀, 7 imm. *Phalacrocorax africanus*. Table Bay, 1913.

In 1880 Piaget (Les Pédiculines, p. 337) arbitrarily set aside Denny's name *brevicornis*, given (Monogr. Anopl. Brit. p. 181,

pl. xiii. fig. 8, 1842) to the *Lipeurus* of the shag [*Phalacrocorax graculus (cristatus)*] and applied the same designation to specimens of this genus taken "Sur un *Carbo sulcirostris* de Célèbes (Muséum de Leide). Sur un *C. africanus* de Dembea (ibid.) la femelle n'avait de taches transverses ni sur le dos, ni sur le ventre." The absence of the transverse markings on the tergites indicates immaturity merely, and is of no systematic value. Apart from using a pre-occupied name, we think it almost certain that Piaget had before him two different species when he drew up his account of *brevicornis*. We know at any rate now that *C. africanus* has a *Lipeurus* of its own which is distinct from the species Piaget has described. It is possible that Piaget's ♀ from *C. africanus* was a straggler on that host (and this is not improbable, since the example occurred on a Museum skin), but bearing in mind the general resemblance to one another of the ♀ ♀ of this group of *Lipeurus* it is simpler to suppose that Piaget judged two forms to be one. This would be all the easier since the example in question was immature. In dealing with *Lipeurus* from *Phalacrocorax (Carbo)* it is inadvisable, in our opinion, to assimilate forms from separate host species unless one has been able to examine critically the ♂ in both instances.

In 1908 Kellogg, quite justifiably, therefore erected the species *afér* for the *Lipeurus* of *P. africanus*, Natron Lakes, Kilimandjaro-meru (Sjöstedt leg.). In introducing this new form Kellogg, who assuredly had not overlooked Piaget's *brevicornis*, remarks: "The new species is quite distinct from any form heretofore recorded, especially in the characters of the male." (The italics are ours.)

Before becoming convinced of the great diversity of species in the series of *Lipeurus* found on *Phalacrocorax*, another possibility had occurred to us, viz., that Piaget might unconsciously have used *brevicornis* in Denny's sense. Though this is not the case, it is curious that true *brevicornis*, D., should come so close as it does to *afér*, Kellogg. The two are, however, abundantly distinct. The genitalia of *afér* are extremely delicate, indeed without dissection their presence is hard to demonstrate.

It should be added that Bagnall and Hall (Journ. Econ. Brol. vii, No. 1, p. 9, Feb., 1912), on the ground that *brevicornis* is pre-occupied, propose to substitute *confusus* for Piaget's name. This name too, we think, should be rejected, as it is still held to apply to a *Lipeurus* from *C. sulcirostris* and *C. africanus*.

We have then (a) *L. brevicornis*, D., from *P. graculus*, (b) *L. afér*, Kellogg, from *P. africanus*, and (c) a third species unnamed from *P. sulcirostris*. It would be easy to propose a new name for the last

but this is inadvisable without a nearer acquaintance with the insect in question. It is doubtful, moreover, whether *P. sulcirostris* is the true host since Piaget had already (Les Pédiculines, p. 335, pl. xxvii. fig. 4, 1880) described a *L. setosus* from the same cormorant. The hosts were in both cases Museum skins. One is left really only Piaget's description and figures. The whole matter of rebaptism had better be dealt with by some one who has access to Piaget's types, and who at the same time possesses fresh material from the original host.

LIPEURUS BACULUS, N. (1818).

Lipeurus baculus, Nitzsch, in Giebel, Ins. Epiz. p. 215, pl. xvi. figs. 8, 9, pl. xx. fig. 3 (1874).

2 imm. ♀ ♀. *Vinago delalandi*. Port St. Johns, Cape Col., Nov., 1901. Shortridge.

3 ♂ ♂, 24 ♀ ♀, 6 imm. From unknown host. 1912.

A cosmopolitan parasite of pigeons. The immature stage is, we think, the *Nirmus claviformis* described by Denny, Monogr. Anopl. Brit. p. 131, pl. ix. f. 7 (1842).

LIPEURUS CONFIDENS, Kellogg (1899).

Lipeurus confidens, Kellogg, New Mallophaga, pt. iii. p. 26, pl. iii. fig. 1 (1899).

♀. *Diomedea exulans* (Wandering Albatross).

♀. *Diomedea melanophrys* (Black-browed Albatross).

♀. *Thalassogeron chlororrhynchus* (Yellow-billed Albatross). In-accessible Is. 1904.

These agree with Kellogg's description save that they are somewhat smaller. They are probably not quite mature. We have noticed in several species of Albatross *Lipeuri* that the nearly adult ♀ ♀ show a sharp demarcation between the 7th and the 8th and 9th segments. The last two are small, but they broaden and lengthen simultaneously with the appearance of fully formed ova.

LIPEURUS TRICOLOR, Piaget (1880).

Lipeurus tricolor, Piaget, Les Pédiculines, p. 363, pl. xxx. fig. 4 (1880).

5 ♂ ♂, 2 ♀ ♀, 5 imm. *Phoebetria fuliginosa*.

Doubtfully distinct from the preceding. Piaget's description attributes a naked metathorax to this insect—an unlikely condition in any species of *Lipeurus*. Piaget's figure also shows broad

median blotches on the abdomen. It is by these characters mainly that Kellogg separates his *confidens* from *tricolor*. In *confidens*, while there are no blotches on the abdominal tergites, such marks appear on the sternites. These may not show on normally preserved opaque examples but when specimens have been macerated or dried the marks on the under side of the abdomen shine through. The above material from Sooty Albatross is in a bad state of preservation and agrees exactly with Piaget's illustration of *tricolor*, but a little care in focusing shows that the blotches seen are on the sternites.

Piaget's types taken from Museum skins were probably in a similar state and a little rough handling would account for the occiput being "nu." On the chief remaining difference between *tricolor* and *confidens*—length—one cannot venture much. We have not sufficiently good material of the species before us on which to base an opinion.

LIPEURUS DIVERSUS, Kellogg (1896).

Lipeurus diversus, Kellogg, New Mallophaga, i. p. 123, pl. viii. figs. 3, 4 (1896).

2 ♂♂, 4 ♀♀, imm. *Oceanites oceanicus* (Wilson's Storm Petrel). 26:iii:04. P. Bonomi leg.

♀. *Majaqueus aequinoctialis* (Cape Hen). 1901. Bonomi, coll.

At first we had referred these examples to *L. angusticeps*, Piaget (Les Pédiculines, p. 306, pl. xxv. fig. 4, 1880), but on reconsidering them, we find that from their dimensions they agree better with *L. diversus*, Kellogg. How the two forms are related it is hard to say. As Kellogg points out, there are conspicuous differences in the measurements, but we should not care to lay great stress on the additional features adduced. Kellogg states that in a ♂ *diversus* the posterior border of the signature is angularly concave not straight as in *angusticeps*. One of the above ♂♂ shows this outline, in the other the line is nearly convex. In *diversus* there are two short temporal hairs which appear also in the S.A. Museum specimens, but in some cases one or other is broken off. Piaget describes *angusticeps* as having one temporal hair, but the example he described may not have been perfect. In *diversus* the inturned antennal bands are continuous with the bands bordering the oral fossa. Now it is true that Piaget says of *angusticeps*, "Les antennales très prononcées s'arrêtant au clypeus," but he adds immediately, "Les deux bandes internes ne s'arrêtent pas à la

hauteur de la fossette ;" and if one looks at fig. 4. pl. xxv., it is apparent that the antennals and the bands bordering the fossa are continuous save for one clear spot. We are of opinion that a closer examination of Piaget's types will show that the band is only apparently interrupted, what happens really in these petrel *Lipeuri* is that the band may be quite uncoloured in this region. The intensity of the coloration is probably a matter of age.

As regards the chaetotaxy of the postero-lateral angles of the metathorax *diversus* has 5 pustulated hairs. If *angusticeps* has in fact only 2 in that position it must be a very anomalous form. It must be borne in mind that Piaget's types were from Museum skins, which would not conduce to the preservation intact of many hairs, weaker spines, etc. For the same reason also the correct outline of the segments may have been lost.

LIPEURUS DENSUS, Kellogg (1896).

Lipeurus densus, Kellogg, New Mallophaga, pt. i. p. 114, pl. vii. figs. 1-2 (1896).

From *Diomedea exulans*—

(a) 3 imm. examples.

(b) imm. and 4 other indeterminable imm. specimens.

In both cases occurring with *L. ferox*, Giebel, of which, at first, we took this form to be the immature stage. Kellogg's ♀ type was not full grown, but later he described the adult ♂.

LIPEURUS FEROX, Giebel (1874).

Lipeurus ferox, Giebel, Ins. Epiz. p. 235 (1874).

From *Diomedea exulans* (Wandering Albatross)—

(a) ♂. Bonomi (?), received 1912, ♂ and ♀ received 1912.

(b) ♂. Tristan d'Acunha, 1904. P. Bonomi, coll.

(c) 5 ♀ ♀. Spring, 1913.

LIPEURUS FULIGINOSUS, Taschenberg (1882).

Lipeurus fuliginosus, Taschenberg, Dic. Mallophaga, in Nova Acta Leop-Carol. Deutsche Akad. d. Naturf. vol. xlv. p. 156, pl. iv. fig. 3 (1882).

♂. *Diomedea melanophrys* (Mollymawk).

♀. *Diomedea exulans*.

3 ♀ ♀. *Oceanites oceanicus* (Wilson's Storm Petrel). 26 : iii : 04. P. Bonomi, coll.

♂, 3 ♀ ♀. *Majaqueus aequinoctialis* (Cape Hen). 1901. Bonomi, coll.

LIPEURUS LONGICORNIS, Piaget (1880).

Lipeurus longicornis, Piaget, Les Pédiculines, p. 334, pl. xxvii.
fig. 3 (1880).

5 ♂♂, 3 ♀♀, 40 imm. *Phalacrocorax lucidus* (White-breasted
Duiker).

LIPEURUS PULLATUS, N. (1818).

Lipeurus pullatus, Nitzsch, in Giebel, Ins. Epiz., p. 236 (1874).

From *Sula capensis* (Malagash)—

(a) 203 ♂♂, 292 ♀♀, 154 imm. 1912.

(b) 6 ♂♂, 6 ♀♀, 23 imm. Cape Town, 1912.

(c) 11 ♂♂, 24 ♀♀, 56 imm. Received 9:iv:13.

4 ♂♂, 7 ♀♀, 9 imm. *Phalacrocorax capensis*.

4 ♂♂, 7 ♀♀. Unknown bird.

We have not overlooked Mjöberg's clearly defined "*Pectinopygus*" (1910) which he proposes as a new genus for this species. But it is our present opinion that the two main characters of this division, viz. the peculiar 3rd joint of the antennae ♂ and the uniquely "pectinated" genitalia ♂ are of specific not generic value. The genitalia ♂ should be used for systematic purposes with great caution, and only when a group of species show a well-marked type of apparatus. Otherwise our classification will be loaded with monotypic genera.

The group embracing the *Lipeuri* of *Sula* we imagine will ultimately prove to be a fairly compact one—whether worthy of generic rank or not future research must decide. We have seen only *L. pullatus*, N. (*Sula bassana*, *S. capensis*) and *L. potens* (*Sula piscatrix*). We do not think that a fair classification will separate these species, but their respective genitalia ♂ are of entirely different types. Interestingly enough the ♀♀ genitalia of these species offer points of resemblance. The organization of the ♀ as a whole seems more stable and primitive.

LIPEURUS SECRETARIUS, Giebel (1874).

Lipeurus secretarius, Giebel, Ins. Epiz. p. 213 (1874).

From *Serpentarius secretarius* (Secretary Bird). Two lots—

(a) 8 ♂♂, 8 ♀♀. Much faded and shrunken.

(b) 9 ♀♀ 6 imm. Labelled "*Phoebetria fuliginosa* (Sooty Albatross)"—a clear error.

LIPEURUS VERSICOLOR, N. (1818).

Lipeurus versicolor, Nitzsch, in Giebel, Ins. Epiz. p. 224, pl. xvi.
f. 7 (1874).

3 ♂♂, 4 ♀♀, 2 imm. *Ciconia alba* (White Stork).

SUB-ORDER AMBLYCERA.

FAMILY GYROPIDAE.

GEN. GLIRICOLA, Mjög.

Gliricola, Mjögberg, Arkiv. för Zoologi, Band 6, N:o. 13, p. 18 (1910).

GLIRICOLA GRACILIS, N. (1818).

Gyropus gracilis, Nitzsch, in Giebel, Zeitschr. f. ges. Naturw. vol. xviii. p. 92, pl. ii. figs. 10, 11 (1861).

♀, 10 imm. *Cavia cobaya* (Guinea-pig).

GEN. GYROPUS, Nitzsch.

Gyropus, Nitzsch, in Germar's Mag. f. Insekt. vol. 3, p. 302 (1818).

GYROPUS OVALIS, N. (1818).

Gyropus ovalis, Nitzsch, in Giebel, Zeitschr. f. ges. Naturw. vol. xviii. p. 89, pl. ii. figs. 1-9 (1861).

5 ♂♂, 6 ♀♀, 21 imm. *Cavia cobaya* (Guinea-pig).

FAMILY MENOPONIDAE.

GEN. MENOPON, Nitzsch.

Menopon, Nitzsch, in Germar's Mag. f. Insekt. vol. 3, p. 299 (1819).

MENOPON APPENDICULATUM, Piaget (1880).

Menopon appendiculatum, Piaget (1880).

Menopon appendiculatum, Piaget, Les Pédiculines, pp. 473-474, pl. xxxvi. fig. 8 (1880).

2 ♂♂, 3 ♀♀, 17 imm. Unknown host.

The ♂♂ are scarcely mature, but the genitalia are plainly discernible, leaving one in no doubt as to the sex. In the younger specimen the basal plate alone is chitinized.

We feel fairly confident in quoting Piaget's name for these peculiar examples, although neither in dimensions nor in some details of chaetotaxy and outline do they completely agree with Piaget's description. But on the other hand, there are in the present case discrepancies between the text and the figure of the French author. Piaget remarks as to the host of *appendiculatum*: "Sur une *Perdix* cinerea. Ce parasite, si différente du type qui infeste les perdix me paraît un individu égaré."

It is unfortunate that the host of the above examples was not recorded. We have in our collection three specimens which we cannot separate from these South African examples, viz.:—

1. ♂ and ♀. "Ground Hornbill" (*Bucorvus caffer*?).
2. ♂. "Eagle from Japan."

These specimens are on two slides, one thirty, the other some fifty years old, and even if the hosts are correctly given on the labels the identity of the real host is still in doubt. It may be the Hornbill or some other ground-frequenting species. It is possible, however, that Dr. Péringuey's examples were taken along with *Lipeurus baculus* from unknown host.

Menopon appendiculatum seems to come closest to the peculiar *Menopon* of Parrots (*Psittacus*, spp.). The posterior femora (2nd and 3rd pairs of legs) bear a postero-ventral row of equal strong, rather short, and somewhat abruptly pointed spines.

MENOPON BREVIPALPE, Piaget (1880).

Menopon brevipalpe, Piaget, Les Pédiculines, p. 498, pl. xl. f. 5 (1880).

♂ ♂, ♀ ♀. *Phalacrocorax capensis* (Trek Duiker). Table Bay, 1913. (a) 43 ♂ ♂, 35 ♀ ♀, 45 imm. (b) 6 ♂ ♂, 6 ♀ ♀, 12 imm.

Phalacrocorax capensis.

3 ♀ ♀. *Sula capensis*.

Near the middle of each side of the 9th tergite are a number of strong hairs, the "petite touffe" mentioned in Piaget's description. Just posterior to this and at the side are 3 short strong spines in a row in a very reliable character for this species.

MENOPON PHAEOSTOMUM, N. (1818).

Menopon phacostomum, Nitzsch, in Giebel, Ins. Epiz. p. 292 (1874).

♂, 7 ♀ ♀ imm. *Pavo cristatus* (Peacock).

MENOPON PUSTULOSUM, N. (1818).

Menopon pustulosum, Nitzsch, in Giebel, Ins. Epiz. p. 298 (1874).

From *Sula capensis* (Malagash)—

(a) 80 ♂ ♂, 60 ♀ ♀, 36 imm.

(b) 13 ♂ ♂, 9 ♀ ♀, 10 imm. Received 9 : iv : 13.

2 ♂ ♂, 3 ♀ ♀, 2 imm. *Phalacrocorax capensis*.

MENOPON RUSTICUM, Giebel (1874).

Menopon rusticum, Giebel, Ins. Epiz. p. 288 (1874).

♂. *Hirundo rustica*.

GEN. ANCISTRONA, Westwood.

Ancistrona, Westwood, Thes. Ent. Oxon. p. 197 (1874).

ANCISTRONA PROCELLARIAE, Westwood (1874).

Ancistrona procellariae, Westwood, Thes. Ent. Oxon. p. 197 (1874).

Adult ♀ and imm. ♀. *Oceanites oceanicus* (Wilson's Storm Petrel).
26 : iii : 04. P. Bonomi leg.

Two species of *Ancistrona* have been described. We have several examples of *A. gigas*, P. (*Fulmarus glacialis*) in our collection, and have seen the types of *A. procellariae* (British Museum collection), but the latter were at the time unmounted. We think Dr. Péringuey's two specimens agree best with *procellariae*. But it is not certain that there are two really distinct species.

GEN. COLPOCEPHALUM, Nitzsch.

Colpocephalum, Nitzsch, in Germar's Mag. f. Insekt. vol. 3, p. 298 (1818).

COLPOCEPHALUM CUCULARE, G. (1874).

Colpocephalum cuculare, Giebel, Ins. Epiz. p. 264 (1874).

From *Serpentarius secretarius*—

(a) 2 ♀ ♀.

(b) 305 ♂ ♂, 453 ♀ ♀, 328 imm.

This, Piaget thinks, is only a variety of *C. candatum*, G. We have had no opportunity of comparing the genitalia of the two forms.

COLPOCEPHALUM PINGUE, Kellogg (1896).

Colpocephalum pingue, Kellogg, New Mallophaga, i. pp. 144-5, pl. xii. fig. 5 (1896).

3 ♀ ♀, 2 imm. *Diomedea exulans* (Albatross).

COLPOCEPHALUM SUBPACHYGASTER, Piaget (1880).

Colpocephalum subpachygaster, Piaget, Les Pédiculines, p. 517, pl. xliii. fig. 2 (1880).

♂, 2 ♀ ♀, imm. *Bubo capensis*.

26 imm. *Eutolmaëtus spilogaster* (Hawk Eagle).

5 ♂ ♂, 19 ♀ ♀, 25 imm. *Buteo jakal*. 9 : iv : 13.

COLPOCEPHALUM UMBRINUM, Piaget (1880).

Colpocephalum umbrinum, Piaget, Les Pédiculines, p. 556, pl. xlvi. fig. 6 (1880).

♀. *Tringa subarquata*.

In the abdominal chaetotaxy this species shows sexual dimorphism

(cf. *C. grandiceps*, Piaget, and *C. bicolor*, Piaget). In the ♂ there is one posterior row of long pustulated hairs on the tergites. Anterior to this row are numerous short pustulated hairs (the pustules being very small) clothing the surface of the tergite. In the ♀ each tergite bears two transverse rows of strong pustulated hairs without any smaller ones. Hence if one is dealing with a ♀ error is liable to arise at No. 29 of Piaget's dichotomic table, p. 513, Les Pédiculines.

COLPOCEPHALUM ZEBRA, N.

Colpocephalum zebra, Nitzsch, in Giebel, Ins. Epiz. p. 271, pl. xiii. fig. 6 (1874).

4 ♂ ♂, ♀. *Ciconia alba* (White Stork).

FAMILY LAEMOBOTHRIIDAE.

GEN. LAEMOBOTHRIMUM, Nitzsch.

Laemobothrium, Nitzsch, in Germar's Mag. f. Insekt. vol. 3, p. 301 (1818).

LAEMOBOTHRIMUM LATICOLLE, N. (1818).

Laemebotthrium laticolle, Nitzsch, in Giebel, Ins. Epiz. p. 252 (1874). 4 ♂ ♂, imm. *Falco subbuteo* (Hobby).

In the foregoing pages Nitzsch's species have been dated only when they appear in the classical list in Germar's Magazine, 1818.

LIST OF HOSTS AND PARASITES.

I. MAMMALIA.

HOMO SAPIENS.

Echidnophaga gallinaceus, Westw.

Ctenocephalus felis, Bouché.

CANIS FAMILIARIS.

E. gallinaceus, Westw.

Linognathus piliferus, Burm.

PROTELES CRISTATUS.

Pulex irritans, L.

OTOMYS BRANTSI LUTEOLUS.

("FIELD-MOUSE.")

P. irritans, L.

Polyplax otomydis, Cummings.

"PORCUPINE."

Dinopsyllus ingens, Rothsch.

ORYCTEROPUS CAPENSIS.

Echidnophaga larina, Rothsch.

Hybophthirus notophallus, Neum.

CAVIA COBAYA.

E. gallinaceus, Westw.

Gliricola gracilis, N.

Gyropus ovalis, N.

ANTILOPE EUCHORE.

Linognathus tibialis, P., var. nov. *euchore*.

CEPHALOPHUS MONTICOLA.

E. gallinaceus, Westw.

Ctenocephalus canis, Curt.

C. felis, Bouché.

II. AVES.

EUTOLMAETUS PENNATUS.

Nirmus vittatus, G.

EUTOLMAËTUS SPILOGASTER.

N. vittatus, G.

Colpocephalum subpachygaster, P.

SERPENTARIUS SECRETARIUS.

Lipeurus secretarius, G.

Colpocephalum cuculare, G.

BUTEO JAKAL.

Docophorus leucogaster, G.

N. vittatus, G.

C. subpachygaster, P.

MELIERAX CANORUS.

N. vittatus, G.

FALCO SUBBUTEO.

Laemobothrium laticolle, N.

- CIRCUS MACRURUS.
N. rittatus, G.
- STRIX FLAMMEA.
E. gallinaceus, Westw.
- BUBO CAPENSIS.
Docophorus cursor, N.
D. rostratus, N.
C. subpachygaster, P.
- BUBO MACULOSUS.
D. cursor, N.
- CORVUS CAPENSIS.
Nirmus varius, N.
- STURNUS VULGARIS.
Nirmus nebulosus, N.
- PASSER ARCUATUS.
Nirmus vulgatus, Kell. and Chap.
- AMADINA ERYTHROCEPHALA.
Nirmus vulgatus, Kell. and Chap.
- HIRUNDO RUSTICA.
Docophorus excisus, N.
Nirmus gracilis, N.
Menopon rusticum, N.
- MEROPS APIASTER.
Docophorus bifrons, N.
- UPUPA AFRICANUS.
Nirmus melanophrys, N.
- TURTUR CAPICOLA.
Goniodes minor, P.
- VINAGO DELALANDI.
Goniodes minor, P.
Lipeurus baculus, N.
- “ FOWLS.”
E. gallinaceus, Westw.
- PAVO CRISTATUS.
Goniodes fal'cicornis, N.
Menopon phaeostomum, N.
- TRINGA SUBARQUATA.
Docophorus lari, D.
Nirmus actophilus, Kell. and Chap.
N. zonarius, N.
Colpocephalum umbrinum, P.

AVOCETTA RECURVIROSTRA.

- Nirmus decipiens*, N.
N. pileus, N.
N. signatus, P.

AEGIALITIS MARGINATA.

- Docophorus cordiceps*, P., var. *semivittatus*, G.
Nirmus macrocephalus, sp. nov.

AEGIALITIS PECUARIA.

- D. cordiceps semivittatus*, G.
N. macrocephalus, nov. sp.

AEGIALITIS TRICOLLARIS.

- D. cordiceps semivittatus*, G.
N. macrocephalus, nov. sp.

CICONIA ALBA.

- Lipeurus versicolor*, N.
Colpocephalum zebra, N.

PROCELLARIA GIGANTEA.

- Mackayia heteracanthus*, Waterst.

OCEANITES OCEANICUS.

- M. heteracanthus*, Waterst.
Lipeurus diversus, Kell.
Lipeurus fuliginosus, Taschb.
Ancistrona procellariae, Westw.

MAJAEQUEUS AEQUINOCTIALIS

- Giebelia herakon*, sp. nov.
Eurymetopus simplex, sp. nov.
E. taurus, N.
Lipeurus diversus, Kell.
Lipeurus fuliginosus, Taschb.

DIOMEDEA EXULANS.

- E. taurus*, N.
Lipeurus confidens, Kell.
Lipeurus densus, Kell.
Lipeurus ferox, G.
Lipeurus fuliginosus, Taschb.
Colpocephalum pingue, Kell.

PHOEBETRIA FULIGINOSA.

- Lipeurus tricolor*, P.

DIOMEDEA MELANOPHRYS.

- D. lavi*, D.
E. simplex, sp. nov.
L. confidens, Kell.
L. fuliginosus, Taschb.

THALASSOGERON CHLORORRHYNCHUS.

E. taurus, N.*L. confidens*, Kell.

LARUS DOMINICANUS.

D. lari, D.

LARUS HARTLAUBI.

D. lari, D.*Nirmus punctatus*, N., var. nov. *lingulatus*.*Lipeurus acutifrons*, Rud.

STERNA BERGII.

Docophorus melanocephalus, N.

SULA CAPENSIS and PHALACROCORAX CAPENSIS.

{ *Lipeurus pullatus*, N.{ *Menopon pustulosum*, N.{ *Lipeurus acutifrons*, Rud.{ *Menopon brevipalpe*, P.

PHALACROCORAX AFRICANUS.

Lipeurus afer, Kell.

PHALACROCORAX LUCIDUS.

Lipeurus longicornis, P.

SPHENISCUS DEMERSUS.

Goniocotes bifasciatus, P.

III. UNKNOWN HOSTS.

Nirmus varius, N.*Lipeurus baculus*, N.*Menopon appendiculatum*, P.*Lipeurus pullatus*, N.

THE MANSE, OLLABERRY, SHETLAND.

February, 1914.

LIST OF ILLUSTRATIONS.

Text-figure 1, p. 276. *Lino gnathus tibialis*, P., var. *euchore* (drawn from slide).

,, 2, p. 303. Genitalia of *Eurymetopus simplex*, n. sp. ♂.

,, 3, p. 304. ,, ,, *taurus*, N. ♂.

(This is the "taurus" of Taschenberg's monograph but possibly not the "taurus" of Piaget's *Essai*.)

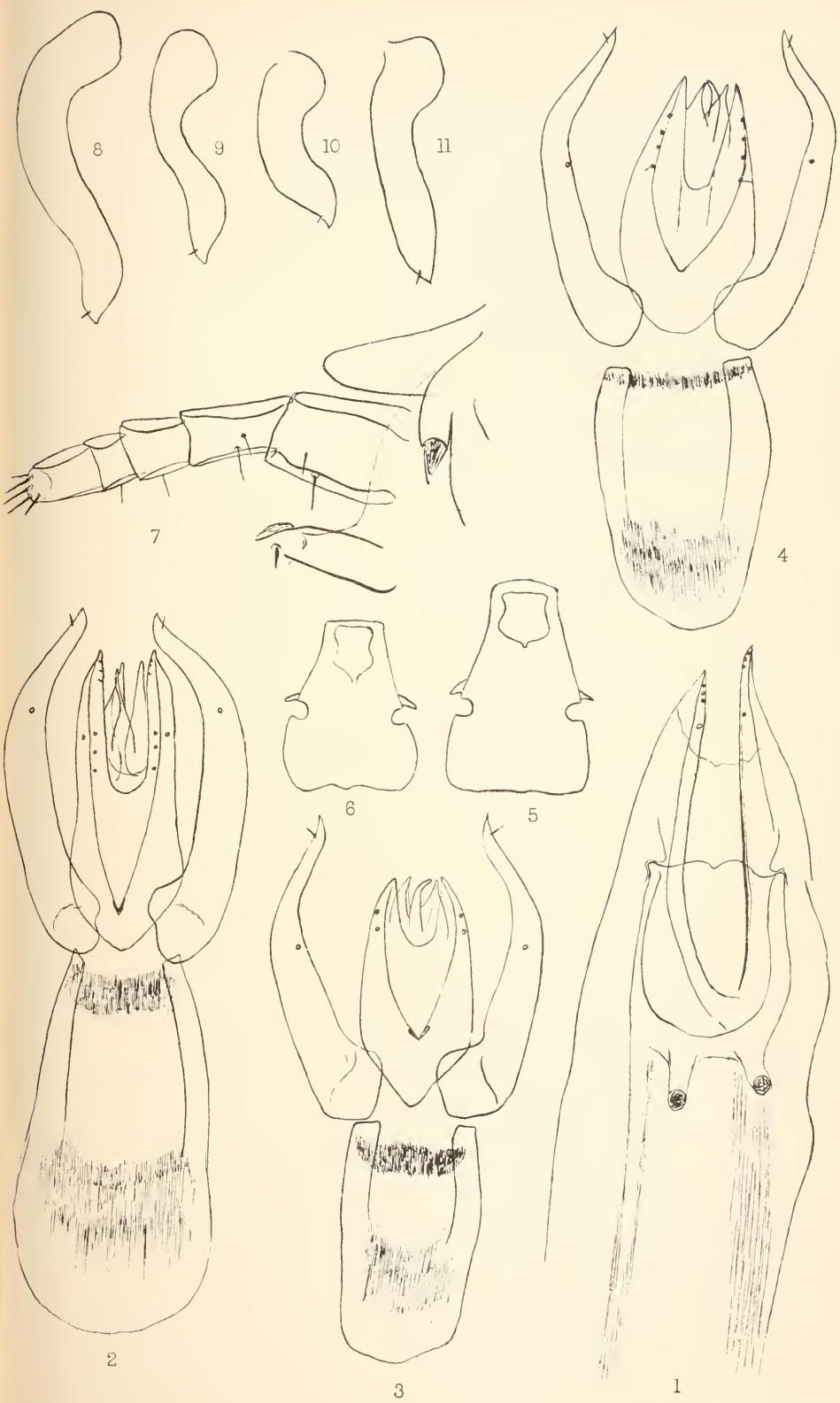
PLATE XXV.

FIG.

1. Genitalia of *Lipeurus acutifrons*, Rudow. Basal plate not entirely shown.
2. ,, ,, *Nirmus macrocephalus*, n. sp.
3. ,, ,, *hiaticulae*, D.
4. ,, ,, *opacus*, Kell. and Chap.
5. Head of *Nirmus macrocephalus*, n. sp.
6. ,, ,, *opacus*, Kell and Chap.
7. Antenna of *Gibelia hexakon*, n. sp.
8. Paramer of *Mackayia heteracanthus*, Waterst.
9. ,, *Gibelia mirabilis*, Kell.
10. ,, *Mackayia dimorpha*, Waterst.
11. ,, *Gibelia hexakon*, n. sp.

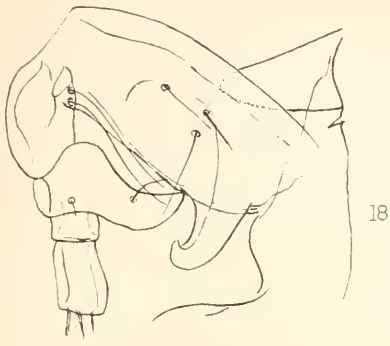
PLATE XXVI.

12. Lateral band of *Mackayia dimorpha*, Waterst. ♀. (*a*₁) seg. 3, (*b*) seg. 7.
13. ,, ,, *heteracanthus*, ,, ,, ,, ,,
14. ,, *Gibelia hexakon*, ,, ,, ,, ,,
15. ,, ,, *mirabilis*, Kell.
16. Genitalia of *Mackayia heteracanthus*, Waterst. ♂.
 - a. Anterior and posterior head spines of *M. heteracanthus*, Waterst. ♂.
 - b. Endomer (?) of *M. heteracanthus*, Waterst. ♂.
17. Antenna of *Gibelia mirabilis*, Kell.
18. ,, *Mackayia heteracanthus*, Waterst. ♂.
19. ,, ,, *dimorpha*, Waterst. ♂.



J.W. del.

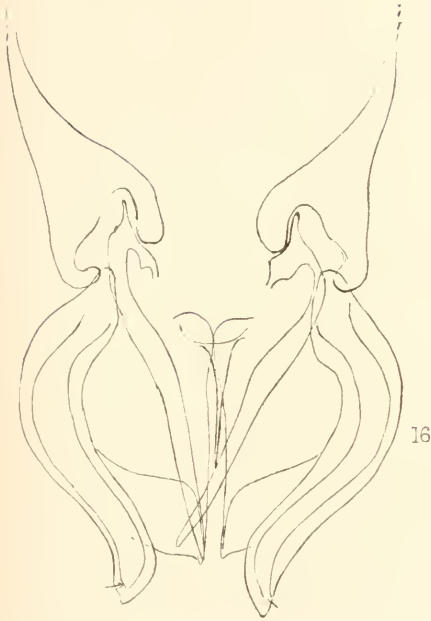
West, Newman photo-lith.



18



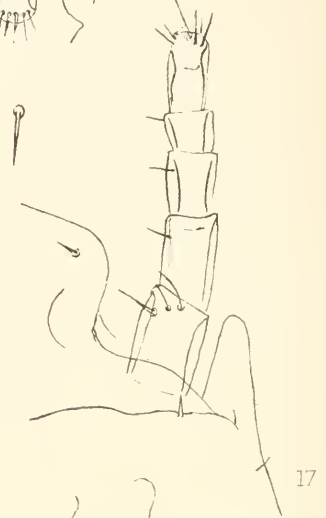
19



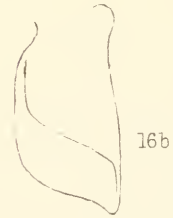
16



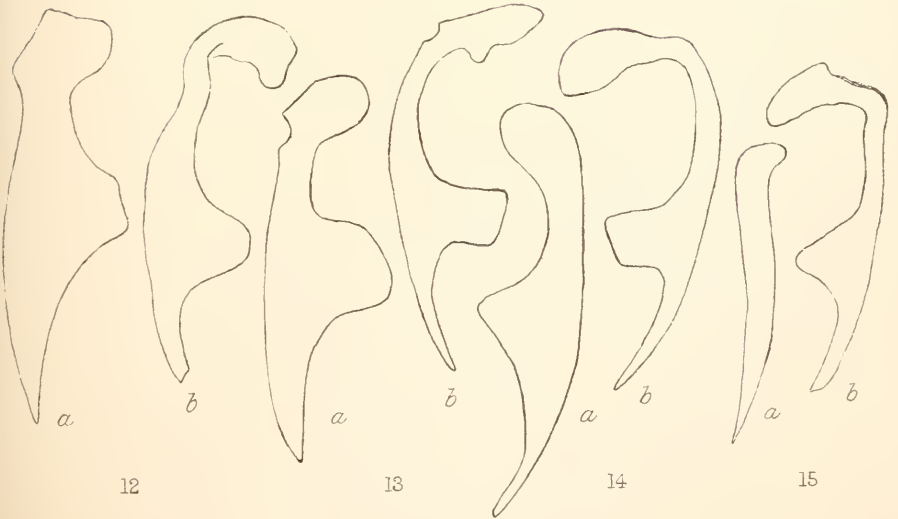
16a.



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16b



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15.—Notes on South African Mutillidae (Hymenoptera) with Descriptions of New or Little Known Species.—By L. PÉRINGUEY, D.Sc. Director.

LARGE as the number of South African Mutillidae is, the additions are still on the increase. This is due to a better acquaintance with the fauna of the Eastern and North-Eastern Transvaal, and especially of Southern Rhodesia. Very few indeed among the species from the last-named locality are represented in the Cape Colony, or even Natal, and those approximating them differ in the sculpture of the second abdominal segment especially.

My first paper on the South African Mutillidae (Ann. S. Afr. Mus. i. 1898) was published somewhat hurriedly to avoid being forestalled, and these preliminary descriptions were simply to ensure priority with a view to the publication ultimately of a Monograph. The material at my command was not as complete at this time as I could have desired, hence some mistakes as to the identity of certain species. André in his "Matériaux pour servir a la connaissance des Mutillides d'Afrique," Zeitschr. f. Hym. Dipt. 1901, has criticized the validity of certain species, basing his ground for doing so on identification alleged to have been made by me. He certainly was justified in some cases, but not in others. In my turn I have been able to examine a number of species described or undoubtedly identified by him, and I am able to correct certain of them which fall into synonymy. Some of the sub-divisions proposed by André seem to me to merge in some cases into each other, but they enable on the whole a better grouping of the species.

SYNONYMS.

- Dasylabroides phyllira*, ♂. Péring., Ann. S. Afr. Mus. i. 1898,
p. 82.
egeria, ♂. Péring., Ann. S. Afr. Mus. i. 1898,
p. 83.
= *capensis*, Sauss., ♂. Péring., Ann. S. Afr. Mus. i. 1898,
p. 85.

- Dasylabroides dalila*, ♀. Péring., Ann. S. Afr. Mus. v. 1909, p. 392.
 = *idia*, ♀. Péring., Ann. S. Afr. Mus. i. 1899, p. 360.
- Dasylabroides latona*, ♀. Péring., Ann. S. Afr. Mus. i. 1898, p. 54.
 Is in all likelihood a varietal form of
 = *caffra*, ♀. Kohl., Verh. Zool. Bot. Ges. Wien, 1882, p. 480.
- Mutilla marcella*, ♂. Andr., Zeitschr. f. Hym. Dipt. i. 1901, p. 345.
 = *daphne*, ♂. Péring., Ann. S. Afr. Mus. i. 1899, p. 371.
- Mutilla argenteiventris*, ♂. Andr., Zeitschr. f. Hym. 1902, p. 25.
 = *cytheris*, ♂. Péring., Ann. S. Afr. Mus. i. 1899, p. 372.
- Mutilla parva*, ♀. Andr., Zeitschr. f. Hym. 1902, p. 41.
 = *hebe*. Péring. (*ariadne*, olim), Ann. S. Afr. Mus. i. 1898, p. 62.
 In *M. parva* the vertex and base of abdomen are reddish.
- Mutilla callisto*, ♀. Péring., Ann. S. Afr. Mus. i. 1898, p. 57.
tecnessa, ♀ ♂. Péring., Ann. S. Afr. Mus. i. 1898, p. 58.
salisburiana, ♂. Andr., Zeitschr. f. Hym. 1903, p. 141.
 = *penicillata*, ♀. Andr., Ann. Soc. Ent. Fr. 1894, p. 676.
 I cannot see any difference between *salisburiana* ♂ and my *tecnessa*, ♂. Moreover I have a typical *tecnessa* from the same neighbourhood as *salisburiana*.
- Mutilla manoa*, ♂. Péring., Ann. S. Afr. Mus. v. 1909, p. 404.
 = *cinchreis*, ♂. Péring., Ann. S. Afr. Mus. i. 1898, p. 90.
- Mutilla laverna*, ♀. Péring., Ann. S. Afr. Mus. i. 1891, p. 442.
 = *glauca*, ♀. Péring., Ann. S. Afr. Mus. i. 1898, p. 54.
- Mutilla chirindana*, ♂. Andr., Zeitschr. f. Hym. 1903, p. 233.
 = *psamathe*, ♂. Péring., Ann. S. Afr. Mus. i. 1899, p. 356.
- Mutilla pectinidorsis*, ♀. Andr., Zeitschr. f. Hym. 1902, p. 30.
 = *ino*, ♀. (*Myrmilla*).
- Barymutilla artemis*, ♀. Péring., Ann. S. Afr. Mus. i. 1898, p. 75.
 = *obtusa*, ♀. Smith, New Spec. Hym. Brit. Mus. i. 1879, p. 189.
- Barymutilla matopoa*, ♀. Péring., Ann. S. Afr. Mus. i. 1899, p. 445.
 = *ignasa*, ♀. Sm., Descr. New Spec. Hym. Brit. Mus. 1879, p. 197.

- Myrmilla echinata*, ♀. Andr., Zeitschr. f. Hym. 3, 1903, p. 137.
spinidorsis, ♀. Andr., Loc. at. 3, 1903, p. 88.
 = *phocia*, ♀. Péring., (*éuterpe*, olim) Ann. S. Afr. Mus.
 i. p. 358, pl. 8f.
- Myrmilla opis*, ♀. Péring., Ann. S. Afr. Mus. i. 1899, p. 358.
 = *dumbrodia*, ♀. Péring., Ann. S. Afr. Mus. i. 1899, p. 364, pl.
 8, fig. 18.
- Myrmilla perse*, ♀. Péring., Ann. S. Afr. Mus. i. 1898, p. 72.
 = *niobe*, ♀. Péring., Ann. S. Afr. Mus. i. 1898, p. 72.

In his Catalogue of the Mutillidae published in "Witsman's Genera Insectorum (fasc. 18), André has incorporated in the different genera of the Family a number of the South African species, but several are still "incertae sedis." The following species may be found however referable to the following genera.

GEN. DASYLABROIDES, Andr.

- Mutilla athis*, ♂. Péring., Ann. S. Afr. Mus. i. 1898, p. 84.
 = *baucis*, ♀. Péring., Ann. S. Afr. Mus. i. 1898, p. 53.
 = *cassiope*, ♀. Péring., Ann. S. Afr. Mus. i. 1898, p. 282.
 = *celaeno*, ♀. Smith., Catal. Brit. Mus. Hym. 1855, p. 12.
 = *ilythia*, ♀. Péring., Ann. S. Afr. Mus. i. 1898, p. 55.
 = *melete*, ♀. Péring., Ann. S. Afr. Mus. i. 1898, p. 81.
 = *maja*, ♂. Péring., Ann. S. Afr. Mus. i. 1898, p. 81.

GEN. STENOMUTILLA, Andr.

- Mutilla mnemosides*, Péring., Ann. S. Afr. Mus. i. 1898, p. 81.

GEN. BARYMUTILLA.

I believe that the following 4 species should be included in this genus.

- Mutilla agave*, ♀. Péring., Ann. S. Afr. Mus. i. 1898, p. 76.
elmira, ♀. Péring., Ann. S. Afr. Mus. i. 1898, p. 365.
obtus, ♀. Smith., New Spec. Hym. Brit. Mus. 1879,
 p. 189.
parca, ♀. Péring., Ann. S. Afr. Mus. i. 1898, p. 76, pl. 8,
 fig. 31.

GEN. MYRMILLA, Wesm.

- Mutilla acrisione*, ♀. Péring., Ann. S. Afr. Mus. i. 1898, p. 72.
aede, ♂. Péring., Ann. S. Afr. Mus. i. 1898, p. 60.
althaea, ♀. Péring., Ann. S. Afr. Mus. i. 1898, p. 52.
antiope, ♀ ♂. Péring., Ann. S. Afr. Mus. i. 1898, p. 60.
bambata, ♂. Péring., Ann. S. Afr. Mus. v. 1909, p. 400.
bellona, ♀. Péring., Ann. S. Afr. Mus. i. 1898, p. 72.
charichloë, ♀. Péring., Ann. S. Afr. Mus. i. 1899, p. 353.
dejanira, ♀. Péring., Ann. S. Afr. Mus. i. 1899, p. 363,
 pl. 8, fig. 23.
erigone, ♀. Péring., Ann. S. Afr. Mus. i. 1898, p. 51.
evadne, ♀. Péring., Ann. S. Afr. Mus. i. 1898, p. 71.
ino, ♀. Péring., Ann. S. Afr. Mus. i. 1898, p. 71.
opis, ♀. Péring., Ann. S. Afr. Mus. i. 1899, p. 358.
pasypphaë, ♀. Péring., Ann. S. Afr. Mus. i. 1898, p. 73.
perse, ♀. Péring., Ann. S. Afr. Mus. i. 1898, p. 73.
phocia, ♀. Péring., Ann. S. Afr. Mus. i. 1898, p. 450.
promontorii, ♂. Péring., Ann. S. Afr. Mus. v. 1909, p. 399.

GEN. DASYLABROIDES, And.

DASYLABROIDES BECHUANA, sp. n.

♂. Apterous; black, with the thorax red, and a broad reddish patch on the vertex, the first, second, and third abdominal segments with a narrow apical border of white pubescence. Head quadrate, with the posterior angles bluntly rounded, eyes lateral, not emarginate, the space behind them and the posterior angle longer than the eyes themselves, mandibles with an inner tooth somewhat distant from the falcate apex, no tooth on the under side, surface irregularly foveate, clothed with a dense white pubescence and some rigid setae; antennae somewhat robust, third joint equal in length to the fourth; thorax hexagonal, neck long, pronotum with the anterior border slightly arcuate but with the angles distinct and slightly sloping laterally for a quarter of the length, the sides of the metanotum are there produced in a broadly triangular tubercle above which are seen the rudiments of the tegulae, the metanotum is gradually narrowed laterally in the shape of a broadly truncate cone, the mesosternum is somewhat convex, but the scutellum is hardly distinct, and the declivity is fairly vertical, the surface is broadly reticulate, the reticulation of the declivity is much broader

than that of the dorsal part, and densely greyish pubescent; abdomen pedunculate, the peduncle not very narrow at the base, nodose at the apex, a little longer than wide at the apex, dentate on each side of the base, and reticulate longitudinally, second segment also longitudinally reticulate, the other segments finely punctate; underneath, the first segment is sharply carinate in the centre, the carina is slightly crenulate and reaches from the base to two-thirds of the length, the segments 2-4 are fimbriated with greyish white hairs; legs bristling with white setae, hind tibiae simple, spurs long, black.

Length 11 mm.

Hab. Cape Colony (Morokweng, Bechuanaland), E. G. Alston.

Allied to *D. alcithoë*, Pér.; the livery of the abdomen is the same and the shape of the first segment nearly alike, but the shape of the thorax is plainly hexagonal, and unlike, for this reason, any other male South African Mutillid known to me.

DASYLABROIDES KATONGA, sp. n.

♂. Black, with the thorax red, abdomen with the hind border of the first, second, and third segments covered with a narrow band of white pubescence. Head not broader than the prothorax, as wide as long on the vertex with the posterior angles very little rounded, eyes moderately large, non-emarginate, space between the hind part of the eye and the posterior angle once and a half the length of the eye, mandibles robust, the right one tri- the left quadri-dentate inwardly, the inferior tooth is in the shape of a sharp tubercle, surface closely and evenly punctate, clothed with partly appressed, partly erect greyish hairs; antennae of the normal shape, third joint half the size of the fourth; thorax with the neck black, the pronotum moderately rounded laterally at apex, the mesonotum moderately convex, the scutellum not very convex, slightly canaliculate in the posterior half, the metanotum is divided from the mesosternum by a conspicuous carinate groove, is rounded laterally and conspicuously reticulate, surface of the pro- and mesonotum covered with small, even foveae, hardly pubescent but sparingly bristling with white setae which are a little denser on the scutellary region; tegulae fuscous; wings fuscous but partly hyaline near the base; abdomen briefly pedunculate petiolate and bearing underneath a long sharp carina, it is deeply and closely punctate above on the petiolate part, the punctures being of nearly the same size as those of the second segment, which are moderately broad, even, and

separated by a smooth interval not equal to their diameter, second and third segment densely fringed with greyish hairs; hind tibiae simple, spurs long, black.

Length 10–11 mm.; expanse of wings 16–17 mm.

Hab. Southern Rhodesia (Salisbury), G. A. K. Marshall.

Not unlike in livery *D. procne*, Pér., from which it differs however in the shape of the mandibles; the slender basal part of the petiolate abdominal segment is shorter, and the apical part more roughly nodose.

DASYLABROIDES THABA, sp. n.

♂. Black, the second abdominal segment with a fringe of dense long white hairs forming a band along the apical border, third segment with a similar band; antennae flavous, tibiae pale rufescent. Head as broad as long on the vertex, eyes slightly emarginate, moderately large, set forward, genae much longer than the eyes, posterior angles broadly rounded, surface covered with even, closely set punctures and sparingly villose black and grey, mandibles simple, left forcipate, trifid at apex, the right bifid only, the inner tooth not apical; antennae long, slender, third joint much shorter than the fourth; thorax with a robust neck, pronotum sloping laterally a little with the outer angles distinct; tegulae not rudimentary, sub-rufescent; scutellum rounded, metanotum not wider than the pronotum, gradually attenuate rounded laterally in the posterior half, surface foveolate punctate in the anterior and median part, sparingly villose black, and reticulate in the metanotum which is villose white; abdomen petiolate, stem of petiole somewhat short, the petiole itself broadly nodose at apex, and foveate above, the carinule underneath very long, entire, second segment plainly carinulate reticulate, but the interval of the punctures are only strigillate towards the apex; legs with white bristles, femora black, tibiae partly rufescent, spinose on the upper side, tarsi and spurs rufescent.

Length 7 mm.

Hab. Cape Town, L. C. Péringuey.

Although the stem of the petiole is slightly shorter than in the other males of this genus, this species, easily recognized by the colour of the antennae, should, I think, be included in *Dasylabroides* rather than in *Dasylabris*. I have seen one example only, and the absence of wings may be accidental.

GEN. DASYLABRIS, Radoz.

DASYLABRIS MATIESA, sp. n.

♂. Black, with the thorax red, abdomen with a silvery white pubescent band on the hind border of the first segment, an ovate elongate patch in the median basal part of the second which has in addition a narrow, apical band triangularly dilated in the centre; third segment covered by a broad white band. Head much rounded behind, eyes somewhat large, genae short, much rounded, surface closely punctate, pubescent black but with a very distinct transverse band of white pubescence on the vertex; thorax pyriform, one-fourth narrower at the base than at the apex, which is truncate with the angles sharp, not emarginate or dentate laterally, closely foveolate and having a small tubercle in the centre of the edge of the declivity. Abdomen sub-pedunculate, the first joint short, nodose, about half the width of the base of the second, which is finely and simply punctate, and is clothed with an appressed black tomentum hiding the sculpture; legs with white bristles, hind tibiae strongly spinose, spurs white.

Length 6 mm.

Hab. Cape Colony (Worcester), F. W. Purcell.

I know no close ally to this pretty little species, of which I have seen one female example, and which is so remarkable by the silvery sheen of the white pubescence.

DASYLABRIS MOAMBA, sp. n.

♀. Head, thorax, antennae, legs and first abdominal segment light red, the other segments black, the second with a median apical silky white patch, a narrow basal band of the same colour dilated in a triangle in the centre, and the sides clothed with a silvery pubescence extending from apex to base, but not dense enough to be termed a band, third segment clothed with a white band, the others with an abbreviated lateral band of the same colour, which is however nearly entire, although not conspicuous on the border of the penultimate segment. Head deeply pitted, clothed with a flavescent pubescence, palps slightly infusate, neck very distinct; third antennal joint as long as the fourth, but more slender; thorax sub-hexagonal, longer than broad, not much amplified in the middle which is slightly angular, the margins not sinuated; it is coarsely foveate and clothed with an appressed flavescent pubescence, abdomen pedunculate, peduncle short, but distinct, spinose on each side at base, second segment covered with very closely set, small,

slightly elongated punctures, pygidial area finely strigillate; legs clothed with flavescent white hairs, tibiae plurispinose, spurs long, white.

Length 9 mm.

Hab. Southern Rhodesia (Plumtree), Father J. O'Neil. A very distinct species, the nearest South African ally of which is *D. pandora*, Pér.

DASYLABRIS BALUCKA, sp. n.

♂. Black, the hind border of first abdominal segment fringed with dense greyish hairs, second segment with a patch of white hairs in the centre above the middle, and the whole of the third and fourth segments covered with a dense band of partly appressed, partly erect white hairs. Third joint of antennal joint half the length of the fourth; eyes large but not emarginate, genae very much rounded giving the base of the head an arcuate shape, surface closely and evenly punctate and clothed with thick black and silky greyish hairs, the latter more appressed; thorax deeply pitted all over, clothed like the head with sparse decumbent whitish hairs and dense erect black ones, the scutellary region with a conspicuous fascicle of long hairs, metanotum rounded laterally from base to apex; abdomen plainly petiolate, the first segment subfoveate punctate, the second very closely cicatricose punctate, the others closely and moderately finely punctate, clothed with very long, greyish hairs; legs black, bristling with black hairs, hind tibiae simple, spurs long, black.

Length $6\frac{1}{2}$ mm.; expanse of wings 9 mm.

Southern Rhodesia (Salisbury), Father J. O'Neil.

This species greatly resembles *Mutilla deiopeia*, Pér., and *M. eunyce*, Pér., which is perhaps a varietal form of *deiopeia*, but the third cubital cell is closed instead of being open as in the last two named species, which belong moreover to the genus *Mutilla*. It is however distinguished from both by the presence of a whitish patch of white hairs on the second segment, and of a white band on the fourth segment. The latter has a wide range, as I have seen an example from Bulawayo differing in no particular from examples found near Cape Town, where I captured several specimens hovering over a low bush under which I found a solitary female of *D. inconspicua*, Sm.

DASYLABRIS MAKANGA, sp. n.

♂. Black, with the pronotum clothed with a dense long, golden-yellow pubescence extending over the scutellary region and the

tegulae; second and third abdominal segments with a series of sparse, long stiff white hairs which are far too scattered to form a band; wings entirely fuscous black; palps black, head much rounded behind the eyes which are large and not emarginate on the upper part, closely pitted on the vertex, which like the anterior part is clothed with dense whitish hairs mixed with a few black ones, and a few orange-yellow ones on the hind border, mandibles trifold at apex, no spine underneath, basal joint of antennae pubescent black, third joint half the length of the fourth; pronotum and mesonotum deeply foveolate punctate, metanotum closely reticulate ampliate laterally behind with the angles very broadly rounded, somewhat shiny, and clothed sparingly with black hairs; first and second segments of abdomen covered with equal, moderately wide foveae and clothed with dense, erect black hairs, the other segments are closely punctate and densely hairy black, the first segment has underneath a short carina truncate at base only; legs black, fore ones with a greyish pubescence, the hairs on the intermediate and hind ones black, hind tibiae simple, spurs black.

Length 11 mm.; expanse of wings 19 mm.

Hab. Southern Rhodesia (Bulawayo).

A very distinct species, but near *D. merope*, Sm.

GEN. STENOMUTILLA, Andr.

STENOMUTILLA MUKSINGA, sp. n.

♂. Black, with the pronotum, mesonotum, scutellary region and tegulae red; abdomen with a silky white band on the first three basal segments; wings hyaline on the first basal third, fuscous with the nervures steel blue on the other two-thirds; head rounded behind, with the genae long, eyes moderately large, not emarginate, surface closely pitted, briefly pubescent, sparsely hairy. Antennae somewhat robust, third joint shorter than the fourth; thorax closely foveate, metanotum short, very declivous, sub-parallel laterally with the hind angles rounded, the declivous part arcuate, the surface clothed with black hairs with a few white ones on the sides; first joint of abdomen petiolate and deeply and evenly punctate with the intervals smooth, the other segments, including the pygidial area, much more finely punctate; legs clothed with whitish hairs, hind tibiae simple, spurs long, black; underneath the second and third segments have a distinct fringe of white hairs.

Length 15 mm.; expanse of wings 24 mm.

Hab. Southern Rhodesia (Salisbury), Father J. O'Neil.

Allied to *S. clelia*, Pér., in which however the white dorsal and lateral part of the thorax is red.

GEN. MYRMILLA, Wesm.

MYRMILLA MAHLALELA, sp. n.

♀. Black, with the thorax red, and the vertex and labrum occasionally red, abdomen with a flavescent median band the hind border, a small central patch at base of the second segment and another larger one in the centre of the apex, third segment clothed with an entire band, fourth with a median patch of the same colour and the segment densely penicillate with flavescent hairs. Head very large, quadrate, nearly as long as broad, eyes very large, lateral, genae as long as the eyes, obtusely rounded, closely striolate on the vertex, and with a median, not very distinct longitudinal central carina, labrum rufescent, mandibles greatly developed, surface very briefly pubescent yellow, and sparingly setose; antennae with the scape rufescent or sub-rufescent occasionally, the two first joints are also rufescent. Third joint more than twice as long as the fourth. Thorax one-third longer than broad, sub-parallel laterally, but slightly wider at the base than at the apex, the basal margin of the pronotum slopes slightly on either side, but is sharply angular, the lateral margin bears 5 short teeth including the one at the basal angle, and the hind border has three long, equi-distant, horizontal spines, the surface is foveolate striolate, very briefly pubescent flavescent; abdomen sessile, briefly pubescent black, and with whitish flavescent setae, the segments are very finely and closely punctate; legs fuscous or fuscous rufescent, tibiae strongly spinose, spurs whitish.

Length 6-6½ mm.

Hab. Southern Rhodesia (Bulawayo, Salisbury), Father J. O'Neil.

♂. Similar to the female in colouring and markings of the abdomen. The head is equally large in proportion to the thorax, the latter however is strongly contracted laterally, the metanotum is ampliate rounded on the sides and distinctly wider than the pronotum, there is no lateral denticulation, but the hind angles are distinctly spinose, and there are three spines similar to those of the female on the apex of the declivity; the hind legs are spinose and the long spurs white.

Length 5½ mm.

Hab. Southern Rhodesia (Salisbury), Father J. O'Neil.

Allied to *M. phocia* (*euterpe*), Pér., and to *M. ilgi*, Andr.; the example of the latter species which I saw in Dr. Braun's collection is allied to *M. mahlalela*, but the thorax is 6-dentate laterally and bears 4 spines on the apex of the declivity; the markings on the abdomen consist of a central elongate patch on the second segment, as in *M. phocia*, and the four penultimate segments are penicillate with yellow hairs.

MYRMILLA NAMAQUA, sp. n.

♀. Pale testaceous, with the greater part of the second abdominal segment infuscate; hind border of the second segment with a narrow whitish band, third segment covered with a whitish band. Head much wider than the thorax, with the genae as long as the eyes and obtusely rounded, the base sinuate, eyes large, supra-lateral, surface hardly pubescent and covered with even, closely set punctures; third antennal joint slender and nearly thrice as long as the fourth; thorax short, one-third longer than broad, truncate at apex with the anterior angles sharp, nearly parallel for one-fourth of the length, emarginate thence for two-fourths with the remaining fourth ampliate rounded with the posterior angles semi-obtuse but hardly broader at the base than the apex of the pronotum, the hind border bears on the centre a small dentiform tubercle, with very faint indications of minute tubercles on either side of it, and also on the sides of the declivity, the surface is finely striolate; the abdomen is beset with white setae, and the second segment which is infuscate except in the centre of the base is finely aciculate; the pygidial area is also finely punctate; legs sparsely hairy, hind tibiae spinose, spurs white.

Length 4 mm.

Hab. Cape Colony (Bushmanland, Enkries), R. M. Lightfoot.

This species is probably allied to *M. dubiosa*, Andr., of which I have seen an example, but which is not represented in the Museum collection; it is differentiated by the size of the head, which is considerably wider than the thorax and very massive in *M. namaqua*, whereas according to André it is about the width of the thorax in *M. dubiosa*.

MYRMILLA BUINGELLA, sp. n.

♀. Black, with the thorax red, the palps, the three basal joints of antennae and the legs red; abdomen sessile with a large median patch of flavescent hairs on the first segment, second segment with a narrow flavescent border dilated with a triangular patch in the centre, the other segments fimbriate with sub-flavescent hairs.

Antennae robust, third joint shorter than the first; head rounded, eyes very large, no genae to speak of, surface rugose, briefly pubescent; thorax nearly twice as long as broad, deeply and regularly emarginate laterally, border of pronotum straight with the angles sharply acuminate, base also straight, slightly wider than the apex, the angles still sharper than at the apex, in the centre of the declivity is a small, bluntly triangular tubercle, the surface is finely punctate and clothed with a decumbent flavescens pubescence; the second abdominal segment is moderately finely punctate and the sides are clothed from apex to base with a whitish pubescence not dense enough, however, to form a patch; the fourth segment is more densely fimbriate than the third; the pygidial area is punctate at base. Legs very briefly pubescent white, spurs extremely short, whitish; hind tibiae plurispinose.

Length $3\frac{1}{2}$ mm.

Hab. Southern Rhodesia (Bulawayo).

A species very distinct from the other South African species of *Myrmilla* known to me.

MYRMILLA SHIKUELLA, sp. n.

♀. Black, with the thorax red, first abdominal segment with a band of flavescens hairs on the hind border, second with two parallel, slightly elongate, small patches situated a little past the median part and at about an equal distance from the centre and from the sides, third segment clothed with an entire band of the same colour. Head wider than the prothorax, with the eyes large and about equi-distant from the insertion of the antennae and from the plainly rounded posterior angles, antennal tubercles conspicuous and very sharp, surface roughly elongate punctate, briefly greyish pubescent; antennae somewhat robust, third joint three times as long as the fourth; thorax one-fourth longer than broad, anterior border slightly sloping on each side with the angles sharp, sub-parallel but slightly emarginate laterally, posterior edge not wider than the anterior but the hind angles somewhat rounded, and bearing on the top of the declivity seven long, horizontal spines of nearly the same length; the surface is visibly striate longitudinally and it is clothed with a very brief flavescens pubescence; abdomen beset with greyish and black hairs, the second, third, and fourth segments plainly fimbriate with yellowish hairs, the dorsal part of all segments finely and regularly punctate, but very finely strigillate on the second but on the sides only, pygidial area closely striolate from the base

to nearly the apex; legs bristling with white setae, hind tibiae strongly spinose on the outer edge, spurs long, white.

Length 9 mm.

Hab. Southern Rhodesia (Plumtree), Father J. O'Neil.

This species is very closely allied to *M. ino*, Pér. (*pectinidorsis*, Andr.) and may prove ultimately to be only a varietal form, but it differs from *M. ino* by the sculpture of the head, which is not so rough nor are the intervals carinulate in the anterior part of the vertex; the prothorax is much more distinctly striolate longitudinally and the punctures of the second abdominal segments are much finer. *M. ino* has been recorded from Natal and the Orange Free State only, to my knowledge.

MYRMILLA BUNGANA, sp. n.

♂. Black, with the neck and dorsal and lateral parts of thorax red, second abdominal segment with a small, sub-transverse flavescent patch situated towards but not quite in the middle, and equi-distant from the centre and the sides, third and fourth segments clothed with a silky whitish band, seemingly interrupted narrowly in the centre in the two examples which I have examined. Head transverse, wider than the prothorax, eyes large, not emarginate, situated forward, the space between the base of the eye and the posterior angle longer than the eye itself, the posterior angles slightly rounded, the base sinuate, surface roughly punctate striate, clothed with a dense greyish flavescent pubescence, antennal tubercles moderately prominent, antennae somewhat robust, third antennal joint shorter than the fourth; thorax twice as long as broad at its widest part, strongly coarctate laterally on the mesonotal region, the rudimentary tegulae distinct, metanotum ampliate rounded, a little wider than the pronotum, slantingly declivous, coarsely foveate all over and beset with whitish and black rigid setae; abdomen sessile, the second segment irregularly strigillate punctate, the irregular longitudinal strigillation more apparent than the punctures; legs fringed with greyish hairs, hind tibiae simple, spurs long, white.

Length 9-10 mm.

Hab. Southern Rhodesia (Empandeni), Father J. O'Neil.

The nearest ally of this species is *M. bambata*, Pér., in which, however, the head is hardly wider than the pronotum, the mesonotum much less strongly constricted, and the metanotum narrower than the pronotum, whereas the metanotum is distinctly wider than the pronotum in *M. bungana*, etc.

MYRMILLA MAPUTA, sp. n.

♂. Black, with the thorax completely red, legs red; second abdominal segment with two whitish small, not very well defined patches situated towards the median part of the disk and equi-distant from the centre and the outer sides, this segment has also a very narrow fringe of semi-pubescent hairs, third segment clothed with a white pubescence, fourth segment with a similar band broadly interrupted in the centre.

Closely allied to *M. aede*, Pér., the head is of the same shape but broader than the thorax at its widest part, the sculpture is alike, but the antennae are more robust, the thorax is more slender, the mesonotum is more strongly co-arcuate, the metanotum is as broad as the apical part of the pronotum; the spots and bands on the abdomen are nearly alike, but the band on the fourth segment is interrupted in *M. maputa*, and the sculpture of the second segment is very fine and not strigillate in *M. maputa*; legs bristling with white setae, hind tibiae spinose, spurs white.

Length 6 mm.

Hab. Natal (Durban), C. N. Barker.

I believe this species to be the male of *M. ino*, Pér. (they were sent me from the same locality); *M. aede* to be the male of *M. dumbrodia*, Pér., and *M. proserpina*, Pér., that of *M. pasyphaë*, Pér., because both sexes occur in the same locality.

GEN. MUTILLA, Linn.

MUTILLA TAKOTA, sp. n.

♀. Black, with the thorax red, abdomen with a faint silky white patch, occasionally obliterated on the first segment, a narrow one, very broadly interrupted in the centre on the apical border of the second, and a broader also interrupted one on the third, last segment densely fimbriate. Head a little broader than the thorax, truncate behind with the angles not rounded, eyes very large, genae distinct, mandibles long, simple, surface roughly foveate punctate covered with a greyish white pubescence intermixed with rigid black setae; antennae robust, third joint nearly as long as the two following taken together; thorax one-third longer than broad, sub-parallel but emarginate laterally, anterior border of pronotum strongly sloping on each side, metanotum not broader than the pronotum at its widest part with the declivity sub-vertical, the surface is covered with broad, deep foveae separated by longitudinal raised intervals forming more

or less distinct carinules ending on the top of the declivity in an ill-defined crenulation, foveae of the declivity wider and deeper than on the disk; abdomen beset with black hairs, white on the sides, second segment conspicuously strigillate from the base to the apex, the raised lines closely set, pygidial area, finely strigillate near the base, finely aciculate on the remainder of the surface; legs set with white bristles, hind tibiae spinose, spurs long, white.

Length $7\frac{1}{2}$ –11 mm.

Hab. Transvaal (Lydenburg), Southern Rhodesia (Salisbury), Father J. O'Neil.

MUTILLA MAROTSA, sp. n.

♀. Black, with the thorax red, abdomen with a narrow apical, broadly interrupted flavescent band on the second segment, and a similar but broader one covering the third segment. The description of *M. takota* suits the present species, but the difference between the two is mainly in the shape of the metanotum which is transversely carinate above the declivity, this carina is faintly crenulate, and in the centre there is an unciform blunt transverse spine, the sides of the declivity are slightly serrate; the second abdominal segment is less conspicuously strigillate; the rest as in *M. takota*.

Length 11 mm.

Hab. Southern Rhodesia (Empandeni), Father J. O'Neil.

MUTILDA BOKOTA, sp. n.

♀. Black, antennae, palpi, tibiae, tarsi brick-red, femora fuscous reddish, thorax red, second abdominal segment with a median, sub-elongate, silky white somewhat flavescent patch reaching from a short distance from the apex to the median part, and with a quite lateral yet somewhat more median, faint whitish patch on each side, the hind border has a narrow silky white fringe which expands into a somewhat broad triangle in the centre, the third segment is covered by a white sub-flavescent band. Head as broad as long, eyes large, genae little produced behind the eyes, rounded, face and vertex irregularly punctate, briefly setulose; thorax parallel, nearly twice as long as broad, and with the angles distinct, truncate behind, and with a triangular sub-obtuse spine in the centre of the border of the declivity, clothed with a moderately dense flavescent pubescence and a few erect hairs; abdomen sessile, second segment evenly punctate, the punctures ovate, not rugose, the intervals inclined to form a slight striation, the other segments are more finely punctate, and the pygidial area is very hairy; hind tibiae spinose, spurs white.

Length 6 mm.

Hab. Southern Rhodesia (Bulawayo).

Near *M. amalita*, Pér., but very distinct.

MUTILLA BEIRA, sp. n.

♀. Black, with the thorax red, the first abdominal segment with a conspicuous apical patch of white pubescence, second with a median ovate patch of the same colour, third, fourth, and fifth segments covered by a white pubescent band, sometimes ill-defined or obsolete on the penultimate. Head transverse on the vertex, base slightly arcuate in the centre, but the posterior angles are sharp and not rounded, eyes large, lateral, genae long, surface coarsely foveate, briefly pubescent white, labrum villose white, mandibles long, simple, antennae somewhat robust, third joint nearly twice the length of the fourth; thorax nearly parallel, nearly one-third as long as broad, fore border of the pronotum is very slightly sloping on each side and the angles are sharp, the metanotum is not broader, and the declivity is nearly vertical, from apex to two-thirds of the length it is longitudinally carinate, the slightly wavy carinules enclosing elongated foveae, in the metanotal part, however, the foveae only are left, the apex of the declivity and also the sides are slightly crenulate, and on the centre of the declivity there is an unciform, transverse, blunt, more distinct tooth, the surface is covered with a somewhat dense white pubescence, and the contracted part of the sides is clothed with a broad conspicuous silky white patch; abdomen sessile, clothed with white and black setae, second segment conspicuously carinate longitudinally, the carinules closely set and enclosing narrowly ovate punctures; pygidial area strigillate from base to apex; legs with white bristles, hind tibiae strongly spinose, spurs white.

Length 6-9 mm.

Hab. Mozambique (Beira), P. A. Sheppard.

The facies and livery of this species is that of *M. exaltata*, Sm., and *M. omphale*, Pér., and it is an ally also of *M. praedatrix*, Sm. But the head is as transverse on the vertex and with the hind angles as sharp as in *M. exaltata*, whereas in *M. praedatrix* the head is rounded laterally behind, and as the large eyes reach the hind margin, there are no genae.

MITILLA GUANDA, sp. n.

♀. Black, with the thorax red, abdomen with a divided patch of flavescens pubescence on the hind border of the first segment, and a

very narrow apical border of the same colour on the second, the other segments have each a very narrow apical band more fimbriate than pubescent. Head sub-transverse, eyes moderately large, lateral, genae long, but attenuate rounded towards the base, surface broadly and roughly pitted; antennae moderately robust, third joint nearly as long as the following two combined; thorax parallel, about one-third longer than broad, very little sinuate laterally, fore border of pronotum straight with the angles sharp, posterior angles distinct, covered with very broad foveae separated by narrow, highly raised walls forming longitudinal carinae which when reaching the edge of the declivity form there a somewhat indistinct crenulation, the sides of the declivity are also sub-crenulate; second abdominal segment covered with highly raised, conspicuous, longitudinal, closely set carinules reaching from base to apex, the other segments are finely and closely punctate, pygidial area finely strigillate on the basal part; legs bristling with white setae, hind tibiae spinose, spurs white.

Length 5 mm.

Hab. Southern Rhodesia (Gwanda), D. Dods.

Remarkable by the sculpture of the second abdominal segment. I do not know of any South African species allied to the present one.

MUTILLA TOUMSA, sp. n.

♀. Black, with the dorsal part of the prothorax reddish, but infuscate on the greater part of the dorsal part, the infuscation leaving only the fore border of the pronotum, and the outer margin reddish, the sides are red; abdomen with a yellow somewhat narrow pubescent band slightly dilated in the centre on the apical border, apical segment fimbriate with yellowish hairs; legs fuscous rufescent. Head moderately rounded behind, eyes large, lateral, genae moderately long, posterior angles rounded, surface foveolate punctate, very briefly pubescent; antennal tubercles and the basal joints of antennae rufescent, the third joint longer than the fourth; thorax parallel, very little emarginate laterally, one-quarter longer than broad, the margin of the pronotum straight with the outer angles sharp, posterior part truncate, vertically declivous, a triangular tubercle in the centre of the border of the declivity, surface covered with deep and broad irregular foveae and very briefly pubescent; abdomen sessile, second segment covered with deep, long, ovate foveae with raised, smooth but non-carinate intervals forming a regular reticulation, the segments following are closely

and finely punctate, legs with whitish bristles, tibiae spinose, spurs white.

Length 4 mm.

Hab. Cape Colony (Worcester), F. W. Purcell.

This species will be easily recognized from its South African congeners by its sculpture, and by the very parallel thorax.

MUTILLA PELLA, sp. n.

♀. Black, with the thorax and the legs red, abdomen with a central ovate flavescens patch extending over the base of the second segment, the latter with a narrow apical flavescens band briefly dilated triangularly in the centre, third segment with a median flavescens patch. Head very slightly wider than the prothorax, eyes large, lateral, genae moderately short, angles not much rounded, base plainly arcuate, surface roughly punctate and clothed with a flavescens pubescence; antennae moderately robust, the third joint not longer than the fourth; thorax narrow, twice as long as broad, straight in front with the angles sharp, parallel for a third of the length, there contracted and briefly incised, thence slightly ampliate, to the same width as the pronotum and with the high angles rounded, the declivity is sloping, and at a short distance from the edge there is a small median tubercle, the surface is covered with slightly wavy, little raised carinules in the intervals of which are irregular foveae, and is clothed with a dense flavescens pubescence. Abdomen sessile, closely strigillate from base to apex; legs bristling with whitish hairs, hind tibiae spinose, spurs white.

Length 3 mm.

Hab. Cape Colony (Cape Town), L. G. Péringuey.

This small species will be easily distinguished by its long narrow thorax, as long as in *M. decipiens*, Sm., but more parallel.

MUTILLA KANZALA, sp. n.

♀. Black, with the thorax red, abdomen with two central, round, orange chitinous spots equi-distant from sides to centre on the second segment, third, fourth, and fifth, each with a narrow pubescent white band. Head not distinctly wider than the thorax; transverse, the posterior angles little rounded, eyes large, lateral, genae shorter than the eyes; it is roughly foveate and briefly pubescent; antennae of the normal shape, third joint hardly longer than the fourth; thorax one-third longer than broad, parallel, but emarginate from the posterior angle of the pronotum to the second third of the length

from where it widens a little, being there as broad as the apical part of the pronotum and moderately rounded at the base, deeply foveate carinate, the slightly wavy carinules forming a distinct, sharp serration at the top of the declivity, the sides of which as well as those of the lateral hind margin are obtusely serrate, the declivity is broadly reticulate, and the surface is covered with a greyish pubescence; abdomen sessile, second segment conspicuously carinulate longitudinally, the carinules closely set and enclosing ill-defined elongate fossulate punctures; pygidial area finely strigillate; legs bristling with white hairs; hind tibiae spinose, spurs white.

Length 8-9 mm.

Hab. Cape Colony (Bredasdorp), H. Fry; Natal (Drakensberg), C. N. Barker.

The two yellow spots on the second abdominal segment are not covered with pubescence, but are chitinous as in *M. acrisione*, Pér. The shape of head and thorax greatly differentiates this species from the last-named species. Not only are the two orange spots alike, but the sculpture of the second abdominal segment is the same in both.

MUTILLA MAMBA, sp. n.

♀. Black, with the thorax totally red; abdomen with two ovate flavescent patches on the second segment, equi-distant from the sides and centre, on the third and fourth is a wide band of the same colour broadly and equally interrupted in the centre; hind border of metanotum with seven horizontal conspicuous spines above the declivity. A close ally of *M. nais*, Pér., whose description would also nearly suit the present species, except that the thorax is less parallel, being distinctly narrower at apex than at base and more emarginate laterally from the well-defined high angles of the pronotum to the third part of the length, the fourth abdominal segment has also a wide pubescent band wanting in *M. nais*, and the pubescent band and patches are flavescent instead of white.

Length 9-10 mm.

Hab. Transvaal (Waterberg), Southern Rhodesia (Empandeni), Father J. O'Neil.

MUTILLA MOGAMBA, sp. n.

♂. Black, first and second abdominal segments red, the first fimbriated with white at apex, the latter with a broad apical border, third segment covered by a dense pubescent white band, pronotum

and metanotum clothed with a thick white pubescence. Head transverse, eyes large, lateral, emarginate, genae projecting slightly beyond the eyes, mandibles trifid at end, hollowed inwardly, strongly dentate underneath in the middle; surface closely foveolate punctate, forehead with a thick bunch of white hairs between the antennae which are robust, and in which the third joint is of the same length as the fourth; thorax convex on the mesonotum, the scutellum sub-orbicular and fringed with dense long silky white hairs, metanotum a little narrower than the pronotum, much rounded laterally behind and entirely clothed above and on the sides with a very dense white pubescence; wings deep fuscous, tegullae also fuscous; abdomen sessile, ventral carina of the first segment long, ending in a small tooth, second segment covered with foveolate punctures, the posterior black band extends to about one-quarter of the surface, the other segments are closely punctate above and below; legs bristling with whitish hairs, hind tibiae spinose, spurs long, white.

Length 12 mm.; expanse of wings 24 mm.

Hab. Transvaal (Barberton), H. Edwards; Zululand (M'Fongosi), W. E. Jones.

A close ally to *M. tecmessa*, Pér.; but without the narrow white band on the second abdominal segment, and with a broad black border on the same joint; the whole metanotum is clothed with a white pubescence; the foveate punctures on the second abdominal segment are a little broader than in *M. tecmessa*, Pér.

Both *M. mogamba* and *M. tecmessa* belong in all likelihood to the *M. exaltata*, Sm., group.

MUTILLA KATANGA, sp. n.

♂. Black, with the second and third abdominal segments red, these second and third segments are densely fimbriate with white hairs which are not quite dense enough to form a band in the only example I have as yet seen. Head conspicuously rounded laterally behind from the base of the eyes which are deeply emarginate, surface closely pitted, and clothed with very dense erect white hairs; antennae robust, third joint as long as the fourth; thorax with the metanotum sub-quadrate but with the angles bluntly rounded and very slightly wider at the apex of the declivity than the pronotum, mesonotum very convex, scutellum rounded, fringed with long, white hairs, surface closely and deeply foveolate punctate, that of the metanotum broadly reticulate; abdomen sessile, first segment

with a ventral carina incised in the centre, second segment sub-cicatricose punctate without any raised intervals, the other segments closely punctate, the dorsal surface and the sides especially are beset with long, white erect hairs, the second segment has underneath three small, sharp tubercles on the apical edge, one median, the other two lateral, and the ventral part of the segments is fringed with greyish long hairs.

Length 8 mm. ; expanse of wings 13 mm.

Hab. Southern Rhodesia (Bulawayo), G. Arnold.

Belongs to the group of *M. zoë*, Pér., *M. concinna*, Pér., and *M. speculatrix*, Gerst., but is at once differentiated by the greatly arcuate hind part of the head, which is straight in the above-named species, and the three tubercles on the border of the ventral part of the second abdominal segment.

MUTILLA NAÏS, Pér.

Ann. S. Afric. Mus. i. 1898, p. 129.

♂. Black, with the pronotum and mesonotum red, abdomen with a large, quadrate silky white patch extending nearly from the sides to some distance from the centre on the second segment, and a broad apical band of the same pubescence widely interrupted in the centre on the third and fourth segments, ultimate segment moderately fimbriate with greyish hairs. Head transverse, not very wide on the vertex, hardly arcuate behind and with the posterior angles slightly rounded, eyes large, lateral, deeply emarginate, space in front of the eyes with a patch of silky hairs, maxillae long, simple ; antennae with the basal joint long, acutely nodose inwardly at apex, third joint of equal length with the fourth. Pronotum somewhat rounded in front, mesonotum convex, carinate longitudinally in addition to the four longitudinal grooves, the intervals foveolate, scutellum almost orbicular, fringed with a flavescent pubescence, metanotum sub-parallel laterally, then conspicuously rounded behind, broadly reticulate ; abdomen sessile, first segment shorter than the apical width, foveolate punctate above and provided underneath with a short, high carina truncate and sub-dentate at apex, second segment sparsely punctate but with the median discoidal part smooth, the other segments finely punctate ; legs clothed with whitish bristles, hind tibiae with two apical spines on the upper side, spurs long, white.

Caught in copulâ by Mr. G. Arnold, of the Rhodesia Museum.

Length 14-15 mm. ; expanse of wings 23-24 mm.

Mutilla nais was originally described from Natal. I have since received specimens from Southern Rhodesia (Bulawayo, Empandeni, Salisbury, Sebakwe, Umtali).

MUTILLA VATUA, sp. n.

♂. Black, with the pronotum, mesosternum, scutellary region and tegulae brick-red; abdomen slightly cyaneous, and with a distinct narrow white band on the hind border of the first and second segments, the others fimbriated with white hairs, the hairs not dense enough to form a distinct band; head transverse on the vertex, the base straight, eyes large, emarginate, genae short, only moderately rounded; vertex closely foveate and briefly pubescent, epistome clothed with a dense silvery pubescence, the sides with long, white rigid hairs; mandibles trifid, forcipate tooth underside distinct, blunt; antennae black, robust, the third joint only slightly shorter than the fourth; thorax closely foveolate punctate and with somewhat scattered white hairs a little more numerous on the scutellary region and on the metanotum which is reticulate black and gradually attenuate rounded laterally behind; wings slightly infusate throughout; abdomen with a faint cyaneous tinge, sessile, first joint distinctly spinose on each side at the base, and with a median carina truncate at each end underneath, sub-foveate punctate, second segment deeply and evenly punctate, without any raised intervals, the other segments somewhat unevenly punctate, legs black, fringed with a few hairs, hind tibiae simple, spurs long, very slender, white.

Length 8 mm.; expanse of wings 11 mm.

Hab. Southern Rhodesia (Bulawayo).

Belongs to the group of *M. lobognatha*, Andr., and *M. umtata*, Pér. The livery is nearly the same, and so is the shape of the mandibles. It differs from *M. umtata*, in which the thorax is coloured alike, by the gradually attenuate metanotum which in the former is somewhat ampliate rounded; the wings are also less deeply infusate.

MUTILLA LITETA, sp. n.

♂. Black, with the pronotum, mesonotum, and tegulae red; abdomen with a broad white pubescent band on the first segment, a narrow one along the apex of the second, and a broad one on the third and fourth. Head transverse, with the base slightly arcuate, but the angles are very little rounded, eyes very large and very

tridentate at apex, the inferior teeth very little developed, surface roughly pitted, clothed with dense greyish erect hairs; antennae robust, the basal joint conspicuously grooved inwardly, the third joint not half the length of the fourth; pronotum straight in front with the angles distinct, thence moderately sloping laterally, metanotum convex, of the normal shape like the rounded scutellum which is fringed behind with long whitish hairs, metanotum slightly narrower than the foreborder of the pronotum, straight laterally, not attenuate behind, but with the angles broadly rounded, surface villose black, and covered with foveate punctures on the mesonotum and metanotum, the metanotum which is villose white is broadly reticulate; tegulae red, wings fuscous with the nervures steel blue, but a little paler near the base; abdomen sessile, first segment with a distinct spine on each side of the base, and somewhat nodose, the carina underneath long, truncate at apex, slightly incised near the base, second segment closely punctate, the punctures not reticulate; legs villose white, hind tibiae simple, spurs long, white.

Length 8-11 mm.; expanse of wings 13-20 mm.

Hab. Transvaal (Lydenburg, Barberton), H. Edwards; Zululand (M'Fongosi), W. E. Jones.

Closely allied to *M. phoebe*, Pér., but in the latter the pronotum alone and the tegulae are red.

MUTILLA NONGUA, sp. n.

♂. Black, with the pronotum, mesonotum, scutellum, and tegulae red, abdomen with the first four segments bearing a narrow flavescent white apical band.

The description of *M. vatua* applies almost in its entirety to the present species which is however of larger size; the pubescent white bands on the first four abdominal segments are plainly defined, but the distinctive character is the sculpture of the second abdominal segment which is strongly reticulate instead of being evenly punctate; the wings are also more deeply infuscate from base to apex.

Length 12-13 mm.; expanse of wings 20-23 mm.

Hab. Natal (Port Shepstone), K. S. Barnard; (Malvern), C. N. Barker.

MUTILLA MOYANA, sp. n.

♂. Black, with the abdominal segments cyaneous, mesonotum and tegulae brick-red, border of the first four abdominal segments with a fringe of dense white hairs forming on each a narrow yet distinct white band; wings fuscous but paler at the base, and with

a tinge of steel blue in the middle of the fore wings. Head transverse, twice as long as broad on the vertex and parallel there, the cheeks prolonged and the hind angles slightly rounded; eyes moderately large not very bulging, slightly emarginate; epistome with dense whitish hairs, vertex evenly foveate punctate, clothed with erect greyish white hairs; thorax clothed with long greyish hairs longer and denser in the scutellary region and on the sides of the metanotum which is subquadrate with the angles very slightly rounded, tegulae large; abdomen sessile, first and second abdominal segments covered with somewhat even sub-cicatricose punctures of moderate size; the other segments are more finely and more evenly punctured, and the pygidial area is numerously and distinctly carinate longitudinally from base to apex; underside, all the segments except the first have a distinct fringe of whitish hairs, and the first segment is sub-carinate in the centre at the base; legs clothed with greyish hairs, spurs long, very slender, black; hind tibiae with four spines.

Length 11 mm.; expanse of wings 17 mm.

Hab. Southern Rhodesia (Barberton).

Near *M. hermione*, Pér., but easily differentiated by the subquadrate, short metathorax; the spurs are black instead of white, etc.

GEN. ODONTOMUTILLA, Andr.

ODONTOMUTILLA UMHLALI, sp. n.

♂. Black, with the dorsal part of the thorax red, abdomen with the hind border of the first segment with a silvery white band, and the third and fourth segments entirely covered with a band of the same colour. Wings hyaline in the basal half, fuscous and slightly steel blue in the other half. Head as broad as the thorax at its widest part, very broad on the vertex, the genae being as long behind the eyes as the eyes themselves, and the outer angles are only slightly rounded, thus making the base somewhat straight; antennae robust, third joint half the length of the fourth; pronotum strongly sloping laterally, mesonotum moderately convex, scutellum not very convex but with an acute lamelliform process projecting behind as an horizontal spinose process on each side; metanotum gradually attenuate from the median lateral part and rounded at apex; surface foveate striolate, but broadly reticulate on the metanotum, which is sparingly villose white, whereas the pronotum and mesonotum are briefly villose black; abdomen sessile, clothed with

erect greyish hairs, sculpture of the first two segments similar to that of the female but a little finer, the other segments finely punctate, pygidial area punctate and slightly striolate, first segment with a somewhat short carina truncate at each end on the ventral side; legs clothed with white hairs, hind tibiae simple, spurs white.

Length 10 mm.; expanse of wings 15 mm.

Hab. Natal (Umhlali), K. S. Barnard.

Allied to *M. psammathe*, Pér., and the livery is the same, but it differs in the shape of the head which is quadrate on the vertex instead of being narrowly transverse, the genal space being nearly as long as the eyes themselves which are emarginate, and the base is slightly arcuate instead of being straight; in this character it resembles *M. petrusiana*, Pér., in which the wings are hyaline for half the length, and fuscous for the remainder, instead of being entirely fuscous as in *M. psammathe*. But the lateral lamelliform carina of the scutellum is a distinctive feature of the genus *Odontomutilla*, and I shall therefore include it in spite of the rounded sides of the metanotum, the shape of which is that of *Mutilla*. My example was caught the same day and in the same locality as a ♀ of *M. ceto*, Pér., said by André to be the same species as *M. rufipes*, Fabr.

ODONTOMUTILLA CHIBUNGA, sp. n.

♂. Black, with a pronotum and mesonotum red; abdomen with a pubescent white band on the border of the second segment, narrowly interrupted in the centre, and a whole one on the third. Head as broad as the pronotum, transverse, straight behind, genae long, hind angles not rounded, eyes large, deeply emarginate, surface clothed with a greyish pubescence; antennae robust, third joint short; pronotum straight in front with the angles sharp, mesonotum convex, scutellum sharply dentate on each side at apex, slightly emarginate in the centre, metanotum gradually amplified diagonally laterally towards the apex which is very sharp, the surface is foveate reticulate and greyish villose on the pronotum, mesonotum, and scutellum, the latter has at apex a fascicle of white hairs, the broadly reticulate metanotum is villose white; tegulae red, wings fuscous with the basal part briefly hyaline; abdomen sessile and clothed above with white hairs, the first segment bears no trace of white band or patch, and the carina underneath is in the shape of a sharp, triangular compressed tooth, the second segment is covered with closely set sub-reticulate punctures in the first half, the punctures assuming an ovate shape without reticulation in the posterior part;

deeply emarginate, the genae moderately long, mandibles strongly legs set with greyish bristles and setae, hind tibiae simple, spurs white.

Length 10 mm.; expanse of wings 16 mm.

Hab. Southern Rhodesia (Empandeni), Father J. O'Neil.

Allied to *O. clymeneis*, Pér., but the second segment of the latter species is scrobiculate reticulate, which is not the case in *O. chibunga* in which the band on the third segment is not interrupted; the whole thorax in *O. clymeneis* is also red. From *O. eunomia*, Pér., in which the colouring of the thorax is similar, it is differentiated by the entire pubescent white band on the third segment, and also by the less cicatricose and smaller punctures of the anterior part of the second segment.

ODONTOMUTILLA LESHUMA, sp. n.

♂. Black, pronotum, mesonotum, and scutellum red; abdomen with a white pubescent band interrupted in the middle on the first and third segments; tegulae red, wings fuscous but hyaline at base for two-thirds of the length. Head somewhat broad on the vertex with the eyes very large and very deeply emarginate, the base arcuate, but the genae are distinct and the outer angles obtusely rounded, the surface is very deeply foveate reticulate and villose black; antennae robust, third joint very short; thorax nearly parallel, pronotum truncate in front with the outer angles sharp, as broad as the head, mesonotum convex, scutellum carinate laterally, sharply spinose on each side behind, and slightly emarginate in the centre, metanotum straight laterally but slightly wider at apex than at base and with the hind angles very sharp, the surface is broadly foveate, but broadly reticulate on the metanotum, villose greyish black in the anterior and median part, villose white on the metanotum, and with a fringe of long greyish white hairs on the apex of the scutellum; abdomen sessile, first segment with a bi-incised longitudinal carina underneath, second segment covered with cicatricose punctures without raised interstices, and becoming smaller towards the apical part, the other segments very closely punctate, surface clothed with black hairs above and greyish white underneath; legs bristling with white hairs, hind tibiae simple, spurs black.

Length 12 mm.; expanse of wings 22 mm.

Hab. Southern Rhodesia (Bulawayo).

The livery is that of the *O. ovata*, Rad. & Sieh., but it is a little less robust and is differentiated at once by the less angularly

ampliated hind part of the metanotum, as well as by the sculpture, especially of the second abdominal segment which is conspicuously carinate longitudinally in *O. ovata*, whereas it is only cicatricose punctate in *O. leshuma*.

It is probable that *O. leshuma* replaces *O. ovata* in Southern Rhodesia.

ODONTOMUTILLA OVATA, Rad. & Sich.

Hor. Soc. Ent. Ross. 1869, p. 84.

M. oxyroë (*megaera*, olim), Péring., Ann. S. Afr. Mus. i. 1899, p. 353.

♂. Black, with the thorax red; first and third abdominal segments with a white pubescent band interrupted in the centre; head transverse, very little arcuate behind, eyes large, deeply emarginate, genae half the length of the eyes, posterior angles very little rounded, surface foveate reticulate; thorax slightly broader in front than the head, nearly straight at apex with the angles very sharp, mesonotum convex, scutellum carinate, dentate laterally on each side, sinuate in the centre, metanotum diagonally amplified laterally from a third of the length with the angles strongly projecting but not quite acute; the surface of the pronotum, mesonotum, and scutellum is deeply foveate almost reticulate longitudinally, metanotum broadly reticulate; elytra fuscous, slightly hyaline at base; abdomen sessile, first segment with a short carina emarginate in the middle underneath, second segment conspicuously carinate reticulate longitudinally from the base to three-fourths of the length, the carinae enclose long, ovate punctures, but disappear on the last fourth part of the length which is more distinctly foveolate, the pubescence is black above and greyish white underneath; legs bristling with white and black rigid setae, hind tibiae simple, spurs white.

Length 12½ mm. to 14 mm.; expanse of wings 23 mm.

Hab. Cape Colony (Graham's Town), Ledoux; (Port St. John, Dunbrody), Father J. O'Neil.

MUTILLA YAMBANA, sp. n.

♂. Black, with the second segment of the abdomen red. Head transverse quadrate with the posterior angles sharp, eyes large, deeply emarginate, whole surface clothed with a very dense silvery white pubescence; antennae with all the joints arcuate; the third half the length of the fourth; thorax of the normal *Mutilla* shape, with

the metanotum narrowing gradually laterally and not as broad as the pro- and mesonotum, surface of the two last-named parts closely and deeply pitted, metanotum clothed with a thick silvery white pubescence; wings fuscous, tegulae black; abdomen sessile, the first and second segments have a wide apical border of white pubescence, which coats also the greater discoidal anterior part of the second segment, all the others are thickly clothed with a similar pubescence; ventral carina of the first segment sharply dentate at apex; legs fringed with white, hind tibiae simple, spurs white.

Length 12 mm.; expanse of wings 19 mm.

Hab. Mozambique (Inhambane), K. H. Barnard.

Allied to *M. andreana*, Pér., and as densely clothed with white pubescence, but the second abdominal segment is red, and the antennal joints are more arcuate.

GEN. BARYMUTILLA, Andr.

BARYMUTILLA BIZANA, sp. n.

♂. Black, with the mesonotum and scutellum red; first, second, and third abdominal segments with an apical narrow flavescent pubescent band, fourth segment with a median apical flavescent patch. Head transverse, sides straight laterally behind the eyes, posterior angles not rounded, base straight, eyes lateral, large, emarginate, mandibles briefly bifid at apex, tooth underneath short, surface roughly and broadly pitted, clothed with a flavescent pubescence and villose hairs; antennae robust, third joint a little shorter than the fourth; thorax nearly parallel, straight in front with the angles sharp, metanotum a little narrower than the promesonotum, quadrate with the posterior angles slightly obtuse, scutellum convex, simple, whole surface strongly obtuse, villose flavescent, tegulae nearly black, wings fuscous; abdomen sessile, first joint with a short truncate carina, second segment with closely set, narrowly reticulate punctures with the intervals little raised, the segments following closely punctate; legs with flavescent and greyish setae, hind tibiae simple, spurs long, black.

Length 11 mm.; expanse of wings 19 mm.

Hab. Mozambique (Beira), P. A. Sheppard.

Not unlike an *Odontomutilla* in general appearance, but differentiated by the simple, convex scutellum. The yellowish pubescent markings are also distinct. I have seen only one example of this species.

GEN. APTEROGYNA, Latr.

APTEROGYNA RHODESIA, sp. n.

♀. Head, antennae, thorax, legs, and first abdominal segment ferruginous red, the other abdominal segments black. Head rounded, eyes small, vertex distinctly striate in the middle, fossulate laterally, beset with whitish, slightly flavescent, not very dense, but long rigid setae. Antennal tubercles very prominent. Pronotum and mesonotum deeply foveate, metanotum also foveate but with distinct longitudinal carinae on the dorsal part, meso-metanotum little amplified laterally, abdomen slightly depressed, first segment deeply foveolate, clothed with long silvery hair-like bristles and a little white pubescence at the junction with the second, second segment twice as broad as long, deeply foveolate but with the whole dorsal part carinulate longitudinally and having a narrow border of dense white hairs, third abdominal segments hardly wider than the second, carinulate from base to apex with the intervals between the carinae fossulate and fringed with a white pubescence like the second and the fourth, pygidium conspicuously striolate and with the lateral edges serrate, legs densely hairy, spurs whitish.

Length 7 mm.

Hab. Southern Rhodesia (Plumtree), Father J. O'Neil.

Allied to *A. climene*, Pér. (? *globularia*, Fabr.), but distinguished apart from the colour of the head and legs by the less amplified meso-metanotum.

♂. Totally black, with the first abdominal segment red. Head small, deeply foveate, clothed like the prothorax with a dense greyish white pubescence, eyes only moderately large, antennae glabrous, except the first joint, slightly brownish, the joints somewhat arcuate outwardly; thorax closely, deeply and equally foveolate; pronotum with two distinct furrows, scutellum hardly swollen and therefore very little convex, metanotum slanting; wings hyaline but with a broad, very pale flavescent band running parallel with the fore margin from a short distance of the nervures to somewhat short of the apex, the nervures conspicuously infuscate; all the abdominal segments closely pitted, the intervals on the third segment so disposed as to appear striolate, the apical part of the second segment is hardly fimbriate with white hairs which form however a narrow band at the apex of the third to sixth; this part of the segments is densely greyish hairy; pygidium deeply pitted, terminal spine red, under part of abdomen as hairy as the upper; tarsi clothed with silvery hairs, spurs white.

Length $9\frac{1}{2}$ mm. ; expanse of wings $14\frac{1}{2}$ mm.

Although the two sexes have not been taken *in copulâ*, there is, I think, little doubt that they are one species.

Hab. Southern Rhodesia (Bulawayo), G. Arnold.

APTEROGYNA BOSCHIMANA, n. sp.

♀. Antennae, palps, thorax, the two basal abdominal joints and legs ferruginous red ; covered all over with rigid white hairs ; apical part of the second abdominal segment narrower than the others. Head of the usual shape, sub-foveolate ; prothorax sub-acutely amplified laterally in the middle, pronotum covered with moderately deep irregular punctures, meso- and metanotum strongly strigillate longitudinally ; petiole short, first and second abdominal segments deeply and irregularly pitted, third covered with ovate seriate elongated punctures, the intervals of which are slightly strigillate in the centre, the whole pygidium striolate longitudinally ; legs densely hairy, spurs white.

Length 5 mm.

Hab. Bushmanland (Henkries), R. M. Lightfoot.

♂. Antennae, all the abdominal segments and the tibiae red, head and thorax black, apical part of femora deeply infusate, tarsal spurs white. Wings lacteous, nervures very pale fulvous, pterostigma fulvous. Head transverse, very hairy, covered with somewhat closely set foveolae ; pronotum very closely punctate, the punctures coarse and closely set, the pubescence is dense, long, whitish ; antennae glabrous reaching the base of the second abdominal joint, all the abdominal segments pitted, the third is finely strigillate, the pubescence is long, dense, whitish flavescens, the long pygidial hook is red ; legs densely hairy.

Length 5 mm ; expanse of wings 8 mm.

Hab. Bushmanland (Henkries), R. M. Lightfoot.

Although not actually captured *in copulâ*, the two sexes were found together in the above-mentioned locality.

APTEROGYNA PROCERA, sp. n.

♀. Antennae, thorax and first abdominal segments red, head, abdominal segments, except the first, and legs black, body and legs clothed with long greyish hairs, the apical border of the abdominal segments have a slightly thicker fringe of whitish hairs which does not however form a band. Head deeply, closely and broadly foveate ; pronotum quadrate transverse ; covered with deep foveae the inter-

vals of which are carinate and longitudinal, on the laterally amplified subaculate mesonotum these carinae are sharper, straighter from the base to the apex of the declivity; basal segment covered with ovate foveae, second with strong longitudinal carinae reaching from apex to base, third carinate from the apex to the median part only and the posterior half is smooth, third and fourth sparsely punctate, pygidial area closely striolate.

Length $13\frac{1}{2}$ mm.

Hab. Cape Town, L. Péringuey.

This species differs from *A. climene*, Pér. (? *globularia*, Fabr.) in the strongly carinate meso-metanotum; in *A. climene* the second abdominal segment is strigillate, whereas it is carinate in *A. procera*, in which species the carinae do not reach further than half the length of the third segment, the posterior half being smooth, whereas it is strigillate from apex to base in *A. climene*.

APTEROGYNA FODINAE, sp. n.

♀. Black, moderately shining, the antennae, thorax, basal joint of abdomen ferruginous red, legs sub-rufescent, tarsi sub-flavescent, spurs white. Head rounded with eyes moderately large, clothed with dense erect sub-flavescent hairs, deeply and irregularly punctate. Thorax very rugose, pronotum sub-trapezoidal, the transverse suture dividing it from the meso-metanotum deep, very conspicuous, meso-metanotum amplified laterally in the centre in a sub-hexagonal shape, very convex, almost gibbose, the whole dorsal part is deeply pitted and the intervals raised in seriate longitudinal carinae less well defined in the anterior than in the posterior part, the surface and the sides are covered with long, greyish hairs; the abdomen is clothed with similar hairs, and the apical part of the first four segments has a narrow band of appressed white hairs, this band being better defined on the second and third, the first segment is deeply foveate, the second and third are conspicuously striolate, the striolae more raised on the second than on the third, but they reach on both from base to apex, upper part of pygidium closely striate for all the length; tibiae not spinose, legs briefly pilose.

Length 5 mm.

Hab. Northern Rhodesia (Broken Hill).

APTEROGYNA BEMBESIA, n. sp.

♀. Antennae, head with the exception of the frons which is fuscous, thorax, first abdominal segment, most of the dorsal part of

the second, and the legs brick-red, the other abdominal segments black; tarsi pale red, the spurs whitish. Head of the normal shape but somewhat larger than usual, moderately pubescent, the pubescence is not very dense and does not hide the foveate punctures; pronotum trapezoidal, punctate strigillate, mesonotum ampliate and angular laterally, and with several conspicuous strigillate carinae, the intervals of which are furrowed and filled with very elongated fossae, the thorax is moderately setose; first abdominal segment deeply pitted and with an unobscured fringe of white hairs, second segment strongly punctate in the centre and strigillate, third and fourth segments still more closely strigillate, pygidium weakly striolate, the apical part of segments 3-4 with a fringe of white hairs, thicker on the third and fourth, pygidium densely pubescent white.

Length 4 mm.

Hab. Southern Rhodesia (Bembesi), Bulawayo Museum.

APTEROGYNA KARROA, n. sp.

♀. The description of *A. cybele* applies to this species, which however differs by the sculpture of the second and third abdominal segments. In *A. cybele* they are both distinctly and closely strigillate from apex to base where, as in *A. karroa*, the second segment is covered with ovate foveae slightly more elongated in the centre than on the sides, and the intervals are not strigillate, the same obtains on the third segment but there the punctures are smaller and narrower, without much raised intervals, and they are somewhat obliterated near the posterior edge.

Length 8-10 mm.

Hab. Willowmore (Graham's Town).

♂. It is the male of this species which I described under the name of *A. cybele*. It is almost identical with the true *A. cybele*, but in the latter the antennae are black, whereas in *A. karroa* the antennae are ferruginous red, the posterior part of the third segment is also less plainly strigillate at apex, and the punctures are not quite so deep in the three first segments as in *A. cybele*. I do not know *A. meniacornis*, ♂, Enderl.

Length 11-12 mm.; expanse of wings 20 mm.

Hab. Cape Colony (Willowmore), Dr. H. Brauns.

APTEROGYNA HENKRIESA, sp. n.

♂. Black, with the first abdominal segment red, the antennae and legs are light fulvous. Antennae nearly as long as the body,

glabrous, the joints slightly arcuate underneath; head broader than long on the vertex, and the genae very short, deeply foveolate and clothed with a long greyish pubescence; prothorax of the normal shape, somewhat closely punctate and hairy; first abdominal segment deeply pitted, second also deeply pitted but not strigillate third sparsely punctate, the punctures somewhat smooth, no trace of strigillate striae, the whole abdomen is densely hairy, the pygidium is punctulate, the terminal spine red. Wings hyaline but slightly lacteous, the nervures and the stigma fulvescent, tibial spurs white.

Length $5\frac{1}{2}$ mm.: expanse of wings 8 mm.

Hab. Bushmanland (Henkries), R. M. Lightfoot.

Easily recognized by the great length of the antennae and the non-strigillate abdominal segments.

APTEROGYNA BULAWAYONA, sp. n.

♂. Totally black, antennae sub-ferruginous; head quadrate, tuberculate on the posterior angle, closely foveolate and clothed with dense greyish hairs longer and silky white laterally; prothorax of the normal shape covered with sub-foveolate punctures with narrow smooth walls in the anterior part, but deeper and very irregular on the metanotum, the whole prothorax covered with long greyish setae; abdomen covered with somewhat sparse, greyish hairs, but without any pubescent band at the apex of the joints, the first and second are covered with large, ovate foveae closely set, the third one is strigillate from apex to base, the intervals being more distinctly elongate ovate in the basal part, apical hook black; wings hyaline, nervures very pallid, stigma brownish, tibial spurs white.

Length 7 mm.; expanse of wings 10 mm.

Hab. Southern Rhodesia (Bulawayo), G. Arnold.

GEN. METHOCA, Latr.

METHOCA MOSUTOANA, sp. n.

♂. Black, with the mandibles, the palps, the three basal joints of the antennae, the tibiae and the basal joint of the tarsi ferruginous red. Head opaque, the face very finely striolate longitudinally in the centre, labrum not distinctly punctate, beset with long whitish setae, lateral space in front of the eyes densely pubescent, the pubescence silvery; eyes large very briefly setose, background of vertex extremely finely aciculate longitudinally and covered with round,

equal, pitted punctures separated by an interval nearly equal to their diameter, mandibles simple, briefly but somewhat densely hairy, scape of antennae shiny, second joint less than half the length of the third; the first two dorsal segments of the prothorax slightly longer than the third, pronotum longer than broad, dorsal part moderately ampliate at apex, covered with closely set fossulate punctures replaced laterally on the anterior part by sub-vertical striae, mesonotum similarly punctured in the anterior part but less deeply in the scutellary region, and with the sides plainly striate vertically, metanotum more finely punctate on the whole dorsal part and striate only on the sides, all three parts briefly and sparsely setulose, the setae greyish and black; abdomen smooth, shiny, concolorous, but with the apical joint sub-rufescent, clothed with dense sub-fulvous hairs, black on the petiole; legs moderately slender, shiny, clothed with short, whitish rigid setae, the intermediate and hind ones with a row of conspicuous spines on the upper side, spurs white.

Length 9 mm.

Hab. Basutoland (Maseru), Dec.

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16.—*Contributions to the Crustacean Fauna of South Africa.*—
By K. H. BARNARD, M.A., *Assistant.*

(Plates XXVII.—XXXIX.)

N.B.—Owing to a regrettable error on the part of the printers, pages 325 to 358 in this Volume X. have been duplicated, so for purposes of index, &c., the pages 325–358 in paper 16 (Crustacea) are distinguished by the addition of “a.”

example of the results of older methods of collecting, it may be mentioned that Krauss, the pioneer of South African Carcinology, obtained only 19 *specimens* of Sphaeromids from Table Bay and the Natal coast.

The remaining 25 species consist of species either hitherto incompletely known or not recorded from South African waters.

Through the kindness of Dr. Lampert, Director of the Stuttgart Museum, I have been permitted to examine the specimens of Sphaeromids collected by Krauss in 1838–42. The specimens have been preserved dry, but otherwise they are in excellent condition and leave no doubt as to their identity with the fresh spirit specimens at my disposal. The result of this examination has been to exclude

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16.—*Contributions to the Crustacean Fauna of South Africa.*—

By K. H. BARNARD, M.A., *Assistant.*

(Plates XXVII.—XXXIX.)

3.—ADDITIONS TO THE MARINE ISOPODA, WITH NOTES ON SOME
PREVIOUSLY INCOMPLETELY KNOWN SPECIES.

(Plates XXVII.—XXXVIII.)

THE following paper is the result of the examination of a large quantity of Marine Isopods collected at various times partly by the Cape Government trawler s.s. "Pieter Faure" and partly by members of the staff of the South African Museum. It contains descriptions of 8 new genera, 42 new species, and one new variety.

These numbers, though somewhat surprising, are but evidence of the richness of the South African crustacean fauna: a fauna which has only in recent years been systematically explored. Even so it is safe to say that only the fringe has been touched, and that there is still much to be done, especially as regards the minuter forms. Of the latter, those described in the following pages come exclusively from the littoral region of Table Bay and False Bay. With the exception of these two localities and the Natal coast the littoral region has been scarcely examined, even superficially. As an example of the results of older methods of collecting, it may be mentioned that Krauss, the pioneer of South African Carcinology, obtained only 19 *specimens* of Sphaeromids from Table Bay and the Natal coast.

The remaining 25 species consist of species either hitherto incompletely known or not recorded from South African waters.

Through the kindness of Dr. Lampert, Director of the Stuttgart Museum, I have been permitted to examine the specimens of Sphaeromids collected by Krauss in 1838-42. The specimens have been preserved dry, but otherwise they are in excellent condition and leave no doubt as to their identity with the fresh spirit specimens at my disposal. The result of this examination has been to exclude

four species included hitherto in the South African fauna and to fix the systematic position of the only species described by Krauss as new. The following is a list of Krauss' names with their equivalents:—

<i>Sphaeroma savignii</i>	= <i>Dynamenella kraussi</i> , n. sp.
<i>Sphaeroma macrocephala</i> , Krss.	= <i>Dynamenella macrocephala</i> (Krss.).
<i>Sphaeroma perforata</i>	= <i>Parisocladus stimpsoni</i> (Heller), n. gen.
<i>Sphaeroma jurinii</i>	= <i>Exosphaeroma gigas</i> (Leach).
<i>Sphaeroma tristense</i>	= <i>Exosphaeroma kraussi</i> , Tattersall.

With regard to the last Tattersall (1913) has already suggested that Krauss' *tristense* was not Leach's *tristense*, and described it as a new species.

Dr. L. von Lorenz, Director of the k.k. naturh. Hofmuseum in Vienna, has also very kindly transmitted for my examination the Sphaeromids collected by the "Novara" expedition in 1857-9 and described by Heller. As a result, my identification of *S. scabricula*, Heller, and *S. stimpsoni*, Heller, have been confirmed, as also the specific identity of certain Cape specimens with the *S. perforata* of Heller, and also in all probability with the *S. perforata* of M. Edwards. A few of Heller's mistakes in regard to *S. stimpsoni* and *S. perforata*, which have caused trouble to previous workers, have been corrected. Hansen's opinion (1905) that *S. integra*, Heller, should be referred to *Isocladus* is shown to be correct, and at the same time the specific distinctness of *S. integra*, Heller, and *S. tristense*, Leach.

In the genus *Cymodoce* the difficulty of assigning the females to their respective males, especially when not taken in the same haul, is a recognized drawback to correct classification. In the present collection *C. acanthiger*, *umbonata*, and *uniquiculata*, n. spp., are the only species of which both sexes were taken in the same haul. In the case of the others the specimens were found to group themselves around certain localities; males being taken in one haul in one place and females in another haul not very far away. Where in such cases the males and females show a close agreement in the details of the appendages, I have considered it not too great an assumption to regard those males and females as belonging to the same species, e.g., *C. valida*, Stebb., *africana*, n. sp., and *comans*, n. sp.

As far as present knowledge goes there seems to be little difference between the faunas of Table Bay and False Bay. There is, however,

a notable difference in size in Sphaeromids; specimens from the (colder) west coast of the Cape Peninsula being larger than those of the same species from the (warmer) east coast.

Throughout the present paper I have adopted the plan of counting seven peraeopods, instead of two gnathopods and five peraeopods, in the Isopoda Anomala as well as the Isopoda Genuina.

The types of all the new species are in the South African Museum.

For answering my inquiries and giving me advice on certain points I am under obligations, and wish herewith to express my thanks to: Dr. W. T. Calman of the British Museum, Dr. C. Chilton of Christchurch, N.Z., Dr. H. J. Hansen of Copenhagen, and Dr. W. M. Tattersall of Manchester. To Dr. Lampert and Dr. von Lorenz I am especially indebted for entrusting respectively Krauss' and Heller's specimens to me for examination. To my friends Mr. J. H. Orton of the Plymouth Marine Laboratory, Mr. F. W. Edwards of the British Museum, and Mr. H. Watson of Cambridge, I wish to express my thanks for copying descriptions and tracing figures in works otherwise inaccessible to me.

FAMILY APSEUDIDAE.

1880. *Apseudidae*, Sars, Arch. Naturg. Christian. vol. 7, p. 6.
1910. „ Stebbing, Tr. Linn. Soc. Lond. Zool. vol. 14, pt. 1,
p. 85. (References.)

GEN. APSEUDES, Leach.

1814. *Apseudes*, Leach, Edinb. Encycl. vol. 7, p. 404.
1902. „ Stebbing, S.A. Crust. pt. 2, p. 48.
1905. „ Richardson, Bull. U.S. Nat. Mus. No. 54, p. 37.
1907. „ Nobili, Mem. Acc. Torino, ser. 2, vol. 57, p. 411.
1911. „ Richardson, Bull. Mus. d'Hist. Nat. 1911, No. 7,
p. 518.
1912. „ id. Proc. U.S. Nat. Mus. vol. 42 (1912), p. 583.
1912. „ id. ibid. vol. 43 (1913), p. 159.
1913. „ Hansen, Danish Ingolf-Exp. vol. 3, pt. 3, p. 10.

APSEUDES DELTOIDES, n. sp.

(Plate XXVII. B.)

Body widest across the carapace which is composed of the head and 1st peraeon segment fused. Rostrum triangular with denticulate margins, the denticulations being quadrate and regular near the

base, but triangular and irregular apically. Eyes very small, of 5-6 facets.

Peraeon segments all equal in length, epimera narrow, only that on 2nd segment produced forwards as an acute spine.

Pleon segments nearly half the length of the peraeon segments, the 6th abruptly narrower than 5th, telson as long as broad, shortly and obtusely produced between the bases of the uropods, lateral margin with one small notch bearing a seta.

First antenna, 1st joint with 3-4 blunt spines on outer margin and 3 smaller acute ones on inner margin, 2nd joint rather more than $\frac{1}{4}$ length of 1st, 3rd shorter still, flagellum 12-jointed, accessory flagellum 6-jointed.

Second antenna, 2nd joint with large blunt tubercles on inner margin (ca. 4 near base and 3 near apex), 3rd, 4th, and 5th joints much narrower than 2nd, flagellum 7-jointed, scale on end of 2nd joint scarcely as long as 3rd joint, with apical setae.

Mandible, cutting-edge 4-dentate in left, entire in right, secondary cutting-edge in left entire, in right more or less bifid, spine-row with 4-5 spines, molar prominent, curved, palp strong, 1st and 2nd joints subequal, 3rd a little shorter, all three especially the 2nd and 3rd setose on inner margin.

First maxilla, outer lobe with ca. 8 spines, inner with 4 setae, with 2-jointed backwardly directed palp.

Second maxilla, outer and middle lobes subequal, inner lobe broader, rounded.

Maxilliped, 2nd joint stout, not quite as long as broad, inner plate quadrate, wider distally with 3-4 teeth on inner margin, 3rd joint short, 4th joint stout with 3 strong spines on outer margin, 5th joint oval, 6th joint obovate, apex of inner plate and inner margins of 4th-6th joints setose.

First peraeopod (gnathopod), 2nd joint subquadrate (3rd absent), 4th small, triangular, obliquely joined to 5th, which is as long as 2nd, 6th large and strong, projecting process (thumb) with 3 large teeth before the terminal tooth, 7th joint (finger) narrowing rapidly from base to apex, slightly curved. No epipod was observed on either of the peraeopods.

Second peraeopod stout, 2nd joint half as long again as wide, outer margin dentate and setose, 3rd small, inconspicuous, 4th as long as 2nd, with 1 spine on both inner and outer apices, 5th shorter with 2 spines on inner and 1 on outer apex, 6th a little longer than 5th, inner margin with 3 strong spines, outer margin with 2, 7th nearly as long as 6th, strong, scarcely curved. A small epipod at base of 2nd joint.

Third to seventh peraeopods slender, 2nd joint about 3 times as long as broad, 3rd very short, 4th and 5th subequal, each with 2 short spines on inner apex and 1 long one on outer apex (except in 7th peraeopod, where there are only a few setae on inner margin), 6th joint in peraeopods 3-6 as long as 4th and 5th together, inner margin with 3-4 spines, in 7th peraeopod 6th joint only a little longer than 5th and without spines on inner margin, 7th joint nearly as long as 6th, slightly curved.

Five pairs of pleopods with rami nearly twice length of peduncle, narrow oblong, setose, uniarticulate.

Uropods, peduncle equal to length of 6th pleon segment, inner ramus twice length of 6th pleon segment and telson together, ca. 12-jointed, outer ramus one-third length of inner, 2-jointed.

Length: 4 mm.; *breadth*: 1 mm.

Colour: In spirit, uniform whitish.

Locality: Gt. Fish Point Lighthouse N. by W., distant 7 miles, 49 fathoms. 4/9/01. One specimen. s.s. "Pieter Faure." (S.A.M. No. A248.)

The specific name refers to the shape of the rostrum, which is unique in both the genus and the family. Although I have succeeded in finding an epipod only on the 2nd peraeopod (and that only on the one side), I nevertheless assign this species to the genus *Apseudes* on account of the general conformity of its characters, although later it may have to be removed to another genus. In the absence of more and better material this cannot be done.

APSEUDES AVICULARIA, n. sp.

(Plate XXVII. A.)

Body, especially the anterior portions, with surface finely pitted. Head plus 1st peraeon segment longer than broad, smooth except for several grooves, rostrum triangular, broader than long, ending in a small point, the lateral margins slightly convex; antero-lateral angles of head not prominent, the eyes fairly large, well marked, black. Peraeon segments 2-7 gradually decreasing in width, their dorsal surfaces divided by shallow grooves into 5 low rounded humps, becoming less distinct on the posterior segments. Pleon segments 1-5 short, subequal, only the 5th with a lateral acute projection, 6th segment not distinct from telson, with a lateral acute projection at base and 2 pointed tubercles on upper surface, telson broader than long, ending in a stout pointed projection as long as telson and curving slightly upwards.

First antenna, basal joint stout with a few small serrations on inner margin, 2nd joint one-third length of 1st, 3rd joint shorter than 2nd, only 4 joints of the flagellum remaining, accessory flagellum 2-jointed.

Second antenna, 1st joint broad, 2nd narrower but equal in length to 1st, 3rd joint shortest, 4th and 5th successively longer, flagellum 3-jointed, 2nd joint longest, 3rd very small, scale on 2nd peduncular joint as long as 3rd joint, with 2 apical setae.

Upper lip with distal margin evenly rounded, epistome with a tubercle in centre.

Lower lip, basal portion broad, the lobe on the exterior distal angle ovate, margins minutely setulose, apex acute.

Mandibles similar to those figured by G. O. Sars for *A. spinosus*, M. Sars, cutting-edge on left mandible quadridentate, on right tridentate, secondary cutting-edge on left tridentate, 1st joint of palp short, 2nd and 3rd subequal, twice as long as 1st.

First maxilla, outer lobe with 6 spines in pairs, the backwardly directed palp with 2 long and 1 short setae (inner lobe lost in dissection).

Second maxilla, all three lobes equal in width.

Maxillipeds, 2nd joint largest, inner plate distally truncate and slightly emarginate, 5th and 6th joints nearly as broad as long, their apices broader than their bases, inner margins of inner plate, 4th and 5th joints, and apex of 6th setose.

First peraeopod (gnathopod), 2nd joint largest, ovate, (3rd absent) 4th and 5th slender, oblong, 5th longer than 4th, 6th and 7th together nearly equal to the 2nd joint, thumb of 6th joint with a square projection just before the apex on inner margin, a few setae on outer and inner margins, 7th joint evenly curved with a low rounded process just before the unguis.

Second peraeopod, 4th joint with one spine on both outer and inner apices, 5th joint with one spine on outer apex and 2 spines on inner margin, 6th joint not expanded, with 2 spines on outer apex and 4 on inner margin, 7th joint nearly as long as 6th, slightly curved. No epipods were observed either on the 1st or 2nd peraeopods.

Remaining peraeopods not very slender, 5th and 6th joints with 2 small spines on inner margin, 7th joint with a tubercle on inner margin before the unguis.

The number and structure of the pleopods could not be determined as they appear to be completely absent, owing probably to an injury either before or after capture.

Uropods with a short, rather stout peduncle as long as the terminal projection of the telson, of the inner ramus only 3 joints remain, outer ramus 2-jointed.

Length : 2.75 mm.

Colour : Whitish, the eyes black.

Locality : Sea Point, near Cape Town. 14/12/13. (K.H.B.)
Low-tide. One specimen. (S.A.M. No. A2660.)

The specific name in allusion to the resemblance of the hand of the first gnathopod to the avicularia of the Polyzoa, a resemblance common to most species of the genus, but especially striking in the present species.

In general shape *A. avicularia* bears some likeness to *A. timaruvia*, Chilton, and *A. multicarinatus*, Whitelegge, but the 6th pleon segment and telson offer ready marks of distinction, not only from the latter two species, but also from all others in the genus.

FAMILY TANAIDAE.

GEN. TANAIS, Audouin and M. Edwards.

For references to the family and the genus see Barnard, Ann. S.A. Mus. vol. 10, pt. 7, p. 197.

TANAIS ANNECTENS, n. sp.

(Plate XXVII. C.)

Body smooth and glabrous except for a band of plumose setae on the 1st and 2nd pleon segments. Head with 1st peraeon segment a little broader than long, anterior margin with a very small median projection, eyes well developed, dark. Peraeon segments all equal. Pleon consisting of 5 segments, the 4th only half the length of the preceding ones, telson broader than long, apex rounded, entire, lateral margin with 1 seta.

First antenna equal to width of head, 1st joint longest, 2nd $\frac{1}{3}$ as long as 1st, with apical tuft of long plumose setae, 3rd slender, half the length of 1st, 4th minute, apically setose.

Second antenna equal to length of head, 1st joint with strong setae on outer apex, 2nd short, 3rd a little longer than 1st, with long apical plumose setae, 4th joint equal to 1st, slender, 5th minute, apically setose.

Upper lip short, broad at base, narrowing rapidly to bluntly rounded, setose apex, margins concave.

Lower lip, outer margin of outer lobes deeply indented, inner lobes longer, apices setose.

Mandibles, apex of left bilobed, one of the lobes distinctly 5-dentate, the other entire, apex of right simple, entire, molar prominent, denticulate.

First maxilla, apex with ca. 8 spines and a few subterminal setae, backwardly directed palp strongly developed, with 10 long apical setae.

Second maxilla small, triangular, apex rounded, with 1 seta.

Maxilliped, 2nd joint half as long again as broad, with long apical setae, 3rd and 4th subequal, both apically setose, 5th broader than long, inner margin setose, 6th ovate, equal to 3rd and 4th together, inner margin setose, inner plate reaching to middle of 4th joint, inner apex with 2 outstanding setae, epipod oval, apex produced into a narrow pointed process.

First pereopod (gnathopod) similar in both sexes, incisive edge on thumb of 6th joint with a strong triangular process near base and a less distinct one near apex, 7th joint evenly but not strongly curved.

Second pereopod, 2nd joint long and slender, 6th joint slender, with straight unguis.

Third to seventh pereopods similar to 2nd, but 2nd joint becomes gradually stouter, 5th joint slender in 3rd and 4th pereopods, stout in 5th, 6th, and 7th, 6th joint small, with minute unguis in 3rd and 4th pereopods, in 5th, 6th, and 7th stout, with strong hooked unguis, 4th joint in all these pereopods with 2 rows of stout spines, 6 in each, on lower apical surface.

All three pairs of pleopods, outer margin of smaller branch completely fringed with setae.

Uropods 4-jointed, 1st and 2nd joints subequal, 3rd a little shorter, 4th still shorter.

Length : 6 mm. ; *breadth* : 1.25 mm.

Colour : Greyish-white, head, pleon and median line on peraeon darker, slate-colour, eyes dark grey-black.

Locality : Dassen Island. April 1897. (R. M. Lightfoot.) ♂♂ and ♀♀ with ova. Buffel's Bay, False Bay. 28/9/13. (K.H.B.) 1 ♂. Low-tide. (S.A.M. Nos. A2550 and A2547.)

This species is intermediate between, and combines the characters of *T. cavolinii*, M. Edw., and *T. philetacrus*, Stebbing, whence the specific name. In the shape of the cephalic segment the present species is nearest *T. cavolinii*, which it also resembles in having several setae on the palp of the first maxilla and a complete fringe of setae on the smaller branch of the pleopods. On the other hand,

it resembles *T. philetaerus* in having 4-jointed uropods and non-denticulate ungues on the 5th, 6th, and 7th peraeopods.

FAMILY GNATHIIDAE.

GEN. GNATHIA, Leach.

For references to family and genus see Barnard, Ann. S.A. Mus. vol. 10, pt. 7, p. 200.

GNATHIA AFRICANA, Brnrd.

(Plate XXXVIII. E.)

1914. *Gnathia africana*, Barnard, Ann. S.A. Mus. vol. 10, pt. 7, p. 201, pl. XVII. B (σ and larva).

Since the description of the male and the larva was published, the female has been discovered.

Female. Anterior margin of head semicircular, entire. 2nd and 3rd peraeon segments short, 4th, 5th and 6th subequal in length, indistinctly separated, anterior margin of 4th, posterolateral angles of 5th and posterior margin of 6th pigmented and more strongly chitinized. Pleon equal to 6th peraeon segment. Telson narrower than in σ , 2 setae on apex and one on lateral margin, just beyond the middle.

First antenna as in σ , but 2nd joint of flagellum as long as 3rd joint of peduncle.

Second antenna as in σ , but 4th joint of peduncle proportionately longer, equal to 2nd and 3rd together.

Maxilliped. Second joint somewhat produced on inner apical angle, so that inner margin of 1st joint of palp is not free, palp rather shorter and stouter than in σ , outer margin decidedly more curved, due to 2nd joint being twice as broad as long, 4th joint more triangular than in σ , not incurved.

First peraeopod (gnathopod) composed apparently of 3 joints. First joint curved, with prominent spine on outer apical angle, 2nd joint half 1st and more slender, outer apical angle with an acute point and 2 setae, 3rd joint nearly as long as 2nd, 2 setae on apex and a row of very fine spinules on outer margin. Marsupial plate oval, about same length as gnathopod.

Rest of the peraeopods as in σ , but with minor differences; tubercles only on 4th joint, 5th joint with a strong pectinate spine and a simple seta arising together just beyond the middle of inner

margin, 6th joint with armature similar to that of ♂ but the spines all acute.

Uropods. Both rami extend a little beyond telsonic apex, inner longer than outer, both with long simple setae on outer and inner distal margins.

Length : 3 mm.

Colour : Whitish, the head, pereaeon segments 1 and 2 and the strongly chitinized parts of 4, 5, and 6, and the pleon grey.

Locality : St. James, False Bay. 15/2/14. (K.H.B.) 23♂♂, 2♀♀ with embryos, and 4 larvae. Sea Point near Cape Town. 15/11/13. 3 larvae, and 26/2/14. 1♂ and 1 ovigerous ♀. (K.H.B.) (S.A.M. Nos. A2693, A2611, and A2717 respectively.)

The original ♂ and larvae were found on Holothurians, but both sexes have since been found at St. James living in great abundance in the tubes of a species of Serpulid worm encrusting the rocks near low-tide. The males are far more numerous than the females. They lie in the mouths of the tubes, which they just about fill up, with the head projecting.

FAMILY ANTHURIDAE.

1814. *Anthuridae*, Leach, Edinb. Encycl. vol. 7, pp. 387-433.
 1886. „ Norman and Stebbing, Tr. Zool. Soc. Lond. vol. 12, p. 119.
 1900. „ Stebbing in Willey's Zool. Res. vol. 5, p. 618 (Synonymy.)
 1905. „ Richardson, Bull. U.S. Nat. Mus. No. 54, p. 62.
 1910. „ Stebbing, Tr. Linn. Soc. Lond. Zool. vol. 14, pt. 1, p. 90. (References.)

GEN. CYATHURA, Norman & Stebbing.

1886. *Cyathura*, Norman & Stebbing, l.c. pp. 121, 124.
 1893. „ Stebbing, Hist. Crust. p. 331.
 1900. „ id. l.c. p. 619.
 1904. „ id. Spolia Zeylanica, vol. 2, pt. 5, p. 9.
 1905. „ Richardson, Bull. U.S. Nat. Mus. No. 54, p. 63.

CYATHURA ESTUARIA, n. sp.

(Plate XXVII. D.)

Body smooth, glabrous. Head as long as broad, half length of 1st pereaeon segment, anterior margin excavate with median pro-

jection not extending beyond the antero-lateral angles, eyes oval, black. Peraeon with 1st segment longer than the others, segments 2-5 subequal and a little longer than head, segments 6 and 7 subequal and rather shorter than preceding segments, anterior margin of segments 3-5 (in the large specimen segments 4 and 5) with a small pit. Pleon segments 1-5 completely fused, without trace of sutures, equal in length to 7th peraeon segment. Telson with straight sides, tapering gradually to the bluntly rounded apex, margins setose, the apical setae being the longest.

First antenna as long as head, 1st joint stout, 2nd and 3rd slender, 3rd a little shorter than 2nd, flagellum as long as 3rd joint, 3-jointed, the 2nd joint by far the longest, 3rd apically setose.

Second antenna rather longer than head, 2nd joint stout and twisted, 3rd and 5th subequal, 4th shorter, flagellum apparently only 1-jointed, setose.

Upper lip triangular, the incision nearly in the median line.

Lower lip, lobes apically truncate, inner apical angle well marked, not setose.

Mandibles, cutting-plate with many fine backwardly directed denticulations, molar fairly prominent, palp strong, 1st joint short, 2nd and 3rd subequal and twice length of 1st, inner margins setulose, apex of 3rd with stronger setae.

First maxilla, apex with one strong spine and 5 smaller ones.

Second maxilla small, triangular, the subacute apex with 1 seta.

Maxilliped, 1st joint distinguishable in the large specimen but not in the smaller, 2nd joint longest, 3rd a little shorter, both margins setose, the inner setae being the stronger, 4th joint small, with 2 strong inwardly directed setae on apex, epipod small, rounded.

First peraeopod, 5th joint narrow, apex pointed and curving slightly outwards, with subapical setae, 6th joint narrow-oval, tapering distally, inner margin (palm) with 1 outwardly curving tubercular spine and setae in front of and behind this, 7th joint slender, reaching to apex of 5th joint.

Second and third peraeopods, 5th joint small, underriding 6th, without any external margin, 6th joint with 1 doubly denticulate spine on inner apex, 7th joint with inner margin denticulate.

Fourth to seventh peraeopods similar to 2nd and 3rd, but 5th joint has a short external margin, peraeopod 7 is longer than rest

and has the 2nd joint broader and both margins of 6th and 7th joints denticulate.

First pleopod with 5 hooked spines on inner apex of peduncle, operculate, covering the other pleopods, obovate, the rounded distal margin fringed with plumose setae.

Uropods, lower (inner) ramus as long as telson, 2nd joint as long as broad, margins entire, setose; upper (outer) ramus reaching just beyond apex of 1st joint of lower ramus, ovate, a little more than twice as long as broad, apex subacute, margins entire, setose.

Length: 27 mm. and 9 mm.; *breadth*: 3 mm. and 1 mm.

Colour: The large specimen in spirit, uniform dirty pink; the smaller ones (alive) whitish with brown mottlings on the head, peraeon, pleon, and uropods.

Locality: Buffalo River (East London), 2 miles above jetty (tidal). One nonovigerous ♀ (the large specimen referred to above). 18/12/98. s.s. "Pieter Faure"; Zwartkops River (Algoa Bay). Several immature specimens. May, 1913. (Mrs. Patterson.) (S.A.M. Nos. A68 and A2269.)

Two other species of this genus are known: *C. carinata* (Kröyer) from both sides of the N. Atlantic, and *C. pusilla*, Stebbing, 1904, from Ceylon. The present species comes very near to the former and differs only in the following respects: it is narrower in proportion to its length, 1:9 whereas Miss Richardson gives 1:7 for *C. carinata*; the 2nd joint of lower ramus of uropod is as broad as long, not broader than long; the apex of the 5th joint of 1st peraeopod and the tubercle on the palm of 6th joint are more prominent; and the lower lip is parallel-sided, not suddenly expanded at the distal half and the inner angles of the lobes are rectangular not rounded (cf. figure in Norman and Stebbing, pl. 27, fig. 3 lbi.).

C. pusilla is easily separated from both the other species in that it has the 6th peraeon segment *longer* than the 7th and is without eyes.

EXANTHURA, n. g.

Very near to *Cyathura*, but differing in having the flagella of 1st and 2nd antennae well developed. Maxilliped 4-jointed (including basal joint), mandible with obsolete molar and 3rd joint of palp shorter than 2nd, flagellum of 1st and 2nd antennae well developed, 1st peraeopod subchelate, other peraeopods ambulatory, pleon segments with distinct sutures, 1st pleopods opercular.

EXANTHURA MACRURA, n. sp.

(Plate XXVIII, A.)

Body narrow, smooth, glabrous. Head a little longer than broad, with small median projection, eyes oval, prominent. Peraeon segments flat dorsally, with a pit in the middle (not on the anterior margin) of segments 4-6, ventrally keeled, 1st segment a little longer than head, segments 2 and 3 subequal, a little longer than 1st, segments 4 and 5 subequal, segments 6 and 7 shorter, posterior segments wider than the anterior ones.

Pleon segments 1-5 as long as 6th peraeon segment, but broader than any of the peraeon segments, fused but the sutures distinct. Telson very long (5 mm. or nearly one-quarter the total length of the animal), equal to peraeon segments 5-7 together, rather spatulate, broader distally than basally, distal margin truncate, postero-lateral angles obtuse, with short plumose setae.

First antenna, 1st joint largest, with a large triangular recurved process on outer margin, 2nd and 3rd together equal to 1st, flagellum as long as peduncle, 9-jointed, 1st joint short.

Second antenna, 2nd joint largest, twisted and hollowed for the reception of 1st antenna, 3rd and 4th subequal, 5th nearly equal to 3rd and 4th together, flagellum a little longer than 5th peduncular joint, 6-jointed, 3rd-5th joints of peduncle and whole of flagellum sparsely setose.

Upper lip triangular, distal margin cleft.

Lower lip, lobes with a small point on inner apical angle.

Mandibles, cutting edge entire, cutting-plate with a feebly convex margin, not toothed but with a series of blunt tubercles, molar nearly obsolete, palp with 2nd joint half as long as 1st, 3rd subequal to 1st, setose.

First maxilla 6-toothed.

Second maxilla small, narrow, apex with 2 setules.

Maxilliped 4-jointed, 1st joint distinct, 2nd and 3rd stout, subequal, 4th rounded, apex with a few setules, epipod oval, a little more than half length of 2nd joint.

First peraeopod, inner apex of 2nd joint produced into an obtuse projection, 6th elongate and much produced backwards, palm short, with scattered setae, the basal half forming a rounded lobe, 7th joint reaching to middle of lobe on palm, unguis to middle of 5th joint, which is apically setose.

Second and third peraeopods, 2nd and 3rd joints subequal, 5th underriding 6th, which is parallel-sided with a short, stout spine on inner apex.

Fourth to seventh peraeopods similar to 2nd and 3rd, but 5th joint not underriding 6th, apex of 5th and 6th each with 2 spines, 7th not appreciably shorter or more slender than preceding ones.

First pleopod very large, 6 mm. long, opercular, covering the other pleopods, margins densely fringed with plumose setae.

The other pleopods small, 3 mm. long, lanceolate.

Uropods, inner ramus large, nearly as long as telson, increasing in width distally, 2nd joint almost as long as 1st, apex obliquely truncate, with short plumose setae, outer ramus reaching to outer distal angle of 2nd joint of inner ramus, lanceolate, twice as long as broad, inner margin straight, outer convex and rather angular, with plumose setae.

Length: 22 mm.; *breadth*: 1st peraeon segment 1.25 mm., 7th peraeon segment 2 mm.

Colour: Whitish with brown mottling on head and peraeon segments, a well-marked dark spot behind each of the pits on 4th-6th segments.

Locality: Sea Point near Cape Town. 12/1/14. (K.H.B.) 1 ♀. (S.A.M. No. A2667.)

Gen. ANTHELURA, Norman & Stebbing.

1886. *Anthelura*, Norman & Stebbing, Tr. Zool. Soc. Lond. vol. 12, pp. 121, 126.

1893. ,, Stebbing, Hist. Crust. p. 331.

1905. ,, Richardson, Bull. U.S. Nat. Mus. No. 54, p. 68.

ANTHELURA REMIPES, n. sp.

(Plate XXVIII. B.)

Body long and very narrow, smooth, glabrous. Head longer than broad, $\frac{2}{3}$ length of 1st peraeon segment, anterior margin rather deeply excavated on either side of the median projection, which scarcely reaches to the level of the antero-lateral angles, eyes absent.

Peraeon keeled ventrally, segments 1-3 and 7 subequal, segments 4 and 5 subequal and longer than preceding segments, segment 6 intermediate in length, segments 6 and 7 with a broad shallow impression on the posterior part.

Pleon segments 1-6 nearly as long as peraeon segment 7, fused, the sutures visible only at the sides, 5th segment a little longer than the others, telson thick and convex above, distal third narrowing

rapidly to the subacute apex, which bears two bunches of long setae, 4 in each, margins entire with fine scattered setules.

First antenna not quite as long as head, 1st joint stout, twice as long as broad, outer margin with long setae, 2nd shorter than 3rd, outer apex of 3rd with 2 long setae, flagellum $\frac{2}{3}$ length of 1st peduncular joint, 7-jointed, 1st joint very wide and short, appearing like a 4th joint of the peduncle, 2nd longest, rest decreasing gradually, apex setose.

Second antenna as long as head, 1st joint short, 2nd swollen and hollow on one side, 3rd and 4th subequal, $\frac{1}{3}$ length of 2nd, 5th a little longer, flagellum equal to 5th peduncular joint, 6-jointed, but only the 1st is really distinct, the rest minute and setose.

Upper lip triangular, cleft symmetrical, apices with small stout spines.

Lower lip, lobes broad, apically truncate, inner angles with 2 recurved spines and a few setules, rounded outer angles with a tuft of setae.

Mandibles, cutting-edge tridentate, cutting-plate with ca. 12 blunt teeth, molar prominent, palp rather slender, 1st joint $\frac{2}{3}$ length of 2nd, 3rd only $\frac{1}{3}$ length of 1st and very slender, with 3-4 apical spines.

First maxilla rather stout, apically bent, 1 strong and 5 smaller apical teeth.

Second maxilla very small, stout, triangular, with 2 apical setae.

Maxilliped, 1st joint distinct, 2nd short and broad, inner plate well developed, half the length of 2nd, apically rounded, with a few marginal setae, 3rd joint short, 4th nearly as long as 2nd, distal margin oblique, 5th small with 1 spine and 3 apical setae; there is very minute 6th joint with 3 apical setae, but it is doubtful if it is really separate from the 5th joint. Epipod subcircular, nearly reaching apex of 2nd joint.

First peraeopod stout, 2nd and 3rd joints subequal, 4th short, outer margin angular, 5th twice length of 4th, completely under-riding 6th, inner apex produced into a blunt lobe, inner margin of 5th with small square pellucid plates set closely together, but interrupted in places by long setae, on the apical lobe these plates are finely fimbriate at the edges, 6th joint elongate oval, tapering rapidly distally, palm straight, setose, 7th joint shorter than palm, bearing a stout unguis as long as itself and reaching to the apical lobe of 5th joint.

Second and third peraeopods, 2nd and 3rd joints subequal, 4th half as long, distally produced on outer margin, 5th under-riding 6th,

inner margin convex with 1 apical spine, 6th $\frac{3}{4}$ length of 3rd, only half as long again as broad, parallelogram-shaped, palm straight with 1 apical spine, 7th joint as long as palm, unguis short and stout, inner margins of 3rd-6th joints with long setae.

Fourth to sixth peraeopods more slender than the 2nd and 3rd peraeopods, 2nd and 3rd joints subequal, 4th and 5th subequal, $\frac{2}{3}$ length of 3rd, half as long again as broad, 5th with a large spine at base and another at apex, each spine bearing a cilium near its end, 6th joint nearly as long as 5th, but only half as wide, apex with 1 stout and several smaller, serrulate spines, 7th joint half the length of 6th, slender, unguis small, with a tuft of setae in place of the secondary unguis, inner margins of 3rd-6th joints with long setae.

Seventh peraeopod longer and more slender than the preceding peraeopods, 2nd joint a little longer than 3rd, 4th and 5th subequal, twice as long as broad, 6th as long as 5th, slender, 7th half length of 6th.

First and second pleopods with 4 hooked spines on inner apex of peduncle, 1st pleopod opercular, outer ramus ovate, inner margin straight, inner ramus $\frac{3}{4}$ length and $\frac{1}{2}$ width of outer; 2nd pleopod (♀) narrower, rami subequal, obscurely 2-jointed.

Uropods, inner ramus reaching to end of telson, both joints subequal, longer than broad, margins entire, inner apical margin of 1st joint setose, apex of 2nd joint with very long setae chiefly on outer distal margin; outer ramus transversely ovate, twice as broad as long, margins entire, setose.

Length: 30 mm.; *breadth*: 2 mm.

Colour: In spirit, dull grey-brown.

Locality: Lion's Head SE. $\frac{1}{2}$ E., distant 42 miles (off Cape Peninsula). 156 fathoms. 13/3/00. 1 nonovigerous ♀. s.s. "Pieter Faure." (S.A.M. No. A58.)

GEN. APANTHURA, Stebbing.

1900. *Apanthura*, Stebbing in Willey's Zool. Res. vol. 5. p. 621.

1910. ,, id. Tr. Linn. Soc. Lond. Zool. vol. 14, pt. 1, p. 93.

APANTHURA AFRICANA, n. sp.

(Plate XXVIII. C.)

Body very narrow in proportion to length. Head half length of 1st peraeon segment, longer than broad, eyes absent.

Peraeon segments 1 and 4-6 longest, subequal, 2, 3, and 7 also subequal, all segments ventrally keeled.

Pleon segments 1-5 equal to 7th peraeon segment, fused, the sutures distinct, telson ovate, nearly twice as long as broad, tapering to an acute apex with ca. 4 apical setae.

First antenna, 1st joint slender, not swollen, 2nd $\frac{1}{3}$ length of 1st, 3rd $\frac{1}{2}$ length of 1st, flagellum equal to 3rd peduncular joint, 1st joint very small, 2nd longest, 3rd minute, setose.

Second antenna, 5th joint slightly longer than 3rd and 4th, which are subequal, flagellum equal to 4th joint, obscurely 3-jointed, apex setose.

Upper lip symmetrically cleft, apices spinulose.

Lower lip, lobes not very broad, outer margin setose, apices with a small point.

Mandibles, cutting-edge indistinctly bidentate, cutting-plate 5-dentate, molar fairly prominent, palp with 2nd joint longer than 1st, 3rd shorter than 1st, apex with 3-4 setae.

First maxilla normal. Second maxilla minute with 1 apical seta.

Maxilliped, 1st joint indistinguishable, 3rd short, 4th a little shorter than 2nd, 5th small with 3-4 apical setae, no inner plate visible, epipod small, oval.

First peraeopod, 5th joint apically produced, setose on inner margin, 6th ovate, palm with distal half abruptly excavate, setose, 7th joint short and stout, reaching half-way along palm, unguis short and very stout.

Second and third peraeopods, 2nd joint longest, 5th completely underriding 6th, its apex truncate, setose, 6th stout, inner margin setose and beset with regular denticulations, which under a high power are seen to be fimbriate, 1 apical serrulate and ciliate spine.

Fourth to sixth peraeopods similar, but 5th joint not completely underriding 6th, with an apical spine.

Seventh peraeopods, both incomplete in the single specimen.

First pleopod with 6 hooked spines on inner apex of peduncle.

Uropods, inner ramus a little longer than telson, narrow, 2nd joint shorter than 1st, half as long again as broad, apex subacute, outer margin setulose; outer ramus a little longer than 1st joint of inner ramus, obliquely ovate, inner margin setose, distally emarginate.

Length: 17 mm.; *breadth*: 1.5 mm.

Colour: In spirit, dirty pink.

Locality : Paternoster Point SE $\frac{3}{4}$ S., distant 9 miles (off Saldanha Bay). 80 fathoms. 17/3/02. 1 nonovigerous ♀. ss. "Pieter Faure." (S.A.M. No. A63.)

APANTHURA DUBIA, n. sp.

(Plate XXVIII. D.)

Body very narrow. Head two-thirds length of 1st peraeon segment, eyes small, round, black. Peraeon segments decreasing slightly in length posteriorly, the 7th shortest. Pleon segments 1-5 equal to 7th peraeon segment, fused but with sutures distinct at least at the sides. Telson twice as long as broad, ovate, apex subacute, setose.

First antenna, 1st joint not twice length of 2nd, flagellum 3-jointed.

Second antenna, 5th joint a little longer than 3rd or 4th, which are subequal, flagellum 1-jointed setose, possibly 2-jointed but suture hidden by setae.

Mouth parts as in *A. africana*, but epipod of maxillipeds larger.

First peraeopod, 5th joint not apically produced, 6th joint narrow ovate, palm straight, setose, with a small subacute lobe at base.

Second and third peraeopods, 5th joint completely underriding 6th, apical spine on 6th joint strong, inner margin apparently without the fimbriate denticulations seen in *A. africana*.

Seventh peraeopod more slender than preceding peraeopods, 5th joint not underriding 6th, inner margin of 6th joint spinulose, both margins of 7th joint spinulose.

First pleopod, inner angle of peduncle with 3 hooked spines.

Uropods, lower ramus a little longer than telson, 2nd joint nearly as long as 1st, twice as long as broad, apex rounded, apex and outer margin setose; upper ramus a little longer than 1st joint of lower ramus, apically indented, all margins setose.

Length : 10 mm. ; *breadth* : 1 mm.

Colour : Yellowish-white, head and peraeon segments with a triangular group of more or less confluent grey spots, on the head and first three segments the base of the triangle is on the anterior margin, but on the four posterior segments on the posterior margin; eyes black.

Locality : St. James, False Bay. (Dr. W. F. Purcell.) April, 1901. 2 ♀♀. Low-tide under stones. (S.A.M. No. 8826.)

This may possibly be identical with *Anthura laevigata*, Stimpson, although it does not agree in having the "first three pairs of legs

stout, with equal, sub-cheliform hands." Nor are the "eyes red." The description of the abdomen, however, agrees well, and the "few crimson spots on the extremities" of the body might be construed in harmony with the colouration of the present species. Hilgendorf (Monatsber. Berl. Ak. Wiss. 1878, p. 847), refers Stimpson's *A. laevigata* and *A. punctata* to the genus *Paranthura*.

It is also very near to *Apanthura sandalensis*, Stebbing (Willey's Zool. Res. pt. 5, p. 621, pl. 65 A.), from the Loyalty Islands. In fact the only difference is that *A. dubia* has the inner apex of 5th joint of first peraeopod (gnathopod) bluntly truncated and a pointed lobe at base of the palm of 6th joint, whereas in *A. sandalensis* the apex of 5th joint is pointed and the palm is plain. In *A. dubia* the lateral margins of the telson are proximately slightly concave, in *A. sandalensis* straight; but this is hardly a point of importance.

MESANTHURA, n. g.

Very near *Apanthura* but distinguished by the complete fusion of the pleon segments without any trace of segmentation, and the mandibular palp having the 3rd joint longer than 1st.

Maxilliped 5-jointed (including basal joint).

Peraeopods 4-7 with 5th joint underriding 6th as in anterior peraeopods, but not to such an extent.

Flagellum of 1st antenna in ♂ enlarged, multiarticulate, densely setose, in ♀ rudimentary.

Flagellum of 2nd antenna rudimentary in both sexes.

MESANTHURA CATENULA (Stimpson).

(Plate XXIX. A.)

1855. *Anthura catenula*, Stimpson, Proc. Ac. Nat. Sci. Philad. vol. 7, p. 393.

1887. ,, ,, Beddard, Challenger Rep. vol. 17, p. 143 (note).

1910. ,, ,, Stebbing, Gen. Cat. S.A. Crust. p. 420.

Body smooth, glabrous. Head $\frac{3}{4}$ length of 1st peraeon segment, anterior margin excavate, with the median process not extending beyond the antero-lateral angles; eyes oval, black. Peraeon segments subequal. Pleon segments 1-5 completely fused in both sexes, the only indication of the composite nature being very faint lines of pigment, no trace of any grooves. Telson with slightly sinuous sides, apex subacute, rounded, setose.

First antenna, 1st joint longest, 3rd shorter than 2nd in ♂, 2nd shorter than 3rd in ♀, flagellum in ♂ enlarged, reaching to posterior margin of head, twice as long as peduncle, composed of 1 basal joint and ca. 12 coalesced joints densely setose, in ♀ as long as 2nd and 3rd peduncular joints together, apparently only 2-jointed, apex setose. Beddard incidentally gives the number of flagellar joints, in specimens which he assigns to this species, as 12-14 in ♂ and 3-4 in ♀.

Second antenna longer than 1st antenna in ♀, 1st joint smaller than 2nd, which is not strongly twisted or hollowed, 3rd and 4th subequal, 5th equal to 3rd and 4th together, flagellum 3 jointed, about equal to 5th peduncular joint, in ♀ 1st joint largest, 2nd and 3rd setose, in ♂ 1st strongly setose, 2nd longest, without setae, 3rd short, with 2-3 apical setae.

Upper lip symmetrically cleft.

Lower lip, lobes with a small point on inner apical angle, outer margin setose.

Mandibles, cutting-edge apparently entire, cutting-plate with 6 denticulations, molar stronger in left, almost obsolete in right, palp strong, 1st joint short, 3rd joint a little more than half length of 2nd, setose.

First maxilla with 1 large and 5 smaller apical teeth.

Second maxilla conical, apex acute.

Maxilliped consisting of 5 joints, 1st small but distinct, 2nd longest, 3rd shortest, 4th nearly as long as 2nd, 5th equal to 3rd, apically rounded, suture between 4th and 5th oblique.

First peraeopod, 3rd joint equal to 6th, 5th triangular, its apex prominent, truncate, setose, 6th joint large, oval, palm distally emarginate, the proximal half setose, 7th joint fitting into the emargination of palm, unguis as long as 7th joint and slightly overlapping apex of 5th.

Second and third peraeopods, 3rd joint longer than 2nd, 5th underriding 6th, which has a stout spine on inner apex and fine spinules along the inner margin.

Fourth to seventh peraeopods, rather longer than the anterior peraeopods, 4th joint longer and more slender, 5th triangular, with 1 spine on inner apex, to some extent underriding 6th.

First pleopod opercular, inner apex of peduncle with 6 hooked setae, covering ramus obovate, distal margin rounded, strongly setose, concealed ramus narrow tapering, not as long as and basally only half the width of covering ramus.

Second pleopod ♂, rami equal, apically rounded, male stylet a little longer than rami, slightly thickened at apex.

Uropods, inner ramus as long as telson, 2nd joint longer than broad, apex rounded, setose, inner distal margin serrulate, outer ramus reaching to just beyond apex of 1st joint of inner ramus, apex strongly indented, outer margin serrulate and densely setose.

Length : Up to 20 mm.

Colour : The very distinctive markings have been well described by Stimpson. The pleon has a black band on its posterior half ; the 6th segment is white, telson black, outer ramus of uropods black with white apex, inner ramus with both joints black at base, white at apex.

Locality : Kalk Bay and St. James, False Bay (R. M. Lightfoot, Dr. W. F. Purcell, K.H.B.) ; Sea Point, near Cape Town. 26/2/14. (K.H.B.) 2 juv. (S.A.M. Nos. 8825, A250, A2106 and A2719.)

Stimpson's specimens were from Simon's Bay in False Bay.

Gen. LEPTANTHURA, G. O. Sars.

1897. *Leptanthura*, G. O. Sars, Crust. Norway, vol. 2, p. 47.

1910. ,, Hodgson, Nat. Ant. Exp. vol. 5, p. 8.

1911. ,, Richardson, Bull. Mus. d'Hist. Nat. 1911, No. 7,
p. 522.

LEPTANTHURA FAUREI, n. sp.

(Plate XXIX. B.)

Body slightly punctate, otherwise smooth, glabrous. Head a little broader than long, $\frac{2}{3}$ length of 1st peraeon segment, with small median rostrum and rounded antero-lateral angles, eyes absent.

Peraeon segments ventrally keeled, the anterior ones more strongly so than the posterior ones, 2nd and 3rd segments subequal, a little longer than 1st, 4th, 5th, and 6th subequal and longer than 3rd, 7th equal to 1st.

Pleon segments united in both sexes, with distinct sutures, 5th segment twice length of any of the preceding, segments 1-5 together equal to 7th peraeon segment. Telson broad, apex rounded with small median notch, in which are situated 4 setae.

First antenna reaching to middle of 1st peraeon segment in ♂, in ♀ to posterior margin of head, 1st joint stout, 2nd and 3rd subequal in ♀, 3rd a little longer than 2nd in ♂, flagellum in ♂ 21-jointed, twice as long as peduncle, first 2 joints triangular, remainder densely setose, in ♀ 3-jointed, 1st joint much the longest, apex setose.

Second antenna, 3rd and 5th joints subequal, 4th a little shorter, flagellum equal to last peduncular joint, obscurely 3-jointed, flagellum and all peduncular joints except 1st apically setose.

Upper lip tapering to the blunt apex, sides concave, distal one-quarter abruptly narrowed.

Lower lip with the lobes long and narrow, tapering to fine acute apices, outer margins rather densely setose.

Mandibles elongate, triangular, with acute piercing apex, palp stout, 2nd joint thrice as long as 1st, 3rd shorter than 1st, with 2 apical pectinate setae.

First maxilla long, very narrow, apex serrulate on inner margin.

Maxilliped, 1st joint indistinguishable, 2nd $3\frac{1}{2}$ times as long as 3rd joint which is obliquely bevelled off on the outer margin to the acute, setiferous apex, 4th joint barely distinguishable, inner apex of 2nd joint with 4 long setae.

First peraeopod, 2nd and 3rd joints subequal, $2\frac{1}{2}$ times as long as wide, both margins of 3rd setose, 4th short but wide, basal margin semicircular, 5th joint with 6 serrate spines and long setae on inner margin, 6th joint oval, produced at base of palm into a strong tubercle bearing a serrulate spine on its apex, palm slightly convex, with serrulate spines and short apically recurved setae, 7th joint stout, abutting on tubercle at base of palm, inner margin with regularly spaced groups of short stout setae, unguis short; tubercle at base of palm not nearly so prominent in ♀.

Second and third peraeopods similar to first, but not quite so stout, 4th joint not so broad in comparison with its length, inner margin of 5th joint with only 2 spines, no tubercle at base of palm of 6th joint, outer margin of 6th strongly setose, 7th joint proportionately longer.

Fourth to seventh peraeopods, 2nd and 3rd joints subequal, 3rd setose on both margins, 4th joint about half the length of 3rd, inner margin and outer apex setose, 5th underriding 6th, inner margin with 2 spines and long setae, 6th equal to 4th and 5th together, inner margin with 4 spines and setae. The spines on the 5th and 6th joints are of the ciliate type described by Norman & Stebbing (Tr. Zool. Soc. Lond. vol. 12, p. 131) in *Paranthura tenuis*, G. O. Sars (= *Leptanthura tenuis*, G. O. Sars).

First pleopod with 4 hooked setae on inner apex of peduncle, outer ramus covering inner ramus and the other pleopods, ovate, inner ramus nearly as long as outer and half as wide, both rami apically setose.

Second pleopod, rami subequal, apices rounded, with indications

of a suture about $\frac{2}{3}$ from base, male stylet arising half-way along inner margin, slender, nearly straight, apex reaching to end of ramus, incurved.

Uropods, inner ramus extending a little beyond telsonic apex, 2nd joint longer than broad, apex bluntly acute, margins not crenulate, outer margin and base of inner setose; outer ramus extending a little beyond apex of 1st joint of inner ramus, as broad as long, apically indented, margins neither crenulate nor densely setose, the two rami arching over telson and meeting in the middle line.

Length: ♂ 26 mm., ovigerous ♀ 19 mm.; *breadth*: ♂ 2 mm., ♀ 1.5 mm.

Colour: In spirit, uniform pinkish.

Locality: 33° 52' S. 25° 50' E. (Algoa Bay). 25 fathoms. 8/12/98. 1 ♀; 33° 3' S. 27° 57' E. (off East London). 32 fathoms. 28/12/98. 2 ♂♂, 4 ♀♀; Umhlangakulu River mouth NW. by W., distant 7 miles. 50 fathoms. 14/3/01. 1 ♂, 1 ovigerous ♀, and 5 immature; Cove Rock N. $\frac{3}{4}$ E., distant 5 miles. 43 fathoms. 2/8/01. 2 ♂♂, 1 ♀, and 3 immature; Keiskamma Point NE. by E., distant 5 miles. 33 fathoms. 27/8/01. 1 ♀. s.s. "Pieter Faure." (S.A.M. Nos. A64, A60, A61, A57, and A62 respectively.)

Named after the Cape Government trawler which collected the specimens.

The only other species of the genus are: *L. tenuis* (G. O. Sars), 1872 (=the *Paranthura tenuis* of Norman & Stebbing), *L. glacialis*, Hodgson, 1910, and *L. truncata*, Richardson, 1911.

GEN. PARANTHURA, Bate & Westwood.

1866. *Paranthura*, Bate & Westwood, Brit. Sessile-eyed Crust. vol. 2, p. 163.
1870. ,, Dohrn, Unters. über Bau u. Entwick. d. Arthrop. p. 91.
1886. ,, Norman & Stebbing, Tr. Zool. Soc. Lond. vol. 12, pp. 122, 129.
1886. ,, Beddard, Chall. Rep. vol. 17, p. 143.
1893. ,, Stebbing, Hist. Crust. p. 332.
1900. ,, id. in Willey's Zool. Res. v. p. 622.
1901. ,, Whitelegge, Sci. Res. "Thetis," p. 216.
1905. ,, Richardson, Bull. U.S. Nat. Mus. No. 54, pp. 63, 75.
1910. ,, id. Proc. U.S. Nat. Mus. vol. 37, p. 77.

PARANTHURA PUNCTATA (Stimpson).

(Plate XXIX. C.)

1855. *Anthura punctata*, Stimpson, Proc. Ac. Nat. Sci. Philad. vol. 7, p. 392.
1878. *Paranthura* ,, Hilgendorf. Monatsber. Berl. Ak. Wiss. 1878, p. 847.
- 1910 *Anthura* ,, Stebbing, Gen. Cat. S.A. Crust. p. 419.

Body smooth, glabrous, narrower in front than behind. Head as broad as long in ♀ (a little longer than broad in other specimens, which may be young ♂ ♂), $\frac{2}{3}$ length of 1st peraeon segment, eyes large, round.

Peraeon keeled ventrally, 1st segment longer than either 2nd or 3rd, which are subequal, 4th and 5th subequal, longer than 1st, 6th equal to 2nd, 7th half the length of 6th.

Pleon segments 1-5 equal to 7th peraeon segment, fused, with distinct sutures. Telson gently tapering to subacute, densely setose, apex.

First antenna as long as head, 1st joint $2\frac{1}{2}$ times as long as broad, not swollen, 3rd joint a little longer than 2nd, flagellum as long as peduncle, 6-jointed, all the joints apically setose.

Second antenna longer than head, 3rd and 4th joints subequal, 5th a little longer, flagellum equal to 5th peduncular joint, consisting of 1 stout setose joint and 1 or 2 minute, obscure, terminal joints concealed in setae.

Upper lip tapering, distal quarter suddenly narrowed, apex blunt.

Lower lip, apices of the lobes pointed, entire, outer distal margin setose.

Mandibles slender, palp strong, 1st joint shortest, 3rd $\frac{3}{4}$ length of 2nd, with apical and marginal spines, inner apex of 2nd with 3 outstanding setae.

First maxilla normal.

Maxilliped, 1st joint indistinct, 2nd not more than 4 times as long as broad, apex without setae, 3rd joint almost as long as 2nd, apex pointed, setose, a very minute setiferous 4th joint, epipod small, oval.

First peraeopod, 2nd and 3rd joints subequal, basal margin of 4th semicircular, outer apex acute, setose, 6th joint oval with prominent acute tubercle, without spine at base of palm, palm slightly convex, setiferous, without spines, 7th joint rather slender, without groups of setae on inner margin.

Second and third peraeopods, 4th joint short, nearly twice as

broad as long, produced externally, 6th joint elongate, oval, palm straight with 6 strong spines and a few setules.

Fourth to sixth peraeopods, 5th joint not underriding 6th, inner apex produced into a small lobe, inner margin of 6th with 2 spines near base and 1 at apex.

Seventh peraeopod, 5th joint not apically produced, inner margin with 4 spines, increasing in size distally, 6th joint with 3 spines on inner margin and 1 at apex.

First pleopod with 4 hooked setae on inner apex of peduncle, inner ramus very narrow, only $\frac{1}{6}$ width of outer ramus, which conceals both inner ramus and the other pleopods.

Uropods, inner ramus a little longer than telson, 2nd joint shorter and narrower than 1st joint, apex rounded, apex and outer margin setose; outer ramus scarcely broader than 1st joint of inner ramus, lanceolate, margins feebly crenulate, setose.

Length: ♂ 16 mm., ♀ with embryos 13 mm.; *breadth*: ♂ 1.25 mm., ♀ 1 mm.

Colour: In spirit, uniform whitish or dull pinkish, eyes dark red.

Locality: Umhlangakulu River mouth NW. by W., distant 7 miles. 50 fathoms. 14/3/01. 1 immature; Cape Morgan N. $\frac{1}{2}$ W., distant 10 miles. 77 fathoms. 26/7/01. 1 immature ♂; Cove Rock NW. $\frac{3}{4}$ W., distant 13 miles. 80 fathoms. 30/7/01. 1 ♀ with embryos. s.s. "Pieter Faure." (S.A.M. Nos. A2555, A59, and A56 respectively.)

I should not have ventured to assign the above specimens to Stimpson's *A. punctata*, had not specimens been obtained from Table Bay (Sea Point, near Cape Town. 15/11/13. (K.H.B.) 3 immature. Low-tide. S.A.M. No. A2612), which, while agreeing structurally with the above specimens, answer very closely to Stimpson's description of the colour of the species in question. These Sea Point specimens are whitish, with minute black punctations, causing the upper surface to appear grey, with the eyes black.

The only points in which they differ from the above description are: the flagellum of the first antenna has only 4 joints and the 1st peduncular joint is stouter, not more than twice as long as broad; the mandibles also are stouter, the trunk not so pointed and the palp shorter, the 3rd joint not more than half the length of the 2nd joint, with fewer setae.

These differences between the littoral and deeper water specimens may well be ascribed to habitat, and consequently both may be identified with Stimpson's species; at any rate until specimens are obtained from his locality (Simon's Bay in False Bay).

FAMILY EURYDICIDAE.

1905. *Eurydicidae*, Stebbing in Herdman's Ceylon Pearl Fish.
Suppl. Rep. 23, p. 10.
1908. ,, id. S.A. Crust. pt. 4, p. 45.

GEN. EURYDICE, Leach.

1815. *Eurydice*, Leach, Tr. Linn. Soc. Lond. vol. 11, p. 370.
1820. ,, Hansen, Vidensk. Selsk. Skr. ser. 6, vol. 5, p. 362.
1905. ,, id. Journ. Linn. Soc. Lond. vol. 29, pp. 340, 356.
1905. ,, Richardson, Bull. U.S. Nat. Mus. No. 54, p. 123.
1910. ,, Stebbing, Tr. Linn. Soc. Lond. Zool. vol. 14, pt. 1,
p. 95.

EURYDICE LONGICORNIS (Studer).

1883. *Cirolana longicornis*, Studer, Abh. K. Ak. Wiss. Berlin, 1882,
p. 28, pl. 2, figs. 15 a-c.
1890. *Eurydice* ,, Hansen, Vidensk. Selsk. Skr. ser. 6,
vol. 5, p. 375.
1910. ,, ,, Stebbing, Gen. Cat. S.A. Crust. p. 421.

Since this species is only known from Studer's brief, yet for purposes of identification quite sufficient, description, the details of the appendages may here be given.

First antenna with 5-jointed flagellum, the 1st joint much the longest, equal to the 1st peduncular joint.

Second antenna with 4-jointed peduncle, Studer having evidently overlooked the short 1st joint, 4th joint equal to 2nd and 3rd together, flagellum ca. 24-jointed.

Upper lip transverse, twice as broad as long, clypeus triangular with a projecting point.

Mandible as figured by Hansen for the other species of the genus, palp with 2nd joint $2\frac{1}{2}$ times length of 1st, 3rd joint a little shorter than 1st, 2nd and 3rd joints setose.

First and second maxillae and maxilliped as figured by Hansen.

First peraeopod with 3rd and 4th joints strongly produced externally, 4th joint underriding 5th, inner margin with ca. 8 stout, blunt spines, inner margin of 6th joint with 6 spines.

Seventh peraeopod, inner margin of 3rd joint with 5 marginal and 3 submarginal groups of 3 spines each, inner apex with 6 spines, outer apex with 3-4 spines, 4th joint with 3 marginal and 3 submarginal groups of 5 spines each, inner apex with ca. 9 spines, outer

margin with 2, outer apex with 3 spines, 5th joint with 2 groups of ca. 9 spines each (not divided into marginal and submarginal groups), inner apex with 4 spines, outer margin with 2, outer apex with 4 spines, 6th joint with 2 groups of 5-6 spines each, inner apex with 4, outer apex with 1 spine, unguis strong, a stout seta in place of secondary unguis.

Male appendages on 7th peraeon segment close together, short, very stout, almost obovate, apices rounded.

First to third pleopods with 4 hooked setae on inner apex of peduncle. Male stylet on 2nd pleopod arising half-way along margin of ramus, extending a little beyond apex of ramus, apex slightly enlarged with its inner margin setulose and a minute terminal point (see Hansen, 1890, l.c. pl. 6, figs. 2*g* and 3*h*.).

Uropods, outer and inner apices of peduncle each with 1 spine, inner ramus rather longer than telson, very broad, outer ramus rather shorter, inner distal margins of both rami with long plumose setae.

Telson with posterior margin denticulate, one plumose seta springing from each indentation, apex with 6 spines in addition.

Epimera with postero-inferior angles acute, slightly produced, the posterior margin concave.

Locality: Salt River near Cape Town, in brackish water. August, 1896. (R. M. Lightfoot.) ♂♂ and ♀♀ with embryos. (S.A.M. No. A265.)

GEN. CIROLANA, Leach.

1818. *Cirolana*, Leach, Dict. Sci. Nat. vol. 12, p. 347.
1905. ,, Stebbing in Herdman's Ceylon Pearl Fish. Suppl. Rep. 23, p. 11. (References.)
1910. ,, Thielemann, Abh. Ak. Wiss. Munich, II. Suppl. Bd., 3. Abh, p. 8.
1910. ,, Richardson, Wash. Bur. Fish. Doc. 736, p. 4.

CIROLANA VICINA, n. sp.

(Plate XXX. B.)

Body minutely granular. Head with minute rostrum, not separating the first antennae. Frontal lamina pentagonal, longer than broad. Posterior margins of peraeon segments scarcely or not at all denticulate. Posterior margins of pleon segments minutely denticulate. Fifth pleon segment without free lateral margins. Telson triangular, sides straight, apex subacute, with plumose setae and 13-14 spines.

First antenna reaching a little beyond end of peduncle of 2nd antenna, flagellum 13-jointed.

Second antenna reaching to posterior margin of 5th peraeon segment, flagellum 34-jointed.

First peraeopod, 3rd joint with 1 spine and 2 setae on outer apex, 4th joint with 5 blunt spines on inner margin.

Second peraeopod, 3rd joint with 2 spines and 2 setae on outer apex, 2 blunt spines on inner apex, 4th joint not produced externally, outer apex with 2 spines, inner margin with 4 large blunt spines near base, 3 at apex and 3 smaller ones between these two groups.

The other peraeopods slender. Seventh peraeopod, 2nd joint not expanded, oblong, inner margin slightly convex.

Male stilet on 2nd pleopod slender, a little longer than ramus, apex acute.

Uropods similar to those figured by Hansen for *C. cranchii* young ♀ (1890 Cirolanidae, pl. 3, fig. 3i), but apex of inner ramus is sub-bifid, inner margin with 10 spines, outer margin with 3 spines near apex, both margins with plumose setae; outer ramus apically sub-bifid, inner margin with 5 spines, outer with 10, both margins with plumose setae.

Length: 13 mm.; *breadth*: 3.75 mm.

Colour: Whitish, tinged on back with grey, caused by numerous minute stellate specks.

Locality: St. James, False Bay. April, 1901 (Dr. W. F. Purcell), and 29/4/12 (K.H.B.). 2 ♂♂ under stones at low-tide. (S.A.M. Nos. 9856 and A2560.)

This species is intermediate between *C. parva*, Hansen, and *C. cranchii*, Leach. The former has been found in the West Indies, East Indies, Ceylon, and Red Sea; the latter is a European form, but under the name of "*Nelocira swainsoni*" has been recorded from Senegambia by Miers (Ann. Mag. Nat. Hist. (5) 8, p. 204, 1881).

The relationships between the three species may be best seen from the following table:—

	<i>C. parva.</i>	<i>C. cranchii.</i>	<i>C. vicina.</i>
Frontal lamina	hexagonal	pentagonal	pentagonal
Peraeopods	slender	stout	slender
Fourth joint of the 2nd and 3rd peraeopods...	not produced	produced	not produced
Apices of the uropods	bifid	acute	sub-bifid.
Number of spines on telsonic apex	8	10-12	13-14.
Size	7-8 mm.	15 mm.	13 mm.

CIROLANA PARVA, Hansen.

1890. *Cirolana parva*, Hansen, Vidensk. Selsk. Skr. ser. 6, vol. 3,
pp. 321, 340, pl. 2, figs. 6-6b, pl. 3,
figs. 1-1d.
1901. ,, ,, Richardson, Proc. U.S. Nat. Mus. vol. 23,
p. 514.
1902. ,, ,, Moore, Bull. U.S. Fish. Comm. vol. 20,
pt. 2, p. 167, pl. 8, figs. 6-8.
1905. ,, ,, Stebbing in Herdman's Ceylon Pearl Fish.
Suppl. Rep. 23, p. 12.
1905. ,, ,, Richardson, Bull. U.S. Nat. Mus. No. 54,
p. 111, figs. 93-95.
1910. ,, ,, Stebbing, Journ. Linn. Soc. Lond. Zool.
vol. 31, p. 217.

Length: 5 mm.; *breadth*: 2 mm.

Colour: Yellowish-grey.

Locality: Mozambique (Conducia Bay). 15/11/12. (K.H.B.)
1 ovigerous ♀ at low-tide. (S.A.M. No. A2216.)

Geogr. Distribution: West Indies and Samoa (Hansen); Florida
and Gulf of Mexico 25 fathoms (Richardson); Porto Rico (Moore);
Ceylon 8-11 fathoms (Stebbing); Red Sea (Stebbing).

CIROLANA UNDULATA, n. sp.

(Plate XXX. A.)

Body smooth, nearly three times as long as broad. Head with
minute rostrum, not separating the first antennae.

Frontal lamina quadrate, a little longer than broad, the free
anterior margin longer than posterior margin, which is joined to
the clypeus.

Peraeon with posterior margin of all the segments finely crimped,
the crimping strongest at the sides and on the posterior segments.
Pleon with posterior margins of first 5 segments denticulate, though
only faintly so on the first segment. The fifth segment without
free lateral margins. Telson longer than broad, triangular, sides
straight, apex subacute with 2 short blunt spines close together,
flanked on either side by 6 stout spines. The interstices between
the spines with short plumose setae, scarcely longer than the
spines. Surface with a median carina which is grooved almost to
the base, lateral margin anterior to the spines with 5 rugae running
inwards towards base of telson, where they divide irregularly.

First antenna reaching end of peduncle of second antenna,

2nd joint longer than 1st, not subequal as in *C. sulcata*, Hansen. Flagellum not quite as long as peduncle, 12-jointed.

Second antenna reaching posterior margin of third peraeon segment, flagellum longer than peduncle, 25-jointed.

Upper lip, distal margin strongly emarginate, setose.

Mandibles, maxillae and maxillipeds normal.

First peraeopod, inner apex of 3rd joint with 1 blunt tubercle, outer apex of 4th joint with 2 small spines and inner margin with 8 blunt tubercles, inner margin of 6th joint with 4 low rounded bosses and small spines between them.

Second peraeopod, inner apex of 3rd joint with 3 blunt tubercles, outer apex with 2 strong spines, outer apex of 4th joint with 1 strong spine and inner margin with 10 blunt tubercles, inner margin of 6th joint smooth with 4 small spines.

Fourth to seventh peraeopods, as in *C. sulcata*, second joints not enlarged nor furnished with natatory setae.

Uropods, both branches a little longer than telson, inner angle of peduncle extending half-way along inner branch, inner branch with inner margin furnished with 11 short spines with short plumose setae between them, apex subacute not bifid, the outer margin at the apex very slightly emarginate, outer ramus with 3 short spines on inner distal margin and 2 on the outer, apex subacute, slightly bifid.

Length : 15 mm. ; *breadth* : 6 mm.

Colour : Whitish, with grey stellate specks.

Locality : Sea Point, near Cape Town. 15/11/13. (K.H.B.) 5 ♀ ♀ with embryos and 3 very young specimens just hatched. Low-tide, beneath stones and encrusting algae. (S.A.M. No. A2614.) Some specimens taken out of crevices in an old piece of iron wreckage were completely rust-red in colour.

This species at first sight resembles *C. sulcata*, Hansen, but is abundantly distinguished by the following characters: the ornamentation of the peraeon and telson, the marginal armature of the latter, the frontal lamina, the number of antennal joints, the number of tubercles on the anterior peraeopods, and the uropods. The specific name refers to the undulate appearance of the margins of the telson.

CIROLANA VENUSTICAUDA, Stebbing, var. *SIMPLEX*, n.

(Plate XXXVII. F.)

Differs from the typical form in the following particulars: smaller size; the denticulations on the posterior margin of 6th

peraeon segment much weaker, almost obsolete in some cases; those on posterior margin of 7th peraeon segments and 2nd, 3rd, 4th, and 5th pleon segments also weaker; the tubercles at base of telson and along the margins absent; the median carina simple, without the basal tooth, and not followed by any tubercles; the telson is longer than broad, apex more obtuse, no spines or setae along the margins and only 10 spines on the apex; outer distal angle of inner uropod rounded, the distal margin consequently more convex.

The more marked of the above differences can be recognized in the young of the two forms. Specimens of *venusticauda* taken from the brood pouch already show 20 spines round the end of the telson, whereas those of the variety show only 7 or 8.

The distribution seems to point to this being a local variety of the more ornate typical form. The former has not yet been found on the west coast of the Cape Peninsula. Stebbing recorded the typical form from Somerset West in False Bay, as well as from Table Bay. These "Somerset West" specimens I have not myself seen; but it is not likely that the above-mentioned differences were overlooked, nor is one justified in supposing that the "Somerset West" specimens had been wrongly labelled. However, all efforts to discover (at least by shore-collecting between tide-marks) the typical form in False Bay, or the variety in Table Bay, have so far failed. The two forms seem distinctly confined to their respective sides of the Cape Peninsula.

Length: ♂ 11 mm., ♀ 10 mm.; *breadth*: ♂ 4 mm., ♀ 3·5 mm.

Colour: Grey, mottled.

Locality: St. James and Kalk Bay, False Bay (Dr. W. F. Purcell); Plettenberg Bay, 3/7/02, s.s. "Pieter Faure"; St. James, 15/2/14 (K.H.B.), ♂ ♂, ♀ ♀, and juv. (S.A.M. Nos. 8830, 150055, A50, and A2685 respectively.)

PONTOGELOIDES, n. g.

Fifth pleon segment with free margins; bases of first and second antennae completely separated, flagella subequal, not long; epistome projecting; mandibular palp with only two joints, the second very long; second maxilla normal, the middle plate not narrower than the outer; maxillipeds 7-jointed, inner plate with 2 coupling-hooks; peraeopods stout; first pleopod not indurated, inner ramus nearly as broad as outer; male stylet on second pleopod not reaching end

of ramus; peduncle of uropods very broad, outer ramus narrower but not shorter than inner.

Very similar to *Pontogelos*, Stebbing (Tr. Linn. Soc. Lond. vol. 14, pt. 1, p. 97, 1910), especially as regards the mandibles and maxillipeds, but differing in the antennae, second maxillae, uropods and peraeopods.

PONTOGELOIDES LATIPES, n. sp.

(Plate XXX. C.)

Body very convex, smooth. Head with small median rostrum meeting the frontal lamina, which is narrow, anteriorly broader than posteriorly, in side view strongly curved; eyes oval, black, in the lateral angles. Peraeon segments 4-7 with a low transverse carina running a short way across the segments from the middle of the sutures with the epimera. Epimera without oblique grooves, rather broad, postero-lateral angles subacute but not produced. Pleon equal in length to peraeon segments 2-7 together. Telson rounded, broader than long, margin minutely serrulate apically, with a few plumose setae.

First antenna reaching to posterior margin of 1st peraeon segment, anterior margin of 1st joint produced along the 2nd joint, but not directed forwards, 3rd joint nearly as long as but much more slender than 2nd joint, flagellum thrice as long as peduncle, 16- or 17-jointed.

Second antenna subequal to first antenna, peduncle 5-jointed, very stout, inner margin of 4th joint and inner apex of 5th joint with long setae, flagellum scarcely as long as peduncle, 12-jointed.

Epistome (clypeus) triangular, prominently projecting.

Upper lip transverse, $2\frac{1}{2}$ times as broad as long, distal margin excavate.

Mandibles with cutting-edge tridentate, molar as in *Civolana*, palp 2-jointed, 2nd joint nearly thrice length of 1st joint, apex rounded with 3-4 long setae.

First maxilla normal, outer plate with 11 spines, inner plate with 3 plumose setae.

Second maxilla normal, outer and middle plates a little narrower than inner plate, each with ca. 9 setae, the inner plate with several stout plumose setae and smaller simple setae.

Maxilliped, 2nd joint (in ♂) twice as long as broad, 4th and 5th joints broad, all joints strongly setose, inner plate narrow, equal in length to 2nd joint, tapering to a blunt point with 2 small plumose setae, outer margin with ca. 8 strong plumose setae, inner margin

with 1 coupling-hook near base and a larger one a little beyond the middle.

First peraeopod, inner margins of 4th, 5th, and 6th joints respectively with ca. 20, 6 and ca. 8 closely set sharp spines.

Seventh peraeopod, 2nd joint cylindrical, not swollen, with 1 bunch of setae at inner apex and another just before apex; inner apex of 3rd joint with 2 spines, outer apex with 1; inner margin of 4th joint with 3 spines, outer apex with 1; outer and inner margins of 5th joint with 3 spines; inner margin of 6th joint with 4 spines; 7th joint half length of 6th.

Male appendages on 7th peraeon segment close together, very short and stout.

First to third pleopods, inner apical angle of peduncle with 3-4 hooked setae and several plumose setae, inner ramus nearly as broad as outer.

Second pleopod, male stylet arising at $\frac{1}{3}$ along the inner margin, short, not reaching apex of ramus, stout, apex acute.

Uropods, peduncle very broad, nearly $2\frac{1}{2}$ times as broad as long, outer apical angle with 1 spine, inner margin fringed with long plumose setae; rami extending a little beyond telsonic apex; inner ramus triangular, base as broad as peduncle, apex subacute, inner margin, apex and distal portion of outer margin with long plumose setae, outer margin with deep subterminal indentation; outer ramus much narrower and scarcely longer than inner ramus, narrow-lanceolate, apex with plumose setae.

Length: 9 mm.; *breadth*: 3.75 mm.

Colour: In spirit, whitish with obscure indications of grey stellate markings.

Locality: Fish Hoek, False Bay, 26/5/96, 1 ♂, and Jan., 1898, ♂♂ and nonovigerous ♀♀ (R. M. Lightfoot); March, 1901, ♂♂ and nonovigerous ♀♀ (W. F. Purcell). In pools some little distance from sea. (S.A.M. Nos. A256, A245, and 9861.)

FAMILY CORALLANIDAE.

1890. *Corallanidae* (part), Hansen, Vidensk. Selsk. Skr. ser. 6, vol 5, pt. 3, p. 280.

1890. *Alcironidae* (part), id. *ibid.* pp. 285, 312, 390.

1893. *Corallanidae* (part), Stebbing, Hist. Crust. p. 345.

1893. *Alcironidae*, id. *ibid.* p. 346.

1904. *Corallanidae*, id. in Gardiner's Fauna, Mald. Laccad. Archip.
vol. 2, pt. 3, p. 703.
1905. ,, id. in Herdman's Ceylon Pearl Fish. Suppl. Rep.
23, p. 19.

GEN. CORALLANA, Dana.

1853. *Corallana*, Dana, U.S. Expl. Exp., vol. 13, pp. 748, 773.
1879. ,, Schioedte and Meinert. Naturh. Tidsskr. ser. 3,
vol. 12, p. 286.
1904. ,, Stebbing, l.c. p. 704.

CORALLANA AFRICANA, n. sp.

(Plate XXX. D.)

Body with a few scattered hairs, chiefly on the lateral portions. Head without sculpturing, eyes large, oval, black. Epimera visible in dorsal view, postero-lateral angles acute, but not sharply produced or spinose. Pleon of 5 segments plus telson, 5th segment with a low, inconspicuous median tubercle (in young specimens quite obsolete), telson as long as basal width, lateral margins slightly sinuous, apex blunt, with 6 stout spines, interspersed with plumose setae, which extend up the lateral margins.

First antenna scarcely reaching to end of peduncle of second antenna, basal joint stout, flagellum 7-jointed.

Second antenna reaching to posterior margin of 3rd pereopod segment, peduncle 5-jointed, 2nd and 3rd joints short, 4th and 5th joints subequal or 4th slightly longer than 5th, flagellum $1\frac{1}{4}$ times length of peduncle, 16-19-jointed.

Upper lip nearly thrice as broad as long, emarginate.

Lower lip, lobes twice as long as broad, apically rounded, with a small pointed accessory lobe near the end.

Mandibles elongate, apex not greatly elongate, bifid in the left, entire in the right, palp 3-jointed, 2nd joint longest, with setae on outer apex, 3rd joint ovate, with long setae.

First maxilla sickle-shaped, unguis well developed and strongly chitinized.

Second maxilla apparently absent, as no trace of it could be found.

Maxilliped, 2nd joint a little longer than 3rd-7th joints together, 3rd and 4th joints small, 5th joint circular, as long as 3rd and 4th together and almost equally wide, with 1 long spine and 2 small

setae on inner apex, 6th joint slender, narrower than any of the preceding, 7th joint minute with apical tuft of setae.

First peraeopod, 3rd and 4th joints subequal, 4th with 5 blunt tubercles on inner margin, 5th joint small, triangular, 6th joint tapering slightly, 7th joint strong and only slightly curved.

Seventh peraeopod, 2nd joint equal to 5th-7th together, 3rd joint slightly expanded posteriorly, with apical setae, 4th joint with 1 spine in middle of and 2 at apex of inner margin, 5th joint with 1 and 3 spines respectively and also a tuft of plumose setae on posterior apical angle, 6th joint with 1 spine in both of the above-named positions and an apical tuft of setae, 7th joint strongly curved.

Second pleopod, male stylet reaches nearly to end of rami, straight, narrow, apex blunt.

Uropods, rami subequal in length, only just reaching beyond telsonic apex, inner ramus about twice as wide as outer, with bluntly rounded apex, outer lanceolate, apex subacute, both rami fringed with plumose setae.

Length : 7 mm. ; *breadth* : 2.5 mm.

Colour : Yellowish-grey with darker mottlings, a more or less distinct dark median stripe.

Locality : Zwartkops River, Port Elizabeth. May, 1913. ♂♂ and 1 ♀ with 9 embryos. (Mrs. Patterson.) (S.A.M. No. A2267.)

GEN. LANOCIRA, Hansen.

1890. *Lanocira*, Hansen, Vidensk. Selsk. Skr. ser. 6, vol. 5, pt. 3, pp. 313, 391, 395.
1904. „ Stebbing in Gardiner's Fauna Mald. Laccad. Archip. vol. 2, pt. 3, p. 706.
1905. „ id. in Herdman's Ceylon Pearl Fish. Suppl. Rep. 23, p. 19.
1910. „ id. Journ. Linn. Soc. Lond. Zool. vol. 31, p. 217.

LANOCIRA CAPENSIS, n. sp.

(Plate XXXI. A.)

1913. ? *Lanocira*, sp., Tattersall, Tr. Roy. Soc. Edinb. vol. 49, pt. 4, p. 880.

Body from about 5th peraeon segment onwards densely setose, more so in the female than in the male, but nearly glabrous in the young. Head with a small upturned rostrum in ♂, the pair of tubercles adjacent to the eyes very low, surface of the head

between them concave; in the ♀ only the median longitudinal concavity present. First peraeon segment longer than 2nd or 3rd, but subequal to 4th and 7th, 5th and 6th a little longer than 1st. Pleon resembling that of *L. gardineri*, Stebbing, except for its denser covering of setae; 6 apical spines on telson.

First antenna equal to peduncle of second antenna, 3rd joint a little over half the length of the fused 1st and 2nd joints, flagellum equal to peduncle, 6-jointed, with sensory filaments.

Second antenna reaching to about middle of 2nd peraeon segment, 4th joint equal to 1st, 2nd and 3rd together, 5th a little shorter, flagellum equal to peduncle, 12-jointed, setose.

Frontal lamina pentagonal.

Upper lip thrice as broad as long, slightly emarginate.

Lower lip, lobes broad with truncate apices.

Mandibles most resembling those figured for *L. latifrons*, Stebbing, cutting-edge bidentate, secondary cutting-edge bidentate, molar conical with a few minute apical setules, palp strong, rather longer than trunk of mandible, 2nd joint a little longer than 1st, 3rd joint shortest, 2nd and 3rd setiferous.

First maxilla, the curved spine on outer plate is of moderate length, about $\frac{1}{4}$ that of outer plate.

Second maxilla, 2nd joint with 3 apical setae, 3rd joint very slender with 2 apical unequal setae.

Maxilliped, 2nd joint scarcely longer than broad, basal joint in ♀ very large, with plumose setae on its inner produced apex, epipod in ♀ (vibratory plate) reaching to 6th joint, margin with plumose setae.

First peraeopod, 3rd joint with spine on outer apex and 2-3 setules on inner apex, 4th joint with 4 strong spines on inner margin (the apical one the largest) and 2 spines on outer apex, 6th joint with 3 long setae on inner apex, in ♂ the unguis is rather longer and more strongly curved than in ♀.

Second and third peraeopods, 3rd joint with 1 spine on outer apex and 2 stout spines on inner apex (the apical one the larger), 4th joint as in first peraeopod.

Seventh peraeopod resembling that of *L. gardineri*, Stebbing.

Male appendages on 7th peraeon segment close together, short, with blunt apices.

Second pleopod, male stylet long, slender, acute, extending a short distance beyond apex of ramus.

Uropods, inner ramus extending only a very little beyond telsonic apex, apex broadly rounded with 9 spines and numerous

long setae, outer ramus a little shorter than inner, with ca. 9 spines as well as long setae on outer and apical margins.

Length: ♂ 6 mm., ♀ 7.5 mm.; *breadth*: ♂ 2.5 mm., ♀ 3 mm.

Colour: Whitish, with fairly numerous minute stellate black specks.

Locality: St. James, False Bay. April, 1901. 1 ♀ with embryos (Dr. W. F. Purcell), and 29/4/12. 1 ♂, 2 ♀♀ with embryos. (K.H.B.) Amongst the tubes of the reef-building worm *Sabellaria capensis*, low-tide. (S.A.M. 9857 and A2561.)

This species resembles very closely *L. gardineri*, Stebbing, but differs from the latter in the form of the mandibles, the length of the spine on the second maxilla and in having 4 spines, instead of 5, on the 4th joint of the first peraeopod. Moreover, it differs not only from *L. gardineri*, but from all other species of the genus in the length of the male stylet on the second pleopod.

This is most probably the same species as the mutilated specimen briefly mentioned by Tattersall. The smaller number of spines on the uropods of the latter may well be due to injury. Tattersall compares the first maxilla of his specimen with that of *L. zeylanica*, Stebbing, but in the present specimens it is not so strongly developed, and moreover his specimen is 12 mm. long and is therefore, after allowing for the effects of injury and the method of preservation, considerably larger than the St. James' specimens.

Tattersall's specimens came from Saldanha Bay, 8-10 fathoms.

FAMILY AEGIDAE.

1879. *Aegidae*, Schioedte & Meinert, Naturh. Tidsskr. ser. 3, vol. 12, p. 325.
1905. ,, Stebbing in Herdman's Ceylon Pearl Fish. Suppl. Rep. 23, p. 20.

GEN. AEGA, Leach.

1815. *Aega*, Leach, Tr. Linn. Soc. Lond. vol. 11, p. 369.
1879. ,, Schioedte & Minert, l.c. p. 334.
1901. ,, Whitelegge, Sci. Res. "Thetis," pt. 3, p. 229.
1905. ,, Richardson, Bull. U.S. Nat. Mus. No. 54, p. 167.
1905. ,, Stebbing, l.c. p. 20.
1910. ,, Thielemann, Abh. Ak. Wiss. Munich, 2 Suppl. Bd. 3 Abt. p. 28.
1910. ,, Richardson, Wash. Bur. Fish. Doc. 736, p. 11.

AEGA GRACILIPES, Hansen.

1895. *Aega gracilipes*, Hansen, Isop. Plankton Exp. p. 15, pl. 1, figs. 6-6c (σ).
1901. ,, Richardson, Proc. U.S. Nat. Mus. vol. 23, p. 533.
1905. ,, id. Bull. U.S. Nat. Mus. No. 54, p. 183, figs. 167, 168.

Flagellum of first antenna 14-jointed. Second antenna extending to posterior margin of 2nd peraeon segment, flagellum 17-jointed.

Length: 24 mm.; *breadth*: 12 mm.

Colour: In spirit, uniform yellowish.

Locality: Cape Point N.E. $\frac{3}{4}$ N. distant 39 miles. 310-560 fathoms. 17/9/03. 1 ovigerous ♀. s.s. "Pieter Faure." (S.A.M. No. 150980.)

Geogr. Distribution: N. Atlantic, 59° N. 8.5° W., 1524 metres (Hansen); Gulf of Mexico, 730 fathoms (Richardson).

AEGA MONOPHTHALMA, Johnston.

(Plate XXXI. B.)

1834. *Aega monophthalma*, Johnston, Lond. Mag. Nat. Hist. vol. 7, p. 233, figs. 43a, b, nec c.
1868. ,, ,, Bate & Westwood, Brit. Sessile-eyed Crust. vol. 2, p. 286.
1877. ,, ,, Schioedte & Meinert, l.c. ser. 3, vol. 11, p. 89.
1879. ,, ,, id. l.c. ser. 3, vol. 12, p. 89.
1897. ,, ,, Sars, Crust. Norw. vol. 2, p. 62, pl. 26, fig. 1.

Body glabrous, very finely punctate, the 5th-7th peraeon segments and the whole of the pleon appearing somewhat eroded.

Head, with the exception of a small triangular portion in the middle of the posterior margin, completely occupied by the eyes, which are in contact for about 9 rows of facets; rostrum completely separating the bases of 1st antennae, curving downwards and meeting the frontal lamina. The latter is shield-shaped, longer than broad, concave, anterior margin bisinuate with the median lobe projecting further than the lateral lobes (more strongly bisinuate than in Sars' figure).

First peraeon segment slightly the longest, 7th the shortest, the rest subequal, anterior margin of 1st segment deeply bisinuate, posterior margins of all segments granular. Epimera distinct on

all segments except 1st, granular, especially the posterior ones, each with a slight hollow above the oblique carina; a carina is also present on lateral margin of 1st segment; epimera of 2nd and 3rd segments posteriorly rounded, of segments 4-7 becoming gradually more produced and acute, but never sharply pointed, epimeron of segment 6 reaching postero-lateral angle of 1st pleon segment, of segment 7 reaching middle of lateral margin of 2nd pleon segment.

First segment of pleon very short, but not completely concealed dorsally by the 7th pereon segment, other segments subequal, posterior margins granular, postero-lateral angles of 1st-4th segments subacute; telson subtriangular, apex rounded with median projecting point, surface granular, excavate at base on either side of the median carina which extends to apex, margin fringed with plumose setae and crenulate, with a stout spine springing from each indentation (ca. 12 on each side).

First antenna extending to middle of eye and nearly to end of 5th peduncular joint of 2nd antenna, 1st and 2nd joints strongly expanded, 2nd joint shorter than 1st, exterior apex produced, 3rd joint slender, not extending far beyond external apex of 2nd, flagellum a little longer than 1st peduncular joint, 8-jointed.

Second antenna reaching to posterior margin of 2nd pereon segment, peduncular joints increasing in length, 5th joint equal to 1st joint of 1st antenna, flagellum half as long again as peduncle, 22-jointed.

Mandible with apex incurved at right angles to trunk, tapering, acute, palp longer than trunk, 2nd joint twice as long as 1st and thrice as long as 3rd, outer margin of 3rd and apices of 2nd and 3rd joints setose.

First maxilla slender, apex with 5 apical hooked spines and one smaller subapical.

Second maxilla with trunk broad at base, rapidly narrowing, outer lobe broader than apex of trunk, with 3 strong curved spines, inner lobe half length and width of outer, with 4 curved spines.

Maxilliped, 1st joint very short, 2nd joint $2\frac{1}{2}$ times as long as broad, 3rd joint short, 4th joint triangular, produced internally, 5th joint also triangular, inner apex produced with 4 spines, 6th joint twice as broad as long, inner margin with 5 strong hooked spines and 2 smaller ones, 7th joint wide but very short, with 4-5 setae; inner plate extending half-way along 4th joint, narrow, apex with 2 setae.

First peraeopod, inner apex of 3rd joint without spine, inner margin of 4th joint with 1 basal and 2 apical spines.

Second paraeopod, inner apex of 3rd joint with 1 spine, inner margin of 4th joint with 3 basal and 2 apical spines.

Third peraeopod, inner apex of 3rd joint with 2 spines, inner margin of 4th joint with 3-4 (right and left peraeopods respectively) basal and 2 apical spines.

Fourth peraeopod, 3rd and 4th joints subequal, as also the 5th and 6th, the number of spines as follows: inner apex 2nd joint 2 small ones, outer apex of 3rd joint 2, inner margin of 3rd joint 1 near base 2 in middle and 2 at apex, outer apex of 4th joint 3, inner margin of 4th joint 1 basal 3 median and 3 apical, outer apex 5th joint 3, inner margin of 5th joint 1 basal 3 median and 4 apical, outer apex of 6th joint 1 spine and 2 setae, inner margin of 6th joint 1 basal 1 median and 2 apical.

Seventh peraeopod more slender than preceding, perhaps due to immaturity of the specimen; the spines are as follows: inner apex of 2nd joint 2, outer apex of 3rd joint 3, inner margin of 3rd joint 1 basal 1 median 2 apical, outer apex of 4th joint 5, inner margin of 4th joint 1 basal 2 median 4 apical, inner margin of 5th joint 1 basal 2 median and whole of apical margin with spines, outer apex of 6th joint 2 small spines and 1 seta, inner margin of 6th joint 1 basal 2 median and 3 apical.

Second pleopod with 9 hooked spines and 8 plumose setae on inner margin of peduncle.

Uropods, peduncle $\frac{3}{4}$ length of inner ramus, rami scarcely as long as telson, inner ramus truncate, distal margin slightly emarginate, both outer and distal margins fringed with plumose setae, denticulate, each with ca. 10 spines; outer ramus narrower than inner, apically rounded, margins fringed with plumose setae, outer and distal margins faintly denticulate, ca. 12 spines on outer margin and 4 round apex.

Length: 23 mm.; *breadth*: 10.5 mm.

Colour: In spirit, uniform yellowish.

Locality: East London NW. $\frac{1}{2}$ N. distant 20 miles. 400 fathoms. 17/4/01. 1 immature specimen. s.s. "Pieter Faure." (S.A.M. 150979.)

Geogr. Distribution: Iceland, Shetland, N. Britain, Norway, German Ocean, Skagerak (Schioedte & Meinert). Parasitic on the Cod (*Gadus morrhua*).

This specimen is in perfect harmony with the description of Schioedte & Meinert, except in the lesser number of flagellar joints

of the 1st and 2nd antennae, and the spines on the 4th joint of the 1st-3rd pereopods. Since the specimen is immature and only $\frac{3}{4}$ the length of the smallest measurements given by the above authors, these differences may be ascribed to difference in age as well as local variation.

The above description is rather detailed in order to facilitate comparison with European specimens, since the discovery of this northern form in deep water off the South African coast bears on the interesting question of Bipolarity.

AEGA MONILIS, n. sp.

(Plate XXXI. C.)

Body with the usual fine scattered punctation, glabrous. Head with rostrum curving downwards but not completely separating bases of 1st antennae, and not reaching the nodular, rhomboidal frontal lamina. Eyes large, oval, contiguous for 5 rows of facets. Peraeon segments 1-3 and 7 subequal, 4-6 a little longer, anterior margin of 1st segment not bisinuate, posterior margin of each segment with a transverse row of granules or small tubercles, faint on the first 3 segments; these segments have in addition a transverse carina across the middle, which is smooth in segment 1, but granulate in segments 2 and 3. Epimera of segments 2-4 as long as segments, posteriorly truncate, postero-inferior angles rounded, that of segment 5 similar but a little longer than segment, those of segments 6 and 7 one-third as long again as segments, postero-inferior angles subacute, that of 7th segment reaching to middle of 2nd pleon segment, all epimera with an oblique carina, above which surface is concave, those of 4th-7th segments with a second weaker carina anterior to the other.

Pleon with 1st segment short, the rest subequal, none of the postero-lateral angles produced, posterior margins with a transverse row of small tubercles; telson subtriangular, sides rounded; in one specimen the apex has a blunt median point, flanked on either side by a spine arising from a small indentation, posterior margin finely crenulate and fringed with plumose setae; in the other specimen (from East London) the apex is subtruncate, with the margin as in the first specimen; surface granulate, without median keel or excavations at base.

First antenna reaching to middle of 1st pereon segment and end of peduncle of 2nd antenna, 1st and 2nd joints not expanded, 2nd a little shorter than 1st, 3rd longer than 1st and 2nd together, flagellum equal to peduncle, 9-11-jointed.

Second antenna reaching to end of 2nd peraeon segment in one specimen, to end of 3rd in the East London specimen, 1st joint larger than 2nd, 3rd, 4th and 5th increasing in length, flagellum half as long again as peduncle, 15-17-jointed.

Mandibles, trunk stout, apex entire, not very acute nor curving inwards, palp longer than trunk, 1st and 3rd joints subequal, 2nd half as long again.

First maxilla rather stout, apex with 1 stout spine and 4 smaller ones.

Second maxilla, basal joint rapidly narrowed distally, outer lobe rounded with 2 hooked spines, inner lobe smaller with 3 not strongly hooked spines.

Maxilliped, apex of 4th joint with 2 setae, of 5th with 2 spines and 1 seta, 6th joint not broader than long, with 3 hooked spines, 7th conical, small, with 1 long apical seta and 2 smaller ones, inner plate reaching to middle of 4th joint, unarmed.

First peraeopod inner apex of 3rd joint unarmed, inner margin of 4th with 3 blunt spines, of 6th with 1 sharp apical spine and 1 very small subapical one.

Second and third peraeopods, apex of 3rd joint with 1 spine, inner margin of 4th joint with 5 blunt spines, of 6th as in first peraeopod.

Fourth to seventh peraeopods, 3rd joint not elongate, in 7th peraeopod about half length of 2nd, all joints (except 2nd) armed with numerous strong spines.

Second pleopod, male stylet straight, fairly stout, tapering to an acute apex, shorter than ramus, inner margin of peduncle with 6 hooked spines and numerous plumose setae.

Uropods, peduncle three-quarters length of inner ramus; inner ramus only just reaching beyond telsonic apex, apex truncate, inner angle rounded, outer angle acute, posterior margin with 4 indentations from each of which arises a spine, outer distal margin with 1 large spineless indentation and 2 smaller ones with spines, posterior and outer margins in addition finely crenulate and fringed with plumose setae; outer ramus shorter than inner and scarcely half as wide, lanceolate, apex acute, inner margin with 2, outer with ca. 8 spines, margins not crenulate but fringed with plumose setae.

The East London specimen differs slightly in having 6 spines and much stronger indentations and crenulations on posterior margin of inner ramus.

Length: 18 mm.; *breadth*: 7.5 mm.

Colour: In spirit, uniform yellowish or pinkish.

Locality: Lion's Head SE. $\frac{1}{2}$ E. distant 42 miles (off Cape

Petinsula). 156 fathoms. 9/3/00. 1 ♂. Sandy Point N. $\frac{1}{4}$ E. distant 10 miles (off East London). 95 fathoms. 14/8/01. 1 ♂. s.s. "Pieter Faure." (S.A.M. Nos. 150982 and 150981.)

Resembles rather closely *A. ophthalmica* (M. Edw.), which however has a bisinuate anterior margin to 1st peraeon segment, a larger number of flagellar joints in 1st antenna, 10 long slender spines on inner margin of 4th joint of anterior peraeopods, and the telson basally excavate.

A. megalops, Norm. & Stebb., 1904, is easily distinguished by having the anterior peraeopods unarmed, though otherwise very similar to the present species.

The specific name in allusion to the bead-like ornamentation of the peraeon and pleon segments.

AEGA UROTOMA, n. sp.

(Plate XXXII. A.)

Exceedingly close to *Ae. truncata*, Richardson (1910, l.c. p. 14, fig. 13).

Body finely punctate. Head with a small median rostrum not nearly as large as in *Ae. truncata*, eyes large, oval, their distance apart equal to one-third their greatest diameter instead of one-half, occupying therefore a relatively larger portion of the head. First peraeon segment longer than 2nd, 3rd and 7th, but subequal to 4th, 5th and 6th, with its anterior margin straight not bisinuate. Epimera of 2nd and 3rd segments as long as their segments, postero-inferior angles rectangular, pointed, of 4th, 5th, 6th and 7th segments a little longer than their segments, postero-inferior angles acute, pointed, each with one oblique carina on the lateral surface and another where the lateral surface passes into the ventral, 1st peraeon segment with a carina on lateral margin but no epimeron. Lateral margins of pleon segments 1-4 with a carina. Telson a little asymmetrical, with two shallow but distinct hollows at base, sides straight, posterior margin slightly concave, postero-lateral angles rounded.

First antenna reaching to end of peduncle of 2nd antenna or the eyes, 1st and 2nd joints dilated, but 1st longer than broad, 2nd shorter than 1st, 3rd extending beyond anterior apex of 2nd joint for $\frac{2}{3}$ of its length, flagellum 14-jointed.

Second antenna with 1st, 2nd and 3rd joints subequal, 4th and 5th also subequal, flagellum on both sides incomplete.

First maxilla with 7 hooked spines on apex.

Second maxilla with 3 simple spines on outer lobe and 2 plumose setae on inner.

Maxilliped without recurved spines on the terminal, all joints as well as the large epipod fringed with plumose setae, posteriorly directed laminar expansion of the 1st joint very large, posterior margin rounded. The loss of the terminal recurved spines and the enlargement of the epipod and basal joint are evidently features of the ovigerous female. The first is correlated with the fact that ovigerous females are never captured on the host like the males and immature specimens, but are found free-living on the sea-bottom where they probably take no food. The epipod and the basal plate serve to produce a current of water through the marsupial pouch, the same structure being found in other families, e.g., *Astacillidae* (see Hansen, Cirolanidae, 1890, p. 287).

First to third pereopods with 6 spines on inner margin of 4th joint instead of the 7 found in *Ae. truncata*.

Second pleopod with 10 hooked spines and numerous plumose setae on inner margin of peduncle.

Uropods as in *Ae. truncata*, but with stout spines as well as plumose setae; outer margin of outer ramus with 2 spines and indications of 2 more, posterior margin of inner ramus with 6 spines on the right, 2 on the left, the rest having been broken off.

Length: 53 mm.; *breadth*: 24 mm.

Colour: In spirit, uniform yellowish.

Locality: Cape Point N. 50° E. distant 18 miles. 180 fathoms. 27/2/02. 1 ovigerous ♀. s.s. "Pieter Faure." (S.A.M. No. 150971.)

GEN. ROCINELA, Leach.

1818. *Rocinela*, Leach, Dict. Sci. Nat. vol. 12, p. 348.

1905. ,, Stebbing in Herdman's Ceylon Pearl Fish. Suppl. Rep. 23. p. 23.

ROCINELA ORIENTALIS, Sch. & Mein.

(Plate XXXVII. D.)

1879. *Rocinela orientalis*, Schioedte & Meinert, Naturh. Tidsskr. ser. 3, vol. 12, p. 395, pl. 13, figs. 1, 2 (♂ ♀).

1884. ,, ,, Miers, Rep. Zool. H.M.S. "Alert," p. 304.

1898. ,, ,, Richardson, Proc. Amer. Philos. Soc. vol. 37, No. 157, pp. 9, 11.

1905. *Rocinela orientalis*, Stebbing, l.c. p. 24, pl. 6 C.

1910. " " Richardson, Wash. Bur. Fish. Doc. No. 736, p. 17.

The flagella of both pairs of antennae are incomplete. As regards the shape and armature of the telson and uropods, the single specimen agrees with the description and figures given by Stebbing.

Length: 13 mm.; *breadth*: 6 mm.

Colour: In spirit, uniform yellowish white.

Locality: Umhlangakulu River mouth NW. by N. distant $7\frac{1}{2}$ miles (Natal). 50 fathoms. 14/3/01. 1 immature ♀. s.s. "Pieter Faure." (S.A.M. No. 150983.)

Geogr. Distribution: Philippine Islands and Calcutta (Sch. & Mein.); Prince of Wales' Channel, 7-9 fathoms (Miers); Moreton Bay, Ceylon and Gulf of Suez (in Brit. Mus. *vide* Miers); Ceylon, 8-20 fathoms (Stebbing); Philippine Islands, 12 fathoms (Richardson).

ROCINELA GRANULOSA, n. sp.

(Plate XXXI. D.)

Body irregularly and minutely granular, the granulations strongest on the posterior margins of peraeon and pleon segments, glabrous. Head triangular, front produced into a blunt rostrum, eyes oval, their distance apart equal in ♂ to the length, in ♀ to the width of eye, 2 small ocelli between eyes. Anterior margin of 1st peraeon segment bisinuate, in ♂ all peraeon segments are subequal, in ♀ 1st, 4th and 7th are subequal, 2nd and 3rd shorter, 5th and 6th longer, postero-lateral angles rounded, not produced. Epimera narrow, postero-lateral angles subacute in ♂, acute in ♀, not strongly produced. First pleon segment completely concealed dorsally in ♀, in ♂ nearly so, not wider than 7th peraeon segment, postero-lateral angles acute, but not produced, segments 2, 3 and 4 wider than 1st, postero-lateral angles acute, slightly produced. Telson triangular, apex rounded, sides very slightly convex, faintly and irregularly crenulate, with an occasional small spine and fringed with plumose setae, a very shallow and obscure median longitudinal groove.

First antenna reaching to middle of 5th peduncular joint of second antenna, 2nd joint twice length of 1st, with 2 plumose setae on inner apex, 3rd joint a little longer, flagellum equal to or a little longer than 3rd peduncular joint, 5-jointed, 5th joint minute, a pair of sensory filaments on 2nd-5th joints.

Second antenna reaching to posterior margin of 2nd peraeon

segment, 3rd and 4th joints subequal, 5th joint longest, flagellum equal to peduncle, 12-jointed.

Mandibles, palp with 1st joint longest, 3rd shortest, narrow and tapering.

First maxilla very slender, apex with a short stout spine and 3-4 setules.

Second maxilla about thrice as broad as first maxilla, apex bilobed, each lobe with a small apical point.

Maxilliped, 2nd joint $3\frac{1}{2}$ times as long as broad, with 1 long plumose seta on outer apical angle, 3rd joint equal to apical width of 2nd, apical joint with 3-4 recurved spines.

First peraeopod, 3rd joint with 1 strong spine and 1 seta on outer apex, 4th joint with 3 spines on outer apex, inner margin with 1 small spine at base and 2 unequal blunt spines near apex, 5th joint with 1 small spine on inner margin, 6th joint with inner margin obliquely produced, apex with 2 low and blunt teeth and 4 sub-marginal spines, in ♀ the teeth are obsolete and 3rd joint has only 1 apical spine on inner margin.

Second and third peraeopods similar, but 4th joint has on inner margin 1 stout, blunt spine at base and 2 unequal, blunt spines at apex.

Fourth to seventh peraeopods, 3rd joint shorter than 2nd in 4th and 5th peraeopods, subequal in 6th and 7th, inner margin of 3rd, 4th and 5th joints with numerous blunt tubercles as well as fairly numerous spines, spines at the apices of the joints strong.

Second pleopod, outer ramus larger than inner, inner apex of peduncle with 4 hooked and several simple setae, male stylet slender and tapering to an acute apex, shorter than ramus.

Uropods scarcely reaching telsonic apex; peduncle extends nearly to end of inner ramus; inner ramus obovate, apex rounded, margins crenulate and fringed with plumose setae, 2 spines on outer distal margin, in ♀ similar but more feebly crenulate; outer ramus subequal to inner ramus in ♂, lanceolate, apex acute, margins denticulate, outer margin in addition with 6-7 teeth, increasing in size distally, each with a spine springing from its posterior basal angle, fringed with plumose setae, in ♀ rather shorter than inner ramus, tapering rather more abruptly to the acute apex, teeth on outer margin not so strong.

Length: ♂ 14 mm., ♀ 12 mm.; *breadth*: ♂ 6.5 mm., ♀ 6 mm.

Colour: In spirit, uniform yellowish.

Locality: Umhloti River mouth NW. $\frac{1}{2}$ W. distant 15 miles (Natal). 100 fathoms. 19/12/00. 1 ♂, 1 juv. Umhloti River mouth

N. by W. $\frac{1}{2}$ W. distant 8 miles. 40 fathoms. 18/12/00. 2 ovigerous ♀♀. s.s. "Pieter Faure." (S.A.M. Nos. A246 and 150986.)

R. granulosa is in many respects close to *R. tuberculosa*, Rich., but is clearly distinguished by the weaker sculpturing on the body, the shape and armature of the 6th joint of the first 3 pairs of pereiopods and the acute apex of the outer ramus of uropods. The last but one character and the absence of ornamentation on the telson serve to distinguish it from *R. signata*, Sch. & Mein., and *R. aries*, Sch. & Mein.

FAMILY CYMOTHOIDAE.

1867. *Cymothoidae*, Bate & Westwood, Brit. Sessile-eyed Crust. vol. 2, p. 274.
1900. ,, Stebbing, S.A. Crust. pt. 1, p. 55. (References.)
1910. ,, Thielemann, Abh. Ak. Wiss. Munich, 2 Suppl. Bd. 3 Abt. p. 33.

GEN. NEROCILA, Leach.

1818. *Nerocila*, Leach, Dict. Sci. Nat. vol. 12, p. 351.
1902. ,, Stebbing, S.A. Crust. pt. 2, p. 55. (References.)
1905. ,, Richardson, Bull. U.S. Nat. Mus. No. 54, p. 219.

NEROCILA RHABDOTA, Koelbel.

1979. *Nerocila rhabdota*, Koelbel, Sitzber. K.K. Ak. Wiss. Wien (Math. nat. Kl.) Bd. 78, Abt. 1, Jahrg. 1878.
1881. ,, ,, Schioedte & Meinert, Naturh. Tidsskr. ser. 3, vol. 13, p. 39, pl. 2, figs. 5, 6 (ovigerous ♀).

Among several specimens of *N. cephalotes*, Sch. & Mein., collected by the s.s. "Pieter Faure," are two specimens which agree with the description and figures of *N. rhabdota* given by the joint authors except in one respect: the inner ramus of the uropods. According to the description it is "narrow, obtuse, extending only a little beyond the apex of telson," whereas in one of the South African specimens (immature ♀) it resembles the inner ramus of *N. cephalotes*, i.e., it is acute, with a tooth on inner distal margin, but it does not extend so much beyond the telsonic apex as in the latter species. In the other specimen both inner rami are broken off short.

Since in all other respects, especially as regards the lateral margins of the peraeon segments and the epimera, both specimens cannot be separated from the typical *N. rhabdota*, the variation in the uropods must be looked upon as local.

Length : 33 mm. ; *breadth* : 13 mm. (not including lateral spines).

Colour : In spirit, uniform yellowish.

Locality : Bakkoven Rock W. $\frac{1}{4}$ N. distant $\frac{3}{4}$ mile (False Bay). 22 fathoms. 7/6/00. 1 immature ♀. Flesh Point N. by E. $\frac{1}{4}$ E. distant 4 miles. 29 fathoms. 28/1/04. 1 ovigerous ♀ ("taken from a branching sponge"). 33° 24' S. 26° 12' E. 20–30 fathoms. 15/3/99. 1 ovigerous ♀. s.s. "Pieter Faure." (S.A.M. Nos. 150969, 150970 and A2713.)

Geogr. Distribution : Senegal, from pectoral fin of *Psettus seba*, C. & V. (Koelbel).

NEROCILA TRICHIURA (Miers).

1847. *Anilocra trichiura*, White, List. Crust. Brit. Mus. p. 108.
Nulla descr.
1877. " " Miers, Proc. Zool. Soc. Lond. 1877,
p. 677, pl. 69, figs. 6, 6a.
1881. *Nerocila* " Schioedte & Meinert, Naturh. Tidsskr.
ser. 3, vol 13, p. 83, pl. 7, figs. 1, 2
(ovigerous ♀).
1910. " " Stebbing, Tr. Linn. Soc. Lond. Zool.
vol. 14, pt. 1, p. 102.

One immature ♀, 24 mm. long, 8 mm. broad, is in the "Pieter Faure" collection, but without record of exact locality. (S.A.M. No. A2564.)

Geogr. Distribution : Indian Ocean (White); Mauritius (Miers); Atlantic Ocean (Schioedte & Meinert); Philippine Islands? (Schioedte & Meinert); Great Chagos (Stebbing).

Parasitic on Flying-fishes (*Erocoetus* spp.).

GEN. IRONA, Schioedte & Meinert.

1884. *Irona*, Schioedte & Meinert, Naturh. Tidsskr. ser. 3, vol. 14,
p. 381.
1897. " Hansen, Bull. Mus. Comp. Zool. Harv. vol. 31, No. 5,
p. 110.
1905. " Stebbing in Herdman's Ceylon Pearl Fish. Suppl.
Rep. 23, p. 27.
1905. " Richardson, Bull. U.S. Nat. Mus. No. 54, p. 265.

IRONA MELANOSTICTA, Schioedte & Meinert.

1884. *Irona melanosticta*, Schioedte & Meinert, l.c. p. 388, pl. 17,
figs. 3-5 (♀).
1910. „ „ Thielemann, Abh. Ak. Wiss. Munich,
2 Suppl. Bd. 3 Abt. p. 45, pl. 2,
figs. 28, 29.

The ♀ agrees well with the original description except in a few particulars. The epimera are scarcely subpendulous or declivous on the right, on the left side not at all so, but continued in the same plane as the segments; the epimera of segments 2 and 3 are the narrowest, that of 4th segment much the largest, those of segments 5-7 intermediate in size. The uropods are not shorter than telson, but the inner ramus extends a little, the outer for nearly half its own length, beyond the telsonic apex. Both pairs of antennae are 8-jointed, the division between peduncle and flagellum indistinct. Peraeon segments, except 1st, with an obscure median depression on anterior margin, deepest on the 2nd-4th segments. The specimen is curved to the right.

The ♂ is more symmetrical, the head proportionately larger, 1st peraeon segment longest, the rest subequal. Antero-lateral angles on 2nd and 3rd segments not marked off by oblique grooves as in ♀. Epimera pendulous, those of 2nd and 3rd segments deepest, posterior margins truncate, that of 4th segment small, those of 5th-7th segments subequal, posterior margins rounded. First and lateral portions of 2nd pleon segments concealed, posterior margin of 5th segment not sinuous. Telson almost as long as broad, apex broadly rounded.

First and second antennae 8-jointed, peduncle and flagellum not distinct.

Upper lip very faintly emarginate, not 4-lobed as in *I. nanoides*, Stebbing.

Mandibles, palp stout, 1st and 2nd joints subequal, 3rd small, all joints without setae.

First maxilla, apex with 3 spines, but the other two appear to have been broken off.

Second maxilla, apex of trunk apparently with 2 small lobes each bearing 3 hooked spines.

Maxilliped, 2nd joint $2\frac{1}{2}$ times as long as broad, inner margin bent inwards at right angles to outer surface, 3rd joint $\frac{1}{3}$ as long as 2nd, 4th joint half length of 3rd, apex with 3 hooked spines.

First and second pleopods, outer ramus broader but not so long

as inner, male stylet on second pleopod arising from base of and extending $\frac{2}{3}$ along ramus, apex blunt, peduncle with prominent oval "epipod" on outer margin, inner apical angle without setae.

Uropods much longer than telson, inner ramus $\frac{1}{3}$ as long again as telson, outer ramus $1\frac{3}{4}$ times as long as telson.

Length: ♂ 15 mm., ♀ 22 mm.; *breadth*: ♂ 6 mm., ♀ 13 mm.

Colour: Yellowish-white with faint bluish tinge, telson except the posterior margin bluish black, eyes black.

Locality: Chinde, mouth of Zambezi River. 4/11/12. 1 ♂, 1 ♀ with embryos. (K.H.B.) In left branchial cavity of *Tylosaurus choram*, Forsk. (S.A.M. No. A2675.)

Geogr. Distribution: Japan, Sandwich Islands (Sch. & Mein.); Japan, on *Belone* sp. (Thielemann).

FAMILY SPHAEROMIDAE.

For references see Stebbing, Gen. Cat. S.A. Crust. 1910, p. 426. Also:—

1908. Baker, Tr. and Proc. Roy. Soc. S. Austr. vol. 32, p. 138.

1910. id. *ibid.* vol. 34, p. 75.

1911. id. *ibid.* vol. 35, p. 89.

GROUP HEMIBRANCHIATAE, Hansen.

GEN. EXOSPHAEROMA, Stebbing.

1900. *Exosphaeroma*, Stebbing, Proc. Zool. Soc. Lond. 1900, p. 553.

1910. „ id. Gen. Cat. S.A. Crust. p. 428.

1913. „ Tattersall, Tr. Roy. Soc. Edinb. vol. 49, pt. 4, p. 882.

EXOSPHAEROMA GIGAS (Leach).

1818. *Sphaeroma gigas*, Leach, Dict. Sci. Nat. vol. 12, p. 346.

1843. „ *jurinii*, Krauss, Südafrik. Crust. p. 65 (non Audouin).

1900. *Exosphaeroma gigas*, Stebbing, l.c. p. 553, pl. 39.

1902. „ „ id. S. Afric. Crust. pt. 2, p. 69.

1910. „ „ id. Gen. Cat. S.A. Crust. p. 428.

1910. *Sphaeroma jurinii*, id. *ibid.* p. 427. (Quotes Krauss.)

I follow Hansen (1905) and Stebbing (in 1902) in keeping *E. gigas* (Leach) and *E. lanceolatum* (White) separate, and the above synonymy refers only to the form known as *E. gigas* and figured by Stebbing in 1900. Stebbing included the species in the South African fauna from an examination of specimens from the Buffalo River. These specimens however are immature. I have examined a large series of all ages collected in the Cape Peninsula; those of the same size as Stebbing's specimens are in all respects indistinguishable from his, but the adults have the uropods extending to the end of the telson and of a different shape. There seems therefore to be some little doubt as to the specific identity of the Cape and the Falkland Islands specimens. Owing to the absence of authenticated specimens of *E. gigas* from the latter locality I am not at present able to carry out a detailed comparison of the two forms.

On the other hand, the identity of Krauss' *jurinii* with the form here called *gigas* is certain (see Introduction).

Specimens from Salt River (Cape Town) in a "pool half a mile from sea" (Dr. W. F. Purcell, S.A.M. No. 9869) have the inner ramus of the uropods sparsely setose, the outer ramus apically subacute and minutely serrulate on outer distal margin, both margins setose, the inner margin especially so. The uropods of the Buffalo River specimens identified by Stebbing are also setose, but the other specimens from Table Bay have the uropods nonsetose or very nearly so; this is the case also with the Falkland Islands specimens.

Stebbing recorded also *E. lanceolatum* (White) from Sebastian Bay. I have collected other specimens in Table Bay which appear to be referable to that species. Dr. W. M. Tattersall has kindly examined them and states that he considers the identification correct. However, as I have seen no authentic specimens of *lanceolatum* I think it best to exclude description and localities of the South African form from this present paper.

EXOSPHAEROMA KRAUSSI, Tattersall.

(Plate XXXII. D.)

1843. *Sphaeroma tristense*, Krauss, Südafrik. Crust. p. 65 (non Leach).
1910. " " Stebbing, Gen. Cat. S.A. Crust. p. 427.
(Quotes Krauss.)
1913. *Exosphaeroma kraussi*, Tattersall, Tr. Roy. Soc. Edinb. vol. 49, pt. 4, p. 884, pl. figs. 2, 6 (♀).

Dr. Tattersall assures me that adult specimens, which I had sent to him, are the same as his species, so that I am able to add the description of the adult ♂ and ♀. Moreover I am able to confirm his suspicion that this was the species which Krauss mistook for *tristense* (Leach); if Dr. Tattersall had seen an adult ♂ (as was Krauss' specimen) he would have had no difficulty with the adjective "stumpfe," as applied to the telsonic apex, in Krauss' diagnosis.

Male. The tubercles are obsolete on the anterior peraeon segments and those that are present on the posterior segments are less conspicuous than in the female. The swellings at the junctions of the epimera and body segments are however as strong or even slightly stronger. Tubercles on 4th pleon segment (not 3rd as in Tattersall's description) not quite as strong. Telson with 2 blunt basal carinae and a median apical one, which latter is fainter in ♂ than in ♀. The sides slightly concave, apex obtusely pointed.

Uropods much larger proportionately than in ♀; inner ramus nearly reaching telsonic apex, apically subtruncate, with very fine indentations on apical margin; outer ramus reaching telsonic apex, ovate, apex subacute, outer distal margin minutely serrulated.

Apex of inner ramus of adult ♀ blunter than in Tattersall's figure and more resembling that of ♂.

The following details apply to both sexes:—

Anterior margin of head with 2 semicircular indents on either side of median point, the flat, straight keel between these indents and the eyes rather strongly produced.

The epimera, as compared with those of *E. gigas*, are more separated, squarer, the antero-lateral angles less rounded.

First antenna reaching to middle of 1st peraeon segment, 1st joint rather less than twice as long as broad, 2nd as long as broad, nearly $\frac{1}{2}$ 1st, 3rd equal to $\frac{2}{3}$ 1st, flagellum equal to 1st and 2nd peduncular joints together, 11-jointed.

Second antenna reaching almost to end of 3rd peraeon segment, 1st-4th joints gradually increasing in length, 5th equal to 1st and 2nd together, flagellum longer than peduncle, 17-jointed.

Epistome, width across proximal end nearly equal to that across the arms, proximal margin flatly rounded, sides deeply concave.

Mandibles, cutting-edge tridentate, secondary cutting-edge in left bidentate, spine-row with 6 spines in left, 10 in right, palp with 1st joint stouter than 2nd and 3rd, 1st and 3rd subequal, 2nd longer, 2nd and 3rd with strong fringe of doubly denticulate setae.

First maxilla, outer plate with 8 spines, innermost 2 denticulate, inner plate with 4 plumose setae.

Second maxilla, all lobes subequal in width, outer and middle ones both with 8 spine-setae.

Maxilliped normal.

Male appendages on 7th peraeon segment short, apically blunt, distance apart equal to the width of one of them.

First to third pleopods with 4 hooked setae on inner apical angle of peduncle.

Male stylet on 2nd pleopod $\frac{1}{4}$ as long again as ramus, tapering to a fine point.

Length: ♂ 12 mm., ♀ 10 mm.; *breadth*: ♂ 6·5 mm., ♀ 5·25 mm.

Colour: Usually a uniform yellowish brown, the borders of the segments and the tubercles of a brighter and deeper hue; or the male has head, lateral parts of 1st peraeon segment, whole of 5th, 6th and 7th segments, the two tubercles on 4th pleon segment, posterior half of telson and uropods pale whitish, the central part of 1st peraeon segment, whole of 2nd, 3rd and 4th segments, 1st-4th pleon segments and basal half of telson sepia-brown; the female corresponding to this form either resembles the ♂ or has the head, peraeon, pleon and basal central part of telson brown, the remainder of telson and the uropods pale; both sexes with a light brown band across the middle of the uropods. Specimens also occur of a nearly uniform slaty-grey colour, or grey-brown with lighter mottlings, or (very rarely) pure white.

Locality: Various places in Table Bay (R. M. Lightfoot, K.H.B.), (S.A.M. Nos. A243, A2283, A2565, and A2605); St. James, False Bay (Dr. W. F. Purcell, K.H.B.), (S.A.M. Nos. 9859 and A2677); Smitswinkel Bay, False Bay. 5/7/12. (K.H.B.) ♂ ♂ and ovigerous ♀ ♀ (S.A.M. No. A2467); Saldanha Bay. 5/9/12. (K.H.B.) ♂ ♂ and ovigerous ♀ ♀ (S.A.M. No. A2462); East London. 3/7/01. s.s. "Pieter Faure" (S.A.M. No. A241). Between tide-marks.

Saldanha Bay (Tattersall).

The specimens from False Bay and East London are smaller than those from Table Bay.

EXOSPHAEROMA BREVITELSON, n. sp.

(Plate XXXII. B.)

Body moderately convex, smooth, epimera visible in dorsal view. Anterior margin of head with 2 shallow indents on either side of median point. Peraeon segments without any tubercles, only a

slight swelling on either side of junction of epimera with body-segments. Epimera separated, antero-lateral angles well rounded. Pleon segments 1-4 without tubercles. Telson triangular, broader than long, margins straight, apex subacute in ♂, rather more rounded in ♀, in both sexes 2 submedian longitudinal carinae begin near base and extend to centre, where they break up into separate tubercles which join to form a single median carina (usually broken up into separate tubercles) extending almost to apex. Surface of the telson in addition with a number of small scattered granules.

First antenna reaching to end of 1st peraeon segment, 1st joint $1\frac{1}{2}$ times as long as wide, 2nd joint as long as width of 1st, 3rd joint $\frac{3}{4}$ length of 1st, flagellum not quite as long as peduncle, 11-jointed in ♂, 9-jointed in ♀.

Second antenna reaching to end of 2nd peraeon segment, joints of peduncle increasing gradually, flagellum equal to peduncle, 14-jointed.

Epistome, proximal angles bevelled off, proximal margin straight, sides straight, not concave (*i.e.*, as far as point where the arms bend outwards).

Mandibles, cutting-edge 4-dentate, secondary cutting-edge in left tridentate, spine-row with ca. 10 spines in left, ca. 14 in right, 1st joint of palp not stronger than others, 2nd longest, 2nd and 3rd with strong fringe of doubly denticulate setae.

First maxilla, outer plate with 10 spines.

Second maxilla, outer and middle plates both with 10 spine-setae.

Maxilliped normal.

First peraeopod, inner apical angle of 4th and 5th joints with 1 strong, apically bifid seta, 6th joint with 3 such setae and 1 doubly serrulate spine at apex.

Seventh peraeopod, fur on 6th joint weaker than in other peraeopods, 4 apically bifid spines on inner margin, 5th joint with apical circle of doubly serrate spines.

Male appendages on 7th peraeon segment short, apices blunt, distance apart equal to the width of one of them.

First to third pleopods with 4 hooked setae on inner apical angle of peduncle.

Male stylet on 2nd pleopod half as long again as ramus, tapering to a fine point.

Uropods in ♂ large, lamellar, extending beyond telsonic apex, inner ramus broader distally than basally, apex truncate, inner apical angle just beyond telsonic apex, outer ramus nearly as long,

but not quite as broad as inner, broader distally than basally, apex rounded-truncate; in ♀ extending almost to telsonic apex, general shape the same as in ♂ but smaller and narrower; margins of both rami in both sexes entire.

Length: ♂ 9·5 mm. (excl. uropods), ♀ 7·5 mm.; *breadth*: ♂ 5 mm., ♀ 4 mm.

Colour: Head and pereaeon brownish, segments 5–7 lighter than the anterior segments, especially at the sides, margins of the segments as well as those of epistome and peduncles of antennae orange, pleon dark brown, telson and basal half of uropods dark brown, the apex of telson to half-way along margins and the distal half of uropods white, basal margins of uropods orange.

Locality: Sea Point near Cape Town. 29/11/13. (K.H.B.) ♂♂ ovigerous ♀♀ and juv. (S.A.M. No. A2628.) Low-tide, under stones.

EXOSPHEROMA VARICOLOR, n. sp.

(Plate XXXII. C.)

Body rather strongly convex, smooth, the epimera scarcely visible in dorsal view. Anterior margin of head with 1 fairly deep and 1 shallow indentation on either side of median point. Pereaeon segments quite smooth; in some ♂♂ there are 2 very obscure submedian tubercles (mere indications), which however are totally absent in other ♂♂ and in ♀♀. Epimera bent downwards almost vertically, not so separated as in *E. gigas*, the antero-lateral angles obsolete, the postero-lateral subacute. Pleon with 2 very obscure submedian tubercles on hind margin of segment 4 in both sexes. Telson as long as broad, sides almost straight, apex rounded, surface smooth with 2 blunt, submedian carinae, with groove between them, on basal portion, the carinae more prominent distally than basally.

Antennae similar to those of the last species, flagellum of 1st 10-jointed, of 2nd 14-jointed.

Epistome similar to that of the last species but sides concave.

Mandibles, cutting-edge 4-dentate in left, 3-dentate in right, secondary cutting-edge in left 3-dentate, spine-row with ca. 6 spines in left, ca. 9 in right, palp stout, 2nd joint longest, 2nd and 3rd joints strongly fringed.

First maxilla, outer plate with 10 spines.

Second maxilla, outer and middle plates both with 10 spines.

Maxilliped normal.

First pereopod, 2nd joint with 1 strong outstanding spine on middle of outer margin, inner apical angles of 4th, 5th and 6th joints

each with 1 strong, apically bifid spine, fur on 4th, 5th and 6th joints very thick.

Seventh peraeopod, circle of serrate spines on apex of 5th joint not well developed, inner margin of 6th joint less furry than in other peraeopods, with 4 strong spines.

Male appendages on 7th peraeon segment short, apices blunt, distance apart equal to the width of one of them.

First to third pleopods with 3 hooked setae.

Male stylet on 2nd pleopod half as long again as ramus, tapering to a fine point.

Uropods almost three-quarters the length of telson in both sexes, both rami ovate, apically rounded, inner ramus a little longer than outer, with apex slightly more pointed.

Length: ♂ 10.5 mm., ♀ 6 mm.; *breadth*: ♂ 5.25 mm., ♀ 3 mm.

Colour: Very variable: uniform pure white or grey; or white with head and 1st peraeon segment brown, or peraeon segments 1 and 4 brown, or peraeon segments 1-4, pleon and lateral portions of telson brown; or white or grey speckled with darker; or grey mottled with darker patches; or white with purplish-brown transverse bands, 1 across head and each peraeon segment, 1 across the united pleon segments 1-4 and 3 more or less curved, across the telson, the last one corresponding with the curve of the distal margin. This last form is characteristic of ♀♀, as only one ♂ with such colouration has been found. The other common form of ♀ is white with head and 1st peraeon segment brown.

Locality: Woodstock Beach. 1896. (Dr. J. D. F. Gilchrist.) Saldanha Bay. 5/9/12. (K.H.B.) Sea Point, near Cape Town. 29/11/13. (K.H.B.) ♂♂, ♀♀ with ova and embryos, and juv. (S.A.M. Nos. A85, A2559 and A2629 respectively.) Low-tide, under stones.

EXOSPHAEROMA PLANUM, n. sp.

(Plate XXXII. F.)

Body very flat, inferior margin of epimera not visible in dorsal view. Head irregularly granular, anterior margin with a fairly deep indentation on either side of median point. Peraeon segments with short longitudinal rugae on lateral portions, the rugae breaking up into irregular granules in centre; 7th segment without any process; junctions of epimera with body segments rather sunk; the epimera rather swollen, curved over on to the ventral surface, overlapping (not separated as in *E. gigas*), 2

longitudinal rugae and some irregular granules on dorsal surface and one ruga where the dorsal and ventral surfaces meet, only one ruga on the epimeron of 7th segment. Pleon segments minutely granular but otherwise without ornamentation. Telson triangular, a little broader than long, minutely granular, the granules being largest on the central raised portion; this part bears 2 sharp longitudinal keels, slightly more prominent in ♀ than ♂, which run from base of telson to the centre, where they unite and continue as a single median, less well-defined keel, to the apex; side margins nearly straight, apex subacute.

First antenna reaching to middle of 1st peraeon segment, 1st joint $1\frac{1}{2}$ times as long as wide, 2nd joint $\frac{1}{4}$ length of 1st, 3rd joint $\frac{2}{3}$ length of 1st, flagellum as long as 1st and 2nd peduncular joints together, 11-jointed in ♂, 10 in ♀.

Second antenna reaching to end of 2nd peraeon segment, joints gradually increasing in length to 4th, 5th joint very little longer than 4th, flagellum a little longer than peduncle, 17-jointed in ♂, 15 in ♀.

Epistome, proximal angles bevelled off, proximal and lateral margins straight, a deep oval pit occupying the greater portion of the proximal end.

Mandibles, cutting-edge obscurely bifid, secondary cutting-edge in left tridentate, spine-row with ca. 10 spines in left, ca. 14 in right, palp stout, 1st and 3rd joints subequal, 2nd longer, a strong fringe of serrate setae on 2nd and 3rd joints.

First maxilla, outer plate with 10 spines, inner plate with 4 plumose setae.

Second maxilla, outer and middle plates each with 12 spines.

Maxilliped, length of 2nd joint equal to twice width at distal end but not twice that of basal width, 1 coupling-hook on inner plate, 4th, 5th and 6th joints lobed internally.

Peraeopods stout; 7th peraeopod with circlet of doubly serrate spines on apex of 5th joint and 5 stout spines on inner margin of 6th joint, fur on 6th joint also less dense than in the other peraeopods.

Male appendages on 7th peraeon segment stout, apices blunt, distance apart equal to the width of one of them.

First to 3rd pleopods with 4 hooked setae on inner apex of peduncle. Male stylet on 2nd pleopod half as long again as ramus, tapering to a fine point.

Uropods in ♂ extending to end of telson, inner ramus truncate apically, inner apical angle subacute, outer apical angle rounded,

outer ramus subequal in size, ovate, apically rounded; in ♀ similar in shape but not quite reaching telsonic apex.

Length: ♂ 15 mm., ♀ 12 mm.; *breadth*: ♂ 7.5 mm., ♀ 6 mm.

Colour: Brown, inclining to orange on the margins of the segments, with the front of head, epistome, posterior margin of 4th pleon segment, whole of telson and uropods white with very faint tinge of grey due to minute pigment specks; one specimen wholly white, only 1st-4th pleon segments brown.

Locality: Sea Point, near Cape Town. 14/12/13. (K.H.B.) ♂ ♂, ovigerous ♀ and juv. (S.A.M. No. A2651.) Low-tide, under stones.

EXOSPHAEROMA PORRECTUM, n. sp.

(Plate XXXII. E.)

Body nearly parallel-sided, slightly wider across the posterior peraeon segments than across the anterior ones, glabrous.

Head with two small angular projections on antero-lateral margins and a median tubercle on frontal margin, dorsal surface with 4 transverse rows of tubercles respectively 2, 4, 3 and 3 in number, the last row being on the posterior margin of head; eyes large, black.

Peraeon with 1st segment twice as long as the others, which are subequal, two transverse rows of tubercles on 1st segment, the anterior one composed of 5, the posterior one of 7 blunt tubercles (2 and 3 respectively on either side of a median one); 2nd and 3rd segments each with a single row of 7 tubercles; 4th-6th segments each with a single row of 6 tubercles, the median one being absent; 7th segment narrower than 6th with 4 tubercles and a small indentation on posterior margin at the junction of the epimeron with dorsum; junctions between 1st-6th epimera and their segments nodular, 2nd-5th epimera bent downwards at right angles, distant from one another and slightly excavated in front of a low oblique ridge; bases of epimera interlocking ventrally.

Pleon longer than peraeon, 4th segment with 2 submedian tubercles on posterior margin; telson longer than broad, its posterior third rather suddenly narrowed to a long tapering dorsally keeled apex; 3 transverse rows of tubercles, the first composed of 2 large submedian tubercles, the second of 4, the 2 submedian ones longer than the lateral ones, the third of 2 small submedian tubercles; a faint indication of a tubercle at the base of the apical keel.

First antenna reaching to anterior margin of 1st pereon segment, 1st joint of peduncle stout, half as long again as broad, 2nd joint nearly half length of 1st but narrower, 3rd joint $\frac{2}{3}$ length of 1st, slender, flagellum nearly as long as peduncle, 8-jointed.

Second antenna reaching to posterior margin of 1st pereon segment, flagellum as long as peduncle, 11-jointed.

Epistome prominent in a dorsal view of the animal, proximal end straight, angles rounded, margins strongly concave, the arms wide and embracing the upper lip.

Mandibles with cutting-edge entire (or obscurely bifid in the left), secondary cutting-edge in the left feebly bifid, spine-row with ca. 8 spines in the left and ca. 4 in the right, molar oblique, setiferous; palp with 1st and 2nd joints subequal, 3rd shorter.

First maxilla with 8 spines on outer lobe, the 4 inmost spines serrulate.

Second maxilla with ca. 8 setae on outer and middle lobes.

Remaining mouth parts as in normal *Exosphaeroma*.

First pereopod, outer margin of 3rd joint and apex of 4th each with 1 spine, inner margin of 6th joint with 2 spines near apex.

Second pereopod, outer apex of 4th joint with 2 spines, 5th joint without spines.

Third to seventh pereopods, 5th joint with serrate spines all round apex, inner margin of 6th joint of 7th pereopod not furry, with 2 distant spines.

Male appendages on 7th pereon segment short, blunt, and some distance apart.

Second pleopod, inner apex of peduncle with 3 hooked spines, male stylet half as long again as ramus.

Third pleopod, outer ramus distinctly 2-jointed.

Fourth and fifth pleopods, outer ramus membranous and 2-jointed.

Uropods not extending more than $\frac{3}{4}$ length of telson, inner ramus parallel-sided, apex feebly bifid, outer ramus rather longer than inner, ovate-lanceolate, apex acute and outwardly recurved.

Length: 5 mm.; *breadth*: 2.5 mm.

Colour: Light brown with the lateral parts of the 4th pereon segment, the base of the pleon and a band across the telson and uropods rather darker, most of the tubercles (especially anteriorly) are tipped with yellowish brown, the others white.

Locality: Sea Point, near Cape Town. 29/11/13. (K.H.B.)
3 ♂♂ under stones at low-tide. (S.A.M. No. A2625.)

GEN. ISOCLADUS, Miers.

1876. *Isocladus*, Miers, Ann. Mag. Nat. Hist. (4) 17, p. 228.
 1905. „ Hansen, Q. J. Microsc. Sci. vol. 49, pt. 1, pp. 103,
 118.
 1906. „ Richardson, Proc. U.S. Nat. Mus. vol. 31 (1907),
 p. 114.
 1910. „ Baker, Tr. R. Soc. S. Austr. vol. 34, p. 84.

ISOCLADUS TRISTENSIS (Leach).

(Plate XXXIII. B.)

1818. *Sphaeroma tristense*, Leach, Dict. Sci. Nat. vol. 12, p. 345
 (? ♀).
 1840. „ „ M. Edwards, Hist. Nat. Crust. vol. 3,
 p. 207.
 1905. „ (?) „ Hansen, l.c. p. 117.
 ? 1906. *Isocladus magellanicus*, Richardson, l.c. p. 114, fig. 18 (♂).
 1913. *Exosphaeroma tristense*, Tattersall, Tr. Roy. Soc. Edinb.,
 vol. 49, pt. 1, p. 882, pl. fig. 1
 (juv. ♂).

Body perfectly smooth and glabrous. Seventh peraeon segment scarcely wider than 6th in ♂, with a long backward, slightly curved process reaching to the telsonic apex, in ♀ quite plain. Junction of epimera with segments well marked, but no sutures. Epimera triangular, narrowing into blunt backwardly directed processes, that of 7th segment not concealing lateral portion of 2nd pleon segment. Pleon quite smooth, telson more strongly convex in ♀ than in ♂, the elongate tubercles at base very obscure, apex subacute, not produced, with a very shallow ventral groove in both sexes.

First antenna, 2nd joint one-third length of 1st, which is stout and internally concave, 3rd joint $\frac{3}{4}$ length of 1st, slender, flagellum as long as 1st and 2nd peduncular joints together, 12-jointed.

Second antenna reaching to end of 3rd peraeon segment, 1st joint shortest, 2nd joint a little longer, 3rd and 4th joints subequal, a little longer than 2nd, 5th joint equal to 1st and 2nd together, flagellum a little longer than peduncle, 14-jointed.

Upper lip triangular with distal margin straight or slightly concave, setose. Epistome broad proximally.

Lower lip with the lobes oval, apically rounded, setose.

Mandibles, cutting-edge 4-dentate in left, obscurely tridentate in right, secondary cutting-edge in left tridentate, in right represented

by a stout, colourless, bifid spine, spine-row with ca. 10 spines in left, 12 in right, molar strong, denticulate, with a tuft of setae, palp stout, 1st and 2nd joints subequal, 3rd a little longer.

First maxilla, outer plate with 8-9 spines, the inner ones denticulate, inner plate with 4 plumose setae.

Second maxilla, all three plates subequal in width, outer and middle each with 13 denticulate spine-setae.

Maxilliped with inner plate nearly as long as 2nd joint, one coupling-hook.

All pereopods with thick fur on inner margin of 4th-6th joints (except the 6th joint of 7th pereopod), 3rd joint with 2-3 spines in middle of outer margin, 4th joint with 3-4 spines on expanded outer apex, 5th joint of 6th and 7th pereopods with apical circle of serrulate spines.

Male appendages on 7th pereon segment contiguous, narrow, apices blunt.

First to third pleopods with 4 hooked setae on inner apex of peduncle. Male stylet on 2nd pleopod nearly half as long again as ramus.

Third pleopod with 2-jointed outer ramus.

Fourth and fifth pleopods, inner ramus fleshy, with transverse folds, outer ramus pellucid, 2-jointed, outer margins of outer rami of 4th and 5th pleopods and of inner ramus of 4th pleopod setulose.

Uropods extending in ♀ as far as, in ♂ a little beyond, the telsonic apex, broad and ovate in ♂, narrower and lanceolate in ♀, outer ramus a little shorter than inner.

Length: ♂ 11.5 mm., ♀ 10.5 mm.; *breadth*: ♂ 6 mm., ♀ 5 mm.

Colour: In spirit, dark brownish grey.

Locality: Tristan d'Acunha. One adult ♂, several nonovigerous ♀ ♀ and young of both sexes. (P. C. Keytel.) 1909. (S.A.M. No. A249.)

Geogr. Distribution: Tristan d'Acunha (Leach); Straits of Magellan (Richardson); Gough Island (Tattersall).

With regard to the uropods it may be pointed out that Miss Richardson's figure hardly conforms to her statement that "the branches of the uropoda are alike in size and shape . . ."; for the inner branch is evenly rounded, whereas the outer has a blunt rounded projection on the outer distal angle. This however may be due to an exaggeration on the part of the artist. In the Tristan specimens both branches are rounded at the end, and the outer is shorter than the inner. No doubt local influences are the

explanation of these small differences, including the slightly longer antennae.

It may also be noted that, where in Miss Richardson's text "only one specimen, a female" occurs, "male" is evidently intended; the explanation to figure 18 is correctly given.

Dr. Tattersall has kindly examined one of my young ♂♂ from Tristan, and states that it is exactly the same as his from Gough Island.

Tattersall (l.c. p. 884) has suggested the possibility of *S. stimpsoni*, Heller, *S. leucura*, White, and *S. integra*, Heller, being synonyms of Leach's species. And to include *S. stimpsoni* and his own specimens of *S. tristense*, he has emended the definition of the genus *Exosphaeroma*. This emendation is now found to be unnecessary, in view of the fact that *S. stimpsoni* ♂ has a telsonic notch and that the adult ♂ of *S. tristense* is undoubtedly an *Isocladus*.

As regards *S. leucura* I can express no opinion. *S. integra*, Heller, the types of which I have examined, is certainly not synonymous with the present species, although it should be placed in the genus *Isocladus*. The three type specimens all have the ♂ appendages on the 7th peraeon segment well developed and the stylet on the 2nd pleopod free from the inner ramus, but it is probable that the adult male with fully developed dorsal process has not yet been found.

Although a detailed description of *I. integer* (Heller) is hardly within the scope of the present paper, the points in which it differs from *I. tristensis* (Leach) may be briefly mentioned. The epimera are larger and squarer, the 7th completely conceals the lateral portion of the 2nd pleon segment, the telson is not so convex, its flattened border proportionately larger, the apex blunter, the outer ramus of uropods extending only slightly beyond telsonic apex, the inner ramus with inner distal angle produced in a subacute point reaching to, but not beyond the telsonic apex, outer margin of inner ramus strongly convex (Heller's figure in Novara Crust. pl. 12, fig. 8, is good, the left-hand inner ramus being quite correctly drawn).

GEN. CYMODOCE, Leach.

1814. *Cymodoce*, Leach, Edinb. Encycl. vol. 7, p. 433.

1902. ,, Stebbing, S.A. Crust. pt. 2, p. 73.

1905. ,, id. in Herdman's Ceylon Pearl Fish. Suppl. Rep.
23, p. 42.

1905. *Cymodoce*, Hansen, Q. J. Microsc. Sci. vol. 49, pt. 1, pp. 70, 104, 119.
1910. „ Stebbing, Tr. Linn. Soc. Lond. Zool. vol. 14, pt. 1, p. 104.
1910. „ Richardson, Wash. Bur. Fish. Doc., No. 736, p. 27.

CYMODOCE AMPLIFRONS (Stebbing).

1902. *Exosphacroma amplifrons*, Stebbing, S.A. Crust. pt. 2, p. 64, pl. 11 (♂).
1905. *Cymodoce* „ Hansen, l.c. p. 122.
1910. „ „ Stebbing, Gen. Cat. S.A. Crust. p. 429.

The original description was based on male specimens, but Stebbing (l.c. p. 66) mentions a smaller specimen which “differed from the largest and from the one figured by having the telsonic apex simple, not trilobed, and by having much-reduced lobes on the basal part of the telson.”

Two large females agree with this description. Moreover the uropods are shorter and do not reach the telsonic apex. The only setae present on the pleon and uropods are: a row along the basal margin of 6th segment in advance of the insertion of the uropods; a tuft on the outer margin of peduncle of uropod; a tuft on inner apical angle of inner ramus; and a tuft on the underside of telson on either side of the terminal notch.

The hind margins of the peraeon segments are not cut into blunt denticles as in ♂, but segments 1-5 are ornamented each with a transverse row of 7 tubercles (1 median, 1 medio-lateral and 2 lateral), and segments 6 and 7 with a row of 6 tubercles (the median one being absent). The medio-lateral tubercles gradually converge posteriorly. On segments 6 and 7 there is a small inconspicuous tubercle between the medio-lateral and lateral tubercles.

The peculiar pittings on the integument of ♂ are inconspicuous in ♀.

Though apparently nearly full grown, these specimens are not ovigerous, and the mouth parts are not modified.

Length: 13 mm.; *breadth*: 7 mm.

Colour: In spirit, pinkish white.

Locality: Port Shepstone WNW. distant 2½ miles (Natal). 24 fathoms. 15/3/01. Two nonovigerous ♀♀. s.s. “Pieter Faure.” (S.A.M. No. A27.)

CYMODOCE VALIDA (Stebbing).

(Plate XXXIII. C.)

1902. *Erosphaeroma validum*, Stebbing, S.A. Crust. pt. 2, p. 66,
pl. 12 A. (♂.)
1905. *Cymodoce valida*, Hansen, Q. J. Microsc., Sci. vol. 49, pt. 1,
pp. 118-122. (Young ♂.)
1910. „ „ Stebbing, Gen. Cat. S.A. Crust. p. 430.

Stebbing in 1910 included *C. setulosum* (Stebbing) in the above synonymy as the female on the strength of Hansen's remarks, (l.c. pp. 118-122). However, among the numerous specimens of *Cymodoce* collected by the s.s. "Pieter Faure," there are 3 adult females which I think should be referred to this species as the true female. Consequently *C. setulosum* should be reinstated as a distinct species. There is also a large male agreeing essentially with Stebbing's description, but nearly a third as long again as his specimens.

Adult male. Peraeon smooth, without tubercles. The 4th segment of pleon with 2 inconspicuous submedian tubercles and another on the lateral portion; telson with 2 large submedian bosses with minute subsidiary tubercles, apex truncate and shallowly trifid.

Flagella of first and second antennae respectively 19 and 18-jointed.

Outer plate of first maxilla with 10 spines.

First peraeopod, 3rd joint with 5-6 spine-setae on outer apex, spines on inner margins of 4th, 5th and 6th joints respectively 8, 5 and 6.

Male stylet on second pleopod extends beyond apex of ramus, curving slightly outwards towards the end and minutely spinulose, apex blunt.

Ovigerous female. Peraeon smooth, without tubercles; pleon with 2 inconspicuous submedian tubercles on 4th segment and 2 bosses on telson, telsonic apex truncate, with a shallow notch but without median lobes. Epimera, pleura, telson and uropods with a pellucid border and fine scattered setae.

Flagella of first and second antennae respectively 22 and 16-jointed.

The mouth parts metamorphosed. Lower lip small, consisting of 2 blunt lobes. Incisive process of mandibles blunt, colourless, with a few minute setules, secondary cutting-edge, spine-row and molar absent. Outer lobe of first maxilla with blunt apex, marginal setules

but no apical spines, inner lobe pointed, with 3 apical setae. The long setae on second maxilla are much reduced. Second joint and epipod of the maxilliped enlarged, with long marginal setae, the inner plate and 4 distal joints furnished only with fine setules.

First pereopod, 3rd joint with 1 spine on outer apex, inner margins of 4th, 5th and 6th joints with 8, 6 and 7 spines respectively.

A slightly smaller nonovigerous ♀ from Natal, with unmodified mouth parts, should also be referred to this species, although the integument is a little rougher than in the Mossel Bay specimens. Also the submedian bosses on telson are low, the tubercles on 4th pleon segment obsolete and the apex of outer ramus of uropods more pointed.

Length: ♂ 22 mm., ♀ 15 mm.; *breadth*: ♂ 12 mm., ♀ 7.5 mm.

Colour: In spirit, yellowish white or dull pinkish, without trace of markings. Dr. Purcell gives the colour of his Kalk Bay specimen as "light brown with coeruleous spots." This accords well with the description which Stebbing gives of his specimens.

Locality: 33° 6' S. 28° 11' E. (off East London). 85 fathoms. 28/1/99. 1 ♂; Mossel Bay. 21 fathoms. 24/6/98. 3 ovigerous ♀ ♀; Umhlangakulu River mouth NW. by N. distant 7½ miles (Natal). 50 fathoms. 14/3/01. 1 nonovigerous ♀; s.s. "Pieter Faure." Kalk Bay (False Bay). Low-tide, March, 1901. 1 non-ovigerous ♀. (Dr. W. F. Purcell.) (S.A.M. Nos. A42, A37, A46 and 9862 respectively.)

CYMODOCE SETULOSA (Stebbing).

1902. *Exosphaeroma setulosum*, Stebbing, S.A. Crust. pt. 2, p. 68, pl. 12 B. (♀).

1905. *Cymodoce* sp., Hansen, Q. J. Microsc. Sci. vol. 49, pt. 1, pp. 118-122.

1910. ,, *valida* (part), Stebbing, Gen. Cat. S.A. Crust. p. 430.

As stated above, I do not think this can be regarded as the female of *C. valida*, but must be separated under its former specific name. The male is at present unknown.

CYMODOCE AFRICANA, n. sp.

(Plate XXXIII. F.)

Peraeon segments with 4 inconspicuous widely spaced tubercles, posterior margins of segments and the epimera granulate and

setiferous. Pleon of male granular, 4th segment with 2 submedian bosses and one lateral tubercle, telson with 2 submedian tubercles near base and 2 more prominent ones in the centre, apex trifid, the median lobe not as long as lateral ones. Pleon of female granular and setiferous especially towards sides, 4th segment with 2 submedian tubercles, telson with 2 submedian tubercles, apex with a notch barely visible in dorsal view, at each apical angle and at the top of the notch is a small tubercle.

Flagellum of first antenna 13-jointed in both sexes, that of second antenna 17-jointed in ♂, 15-jointed in ♀.

Outer lobe of first maxilla in ♂ and unmodified ♀ with 10 spines.

Maxilliped of modified ♀ with a few setules on inner plate and the 4 terminal joints quite smooth, 2nd joint with long marginal setae.

First peraeopod, 3rd joint with 1 spine on outer apex, inner margin of 4th, 5th and 6th joints respectively with 7, 5 and 6 spines in ♂, 5, 5 and 6 in ♀.

First to third pleopods with 3 hooked spines on inner apical angle. Male stylet on second pleopod extending beyond ramus.

Uropods of ♂, both rami pointed, outer rather narrower and longer than inner, both extending some distance beyond telsonic apex; of ♀, inner ramus truncate, with sharp outer apical angle, outer ramus shorter than and folding some way but not completely under inner ramus, apex bluntly pointed, both rami minutely setulose and extending only a short way beyond telsonic apex.

A smaller specimen (No. A44), 14 mm. × 6.5 mm., differs from the above only in the more conspicuous granulations on the peraeon segments, the stronger pubescence on the uropods and the smallness of the median lobe of telsonic apex. The East London specimens all agree with this smaller specimen; the larger of the two measures 15 mm. × 7.5 mm.

Length: ♂ 21 mm., ♀ 14 mm.; *breadth*: ♂ 10 mm., ♀ 7.5 mm.

Colour: In spirit, uniform pinkish or yellowish.

Locality: Lion's Head N. 67° E. distant 25 miles (off Cape Peninsula). 131 fathoms. 28/3/00. 1 ♂; Lion's Head N. 63° E. distant 34 miles. 154 fathoms. 19/4/00. 2 ♂♂, 2 ♀♀; Cape Point N. 50° E. distant 18 miles. 180 fathoms. 27/2/02. 1 ♂; Vasco da Gama Point S. 75° E. distant 13 miles (off Cape Peninsula). 166 fathoms. 25/4/00. 1 ovigerous ♀ and 1 non-ovigerous ♀; Buffalo River NW. $\frac{1}{2}$ W. distant 19 miles (off East London). 300 fathoms. 16/4/01. 3 ♂♂. s.s. "Pieter Faure." (S.A.M. Nos. A43, A2721, A44, A41 and A2279 respectively.)

CYMODOCE ACANTHIGER, n. sp.

(Plate XXXIII. E.)

Head, peraeon, and pleon granular, feebler in ♀, glabrous. Peraeon with 2 tubercles on 6th segment and 4 on 7th segment, in ♀ with no tubercles on any of the segments. Pleon in ♂ with 4th segment produced into 2 large submedian pointed processes, with a small tubercle on the lateral portion, telson with 2 small tubercles hidden beneath the processes, apex trifid, the median lobe not as long as lateral ones; in ♀ with 2 large submedian tubercles on 4th segment, telson with 2 small submedian tubercles, apex with a notch invisible in dorsal view, without median lobe, but the top of the notch projects as a very slight tubercle.

Flagella of first and second antennae respectively 15 and 18-jointed in ♂, 14 and 17-jointed in ♀.

Outer plate of first maxilla with 9 spines.

First peraeopod with 3 spines on outer apex of 3rd joint, inner margin of 4th, 5th and 6th joints with 5, 4 and 6 spines respectively.

Male appendages on 7th peraeon segment short, stout, apices blunt.

First to third pleopods with 4 spines in ♂, 3 in ♀, on inner apical angle of peduncle. Male stylet on 2nd pleopod extending beyond apex of ramus, tapering gradually.

Uropods extending some distance beyond telsonic apex, both rami in ♂ long, narrow and pointed, the outer longer than inner; in ♀ the inner is squarely truncate, the outer shorter and narrower than inner, apically pointed, and folding under inner ramus.

Young males, 15 mm. × 7.5 mm., resemble the female except that there are traces of the submedian tubercles on 7th peraeon segment.

Length: ♂ 18 mm., ♀ 14 mm.; *breadth*: ♂ 9 mm., ♀ 7 mm.

Colour: In spirit, yellowish white.

Locality: Buffalo River NW. $\frac{1}{2}$ W. distant 19 miles (off East London). 300 fathoms. 16/4/01. 2 ♂♂, several nonovigerous ♀♀ and young of both sexes. s.s. "Pieter Faure." (S.A.M. Nos. A40, A45.)

CYMODOCE COMANS, n. sp.

(Plate XXXIII. D.)

Head smooth, glabrous. In the male the posterior margins of peraeon segments are slightly, the epimera and pleon strongly

pubescent. In the female the peraeon and pleon are smooth, but with irregular reticulations chiefly noticeable on the pleon. The epimera with long setae. A transverse row of tubercles on 5th peraeon segment in ♂, and 2 rows on both the 6th and 7th segments. In ♀ no tubercles on any of the segments. Pleon in ♂ with 2 submedian tubercles on 4th segment, telson with 2 submedian ridges each with a small pointed tubercle at base and another at apex, below the latter the ridge is setose, 2 setose tubercles a little outside the posterior ends of ridges, apex deeply trifid, lateral and median lobes apically bifid, the median lobe not reaching beyond lateral lobes, with a smooth backwardly curving tubercle at its base. In ♀ the pleon is without any tubercles, telson evenly convex from base to apex, apex shallowly trifid, setose.

Flagella of 1st and 2nd antennae respectively 26 and 21-jointed in ♂, 24 and 20-jointed in ♀.

First maxilla with 9 spines in ♂, 11 in ♀, on outer plate.

First peraeopod, outer apex of 3rd joint with 3 spines in ♂, 2 in ♀, inner margin of 4th, 5th and 6th joints with 6, 4, and 5 spines respectively in both sexes.

Male appendages on 7th peraeon segment elongate, slender and tapering.

First to third pleopods with 3 hooked spines on inner apex of peduncle, male stylet on 2nd pleopod extending beyond ramus, straight, apex obliquely truncate.

Uropods, in ♂ both rami extend beyond telsonic apex, inner ramus parallel-sided, truncate, outer ramus broader than and folding under inner, ovate, with apical denticle, both rami strongly setose; in ♀ rami extend only a very little beyond telsonic apex, inner ramus truncate, the slightly concave truncate margin and the outer margin obscurely denticulate, outer ramus ovate, both margins obscurely denticulate, both rami with long closely-set setae.

Length: ♂ 18 mm., ♀ 13 mm.; *breadth*: ♂ 8 mm., ♀ 7 mm.

Colour: In spirit, uniform dull yellowish, living female ivory-white.

Locality: Near Muizenberg, False Bay. 5-10 fathoms. 12/9/97. 1 ♂; Rockland Point NW. by W. $\frac{1}{2}$ W. distant 1 mile (False Bay). 22 fathoms. 24/9/02. 2 juv. ♀ ♀. s.s. "Pieter Faure." Agulhas Bank. 43 fathoms. 23/5/12. (K.H.B.) 1 nonovigerous ♀. (S.A.M. Nos. A47, A35, and A2280 respectively.)

This seems closely allied to *C. zanzibarensis*, Stebbing (1910, l.c. p. 105, pl. 9D), for the style of ornamentation on the pleon is very similar. The details however are not the same; thus in *C. comans*

only the submedian teeth are present on the posterior margin of 4th pleon segment, the basal and central submedian tubercles on the telson are connected by 2 ridges and the tubercles on the outside of the central ones are separated from the latter by a well-marked groove, whereas in *C. zanzibarensis* the outside tubercle and the central one are combined into one bifid tubercle; the terminal boss is absent in *C. comans*, a small conical tubercle taking its place; and also the median lobe does not extend beyond the apices of the lateral ones.

It must be confessed that the correlation of the females with the above male rests only on a general proximity of the localities of capture and a fairly close agreement in the details of the appendages, especially the armature of the peraeopods.

CYMODOCE FALCATA, n. sp.

(Plate XXXIV. A.)

Closely allied to *C. uncinata*, Stebbing, 1902, but differing in the following particulars: head, peraeon, pleon, and uropods hirsute, the hairs on the epimera, lateral margins of pleon and a fringe on hind margin of 4th pleon segment being plumose and very long. The submedian tubercles on 4th pleon segment partake more of the character of bosses and are far more prominent than the submedian bosses on the telson, exactly the reverse of what is found in *C. uncinata*. Posterior to the bosses on the telson are 2 minute submedian tubercles. The median lobe of the trifid apex ends in a recurved hook, immediately in front of which is a flat button-like knob. The inner ramus of the uropods is similar to that of *C. uncinata*, but the outer is nearly twice as long as the inner, projecting well beyond telsonic apex, lanceolate with acute apex.

Flagella of 1st and 2nd antennae respectively 13-16-jointed and 14-17-jointed.

There are no differences in the mouth parts. In *C. uncinata* the greatest width of the inner plate of the maxilliped is described as being in the upper half. I find on examination that this is not a constant character.

The 6th joint of the 1st peraeopod has 4 spines on inner margin instead of 6, as in *C. uncinata*.

Male appendages on 7th peraeon segment rather more elongate and the male stylet on 2nd pleopod tapers more rapidly to the apex in the distal third.

Length: 13 mm.; breadth: 6 mm.

Colour : In spirit, uniform dirty yellow.

Locality : Green Point lighthouse S. $\frac{1}{4}$ W. distant $2\frac{1}{2}$ miles (Table Bay). 22 fathoms. 5/3/00. 3 ♂♂. ss. "Pieter Faure." (S.A.M. No. A31.)

CYMODOCE UNGUICULATA, n. sp.

(Plate XXXIV. B.)

Also close to *C. uncinata*. Body smooth, without sculpturing, with thin scattered setae. The margins of the epimera, pleon, telson, and uropods with a thick fringe of setae, stronger in ♂ than ♀. Telson with 2 large submedian bosses in both sexes, apex in ♂ trifold, the middle lobe projecting a little beyond the lateral ones and bearing a button-like knob on its upper surface, apex in ♀ with a notch concealed in dorsal view by a short blunt projection.

Flagella of 1st and 2nd antennae respectively, 12 and 14-jointed in ♂, 17 and 16-jointed in ♀.

The mouth parts do not differ greatly from those of *C. uncinata*. There are 9–10 spines on outer plate of 1st maxilla. In an ovigerous ♀ with modified mouth parts the inner plate of 1st maxilla is without setae, the other plate minutely setose, 2nd maxilla without long setae on any of the plates, terminal 4 joints of maxilliped without setae, inner plate with only 2 apical setae and outer margins of 2nd joint and epipod setose.

First gnathopod with 6, 3 and 4 spines respectively on inner margins of 4th, 5th and 6th joints in both sexes.

Male appendages on 7th pereaeon segment intermediate in length between those of *C. uncinata* and *C. falcata*, but similar in shape.

First to third pleopods with 3 hooked spines in ♂, 2 in ♀, on inner apex of peduncle. Male stylet on 2nd pleopod very distinctive. As far as the end of ramus it is of equal width, it then broadens out into a lanceolate spatula with pointed apex and margins thickly set with minute recurved spinules. An approximation to this form of stylet is found in *Cilicaca whiteleggei*, Stebbing (1905, l.c. p. 40, pl. 9 A).

Uropods scarcely reaching beyond telsonic apex, inner ramus truncate, as in *C. uncinata*, outer ramus folding under inner, ovate lanceolate, apex acute, curved outwards, with a tooth on inner margin and a semicircular indentation on outer margin, in ovigerous ♀♀ the apex is usually short and blunt, not falcate.

Length : ♂ 13 mm., ♀ 11 mm.; *breadth* : ♂ ♀ 6 mm.

Colour : In spirit, uniform yellowish, both pairs of antennae,

maxillipeds, peraeopods, and sometimes the 1st pleopods with minute black pigment-specks.

Locality: Table Bay, sewage outlet. July, 1896. (Dr. J. D. F. Gilchrist.) 3 ♂♂ and several ♀♀, some ovigerous. Saldanha Bay, low-tide. 5/9/12. (K.H.B.). 1 ovigerous ♀. (S.A.M. Nos. A84 and A2464.)

CYMODOCE UMBONATA, n. sp.

(Plate XXXIV. C.)

Very near to *C. uncinata*. Body granular, the granules arranged more or less distinctly in two transverse rows on peraeon segments, stronger and irregularly arranged on pleon. Head nearly smooth, rostral point setose. Each epimeron with a tuft of setae. Fourth segment of pleon with 2 low submedian tubercles, each with a tuft of setae which are obsolete in the adult ♂; telson with 2 narrow and obscure submedian longitudinal carinae extending to the middle of telson where they end in 2 low tubercles, apex in ♂ trifold, the median lobe shaped like a large flat-topped button, in ♀ obtusely pointed with a notch visible from behind but not in dorsal view; in young ♂♂ the apex is faintly trifold, the median lobe more prominent than the lateral ones, but not button-shaped.

Flagella of 1st and 2nd antennae respectively 14-16 and 15-17-jointed, peduncle of antennae 1 setose on anterior surface.

Outer plate of 1st maxilla with 9 spines.

First peraeopod with 3 spines on outer apex of 3rd joint, and 6, 4 and 4 spines respectively on the inner margins of 4th, 5th and 6th joints.

Male appendages on 7th peraeon segment as in *C. uncinata*.

Pleopods 1-3 with 3 hooked spines on inner apex of peduncle, male stylet on 2nd pleopod half as long again as ramus, stout, tapering rapidly in the distal third to the pointed apex.

Uropods scarcely reaching telsonic apex, inner ramus truncate, outer folding under inner, obovate, apex tridentate, the outer tooth being half-way up the outer margin, both notches setose, especially the outer one.

Length: ♂ 15 mm.; *breadth*: ♂ 7.5 mm

Colour: In spirit, uniform yellowish.

Locality: Cape Hangklip ESE. distant 7 miles (False Bay). 50 fathoms. 9/10/02. 3 adult ♂♂, 3 nonovigerous ♀♀, and 2 immature. s.s. "Pieter Faure." (S.A.M. No. A39.)

Though much like *C. uncinata*, this species is distinguished by the granulate surface, the tufts of setae round the anterior and

lateral margins of the animal, the much more pronounced tridentate character of the outer ramus of uropods, the large median lobe of the telsonic apex which is shaped like a button instead of a recurved hook, and also by the armature of the 1st peraeopod.

GEN. CILICAEA, Leach.

1818. *Cilicæa*, Leach, Dict. Sci. Nat. vol. 12, p. 342.
 1905. „ Stebbing in Herdman's Ceylon Pearl Fish. Suppl.
 Rep. 23. p. 33.
 1905. „ Hansen, Q. J. Microsc. Sci. vol. 49, pt. 1, pp. 104, 122.
 1905. „ Richardson, Bull. U.S. Nat. Mus. No. 54, pp. ix, 307.

In Stebbing's paper will be found a complete list of references and synonyms; and also a key to the species of the genus, in using which, however, the papers of Hansen and Miss Richardson must be borne in mind, for many of the species included in the key have been transferred by these authors to other genera.

CILICAEA LATREILLEI, Leach.

(Plate XXXII. I.)

1818. *Cilicæa latreillei*, Leach, l.c. p. 342.
 1884. „ „ Miers, Rep. Zool. H.M.S. "Alert," p. 308.
 (Synonymy.)
 ? 1902. *Cymodoce inornata*, Whitelegge, Sci. Res. "Thetis," pt. 4,
 p. 263, fig. 30 (♀).
 1905. *Cilicæa latreillei*, Stebbing, l.c. p. 36, pls. iii. B. and viii.
 (Synonymy.)
 1905. *Cymodoce inornata*, id. ibid., p. 43 (♀) (? non Whitelegge).
 1910. *Cilicæa latreillei*, Richardson, Wash. Bur. Fish. Doc. No.
 736, p. 29.

A nonovigerous female agrees well with Whitelegge's description, as modified by Stebbing to include a specimen with 2 low bosses on telson; it also agrees with Miers' description of the ♀ of *C. latreillei* and with another South African specimen which has in addition an incipient median process on 7th peraeon segment, and is a young ♂. Details of ♀ are as follows:—

Whole body covered with short thick pubescence. The greatest width and the greatest height are in the 1st peraeon segment. The fore part of the body in consequence appears enlarged. The 4th segment of pleon has a hardly perceptible median boss, telson with

2 low submedian bosses, apex trifold with the median triangular lobe not reaching the apices of the lateral ones.

Flagella of both pairs of antennae 20-jointed.

Mouth parts not metamorphosed. Outer plate of first maxilla with 10 spines.

First pereopod with 3 spines on the much-produced outer apex of 3rd joint, inner margin of 4th, 5th and 6th joints with 8, 5 and 6 spines respectively.

Inner apex of peduncle of 1st-3rd pleopods with 3 hooked spines.

Uropods, both rami project beyond telsonic apex, inner ramus with apex truncate, outer margin distally emarginate, outer ramus folding under inner, lanceolate, apically acute, with deep notch on outer margin.

I therefore regard Stebbing's Ceylon specimen as undoubtedly a ♀ *latreillei*, and would, with perhaps some hesitation on account of the smooth telson, make *inornata*, Whitelegge, also a synonym of Leach's species.

Length: ♂ 22 mm., juv. ♂ 17 mm., ♀ 15 mm.; *breadth*: ♂ 9.5 mm., ♀ 8 mm.

Colour: Uniform yellowish, in spirit.

Locality: Port Durnford NE. by E. distant 9 miles (Zululand coast). 13 fathoms. 18/2/01. 2 ♂ ♂. Beacon E of East London N. $\frac{1}{4}$ E. distant 10 miles. 52 fathoms. 12/7/01. 1 juv. ♂. 33° 6' S. 28° 11' E. (off East London). 85 fathoms. 28/1/99. 1 nonovigerous ♀. s.s. "Pieter Faure." (S.A.M. Nos. A48, A2743, A36.)

Geogr. Distribution: Port Jackson 5-7 fathoms, Thursday Island 4-5 fathoms, Port Curtis 7 fathoms, Albany Island 3-4 fathoms, and King George's Sound, W. Australia (?) (in Brit. Mus. *vide* Miers); Port Jackson (Haswell); Ceylon (Stebbing); Philippine Islands 10-29 fathoms (Richardson).

GEN. PARACILICAEA, Stebbing.

1910. *Paracilicaea*, Stebbing, Tr. Linn. Soc. Lond. Zool. vol. 14, pt. 1, p. 106.

PARACILICAEA MOSSAMBICUS, n. sp.

(Plate XXXIV. D.)

Body with a reticulate or eroded appearance. Head practically glabrous. Pereon segments setose, especially at sides, without granules or denticles. Pleon minutely granular, setose, 4th segment with 2 obscure submedian teeth on posterior margin. Telson

with 2 submedian ridges beginning at base, increasing in height posteriorly and culminating in 2 large setose bosses, each surmounted by a small glabrous point, apex trifid, the middle lobe rather bulbous dorsally, its apex just exceeding those of the lateral lobes, all three lobes apically bifid.

First antenna, flagellum 15-jointed.

Second antenna, flagellum 18-jointed.

Upper lip as broad as long, apex setose; epistome with lateral margins angularly convex.

Mandibles, cutting-edge entire, secondary cutting-edge in left mandible bidentate, spine-row with ca. 3 (?) spines in left, 5-6 spines in right.

First maxilla, outer plate with 10 spines, 3 or 4 inmost ones denticulate.

Second maxilla, outer and middle plates with 8 spines.

First peraeopod, inner margins of 4th, 5th and 6th joints with 5, 4 and 5 spines respectively, outer margin of 3rd joint with 1 spine near base, 2 in middle, between these and apex 3-4 small spines.

Seventh peraeopod, 5th joint with 3 groups of 3 spines, the apical ones much the largest, 6th joint with 3 spines in middle and 1 at apex of inner margin.

Male appendages on 7th peraeon segment contiguous, long and narrow.

Second pleopod, inner apical angle of peduncle with 2 hooked setae, male stylet half as long again as ramus, straight, tapering, minutely spinulose from base to apex.

Uropods, inner ramus projecting only a little beyond telsonic apex, subacute, hirsute, outer ramus twice as long, stout, apex bifid, hirsute on outer surface.

Length: 8 mm.; *breadth*: 3.5 mm.

Colour: Pale buff, apices of telsonic ridges canary yellow.

Locality: Mozambique (Conducia Bay). 15/11/12. (K.H.B.)
Low-tide. 1 ♂. (S.A.M. No. A2472.)

Very similar to *P. hanseni*, Stebbing (l.c. p. 107, pl. 9 C.) from Zanzibar, but easily distinguished by the sculpturing of the pleon and the absence of denticles on the peraeon segments.

PARISOCLADUS, n. g.

Maxillipeds with 4th, 5th, and 6th joints inwardly produced. Anterior peraeopods without natatory setae. Outer ramus of 3rd

pleopod 2-jointed. Outer rami of 4th and 5th pleopods membranous, 2-jointed. Seventh pereaeon segment with median process in ♂, with or without in ♀. Telson with a notch widening anteriorly in ♂, in ♀ entire. Uropods lamellate, at least in ♂. Mouth parts in ♀ not metamorphosed. Marsupial plates overlapping in middle line. Development in internal pouches.

Separated from the following genus, *Sphaeramene*, by the process on 7th pereaeon segment and the lamellate uropods, which latter character connects it with *Isocladus*.

PARISOCLADUS STIMPSONI (Heller).

(Plate XXXII. G.)

1843. *Sphaeroma perforata*, Krauss, Südafr. Crust. p. 65 (non M. Edwards).
1866. „ *stimpsoni*, Heller, Novara Crust. p. 139, pl. 12, fig. 10.
1905. *Exosphaeroma* „ Hansen. Q. J. Microsc. Sci. vol. 49, pt. 1, pp. 116, 118.
1910. „ (?) „ Stebbing, Gen. Cat. S.A. Crust. p. 428.

Heller's concise and clear diagnosis makes the identification of specimens an easy matter. But whereas his description of the telson and the process on the 7th pereaeon segment applies to the female, his figure evidently represents a male. It would seem that the specimens in the Copenhagen Museum (if correctly named), which Hansen has seen, must be all females, since if he had seen the male he could not have assigned this species to *Exosphaeroma*. Stebbing accepts Hansen's opinion, but draws attention to the inconsistency of placing this species in the genus *Exosphaeroma* as defined by Hansen.

The transverse rows of tubercles on the pereaeon segments are not present in Heller's specimens. And indeed these are very variable, being sometimes quite obsolete, sometimes (especially in specimens from False Bay) very distinct; the posterior ones being always more distinct than the anterior ones. The full complement is 6 tubercles in a transverse row on each segment, sometimes there is also a minute one on each epimeron. Two small tubercles on 7th segment, one on either side of the process.

The process on the 7th pereaeon segment is apically bifid (in side-view) in ♂, entire in ♀.

The epimera are not distinct from the segments, and each bears

a sharp keel which forms the lateral margin of the animal when viewed from above, below this keel the epimera are vertical.

Pleon with a short 1st segment, almost concealed under 7th peraeon segment, 2nd segment wider than the others, its rounded pleura entirely concealing the epimera of the 7th peraeon segment ventrally, 4th segment with 2 small submedian tubercles on posterior margin; telson with 2 low submedian carinae, outside of which on either side is an elongate tubercle, and behind the carinae 2 minute submedian tubercles. The distinctness of these 4 tubercles is very variable, in adult males they are often obsolete. Sometimes also both the elongate tubercles are divided into 2 circular tubercles. Apex acute, in the male with a narrow slit widening anteriorly into an oval longitudinal foramen, in the female entire with a dorsal longitudinal carina. In the young male the apex is bifid with a narrow Λ -shaped groove on dorsal surface.

First antenna, 1st joint longest, with sharp carina on anterior margin, 2nd joint shortest, flagellum shorter than peduncle, 12-jointed.

Second antenna, 3rd and 4th joints subequal, 5th longest, flagellum a little shorter than peduncle, 14-jointed.

Epistome short proximally rounded, the arms narrow; upper lip with slightly convex distal margin, setose.

Lower lip with short, broad lobes, apices rounded setose.

Mandibles, cutting-edge bluntly and obscurely tridentate, secondary cutting-edge in left tridentate, spine-row in both with ca. 8 spines, molar well developed, denticulate, with tuft of setules, palp stout, 2nd joint not longer than 1st or 3rd, 1st slightly longer than 3rd.

First maxilla, outer plate with 10 spines, the inner ones denticulate.

Second maxilla, outer and inner plates both with 8 denticulate setae.

Maxilliped, outer margin of 2nd joint sinuous, inner plate $\frac{2}{3}$ length of 2nd joint, slender, 1 coupling-hook, lobes of 4th-6th joints and apex of 7th setose.

First peraeopod, inner margin of 4th-6th joints with short, thick fur, inner margin of 7th with blunt denticles.

The other peraeopods similar to 1st, but becoming successively longer and 5th joint nearly as long as 4th, not triangular.

Male appendages on 7th peraeon segment short, some distance apart, apices blunt.

Marsupial plates overlapping in middle line, development in internal pouches.

First to third pleopods with 3 hooked setae on inner apex of peduncle.

Male stylet on 2nd pleopod narrow, longer than ramus, apex acute.

Fourth pleopod with outer margin of 1st joint of outer ramus sparsely setose.

Uropods in adult males extending slightly beyond, in females and immature specimens as far as telsonic apex, inner apical angle of both rami slightly prominent, outer distal margin of outer ramus serrulate.

Length: Largest ♂ 16 mm., ♀ 11 mm.; *breadth*: ♂ 8 mm., ♀ 5 mm.

Colour: Ground colour and markings rather variable; head and peraeon usually slaty, speckled with lighter dots, the 4th peraeon segment with a median semicircular blue mark, open behind, the process on 7th peraeon segment nearly white, continued in the male as a light median streak on 6th and 5th segments; telson rather paler than rest of body, its borders distinctly paler, each with 2 dark greenish-brown patches; uropods variously mottled with brown and green with lighter speckles, the green usually forming a transverse apical band on inner ramus and 2 apical patches on the outer. The outer margin of the inner ramus and the inner margin of the outer each have a semicircular transparent patch about the middle, which when the uropods are expanded appear like a circular hole through the uropods.

Locality: Table Bay (Camps Bay, Three Anchor Bay, and Sea Point). (R. M. Lightfoot.) False Bay (Kalk Bay, St. James and Smitswinkel Bay). (Dr. W. F. Purcell, K.H.B.) Port Shepstone, Natal. 23/12/12. (K.H.B.) 1 ♂. Under stones and in rock crevices from high-water mark downwards. (S.A.M. Nos. A242, A259, A263, A2456, A2468, and A2715.)

Types (2 ♂ ♂, 3 ♀ ♀) in the k.k. naturh. Hofmuseum in Vienna.

The Natal specimen differs slightly in minor details from the Cape specimens: the tubercles on the peraeon, except the two on the 7th segment, are practically obsolete, on the other hand the tubercles posterior to the two keels on the telson are rather more numerous, the apical slit is proportionately wider anteriorly and there is just a suspicion of a median tooth, the serrations on outer distal margin of outer uropods very well marked. It measures only 8 mm. × 4 mm., although it is full grown; but in this connection it may be mentioned that specimens from the east side of the

Cape Peninsula in False Bay are smaller than specimens from the west side in Table Bay (see Introduction).

PARISOCLADUS PERFORATUS (M. Edw.).

(Plate XXXII. H.)

1840. *Sphaeroma perforata*, M. Edwards, Hist. Nat. Crust. vol. 3, p. 211.
 1866. " " Heller, Novara Crust. p. 139, pl. 12, fig. 9 a ♂, b ♀.
 1905. *Dynamenella* (?) , , Hansen, Q.J. Microsc. Sci. vol. 49, pt. 1, pp. 117, 126.
 1910. *Cycloidura* (?) , , Stebbing, Gen. Cat. S.A. Crust. p. 431.

Body very minutely shagreened, not granulate except on the telson, where the granules are well developed and hirsute, body glabrous except on the epimera, telson and uropods, the female less strongly granulate and hirsute than the male.

In the male peraeon widening gradually to the 6th segment, 7th narrower, its lateral margins overlapped by 6th, with a stout process reaching to the middle of the telson, apex of the process with a tuft of setae and a notch on underside, a minute tubercle at base on either side. In the female peraeon nearly parallel-sided, 7th segment without a process, but posterior margin with a slight median rounded lobe.

Pleon in male with 2 very obscure submedian tubercles on 4th segment (often quite obsolete), telson with 2 small submedian tubercles in centre and numerous irregularly scattered granules, apex acute, with a narrow slit widening anteriorly into an oval transverse foramen. In the female 4th segment 2 minute submedian tubercles, telson with 2 submedian humps each with 1 or 2 minute points, apex subacute, rather upturned, with deep ventral groove, scarcely visible in dorsal view.

First antenna, 1st and 2nd joints not stout, nor internally keeled, 2nd a little over half the length of 1st, 3rd $\frac{3}{4}$ length of 1st, flagellum as long as peduncle, 10-jointed.

Second antenna reach to end of 2nd peraeon segment, 1st joint short, 3rd and 4th subequal, longer than 2nd, 5th twice length of 2nd, flagellum a little longer than peduncle, 13-jointed.

Epistome triangular, proximal end shortly truncate, the arms not embracing more than half of the upper lip, whose distal margin is rounded and setose.

Lower lip with short and broad lobes, apices subrotund.

Mandibles, cutting-edge tridentate, secondary cutting-edge in left tridentate, in right feeble and colourless, spine-row with ca. 6 spines in left, ca. 8 in right, molar quadrate in left, denticulate, in right oblique and more strongly denticulate, all three joints of palp subequal, on the 1st rather shorter than the other two.

First maxilla, outer plate with 8 spines, the inner ones denticulate.

Second maxilla, outer and middle plates each with 8 denticulate setae, all three plates subequal in breadth.

Maxilliped, 2nd joint a little longer than inner plate, 4th-6th joints inwardly produced and, like the apex of 7th, setose.

First peraeopod, 3rd joint not apically expanded, outer margin with 2 spines in middle and 1 near base, 4th joint with 3-4 spines on produced outer apex, inner margin of 4th-6th joints with thick fur.

Second to sixth peraeopods similar to 1st, but becoming successively longer, 5th joint oblong instead of triangular, 4th joint not so strongly produced on outer apex.

Seventh peraeopod the longest and most slender, 5th joint a little longer than 4th, 6th equal to 3rd, inner margin of 4th and 5th, but not that of 6th, furry.

Male appendages on 7th peraeon segment stout, contiguous, apices blunt.

First to third pleopods with 2-3 hooked setae on inner apex of peduncle.

Male style on 2nd pleopod half as long again as ramus, slender, tapering to a fine point.

Outer margins of both outer and inner ramus of 5th pleopod setose.

Uropod with rami subequal in ♂, lamellate, oval, extending just beyond telsonic apex, apices subacute, outer distal margin of outer ramus minutely serrate, margins of both rami setose; in ♀ outer ramus rather shorter than inner, neither rami reaching telsonic apex, narrow lanceolate, outer distal margin of outer ramus minutely serrate, margins of both rami finely setose.

Length: ♂ 6 mm., ♀ 5 mm.; *breadth*: ♂ 3 mm., ♀ 2.5 mm.

Colour: ♂ Grey or brown, mottled with small darker spots or patches, the 7th peraeon segment dark, the process whitish continued forwards on segments 6 and 5 as a whitish median stripe, widest on segment 5, bordered on either side with dark brown or grey, pleon and uropods usually lightish, sometimes whole animal is greyish white with scarcely any dark colouring: ♀ orange-

brown, mottled with darker, a light circular median patch on peraeon segments 5 and 6, narrowing to a median stripe on segment 7, uropods banded and mottled; young specimens usually more uniform, peraeon brown, the epimera, head and pleon lighter.

Locality: St. James and Buffels Bay (False Bay). June, 1912, and 28/9/13. (K.H.B.) Sea Point, near Cape Town. November, 1913. (K.H.B.) ♂♂, ovigerous ♀♀ and young. Under stones, at low-tide. (S.A.M. Nos. A2442, A2522, and A2606.)

Geogr. Distribution.—St. Paul (M. Edwards, Heller). I have not seen M. Edwards' type, but seeing that both his and Heller's specimens came from the same locality there would seem little reason for doubting that they are both the same species. The four tubercles on the peraeon segments mentioned by M. Edwards are absent in Heller's specimens (as in the Cape ones), but little weight can be attached to this point (see *P. stimpsoni* for variation in respect to dorsal tubercles). There is no doubt that the Cape specimens are the same species as Heller's; the only points of difference being: the latter are larger, reaching 9–10 mm., the process on 7th peraeon segment is of the same width throughout and ends squarely instead of slightly tapering to a blunt point, the tip overhangs and is hollowed beneath exactly as in the Cape specimens, there are 10 denticulate setae instead of 8 on the outer and middle plates of the second maxilla. These slight differences can only be local variations.

Heller seems to have made some curious mistakes in his report on this species. After expressing the opinion that M. Edwards' diagnosis was "based on females only," he gives a description of the male which is applicable to his fig. 9*b*, yet this figure is labelled ♀. As a matter of fact fig. 9*b* represents a young ♂; there are no ♀♀ at all amongst Heller's material. One of the bottles contains 5 juv. ♂♂ labelled "♂", the other contains 1 adult ♂ and fragments labelled "♀". Fig. 9*a* is correctly labelled ♂, but does not truly represent the terminal slit and foramen.

I have some little doubt as to whether these two species should be regarded as congeneric. Besides the presence of a process on the 7th peraeon segment in the ♀ of *stimpsoni* and its absence in *perforatus*, there is a very noticeable difference in the male stylets on the 7th peraeon segments. These in *stimpsoni*, which I regard as the genotype, are a good distance apart, whereas in *perforatus* they are contiguous. Although this character has not yet been taken into account in defining the genera of *Sphaeromidae* I am inclined to attach a more than specific importance to it. There are at least three types of male appendages in the family: (1) where the

two appendages are a little distance apart, characteristic of *Exosphaeroma*; (2) where they are contiguous, characteristic of *Cymodoce* and *Dynamenella*; (3) where they are fused in part, the only example of this case known to me being *Dynoides serratisinus* n. g. et sp. (see infra). The other genera, so far as known to me, can be arranged in either the first or the second group.

SPHAERAMENE, n. g.

Maxillipeds with 4th, 5th and 6th joints inwardly produced. Anterior peraeopods without natatory setae. Outer ramus of 3rd pleopod 2-jointed. Outer rami of 4th and 5th pleopods membranous, 2-jointed. Seventh peraeon segment without processes. Telson in ♂ with a slit widening anteriorly; in ♀ entire. Uropods not lamellar. Mouth parts in ♀ not metamorphosed. Marsupial plates not overlapping. Development in internal pouches.

SPHAERAMENE POLYTYLOTOS, n. sp.

(Plate XXXIII. A.)

1905. *Sphaeroma* (?) *scabriculum*, Hansen, Q. J. Microsc. Sci. vol. 49, pt. 1, pp. 102, 103, 116 (non Heller).
1910. *Exosphaeroma* ,, Stebbing, Gen. Cat. S.A. Crust. p. 429.

Head, peraeon and pleon with flat-topped, button-like tubercles with the posterior margins projecting freely. They are disposed as follows: the head has a small rostral point, behind this 2 transverse rows, the anterior ones being the larger, near the posterior margin of head 2 small median tubercles, 1 large submedian and 2 small ones between this and the eye.

The first peraeon segment, which is slightly longer than any of the following segments, bears 6 large tubercles with intermediate smaller ones, the epimeron has 2 large tubercles, the one anterior to the other. Each of the remaining peraeon segments bears 6 large tubercles with 3 smaller intermediate ones, the epimera each bear 2 large tubercles (except the 7th which bears only 1), the one dorsal to the other, and a small tubercle on the junction with the segment.

Whole of 1st and central portion of 2nd and 3rd pleon segments hidden beneath 7th peraeon segment, which is without any processes. Lateral portions of the 2nd and 3rd segments with 2 small tubercles. The 4th segment bears 6 tubercles, the 2 sub-

median ones being large, the lateral portion bears 1 tubercle. Ventrally the pleuron of 2nd segment does not hide the 7th peraeon segment.

The telson has 5 transverse rows of tubercles, the 1st with 4 small, the 2nd with 6 large, the 3rd with 6 small, the 4th and 5th each with 4, of which the 2 submedian ones in the 4th row are large, the rest small; telsonic apex in ♂ with a narrow slit widening anteriorly into a transverse oval foramen, in ♀ entire, subacute, a little upturned with 2 (in adult, 1 in young) small tubercles. Ventral groove in both sexes very shallow and open.

First antenna, 1st joint stout, 2nd half as long as 1st, 3rd slender, longer than 2nd, flagellum equal to first 2 joints together, 18 joints.

Second antenna, reaching to middle or end of 4th peraeon segment, 2nd-4th joints subequal, 1st shorter, 5th half as long again as 4th, flagellum a little longer than peduncle, 17-jointed.

Epistome not greatly expanded distally, proximal end transversely bifid, labrum with distal margin slightly convex, setose.

Lower lip with short, broad lobes, apices rounded.

Mandibles, cutting-edge 4-dentate, secondary cutting-edge in left tridentate, spine-row with ca. 10 spines in left, ca. 15 in right, palp stout, 1st and 2nd joints subequal, 3rd a little shorter.

First maxilla, outer plate with 8-9 spines, inner ones denticulate, inner plate with 4 setae.

Second maxilla, outer and middle plates each with 11 denticulate setae.

Maxilliped, 2nd joint as long as inner plate, which has 1 coupling-hook about the middle of the margin, 3rd, 4th and 5th joints internally lobed.

First peraeopod, middle of outer margin of 3rd joint with 1 outstanding spine, 4th joint externally produced, with 3 spines on apex, 5th small triangular, inner margins of 4th-6th joints thickly furred, inner margin of 7th minutely denticulate.

Second to seventh peraeopods similar to 1st, but 5th joint oblong, apex of 5th in 3rd-7th peraeopods with spines all round, apex of 4th with 6 or more spines; fur on 4th and 5th joints in 7th peraeopods not so strong as on other peraeopods, absent on 6th which is sparsely setulose.

Male appendages on 7th peraeon segment short, stout, some distance apart, apices blunt.

Marsupial plates not overlapping, the brood developed in internal pouches.

First to third pleopods with 4 hooked spines on inner apex of peduncle.

Second pleopod, male stylet extending beyond apex of ramus, narrow, tapering to an acute apex.

Uropods, inner ramus narrow oblong, apex bifid, with rounded inner apex, a longitudinal row of 6 tubercles down the centre (but the number is subject to variation); outer ramus lanceolate, apex acute, turned outwards, without tubercles; both rami extending a little beyond telsonic apex.

Length: ♂ 17 mm., ♀ 16 mm.; *breadth*: ♂ 9 mm., ♀ 8 mm.

Specimens from Kalk Bay and St. James measure: ♂ 11 × 5 mm., ovigerous ♀ 9 × 4.5 mm.

Colour: Brownish grey, some or all of the tubercles of a sienna-brown or sometimes orange-brown.

Locality: Plettenberg Bay. 3/7/02. 1 ♀ with embryos, s.s. "Pieter Faure." Kalk Bay, False Bay. 26/5/96. (R. M. Lightfoot.) 2 ovigerous ♀ ♀. Sea Point, near Cape Town. Nov. and Dec., 1913. (K.H.B.). ♂ ♂, ovigerous ♀ ♀ and immature specimens. St. James, False Bay. 15/2/14. (K.H.B.) 2 ♂ ♂, 1 ♀ and young. Also 2 ♂ ♂, 1 ovigerous ♀ and 1 young ♂ from the "Pieter Faure" collection without locality. (S.A.M. Nos. A49, A262, A2647, A2679 and A2455 respectively.)

They are found at low-tide occasionally under stones, but most frequently in the holes and crevices of the reef-like masses of tubes formed by the worm *Sabellaria capensis*.

On sending specimens of this species and of the species which I took to be the true *Sphaeroma scabricula* of Heller to Dr. H. J. Hansen, he informed me that my surmise was correct, that he had not seen the true *scabricula* and that the species to which he referred on pp. 102, 103, 116 of his Revision of the Sphaeromidae was in reality the present new species. This justifies the above synonymy.

DYNOIDES, n. g.

Maxillipeds with 4th, 5th and 6th joints inwardly produced. Anterior peraeopods without natatory setae. Outer ramus of 3rd pleopod unjointed. Outer ramus of 4th and 5th pleopods membranous, without folds, 2-jointed. Seventh peraeon segment unarmed. Pleon (4th? segment) with median process. Telson with a slit with small median lobe at its anterior end. Female unknown.

DYNOIDES SERRATISINUS, n. sp.

(Plate XXXIV. F.)

Body parallel-sided, rather strongly convex, minutely granulate and finely setulose, the setules being thickest on the epimera. Head and peraeon smooth, without any trace of tubercles, 7th segment of peraeon bordered laterally by the epimera of 6th segment, epimera rather long, quadrate. Pleon segments 1-4 so intimately fused that sutures are invisible. From the posterior margin arises a large, triangular, conical process extending to middle of telson, its basal width equal to half that of the segment. Telson strongly convex in centre, where it is covered with scattered granules (stronger than those on the rest of body), near the margins and especially at the apex, it is flat, apex pointed, with a deep parallel-sided slit whose anterior end has a small triangular median lobe and whose sides are furnished with 7 backwardly-directed acute teeth. The median lobe and the outer distal margins are setulose.

First antenna reaching to middle of 1st peraeon segment, 1st joint equal to 2nd and 3rd together, 3rd a little longer than 2nd, flagellum as long as peduncle, 13-jointed, 1st joint equal to 3rd peduncular joint.

Second antenna reaching to beginning of 2nd peraeon segment, 1st and 4th joints subequal, 3rd shortest, 5th longest, 2nd intermediate in length between 4th and 5th, flagellum longer than peduncle, 20-jointed, the joints strongly setose.

Epistome, distance from proximal margin to base of upper lip less than width across the arms, proximal end rounded, sides very slightly concave, distal margin of upper lip rounded setose.

Lower lip, lobes oval, apically subacute, strongly setose.

Mandible, trunk straight, somewhat stout, cutting-edge 4-dentate, secondary cutting-edge in left 3-dentate, spine-row with 5 spines in left, 6 in right, molar quadrate, strongly denticulate and setose on posterior margin, palp with 1st joint stout, 2nd and 3rd slender, 1st and 2nd subequal in length, 3rd a little longer, 2 long setae on apex of 2nd, margin of 3rd with gradually lengthening setae.

First maxilla, outer plate with 6 spines.

Second maxilla, outer and middle plates with 4 spines, the 2 largest denticulate, all three plates subequal in width.

Maxilliped, 2nd joint 3 times as long as broad, 4th, 5th and 6th joints lobed internally, 6th not so strongly as the other two, inner plate half the length of 2nd joint, apex rounded with plumose setae, 1 coupling-hook.

First peraeopod, 3rd joint nearly equal to 2nd, with a group of spinules on outer distal margin, 4th rather strongly expanded on outer apex, outer apical angle with 1 long seta, inner apical angle of 6th joint with 1 long seta, both inner and outer margins of all the joints setulose, the inner margins more strongly so than the outer.

Second peraeopod, 4th, 5th and 6th joints more strongly furred on inner margin.

Seventh joint in all peraeopods with 3 lamella-like teeth, secondary unguis strong.

Male appendage on 7th peraeon segment long, narrow, the distal half divided into two slender tapering portions.

First pleopod, lobes subequal in length, with long plumose setae.

Second pleopod rather longer than 1st, ♂ stylet arising from base of inner ramus, $2\frac{1}{2}$ times length of ramus, stout basally but tapering to a fine point, at about half its length doubled on itself. Both 1st and 2nd pleopods with 2 hooked spines on inner apex of peduncle.

Third pleopod longer than 1st or 2nd, outer ramus unjointed.

Fourth and fifth pleopods inner ramus strongly plicate, outer ramus membranous, without plicae, 2-jointed, rather obscurely so in 5th, squamose projections in 5th small, outer margin of 4th nonsetose, of 5th with very fine setules.

Uropods extending slightly beyond telsonic apex, subequal, inner ramus ovate, apex rounded-subtruncate, distal margin indistinctly serrulate, setose, outer ramus ovate, apex rounded, outer distal margin indistinctly serrulate, whole outer margin setose.

Length: 5 mm.; *breadth*: 2.5 mm.

Colour: Brownish, a lighter longitudinal median patch on peraeon segments 4-7 and extending on to the process on pleon, portions of the telson and uropods also lighter.

Locality: Port Shepstone, Natal. 23/12/12. (K.H.B.) 1 ♂. Low-tide. (S.A.M. No. A2716.)

In one character this species differs from all other Sphaeromids known to me: the male appendages on the 7th peraeon segment instead of being separate throughout their length, are here fused in the basal half.

But for the Hemibranchiate character of the 4th and 5th pleopods this species might be placed in the genus *Dynamenella*. On the other hand, it cannot be included in any of the Hemibranchiate genera hitherto established on account of the unjointed outer ramus of pleopod 3 (*Sphaeroma* and *Hemisphaeroma* being the only genera presenting this feature).

A new genus is thus unavoidably necessary. This genus together

with the two previous ones, *Parisocladius* and *Sphaeramene*, appear to represent a third section of the Hemibranchiate *Sphaerominae*, equal in value to Hansen's *Sphaeromini* and *Cymodocini*. This section is intermediate between the Hemibranchiatae and the Eubranchiatae, combining the pleopods of the former with the telson of the latter. Within the section, *Parisocladius* and *Sphaeramene* are nearer the typical Hemibranchiatae in having a 2-jointed outer ramus to pleopod 3, while *Dynoides* is nearer the Eubranchiatae in having the outer ramus of pleopod 3 unjointed.

GROUP EUBRANCHIATAE, Hansen.

Gen. DYNAMENELLA, Hansen.

1905. *Dynamenella*, Hansen, Q. J. Microsc. Sci. vol. 49, pt. 1, pp. 107, 126.
 1905. „ Richardson, Bull. U.S. Nat. Mus. No. 54, p. ix.
 1906. „ id. Proc. U.S. Nat. Mus. vol. 31 (1907), p. 14.
 1907. „ Nobili, Mem. Acc. Sci. Torino (2), vol. 57, p. 422.

Hansen gives as one of the characters of this genus "without real processes," and Miss Richardson accepts this (l.c. 1906, p. 14). However in the type species *D. perforata* (Moore) the 7th peraeon segment is produced backward in 2 rounded lobes (Richardson, 1905, l.c. p. 300, fig. 319). To a less extent the same is the case in *D. australis*, Richardson, and *D. scabricula* (Heller). There seems therefore no reason why *D. dioxus*, n. sp., should not be included in the genus, at least for the present; and this I have done. To the definition of the genus thus modified—namely, 7th peraeon segment with or without processes in ♂—can be added: mouth parts in ♀ not modified, brood developed in internal pouches.

The terminal notch is variable, being sometimes of the same width throughout, sometimes widening anteriorly into a foramen, but it is always similar in both sexes, though often rather deeper in the ♂ than the ♀. The cordiform shape of the aperture in *D. dioxus*, n. sp., invites comparison with *D. platura*, Nobili (1907, l.c. p. 423, pl. 2, fig. 12), and *Cymodocea cordiforaminalis*, Chilton (1882, Tr. N.Z. Inst. vol. 15, p. 188, plate 22a, fig. 1). The two last-mentioned species in fact appear to be very closely allied if not actually identical. The figure of the telson of the female which Nobili gives (fig. 12a) may very possibly be that of an immature specimen in which the apical notch has not reached its full development.

The South African representatives of this genus can be divided into three groups, characterized as follows:—

Seventh peraeon segment without prominent processes, one or more of the peraeon segments tuberculate, telsonic notch widening anteriorly but without median lobe.	}	<i>D. scabricula</i> (Heller). <i>D. australis</i> , Richardson. <i>D. bicolor</i> , n. sp.
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Seventh peraeon segment with 2 prominent processes, telsonic notch widening anteriorly, with median lobe.	}	<i>D. dioxus</i> , n. sp.
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Peraeon segments all smooth, telsonic notch not widening anteriorly.	}	<i>D. kraussi</i> , n. sp. <i>D. macrocephala</i> (Krauss). <i>D. ovalis</i> , n. sp.
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D. scabricula and *D. dioxus* both occupy rather isolated positions, the first on account of its mandibles and uropods, the second in possessing well-developed processes on the 7th peraeon segment.

DYNAMENELLA SCABRICULA (Heller).

(Plate XXXV. A.)

1866. *Sphaeroma scabricula*, Heller, "Novara" Crust. p. 141, pl. 12, fig. 11.

As mentioned above under *Sphaeramene polytylotus*, the specimens assigned by Hansen in 1905 to Heller's species were in reality not that species; the *Sphaeroma* (?) *scabriculum* of Hansen therefore drops out of the synonymy of *D. scabricula* (Heller).

The transverse rows of tubercles on the peraeon segments, which are single in the centre, break up laterally into a number of small tubercles on each segment.

The two median tubercles on the 7th peraeon segment in the ♂ are much larger than the rest, in consequence of which the posterior margin is slightly bilobed.

The 1st pleon segment is narrow, only visible laterally; the 2nd segment has the pleuron produced forward as an acute process under-riding the epimeron of 7th peraeon segment; 3rd and 4th segments also narrow.

There are two small and obscure submedian tubercles on the 4th pleon segment, and 2 submedian rather elongate tubercles at the base

of the telson between the two "carinae." Heller uses the word "carinae," but it would be better to say "humps," tuberculate externally, smooth internally.

In the female the tubercles on the peraeon are barely visible except on the posterior segments, where they are nevertheless smaller than in the male. The tubercles on the pleon are also smaller in the female, and the telsonic notch is less expanded anteriorly.

Epimera not distinctly separated from segments, not keeled, the inferior margins forming the outline of the animal in dorsal view, epimeron of 7th segment not hidden ventrally by pleuron of 2nd pleon segment.

First antenna, 1st joint longest, 2nd joint shortest, both with upper and lower margins sharply keeled, inner face of 1st joint hollowed for reception of first 2 peduncular joints of second antenna, that of 2nd joint with median longitudinal keel, 3rd joint cylindrical and slender, flagellum 8-jointed, not quite as long as 1st peduncular joint.

Second antenna reaching to posterior margin of 3rd peraeon segment, 5th joint longest, 2nd and 4th subequal, 1st shortest, flagellum equal to peduncle, 16-jointed.

Upper lip distally rounded, setose, only the proximal third embraced by the epistome, the proximal end of which is bluntly pointed.

Lower lip, lobes fairly elongate with rounded and setose apices.

Mandibles resembling those figured for *D. perforata* by Moore (Bull. U.S. Fish. Comm. vol. 20, pt. 2, 1902, pl. 10, fig. 14) elongate, cutting-edge bluntly rounded, secondary cutting-edge in left obscurely bidentate, spine-row with ca. 5 spines in left, ca. 8 in right, molar not prominent, denticulate, with tuft on setae on posterior margin, palp slender, joints decreasing in length, 2nd and 3rd setose.

First maxilla, outer plate with 10 spines, the inner ones denticulate, inner plate with 4 plumose setae.

Second maxilla, outer and middle plates with 8 spines.

Maxilliped 2nd joint elongate, 4th, 5th and 6th joints internally obed.

The mouth parts project rather prominently owing to their elongate character.

First peraeopod, 4th joint strongly produced and furry on outer apex, fur on inner margins of 4th, 5th and 6th joints, thick and rather long, secondary unguis not bifid, inner margin of 7th joint denticulate.

Second to seventh peraeopods similar, outer margin of 2nd joint expanded and keeled, most prominently on the 6th peraeopod.

Marsupial plates overlapping in the middle line. Position of developing embryos not determined, as no ovigerous females have been seen.

Male appendages on 7th peraeon segment contiguous, short, stout, with blunt apices.

First to third pleopods with 2 hooked spines on inner apex of peduncle. Outer ramus of 1st pleopod larger than inner, with prominent outstanding spine in middle of outer margin. Male stylet on 2nd pleopod a little longer than ramus, stout, slightly enlarged subapically, apex blunt.

Uropods extending slightly beyond telsonic apex, more so in ♂ than in ♀, inner ramus broad, apex roundly truncate, outer ramus narrower and rather longer than inner, inner margin straight, outer convex, apex pointed.

Length: ♂ 16 mm., ♀ 11 mm.; *breadth*: ♂ 8 mm., ♀ 5.5 mm.

Colour: Heller gives a good description of one colour variety. Other variations are as follows: Slaty grey, either uniform or with the darker patches mentioned by Heller, these patches being so arranged as to leave a dumb-bell-shaped light grey median stripe, one end of which is on segments 3 and 4, the other end on the telson, where it is flanked on either side by a longitudinal dark band (characteristic of young specimens from St. James); brown with the head, a median patch on peraeon segments 3 and 4, and on pleon segments 1-4, telson and uropods white; white with head and peraeon segment and the lateral portions of pleon segments 1-4 red-brown; whitish with a black V-shaped mark, diverging anteriorly, on peraeon segments 3-5, the pleon, telson and uropods mottled with black, on the posterior portion of the body the white ground colour becomes a brilliant green which however is soon lost in spirit (this last variety characteristic of large males from Sea Point).

Locality: Dassen Island, April, 1897 (R. M. Lightfoot); Hout Bay, 11/2/14 (K.H.B.); Sea Point, near Cape Town, 13/4/14 (K.H.B.); St. James, False Bay, March, 1901 (Dr. W. F. Purcell), May, 1912 (K.H.B.), and 9/2/14 (S. H. Haughton). ♂♂, ovigerous ♀♀ and juv. In crevices of rocks which are left dry at low-tide, where they harmonize well with the encrusting algae. (S.A.M. Nos. A2549, A2669, A2727, 9855, A2284 and A2668 respectively.)

Types (3 ♂♂) in the k.k. naturh. Hofmuseum in Vienna.

DYNAMENELLA AUSTRALIS, Richardson.

(Plate XXXV. E.)

1906. *Dynamenella australis*, Richardson. Proc. U.S. Nat. Mus. vol. 31 (1907), p. 15, fig. 19.

To Miss Richardson's excellent description the following details may be added: Epistome intermediate between that of *D. scabricula* and *D. kraussi*, main and secondary cutting-edges of the mandibles tridentate, ca. 8 spines in the spine-row, the smaller unguis on peraeopods distinctly and deeply bifid, the fur on inner margins of 3rd-6th joints thick but short, inner apex of peduncle of 1st-3rd pleopods with 6 hooked setae, outer ramus of pleopod 1 with an outstanding spine on outer margin, male stylet on pleopod 2 a little longer than ramus, slightly enlarged subapically as in *D. scabricula*, the whole body minutely granular and setose.

Length: 9 mm.; *breadth*: 4.5 mm.

Colour: "The body . . . is marked with patches of black over a light surface. The abdomen is dark, as well as the head, and there is a broad stripe of the darker colour on the inner uropod" (Richardson). In living specimens the colouration is as follows: Whitish with the lateral margins of the peraeon, the anterior margin of the head, and the antennae reddish, on peraeon segments 4 and 5 two dark red oblique stripes diverging posteriorly, and on segments 6 and 7 two similar stripes or patches converging posteriorly, thus forming a diamond-shaped mark on segments 4-7, the tubercles and the apices of telson and uropods pinky red.

Locality: Sea Point, near Cape Town. 28/12/13. (K.H.B.) 2 ♂♂. Hout Bay. 11/2/14. (K.H.B.) 1 ♂. (S.A.M. Nos. A2666 and A2670.)

Types in the U.S. National Museum.

DYNAMENELLA BICOLOR, n. sp.

(Plate XXXVI. A.)

Body very finely shagreened, glabrous. Peraeon with a transverse row of eight low tubercles on each segment, becoming obsolete anteriorly, but quite distinct on segments 5-7. Pleon with two low tubercles on 4th segment, telson with a transverse row of 4 tubercles near base, the two inner ones being smaller than the outer, beyond these 2 large submedian tubercles, a large tubercle just anterior to, and partly concealing in dorsal view the terminal notch, which is narrow and deep, slightly wider anteriorly than posteriorly.

First antenna reaching to posterior angle of 1st peraeon segment, flagellum 11-jointed.

Second antenna reaching about as far as first, flagellum 13-jointed. Epistome with sides straight, proximal end obtuse.

Mandibles as in *D. kraussi*, cutting-edge in left mandible obtusely tridentate, in right entire, secondary cutting-edge in left strongly chitinized, entire, in right pale and transparent, serrulate; spine-row with 5 spines.

Peraeopods, with thick but short fur on 3rd-6th joints; 1st peraeopod with a strong doubly-serrate spine-seta on inner apices of 4th-6th joints; smaller unguis feebly bifid; 7th peraeopod with several long setae on outer margin of 3rd joint and apices of 4th and 5th joints, outer margin 6th joint not setose.

Pleopods 1-3 with 3 hooked setae on inner apex of peduncle; pleopod 1 without outstanding spine on outer margin of exopod; pleopod 2 with male stylet $\frac{3}{4}$ as long again as ramus, stout, apex subacute.

Uropods scarcely extending beyond telsonic apex, both oval with rounded apices, subequal in length, the outer a little broader than inner.

Length: 8 mm.; *breadth*: 4.5 mm.

Colour: Head and peraeon segments 1-4 pinky brown, with a round whitish median patch extending over segments 2-4, and on these same segments 2-3 small round bluish-black spots on either side of the median patch; segments 5-7, telson, uropods and median portion of 4th pleon segment whitish, the telsonic tubercles pinkish; lateral portions of 4th pleon segment brown with 2 bluish-black spots.

Locality: Sea Point, near Cape Town. 15/11/13. (K.H.B.) 3 ♂♂; the largest specimen is in process of moulting, probably for the last time since the male stylet and penis are fully developed; the length of a full-grown specimen will therefore be a little more than that given above. (S.A.M. No. A2609.)

This species is close to *D. australis*, Richardson, in the general scheme of sculpturing of the pleon, but differs in the number of tubercles as well as in the following characters: The single row of tubercles on peraeon segment 7 and the presence of tubercles on the segments anterior to this, the shape of the uropods, the epistome and the details of the peraeopods and pleopods.

DYNAMENELLA KRAUSSI, n. sp.

(Plate XXXV. B.)

1843. *Sphaeroma savignii*, Krauss, D. Südafrik. Crust. p. 65. (non M. Edwards.)

1910. *Sphaeroma savignii*, Stebbing, Gen. Cat. S.A. Crust. p. 432.
(Quoted from Krauss.)

Body nearly parallel-sided, convex, smooth and glabrous.

Head as long as 1st peraeon segment, which is not much longer than the following segments, 7th segment entirely without trace of tubercles or lobes. Epimera not distinct from segments, continuing in same plane as segments, their free ends quadrate, 6th and 7th slightly produced backwards.

Pleon with 1st segment not concealed, even in median line, segments 1-4 without ornamentation. Telson convex, rounded, apex with a small semicircular notch, ventrally grooved.

First antenna, 1st and 2nd joints stout, upper and lower margins keeled, whole of inner face of 2nd and distal end of 1st with a median keel, 3rd joint slender, almost equal to 2nd, flagellum as long as 1st joint, 12-jointed.

Second antenna reaching to 3rd peraeon segment, 1st joint small, 2nd and 4th subequal, 3rd a little shorter and 5th a little longer, flagellum a little longer than peduncle, 19-jointed.

Epistome proximally truncate, lateral margins convex; upper lip distally straight with slight median prominence, setose.

Lower lip, lobes short and broad, apices rounded, setose.

Mandibles stout, cutting-edge blunt, entire, secondary cutting-edge in left tridentate, in right represented by 2 translucent plates with truncate and denticulate apices, spine-row with ca. 6 spines in left, ca. 8 in right, palp with 1st joint longest, 2nd and 3rd subequal.

First maxilla, outer plate with 7 spines, the 3 outer ones denticulate on their outer edges, the 4 inner ones on their inner edges, inner plate with 4 plumose setae.

Second maxilla, outer and middle plates each with 6 denticulate spines.

Maxilliped, inner plate shorter than 2nd joint in ♂, almost as long in ♀, with 1 coupling-hook.

First peraeopod stout, 3rd joint distally expanded externally, setulose, with 1 outstanding spine, 4th joint also expanded, 5th small, triangular, 6th ovate, inner margin of 4th, 5th and 6th joints with short, thick fur, inner margin of 7th with regular close-set denticles.

Second to seventh peraeopods similar but longer, 2nd and 3rd joints subequal, 4th not so prominently expanded, 5th oblong, 6th elongate-oblong. Secondary unguis on all peraeopods simple, entire.

Male appendages on 7th peraeon segment contiguous, stout, apically obtuse.

Marsupial lamellae overlapping in the middle line, the brood developed in internal pouches.

First to third pleopods with 6 hooked spines on inner apex of peduncle.

First pleopod with outer ramus a little longer than inner, without spine on outer margin, outer ramus and the uncovered portion of inner ramus indurated, pigmented.

Second pleopod with outer ramus half length of inner, male stylet stout, longer than ramus, apex acute.

Third pleopod with outer ramus $\frac{3}{4}$ length and $\frac{1}{2}$ width of inner ramus.

Uropods, inner ramus as long telson, oval, apex rounded, outer ramus smaller.

Length: ♂ 13 mm., ♀ 10 mm.; *breadth*: ♂ 6.5 mm., ♀ 5 mm. Male specimens from the Atlantic coast of the Cape Peninsula frequently attain a size of 16 mm. × 8 mm.

Colour: The ground colour varies from maroon to greenish brown, some specimens are uniform, but more frequently there is a row of lighter spots near the epimeral sutures and at the base of the uropods, and 3 or 4 lighter, rather irregular, patches down the middle of the back, one covering the posterior part of the head and anterior part of the 1st peraeon segment, another on 2nd-4th, another on 5th-7th peraeon segments, the fourth, if present, at the base of the pleon. These spots and patches are either whitish, or pale reddish, or green. Peraeopods not dark. Young specimens are usually uniform, but may have a whitish patch on the epimera and sides of the peraeon.

Locality: Green Point, near Cape Town, March, 1899 (Dr. W. F. Purcell), 1 ♂; Sea Point, near Cape Town, Nov. and Dec., 1913 (K.H.B.), ♂ ♂, ♀ ♀ and young; St. James, False Bay, April, 1901 (Dr. Purcell), and June, 1912 (K.H.B.), ♂ ♂, ♀ ♀; Buffels Bay, False Bay, 28/9/13 (K.H.B.), ♂ ♂, ♀ ♀ and young; Atlantic coast near Cape of Good Hope, 29/9/13 (K.H.B.), ♂ ♂, ♀ ♀; St. James, 15/2 14 (K.H.B.), ♂ ♂, ovigerous ♀ ♀ and young; Port Shepstone, Natal, Dec., 1912 (K.H.B.), ♂ ♂ and immature specimens. (S.A.M. Nos. 13548, A2604, 8829, A2448, A2520, A2528, A2678, and A2238 respectively.)

Krauss obtained his specimens from the Natal coast.

This species lives amongst the red and brown seaweeds near low-water mark.

DYNAMENELLA OVALIS, n. sp.

(Plate XXXV. D.)

1913. *Sphaeromidae inc. sed.* (2) Tattersall, Tr. Roy. Soc. Edinb. vol. 49, pt. 4, p. 888, pl. figs. 9, 10.

Very similar to *D. kraussi*, but well differentiated by its smaller size and oval shape, the width being $\frac{2}{3}$ of the length instead of $\frac{1}{2}$ as in the latter. Also the body is much flatter and the epimera do not continue in the same curve as the dorsa, there being a distinct though shallow groove between them. The notch at the end of telson is shallower.

Epistome rather stouter, inner margins of arms convex, not straight or slightly concave, ends of the arms squarely, not obliquely, truncate.

Third joint of 1st peraeopod not strongly expanded at outer apex.

First to third pleopods with 4 hooked spines on inner apex of peduncle. Male stylets not developed externally, ♂ being immature.

In other respects resembling *D. kraussi*.

Length: ♂ 7.5 mm., ♀ 5.5 mm.; breadth: ♂ 5 mm., ♀ 3 mm.

Colour: Olive-brown, with fine darker mottlings and minute black specks, peraeon with scattered metallic golden specks, peraeopods not dark.

Locality: St. James, False Bay. June, 1912. (K.H.B.) 1 ♂, 3 ovigerous ♀ ♀, 2 juv. (S.A.M. No. A2444.)

Dr. Tattersall has kindly confirmed the identity of my specimens with the single ♀ obtained by the "Scotia" in Saldanha Bay.

DYNAMENELLA MACROCEPHALA (Krauss).

(Plate XXXV. C.)

1843. *Sphaeroma macrocephala*, Krauss, Die Südafrik. Crust. p. 65.
1910. " " Stebbing, Gen. Cat. S.A. Crust. p. 432. (*Sphaeromidae incertae sedis.*)

Krauss' brief description is as follows: "Body somewhat flattened, smooth, light green with darker spots. Head very broad and nearly as long as first two thoracic segments. Abdomen very convex, obscurely bituberculate, triangular, the apex shallowly notched. Branches of the uropods as long as the abdomen, the upper [= inner] oblique and rounded, the lower [= outer] elongate oval. In algae on the Natal coast. Length 2 lines."

After examining, as far as possible, Krauss' exsiccated type specimen, I decided that the characters were not definite enough to separate it from *D. kraussi* (the *Sphaeroma savignii* of Krauss). It might very well be a young and abnormal specimen of that species. Since then, however, specimens have been collected in Table Bay, which prove to be adult and which show the bituberculate character of the telson very much more pronounced than in Krauss' specimen.

Though described as "smooth," the body is in reality (both in the type specimen and the Table Bay specimens) very finely granular. In respect to convexity it is intermediate between *D. kraussi* and *D. ovalis*.

The following details are taken from the fresh specimens:—

First antenna scarcely reaching middle of first peraeon segment, the keel on the upper margin of 2nd peduncular joint very prominent, flagellum 9-jointed.

Second antenna reaching nearly to middle of 3rd peraeon segment, flagellum 16-jointed.

Epistome as in *D. ovalis*, the proximal margin scarcely marked off from the lateral margins.

First peraeopod, third joint not very strongly expanded on outer distal margin.

Male appendages on 7th peraeon segment contiguous, stout, apices blunt.

First to third pleopods with 4 hooked spines on inner apex of peduncle.

Length: 6.5 mm.; *breadth*: 3.5 mm.

Colour: Grey with greenish or brownish spots and streaks, the anterior portion of pleon usually darker than, the telson lighter than, the peraeon, 2nd joint of all peraeopods dark brownish.

Locality: Sea Point, near Cape Town. 15/11/13. (K.H.B.) ♂♂, ovigerous ♀♀ and young. (S.A.M. No. A2608.)

Type in the Stuttgart Museum.

DYNAMENELLA DIOXUS, n. sp.

(Plate XXXIV. E.)

Body finely granular, with long scattered hairs, most numerous on the epimera. First peraeon segment nearly as long as head and longer than the other segments. Seventh segment with two large submedian processes extending to middle of the telson and almost completely concealing the anterior segments of the pleon.

Telson with 2 small, round, rather widely-spaced tubercles. Apex with a V-shaped foramen, wider anteriorly, with a median lobe.

In the ♀ there are no processes on the 7th peraeon segment and the median lobe in the telsonic foramen is smaller.

First antenna, first joint nearly 3 times length of 2nd, exterior margins of 1st and 2nd setose, 3rd joint slender, flagellum equal to 1st peduncular joint, 6-jointed.

Second antenna, peduncle a little longer than that of 1st antenna, 1st joint shortest, 2nd and 4th subequal, 5th longest, flagellum equal to peduncle, 7-jointed.

Upper lip triangular, distal margin slightly convex, setose, epistome short, rounded proximally.

Lower lip with rather broad lobes, apices rounded, setose.

Mandibles, cutting-edge quadridentate, secondary cutting-edge tridentate, stronger in left than right, spine-row with 7 spines, molar oblique, denticulate, setose on posterior margin, palp with 2nd and 3rd joints subequal, a little shorter than 1st.

First maxilla, outer plate with 8 spines, the inner ones denticulate, inner plate with 4 plumose setae.

Second maxilla, outer and middle plates with 5-6 denticulate setae, inner plate not much broader, with numerous plumose setae.

Maxilliped, 2nd joint, strongly setulose on outer margin, inner plate not quite as long, broadest in middle, apex rounded, 1 coupling-hook, 4th-6th joints strongly lobed internally and, like the apex of the slender 7th joint, setose.

First peraeopod, 3rd joint not strongly expanded on exterior margin, outer and inner margins of all joints setulose, inner apices of 4th-6th joints each with 1 large serrulate spine, unguis strong, no secondary unguis but a spine in its place.

Second peraeopod longer and more slender, with secondary unguis.

Remaining peraeopods rather stouter, except the 7th, which is about as slender as the 2nd.

Male appendages on 7th peraeon segment close together, tapering, apices subacute.

First to third pleopods with 3 hooked setae on inner apex of peduncle.

Second pleopod, outer ramus shorter than inner, male stylet somewhat enlarged distally, apex subacute, extending beyond inner ramus.

Third pleopod, outer ramus shorter than inner, one-jointed.

Fourth and fifth pleopods, both rami branchial, with about 6 folds.

Uropods, inner ramus as long as telson, apex obliquely truncate,

outer ramus a little shorter, obovate, apex rounded, distal margins of both rami minutely crenulate and setose.

Length : 3.5 mm. ; *breadth* : 1.3 mm.

Colour : Purplish brown (turning pinkish in spirits) with an hour-glass-shaped light patch on back of peraeon.

Locality : Sea Point, near Cape Town. 15/11/13. (K.H.B.) One adult and 1 immature ♂, and 2 nonovigerous ♀♀. St. James, False Bay. 15/2/14. (K.H.B.) 1 nonovigerous ♀. Low-tide. (S.A.M. Nos. A2610 and A2682.)

GEN. CYMODOCELLA, Pfeffer.

1887. *Cymodocella*, Pfeffer, Jahrb. Wiss. Anst. Hamburg, vol. 4, pp. 18, 20, 69.
1905. ,, Stebbing in Herdman's Ceylon Pearl Fish. Suppl. Rep. 23, p. 30.
1905. ,, Hansen, Q. J. Microsc. Sci. vol. 49, pt. 1, pp. 80, 107, 126.
1910. ,, Stebbing, Gen. Cat. S.A. Crust. p. 430.
1910. ,, Hodgson, Nat. Antart. Exp. vol. 5, p. 31.

Besides *C. tubicauda*, Pfeffer (l.c.), the only other species of this genus is *C. algoense* (Stebbing) (1875, Ann. Mag. Nat. Hist. (4) 15, p. 186, pl. 15 A, figs. 3, 3a). The latter was described from a specimen $\frac{1}{12}$ inch in length, which appears to be immature, judging from the shape and size of the posterior peraeon segments and the uropods; also the circular foramen on the telsonic apex is incomplete and not directed dorsally. Although both the species described below are very common at the Cape, the smallest specimens I have yet come across are $\frac{1}{8}$ inch in length and cannot be correlated with *C. algoense*. Until therefore further and adult specimens of *C. algoense* are obtained from Algoa Bay (if the original specimen did in reality come from that locality, on which point there is a little doubt), the name *algoense* cannot be applied to either of the present species.

From *C. tubicauda*, Pfeffer, as described by Hodgson (l.c. p. 31) and figured by him (Crust. of the "Southern Cross," pl. 33, fig. 2), both the Cape species are abundantly distinct. Thus *C. tubicauda* has small eyes, both rami of the uropods are lanceolate, not oval, the outer ramus of 1st pleopod is a little longer than inner, no mention is made of the 2nd peraeopod being much more slender than the other peraeopods, nor of the pectinate spines on apex of 5th joint of 7th peraeopod, no mention is made in the description

of tubercles on the telson, though from the figure there would appear to be 4 such, the general shape is more oval.

C. tubicauda seems to be essentially an antarctic form, not having been found north of 50° S. latitude.

CYMODOCELLA SUBLEVIS, n. sp.

(Plate XXXVI. B.)

Body very finely shagreened, visible chiefly on posterior margins of peraeon segments. Head with eyes of the normal Sphaeromid size. Seventh segment of the peraeon narrower than, and laterally overlapped by, the 6th segment. Epimera not distinctly separated from segments, almost vertical. Pleon with 1st segment concealed beneath 7th peraeon segment, 4th segment with 2 very obscure tubercles, telson convex basally, with 2 obscure tubercles, lateral margins bent inwards ventrally forming a tube curving upwards with the apical foramen directed dorsally.

First antenna, 1st joint stout, twice as long as 2nd or 3rd, which are subequal, 3rd more slender than 2nd, flagellum 7-jointed, equal to 1st and 2nd peduncular joints together.

Second antenna, 1st and 3rd joints subequal, 2nd a little longer, 4th and 5th a little longer than 2nd, subequal, flagellum 10-jointed, as long as peduncle.

Epistome triangular, proximally narrow, widening rapidly but embracing hardly more than the basal third of upper lip, which is broader than long, distal margin rounded.

Lower lip with lobes short, broad, apically rounded.

Mandibles, cutting-edge bidentate, secondary cutting-edge well developed in left, spine-row with ca. 6 spines, molar strong, oblique, denticulate, palp slender, 1st joint slightly longer than 2nd, 3rd shorter.

First maxilla, outer plate with 9–10 spines, the inner ones denticulate, inner plate with 4 plumose setae.

Second maxilla, outer and middle plates each with 4 minutely denticulate spine-setae.

Maxilliped, inner plate equal to 2nd joint, with 1 coupling-hook, 4th, 5th and 6th joints internally lobed.

First peraeopod with 4th joint produced on outer apex, with 1 strong spine, inner apices of 4th, 5th and 6th joints each with 1 strong doubly pectinate spine, fur on these same joints not very thick or long.

Second peraeopod longer and much more slender than first, 3rd and

6th joints subequal, nearly equal to 2nd joint, 5th joint elongate, as long as inner margin of 4th, inner apices of 4th and 5th joints with 1 long seta.

Third to seventh peraeopods as stout as 1st peraeopod, but increasing in length, 5th joint in 7th peraeopod with an apical circle of long pectinate spines, outer margin of 3rd joint with 2 long spines and 2 shorter ones.

Male appendages on 7th peraeon segment contiguous, very long, narrow and tapering to fine points.

First to third pleopods with 3 hooked setae on inner apex of peduncle; inner ramus of 1st pleopod half as long again as outer; both rami of 2nd pleopod subequal, male stylet $2\frac{1}{2}$ times as long as ramus, rather stout basally, tapering gradually to a fine point; inner ramus of 3rd pleopod rather shorter than the unjointed outer ramus.

Uropods, rami not quite reaching telsonic apex, outer a little shorter than inner, lamellar, obovate, with rounded apices, outer margin of outer ramus and inner margin of inner ramus thickened.

Length: 3.3 mm.: *breadth*: 1.75 mm.

Colour: Dark purplish brown, either uniform or with a whitish telson.

Locality: Sea Point, near Cape Town. 29/11/13. (K.H.B.)
3 ♂♂, 1 ovigerous ♀ and several immature. (S.A.M. No. A2623.)

CYMODOCCELLA PUSTULATA, n. sp.

(Plate XXXVI. C.)

Body covered with granules, which are strongest on the peraeon segments, weakest on the head. Seventh peraeon segment narrower than 6th, the posterior margin strongly bilobed (the lobes rather gibbous but not tuberculate). Fourth segment of pleon with 2 small submedian tubercles, telson with 4 tubercles at base, the 2 middle ones largest and rather elongate, behind these 2 submedian tubercles, apex tubular, upturned, the foramen directed dorsally. The females and immature specimens are less strongly tuberculate and the 7th peraeon segment is scarcely bilobed.

Flagella of 1st and 2nd antennae respectively 10 and 11-jointed.

Male appendages on 7th peraeon segment moderately long, contiguous, apices acute.

Male stylet on 2nd pleopod extends half its own length beyond apex of ramus, its apex blunt and slightly enlarged, inner ramus half as long again as outer.

In other respects this species resembles *C. sublevis*. The young (2.5–3 mm.) of the two species are difficult, if not impossible, to separate except by the colouration, which seems quite distinctive.

Length: 4.5 mm.; *breadth*: 2.2 mm.

Colour: Greenish or reddish brown; in young specimens the head, 1st peraeon segment and pleon (either the whole or only the anterior portion) are dark, the intervening portion light, sometimes a reddish band across the lighter peraeon segments; the older the specimens, the more they tend towards a uniform colouration.

Locality: St. James, June, 1912; and Buffels Bay, 28/9/13 (both in False Bay). (K.H.B.) 2 ♂♂; Sea Point, near Cape Town. 15/11/13. (K.H.B.) ♂♂, ♀♀ and young from 2.5 mm. in length upwards. (S.A.M. Nos. A2447, A2548 and A2607 respectively.)

FAMILY IDOTEIDAE.

For references see Stebbing, S.A. Crust. pt. 1, p. 51, 1900, and pt. 2, p. 55, 1902. Also: Barnard, Ann. S.A. Mus. vol. x. pt. 7, p. 203, 1914.

GEN. PARIDOTEA, Stebbing.

1900. *Paridotea*, Stebbing, S.A. Crust. pt. 1, p. 52.

1909. „ Chilton, Subant. Is. New Zeal. vol. 2, p. 660.

PARIDOTEA RETICULATA, n. sp.

(Plate XXXVI. D.)

Body parallel-sided, smooth, not very convex. Head with frontal margin concave with median notch, eyes irregularly round, black. Peraeon with postero-lateral angles of segments 1–3 rounded, of segments 4–7 subacute. Epimera of 2nd and 3rd segments narrow, the former a little more than half the length of its segment, the latter $\frac{2}{3}$ length of its segment; epimera of 4th to 6th segments as long as their segments, their postero-lateral angles subacute; epimeron of 7th segment a little longer than its segment, postero-lateral angle acute. All the epimera are without lateral keels, the upper surface passing into the ventral surface without a break. The sterna of 4th–7th segments are quadrate, with postero-lateral angles rounded, posterior margin emarginate with (on 6th and 7th sterna) a small median and a small submedian notch. Pleon nearly equal to the

6 posterior peraeon segments together, consisting of a single segment with 3 lateral sutures, the basal one of which is very faintly marked up to the median line, where however it disappears entirely. Telson with straight sides and a low rounded median keel, on either side of which the telson is nearly flat, not convex; the apical margin between the acute postero-lateral angles is straight or very slightly convex; a short but distinct keel runs along the postero-lateral angles.

First antenna reaching to end of 2nd peduncular joint of second antenna, resembling that of *P. unguolata* (Pallas).

Second antenna reaching to middle or posterior margin of 5th peraeon segment, inner apex of 3rd, 4th and 5th peduncular joints produced, flagellum with from 24 joints in a small specimen to 32 in the largest specimens.

The mouth parts resemble those of *P. unguolata* except that the lateral margins of the epistome are angular, not evenly convex, and the inner lobe of the first maxilla has only 3 plumose setae.

Peraeopods stout, 6th joint of 1st peraeopods setose on inner margin, with a short spiniform tubercle near the base; 6th joint of 2nd and 3rd peraeopods not setose, with spine near base and 2-3 setae at apex, in ♀ the basal spine is absent but represented by a tuft of 2-3 setae; 6th joint of remaining peraeopods with 2 tufts of 2-3 setae, one near base, the other at apex; 3rd and 4th joints not produced externally on any of the peraeopods.

Pleopods as in *P. unguolata*.

Uropods with strong rounded longitudinal keel on peduncle, ramus $\frac{2}{3}$ as long as broad, apical margin truncate.

Length: 63 mm.; *breadth*: 16 mm.

Colour: Deep orange-brown with black reticulations, a median stripe on peraeon and base of pleon and telson and the postero-lateral angles of telson green; peduncular joints of second antennae and the joints of the peraeopods with dark apical bands.

Locality: Table Bay (washed up on beach), April, 1913. 1 ♂ and 1 ♀ with young. (L. Péringuey, jun.); Table Bay. 26/3/96. 1 immature ♀. s.s. "Pieter Faure." Sea Point, near Cape Town. 13/4/14. (K.H.B.) ♂♂, ovigerous ♀♀ and juv. On the stalks and fronds of the Sea Bamboo (*Ecklonia buccinalis*) at low-tide. (S.A.M. Nos. A2645, A7 and A2724.)

Although on a cursory glance this species appears very similar to *P. unguolata*, it is nevertheless easily separated by a number of characters, viz.: the lesser convexity of the body, the shape of the epimera and sterna (in *P. unguolata* the sterna are rounded posteriorly, without the postero-lateral angles and with only a median notch), the

composition of the pleon, the keel on the telson and the shape of the telsonic apex, the length of the 2nd antennae and the produced peduncular joints of same (out of many examples of *P. unguolata* I have not seen one in which the 2nd antennae exceed the posterior margin of the 3rd peraeon segment), the inner lobe of the 1st maxilla (*P. unguolata* has 5 plumose setae), the nonproduced 3rd and 4th joints of the peraeopods and the armature of the 6th joint, the keel on the peduncle and the shape of the ramus of the uropods (in *P. unguolata* the ramus is nearly square, not evidently broader than long), and lastly the colouration.

Young specimens taken from the brood pouch show the distinctive produced joints of the peduncle of the 2nd antennae. The telsonic apex has a well-marked semicircular notch, and the postero-lateral angles are rounded. The young of *P. unguolata*, also from the brood pouch, have the telsonic apex only slightly emarginate.

As to the genus in which this species should be placed, it will be noticed that it differs from *P. unguolata*, the type species, in the number of setae on the inner plate of the 1st maxilla and the composition of the pleon. In the possession of 3 lateral sutures on the pleon it agrees with *Glyptidotea*, Stebbing, and *Pentias*, Richardson; with the former it also agrees as regards the 1st maxilla (no description has been given of the 1st maxilla of *Pentias hayi*, Richardson, the only species), but it differs from both as regards the epimera.

Inasmuch as it agrees with *Paridotea* in all except these two features, and taking into account the fact that the pleon appears to be subject to considerable variation, even within the same species (see Chilton's discussion in Tr. New Zeal. Inst. vol. 22, 1890, p. 199, on this feature in *Idotea (Paridotea) peronii*, M. Edw.), there can be little doubt that it should be placed in the genus *Paridotea*.

PARIDOTEA RUBRA, n. sp.

(Plate XXXVII. A.)

Body rather flat, smooth, glabrous. Head broader than long, anterior margin arcuate, antero-lateral angles acute, eyes about in middle of lateral margins, dark. Peraeon, 1st segment wider than head, antero-lateral angles rounded, postero-lateral angles of 2nd-7th segments rectangular. Epimera as long as their segments, except those of 2nd and 3rd segments, large, rounded, postero-inferior angles of those of 2nd-5th segments rounded, of 6th rectangular and of 7th subacute. Posterior margins of sterna nearly straight, with rather deep median incision. Pleon with 1 complete and 2 incom-

plete lateral sutures, lateral margins sinuate, apex excavate, postero-lateral angles rounded.

First antenna reaching to middle of antepenultimate peduncular joint of 2nd antenna, flagellum with 8 groups of setae and sensory filaments.

Second antenna reaching to posterior margin of 3rd peraeon segment, peduncular joints not produced, 2nd and 3rd joints subequal, 4th and 5th joints subequal, flagellum 21-jointed.

Upper lip rounded, strongly setose.

Lower lip, lobes broad, rounded, strongly setose.

Mandibles, cutting-edge 4-dentate, secondary cutting-edge tridentate, spine-row with ca. 7 spines, molar quadrate in left, oblique in right.

First maxilla, outer plate with 10 spines, the 2 innermost denticulate, inner plate with 3 plumose setae.

Second maxilla, outer and middle plates with 3 setae, inner plate twice as broad as others.

Maxilliped 7-jointed, epipod reaching to end of 4th joint, apex incurved.

Peracopods all similar, stout, 6th joint with 1 stout bifid tubercle near base and 2 setae just beyond, palm of 6th joint of 1st peraeopod has in addition scattered setae, unguis unequal.

First and second pleopods with ca. 8 hooked setae on inner apex of peduncle, male stylet on 2nd peraeopod nearly as long as ramus, apex acute.

Uropods, ramus short, broader than long, especially in ♀, apex truncate, sloping inwards, no setae on outer apex of peduncle.

Length: ♂ 47 mm., ♀ 38 mm.; *breadth*: ♂ 15 mm., ♀ 13 mm.

Colour: Uniform deep red-brown, with a darker median spot on anterior margin of peraeon segments 2-7.

Locality: Sea Point, near Cape Town. 23/12/13. (K.H.B.) 2 ♂♂, 1 ♀ with embryos, and several immature. (S.A.M. No. A2664.). Amongst the matted red seaweed growing on the stems of the Sea Bamboo (*Ecklonia*) at low-water mark.

This species agrees with *P. reticulata* in having 3 plumose setae on inner plate of 1st maxilla.

PARIDOTEA FUCICOLA, n. sp.

(Plate XXXVI. E.)

Body narrow, parallel-sided in ♂, middle segments of peraeon slightly wider in ♀, smooth, glabrous. Head with anterior margin

slightly emarginate, antero-lateral angles not prominent, eyes in middle of lateral margin, dark. Peraeon with both anterior and posterior margins of 1st segment concave, 1st segment in middle line $\frac{2}{3}$ length of 2nd, 2nd-4th subequal, 5th-7th subequal and as long as 1st. Epimera of 2nd-5th segments $\frac{2}{3}$ as long as their segments, not quite reaching posterior margin, those of 6th and 7th segments as long as their segments. Pleon equal in length to last 4 peraeon segments together, with 1 complete and 2 incomplete lateral sutures, slightly tapering to a rounded apex with a small shallow semicircular notch.

First antenna reaching to middle of 3rd peduncular joint of 2nd antenna, basal joint stout, enlarged, nearly 3 times as broad as 2nd joint, 2nd and 3rd subequal, flagellum as long as 1st joint, with ca. 13 groups of sensory filaments in pairs and a few setules.

Second antenna reaching to, or a little beyond, end of 2nd peraeon segment, 1st joint smaller than 2nd, excised on outer apical margin, 2nd-4th joints subequal, 5th a little longer, flagellum a little longer than peduncle, 18-21-jointed.

Upper lip broader than long, distal margin straight or slightly emarginate, setiferous.

Lower lip, lobes stout, inner margin oblique, with strong stout setae.

Mandibles, both geniculate, cutting-edge 4-dentate, secondary cutting-edge tridentate in left, bidentate and weaker in right, spine-row with ca. 4 spines, molar denticulate with setules on posterior margin.

First maxilla, outer plate with 7 spines, inner plate with 3 plumose setae.

Second maxilla, outer and middle plates with 6 spines.

Maxilliped narrow, 7-jointed, 3rd joint very short, 5th produced at inner apex, 6th nearly as long as 2nd, 7th semicircular, short, inner plate as long as 2nd joint, with 1 coupling-hook, epipod reaching to end of 4th joint, narrow, lanceolate, apex blunt, slightly incurved.

Peraeopods not very slender; 1st peraeopod shorter than rest, 6th joint oblong, not ovate, nor enlarged, inner margin with 3 large serrate spines and numerous pectinate setae.

Second peraeopod, 6th joint with 2 large serrate spines but no pectinate setae. Third peraeopod similar to 2nd, but only 1 spine on 6th joint.

Fourth to seventh peraeopods with thick fur on inner margin of 4th-6th joints.

Ungues in all the peraeopods equal and strong, with a tuft of setae at their base.

Male appendages on 7th peraeon segment contiguous, short, apices blunt.

Marsupial plates overlapping.

Pleopods narrow; 4 hooked spines on inner apex of peduncle, male stilet on 2nd pleopod half as long again as ramus, slender, scarcely tapering, apex obliquely truncate.

Uropods narrow, nearly parallel-sided, suture between peduncle and ramus oblique, width of ramus equal to inner margin, apex truncate, slightly emarginate, no seta on outer apex of peduncle.

Length: ♂ 22 mm., ♀ 17 mm.; *breadth*: ♂ 3.5 mm., ♀ 4 mm.

Colour: Greenish brown, often with a darker discontinuous median stripe on peraeon segments.

Locality: Smitswinkel Bay (False Bay). 5/7/12. (K.H.B.) 3 ♂♂, 1 ♀ and 2 young; Buffels Bay (False Bay). 28/9/13. (K.H.B.) 3 ♂♂, 1 ♀ with ova; Atlantic coast near Cape of Good Hope. 29/9/13. (K.H.B.) ♂♂, ♀♀ with ova, and young; St. James, False Bay. 15/2/14. (K.H.B.) ♂♂, ♀♀ with ova. (S.A.M. Nos. A2469, A2525, A2526 and A2684 respectively.)

Found on brown seaweeds at low-water mark.

This species appears to be very close to *Idotea elongata*, Miers, although there is considerable difference in the shape of the telsonic apex. This difference is noticeable in comparing the Cape species with Miers' figure (Cat. N.Z. Crust. 1876, p. 93, pl. 2, fig. 3), and Dr. Calman informs me that Miers' figure is a very fair representation of the actual type specimens. I am unable to give a detailed comparison of the appendages owing to a want of specimens of *I. elongata*.

Dr. Calman also informs me that the type specimens of *I. elongata* in the British Museum have 1 complete and 2 incomplete basal sutures on the pleon and are therefore referable to *Paridotea*. This does not quite agree with Miers' description (J. Linn. Soc. 1881, vol. 16, p. 54). "Postabdomen . . . having usually indications of a lateral suture . . ." Chilton has commented on the variability of these sutures (Subant. Is. N.Z. 1909, vol. 2, p. 658) and says of specimens coming, like the type specimens, from the Auckland Islands: "The lateral suture on the pleon is often very indistinct, so that the pleon is almost or quite uniaarticulate."

Seeing however that the type specimens show the distinctive

character of *Paridotea*, I think it legitimate to include *elongata* in this genus, which will therefore contain the following species:—

- Paridotea ungulata* (Pallas). Type species.
 „ *peronii* (M. Edw.).
 „ *elongata* (Miers).
 „ *rubra*, n. sp.
 „ *reticulata*, n. sp.
 „ *fucicola*, n. sp.

Among the four common Cape specimens, *P. ungulata*, *rubra*, *reticulata*, and *fucicola*, I have found no variation in the distinctness of the pleon sutures.

FAMILY ASTACILLIDAE.

1908. *Astacillidae*, Stebbing, S.A. Crust. pt. 4, p. 50.

1911. *Arcturidae*, Koehler, Bull. Inst. Océan. Monaco, No. 214, p. 1.

1914. *Astacillidae*, Barnard, Ann. S.A. Mus. vol. x. pt. 7, p. 206.

IDARCTURUS, n. gen.

Body not geniculate, head fused with 1st peraeon segment, all the segments of the pleon fused into one piece, 4th peraeon segment longer than the others in the female only, but not markedly elongate, antennae, mouth parts, peraeopods, pleopods and uropods as in *Astacillidae*, ♂ appendage on 7th peraeon segment single, no appendage on 3rd or 5th segments of ♂, 3 pairs of marsupial plates.

This genus forms a transition from the typical *Astacillids* to the *Pseudidoteids* and *Amesopus*, themselves intermediate between the *Astacillidae* and *Idoteidae*. But that it must be placed in the former family and not the *Pseudidoteidae* or *Amesopidae* is clearly shown by the appendages, especially the anterior peraeopods.

IDARCTURUS PLATYSOMA, n. sp.

(Plate XXXVII. B.)

Body flattened, not geniculate, resembling an *Idoteid*, smooth, glabrous. Head united with 1st peraeon segment, but the sutures distinct laterally, anterior margin excavate, eyes oval, in middle of lateral margins. Peraeon segments 2 and 3 subequal, a little longer

than 1st, 4th segment in ♀ as long as head and first 2 segments together, not laterally expanded, segments 5-7 subequal, as long as first 3 segments together, in ♂ 4th segment as long as 2nd and 3rd together, segments 5-7 subequal, twice as long as 4th and thrice length of 3rd. Epimera distinct except on 1st segment, narrow, inferior margin of those on 5th-7th segments angular. Pleon nearly equal to last two segments of peraeon together, all segments completely fused without trace of sutures, but in ♂ the basal portion is a little wider than the distal part, tapering very slightly to the rounded, entire apex.

First antenna scarcely reaching end of 2nd peduncular joint of 2nd antenna, 1st joint very stout, as broad as long, 2nd joint $\frac{1}{3}$ width of, and $\frac{1}{2}$ length of 1st joint, 3rd joint a little slenderer and shorter, flagellum 1-jointed, as long as 2nd peduncular joint, apex with 3 setae and 2 large sensory filaments.

Second antenna reaching to end of 4th peraeon segment, first 2 joints short, subequal, 3rd joint equal to 1st and 2nd together, 4th joint half as long as 3rd, 5th joint a trifle shorter than 4th, flagellum a little shorter than 5th joint, 4-jointed in ♂, 1st joint longest, 2nd-4th subequal, 5th small and ending in a small curved claw-like process, all joints with apical setae.

Upper lip transverse, distal margin rounded.

Lower lip, lobes short with rounded-truncate apices, inner angles with stout setae.

Mandibles stout, straight, cutting-edge and secondary cutting-edge in both tridentate, apparently no spine-row, molar strong, reaching to level of end of cutting-edge, palp absent.

First maxilla, outer plate with 10 straight simple spines, inner plate with 3 plumose setae.

Second maxilla, outer and middle plates each with 4 setae.

Maxilliped, 2nd joint short and stout, inner plate equal to 2nd joint, apex truncate with a few plumose setae, 2 coupling-hooks in middle of inner margin, 5th joint oval, equal to 2nd joint in length, 6th $\frac{1}{2}$ length of 5th, 7th $\frac{1}{3}$ length of 6th, 4th-6th joints setose internally, epipod in ♀ reaching base of 5th joint, rounded, broader than long, backward projecting plate on 1st joint in ♀ very large.

First peraeopod short, closing over the maxilliped, 2nd joint longest, 5th and 6th subequal, rather longer than 4th, 7th short and slender, equal to width of 6th joint, 4th-6th joints with thick fringe of long serrulate setae on inner margin, 7th joint with a few terminal setae.

Peraeopods 2 to 4 similar but becoming successively longer, 2nd

joint stout in peraeopods 2 and 3, longer in peraeopod 4, 4th-6th joints subequal in peraeopod 2, in peraeopods 3 and 4 4th joint a little longer than 5th and 6th, inner margins of 3rd-6th joints with fringe of long setae, 7th joint minute, ending in a curved unguis.

Peraeopods 5 to 7 subequal in length and similar to one another, stout, 2nd joint longest, twice as long as wide, outer margin with blunt tubercles (obscure on peraeopod 5), 5th joint shortest except 7th, which is triangular and ends in a short but strong curved unguis, with a strongly chitinized "pad" on inner margin before the unguis.

Male appendage on 7th peraeon segment single, tapering gradually to a subacute apex.

Marsupial plates 3 pairs, on segments 2-4, that on 4th segment has no inset piece, but posterior margin is setose, inferior margin simple.

First pleopod with oblique row of 3 (♂) or 4 (♀) hooked setae on middle of peduncle, rami as long as peduncle, outer ramus in ♂ with long setae in middle.

Second pleopod with 3 hooked setae near inner apex of peduncle, rami longer than peduncle, male stylet a little longer than ramus, distal end enlarged, curved outwards and ending in a finely pointed apex.

Third to fifth pleopods with rami lanceolate, covering ramus shorter than the other, with a long plumose setae near apex on outer margin.

Uropods narrow, proximal end rounded, tapering gradually distally, exposed ramus small, triangular, longer than broad, outer margin slightly concave, margins finely setose, concealed ramus very small with 3 terminal setae and 1 subterminal on outer margin.

Length: ♂ 5 mm., ♀ 10 mm.; *breadth*: ♂ 1 mm., ♀ 2 mm.

Colour: Uniform claret-colour, 5th joint and flagellum of 2nd antennae with lighter bands, eyes black.

Locality: Atlantic coast of the Cape Peninsula near the Cape of Good Hope and near Cape Town. 29/9/13 and 15/11/13. (K.H.B.) 2 ♂♂, several ♀♀, some ovigerous, and young from 3 mm. upwards. On red seaweed at low-tide. (S.A.M. Nos. A2527 and A2600.)

In immature specimens peraeon segments 4-7 are subequal, and specimens under 4 mm. in length lack the peraeopods on 7th peraeon segment.

The specific name is in allusion to the flattened shape of the animal, in consequence of which it is exceedingly difficult to see; it is the exact colour of the weed, lies along the smaller branches and clings very tenaciously.

FAMILY JAERIDAE.

1910. *Jaeridae*, Stebbing, J. Linn. Soc. Lond. Zool. vol. 31, No. 207, p. 224. (References.)

GEN. JAERA, Leach.

1814. *Jaera*, Leach, (? Tr. Linn. Soc. vol. 11, p. 373), Edinb. Encycl. vol. 7, p. 434.
1825. ,, Desmarest, Consid. Gen. Crust. p. 316.
1840. ,, M. Edwards, Hist. Nat. Crust. vol. 3, p. 147.
1840. *Jaeridina*, id. ibid. p. 150.
1887. *Jaera*, Pfeffer, Jahresber. Hamb. wiss. Anst. vol. 5, p. 134.
1893. ,, Stebbing, Hist. Crust. p. 379.
1897. *Jaera*, J. O. Sars, Crust. Norw. vol. 2, p. 103.
1905. *Jaera*, Richardson, Bull. U.S. Nat. Mus. No. 54, p. 449.
1905. ,, Tattersall, Fish. Ireland Sci. Invest. 1904, No. 2, p. 51.

JAERA SERRATA, n. sp.

(Plate XXXVIII. A.)

Body glabrous except for a few scattered setae on the sides. Head without rostrum, anterior margin nearly straight, antero-lateral angles acutely produced, lateral margins with six teeth and scattered setae, eyes oval, black.

Peraeon segments subequal, antero-lateral angles of first segment each with a stout spine, no marked gap between the anterior four segments and the posterior three.

Pleon nearly equal to last three peraeon segments, longer than broad, oval, lateral margins with scattered setae and towards apex with six teeth, notches for uropods well marked, leaving a median point.

First antenna reaching to end of 5th peduncular joint of second antenna, 1st joint very stout, 2nd and 3rd slender, not distinguished from the 3-jointed flagellum.

Second antenna about twice length of head, 3rd joint with a distinct scale bearing 2 setules, 5th and 6th joints subequal, flagellum as long as peduncle, 15-jointed.

Upper lip as in *J. marina*.

Mandibles as in *J. marina*, the molar very prominent, the joints of the palp slightly increasing in length from the first.

Maxillipeds, 4th and 5th joints larger than 3rd or 6th joints, but

not greatly expanded, epipod with outer margin angular not rounded as in *J. marina*, reaching to middle of 5th joint.

Peraeopods all similar, the posterior ones rather longer, the first apparently uniunguiculate, the rest biunguiculate.

First pleopods elongate, outer angle of peduncle produced into a long thin point exceeding in length the rami, which are well developed with blunt setose apices.

Second pleopods, peduncle ovate, apically acute, setose on apical distal margin, outer ramus large, bilobed, near apex of peduncle, inner ramus (= penial filament) very bulbous at base, the distal portion narrowing to a long thread nearly twice length of pleopod.

Third pleopods, inner ramus with 2 apical setae, outer ramus about as long, 2-jointed, the second joint setose.

Fourth pleopods, inner ramus with 2 apical setae, outer ramus shorter, narrow, pointed, 1-jointed.

Fifth pleopods, small, only one ramus (with apical setae?).

Uropods short, peduncle stout, setose around the bases of the rami which are elongate lanceolate, the inner longer than the outer.

Length: 2 mm.; *breadth*: .5 mm.

Colour: Whitish.

Locality: Sea Point, near Cape Town. 29/11/13. (K.H.B.) 1 ♂ (S.A.M. No. A2633.)

Though assigned to the genus *Jaera* this species is not in full accord with the definition of that genus or the figures of *J. marina* given by Sars. Firstly, the presence of a distinct scale on the third peduncular joint of the second antennae brings it into harmony with the great majority of the genera in the family; *Jaera* (as defined by Sars) and *Jaeropsis* being the only genera in which it is lacking.

Secondly, the maxilliped resembles that of *Janira*, and differs completely from that of *Jaera marina* in having an angular outer margin to the epipod.

Thirdly, the first pleopods are quite peculiar, but as Tattersall (l.c.) has shown that this pair of pleopods differ very considerably in *Jaera marina* and *Jaera nordmanni*, two species otherwise very hard to separate, this feature has little importance in deciding on the systematic position of the present species. These pleopods approximate somewhat to those of *Janira*, as do also the third pleopods.

Fourthly, the elongate, parallel-sided body is rather different from the more oval shape of the typical species.

However, the shape of the head, the peraeon segments without distinct epimera, the short first antennae and the uropods all

make a near approach to *Jaera*, and for the present the species may remain in this genus.

GEN. IAIS, Bovallius.

1886. *Iais*, Bovallius, Bib. K. Svenska, Vet. Ak. Handl. vol. 2, No. 15, pp. 4, 50.
1886. *Jaera* (part), Beddard, Challenger Rep. vol. 17, p. 19.
1887. *Iais* (*Janthe*), Pfeffer, Krebse von Süd-Georgien, p. 18.
1900. „ Stebbing, Proc. Zool. Soc. Lond. 1900, p. 548.

IAIS PUBESCENS (Dana).

(Plate XXXVII. C.)

1853. *Jaera pubescens*, Dana, U.S. Expl. Exp. vol. 13, p. 744, pl. 49, figs. 9a-d.
1900. *Iais* „ Stebbing, l.c. p. 549, pl. 38 (♀). (Synonymy.)
1904. „ „ id. Spolia Zeylanica, vol. 2, pt. 5, p. 10.
1909. „ „ Chilton, Subantaret. Is. New Zealand, Crust. vol. 2, p. 649.

It appears that the male has so far escaped observation. It does not differ essentially from the female except as regards the mandibles. These have the incisive process very much prolonged, gently curved and tapering gradually to a subacute, entire apex, with a strong seta about half-way along the inner margin, spine-row with 4 spines, molar similar to that of ♀ but rather weaker, palp as in ♀, arising from a short process.

The lobes of the lower lip are short, almost semicircular, the inner margin straight, the apical angles being internal therefore and not external as in Stebbing's figure.

First pleopods fused basally, not diverging distally, the outer margins sinuous, rami well developed, oblong with rounded apices, sparsely setulose.

Second pleopod with peduncle longer than broad, apex subacute, outer ramus arising some little distance from apex, male stylet extending as far as, not beyond, the apex of peduncle.

Third pleopod similar in both sexes, inner ramus stout, suture between the 2 joints oblique, 2nd joint apically truncate, with 2-4 denticles, outer ramus half width of inner, curving inwards, apex pointed, margins setulose, an obscure suture dividing off the distal third.

Length : 2.5 mm.

Colour : White or pale pinkish, the ova salmon-coloured.

Locality : Several localities near Cape Town in Table Bay both free-living on the underside of stones and commensal with the following Sphaeromids : *Exosphaeroma gigas*, *E. kraussi*, *E. brevitelson*, *E. varicolor*, *E. planum*, *Parisocladus stimpsoni*, *P. perforatus*, *Sphaeramene polytylotos*, *Dynamenella scabricula*, *D. kraussi* (K.H.B.); Saldanha Bay on *Exosphaeroma kraussi* (K.H.B.); St. James and Buffels Bay in False Bay on *Dynamenella scabricula*, *D. kraussi* (K.H.B.).

Tristan d'Acunha on *Isocladus tristensis*. (P. C. Keytel. 1909.)

Geogr. Distribution : Terra del Fuego (Dana), Straits of Magellan (Bovallius), Kerguelen (Smith and Beddard), Falkland Islands (Stebbing), South Georgia (Pfeffer), in each case on *Exosphaeroma gigas*; Tasmania (G. M. Thomson), on ? *Sphaeroma quoyana*; New Zealand (Chilton) free and on ? *Sphaeroma obtusa*; Ceylon (Stebbing), in the burrows of *Sphaeroma terebrans*.

When found on Sphaeromids, they are among the bases of the peraeopods, though on *Sphaeramene polytylotos* they seem to prefer to live among the pleopods. As a rule there is only one adult ♂ and one ♀, with or without one or two immature ones, on each "host." On *Dynamenella scabricula* in Table Bay, however, I have found them extremely abundant, as many as 12 or 15 being taken from a single large ♂. They are found more frequently on ♂ Sphaeromids than ♀, and it is rare to find any on young specimens.

GEN. JANIRA, Leach.

For references see : Barnard, Ann. S.A.M. x. pt. 7, p. 219, 1914.

JANIRA EXSTANS, n. sp.

(Plate XXXVIII. B.)

Body apparently smooth and glabrous, but much overgrown with foreign substances. Head with antero-lateral angles well marked, anterior margin strongly produced into a broad rounded process, length of head (incl. process) equal to width, eyes on the lateral margins, prominent.

Peraeon in ♂ with 1st segment nearly twice as long as any of the succeeding ones, in ♀ equal to or a little shorter than the others, the last three segments distinctly shorter than the anterior ones, lateral margins rounded, epimera indistinct.

Pleon broadly oval, longer than broad, margins entire.

First antenna reaching to end of 4th peduncular joint of 2nd antenna, 1st joint stout, 2nd a little longer, flagellum longer than peduncle, 4-jointed, 3rd joint longest, 4th minute.

Second antenna, 3rd joint without scale, 5th and 6th subequal, longer than first 4 joints together, flagellum nearly twice as long as peduncle, ca. 38-jointed in ♂, ca. 24 in ♀.

Upper lip short, as broad as long, apex rounded.

Lower lip with short, broad lobes, inner apex strongly setose.

Mandibles, cutting-edge 4-dentate, secondary cutting-edge in left 4-dentate, spine-row with 5 spines, molar fairly prominent, palp with 3rd joint shorter than 2nd, with apical seta, no marginal setae on 2nd or 3rd joints.

First maxilla, outer plate with ca. 10 (?) spines, inner plate with 5 setae.

Second maxilla, outer and middle plates with 4 spines each.

Maxilliped, inner plate nearly as long as 2nd joint, 2 coupling-hooks near base, 4th and 5th joints not expanded, epipod reaching end of 4th joint, narrow lanceolate, outer margin slightly angular, apex acute tapering.

First peraeopod in ♂ stout, subchelate, 2nd and 3rd joints subequal, inner surface of 3rd joint with 7 transverse rugae on inner margin, 4th joint with 1 stout spine on outer apex, 5th joint triangular, distally produced on inner side, with 1 stout spine on inner apical angle and another further along distal margin, 6th joint curved, inner margin distally serrulate, 7th joint half as long as 6th, biunguiculate. In ♀ prehensile but scarcely stouter than the other peraeopods, 3rd joint without rugae, 5th joint with 1 long spine on inner apical angle, inner margin of 6th joint not serrulate.

Second to seventh peraeopods similar, the posterior ones longer and rather more slender than anterior ones, 2nd and 3rd joints subequal, 4th with 2 spines on outer apex, 5th and 6th subequal and equal to the 2nd and 3rd, inner margin of 6th with 4 spines in ♂, 3 in ♀, 7th joint biunguiculate.

First pleopod ♂, peduncle narrowing rather rapidly, apex not expanded, but outer angle with 1 spine, ramus rounded truncate, setose.

First pleopod ♀ (operculum) rather pear-shaped, as broad as long, tapering to a broadly rounded apex, with a few scattered setae.

Second pleopod ♂ narrow, outer margin nearly straight, apex subacute, setose, ramus at some distance from apex, very small, male stylet stout, reaching to apex.

Third pleopod inner lobe broad, apex rounded with 2 setae, outer lobe 2-jointed, a little longer than inner.

Uropods three-quarters length of pleon, inner ramus longer than outer, both longer than peduncle, with strong apical setae.

Length: ♂ 2.5 mm., ♀ 1.75 mm.; *breadth*: ♂ .75 mm., ♀ (ovigerous) .75 mm.

Colour: Pale grey, eyes reddish, ova salmon-coloured.

Locality: Buffels Bay (False Bay). 28/9/13. (K.H.B.) ♂ ♂ and ♀ ♀ with ova, under stones at low-tide; Sea Point, near Cape Town. 14/12/13. (K.H.B.) 1 ♀ with ova; Hout Bay. 11/2/14. (K.H.B.) ♂ ♂ and ♀ ♀ with ova. (S.A.M. Nos. A2546, A2658 and A2674.)

In respect to the stout, subchelate 1st peraeopods this species may be compared with three other species of small size: *J. minuta*, Richardson, 1902, *J. nana*, Stebbing, 1905, and *J. crosslandi*, Stebbing, 1910. The absence of a scale on the 3rd joint of the 2nd antennae, however, is distinctive and brings the species into conflict with the definition of the genus *Janira*. The shape of the head also is peculiar and recalls that of *Nannoniscus*, Sars, and *Austro-nanus*, Hodgson, 1910. It is in allusion to these last two features that the specific name is chosen.

FAMILY MUNNIDAE.

1882. *Munnidae*, Sars, Vidensk. Forh. Christ. No. 18. p. 17.

1897. ,, G. O. Sars, Crust. Norw. vol. 2, p. 105.

1905. ,, Richardson, Bull. U.S. Nat. Mus. No. 54, p. 479.

KUPHOMUNNA, n. gen.

Resembling *Munna* in general shape, but head produced anteriorly into a rostrum, 1st peraeon segment much larger than any of the others, gibbous, epimera visible on posterior segments only, uropods not very small, composed of a peduncle and two rami, palp of maxilliped slender.

Generic name from *κνφοε*, hunch-backed, and *Munna*, in allusion to the enlarged 1st peraeon segment.

KUPHOMUNNA ROSTRATA, n. sp.

(Plate XXXVIII. C.)

Body apparently glabrous, but much overgrown with Diatoms, etc.

Head with anterior margin sinuate, produced below the anterior

margin into a long and broad rostrum, with 4-5 teeth on lateral margins and a bluntly rounded apex, eyes well developed on the lateral projections.

Peraeon with 1st segment very large, swollen and gibbous, as long as the 3 following segments together, segments 2-4 equal in length, lateral margins subquadrate, with 1 spine on antero-lateral angle, segments 5-7 equal and a little longer than the anterior segments, diminishing gradually in width, lateral margins rounded, with 1 spine on antero-lateral angles. Epimera visible only on segments 5-7, with 1 spine.

Pleon of one piece, oval, margins entire.

First antenna, peduncle stout, 2nd joint half length of 1st, flagellum 3-jointed.

Second antenna, first 3 peduncular joints stout, short, 4th and 5th elongate, subequal, flagellum nearly as long as peduncle, 15-jointed.

Upper lip with rounded, setose distal margin.

Lower lip, lobes rather short, ovate, outer margin distally setose, inner margin distally emarginate, apex subacute.

Mandibles narrow, cutting-edge tridentate, secondary cutting-edge on left tridentate, absent on right, spine-row with 5 spines in both mandibles, molar prominent, no trace of a palp.

First maxilla outer plate with 7 spines, some denticulate on outer margin, inner plate with 4 setae.

Second maxilla, outer and middle plates each with 4 spines.

Maxilliped, 2nd joint increasing in width distally and passing into inner plate without distinct suture, outer margin of inner plate oblique, setose near apex, 2 coupling-hooks at base, 3rd joint short, 4th and 5th joints subequal, 6th a little longer and 7th a little shorter, epipod reaching to about middle of 4th joint.

First peraeopod, 2nd joint longest, 3rd with 3 spines on outer apex, 4th strongly produced externally, with 2 spines on subacute apex, 5th triangular, outer margin spinose, distal margin with 7 stout blunt spines, each with a cilium near apex, 6th oval, palm with 3 spines, 7th slender as long as 6th, with a single slender unguis.

Second to seventh peraeopods similar to one another except that 2nd is a little stouter and has 5th joint elongate-oval instead of oblong; 6th joint longest, 7th short, with 2 unguis.

First pleopod ♂, peduncle tapering, apices curved outwards, acute, a group of fine setae half-way along outer margin, ramus obscurely separated from peduncle, with 2 spines.

Second pleopod ♂, peduncle elongate-lanceolate, apex acute, outer

ramus inserted a little beyond the middle of inner margin and a long way from apex, male stylet reaching to end of peduncle.

Third pleopod, outer ramus apparently single-jointed, apex acute, inner ramus with blunt apex (without setae?).

Fourth pleopod, outer ramus single-jointed, apex acute, inner ramus with 3 strongly plumose setae on apex.

Fifth pleopod with 1 branch only (apparently).

Uropods well developed, peduncle longer than rami, of which the inner is longer than the outer.

Length : 2 mm. ; *breadth* : 1 mm.

Colour : Whitish, head and 1st peraeon segment grey, the latter with darker mottling, rostrum with a tinge of red.

Locality : Buffels Bay (False Bay). 28/9/13. (K.H.B.) 1 ♂.
Low-tide. (S.A.M. No. A2543.)

[N.B.—Pages 325 to 358 having been unfortunately duplicated, the *second* appearance of these *thirty-four* pages (only) is indicated by an “*a*” after each page number. Pages 325–358 appeared in Part X.; 325*a*–358*a* are in this Part, XI.]

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PLATE XXVII. A.

Apseudes avicularia, n. sp.

- n.s. Line representing natural size of specimen drawn magnified 13 times, with 6th pleon segment and telson further enlarged.
a.₁, a.₂. First and second antennae.
prp.₁. (gn.). First peraeopod with apices of 6th and 7th joints further enlarged.
prp.₂. Second peraeopod.

PLATE XXVII. B.

Apseudes deltoides, n. sp.

- rostr. Anterior margin of head with rostrum and bases of 1st and 2nd antennae.
a.₁, a.₂. First and second antennae.
mand. r. Right mandible with spine-row further enlarged.
mand. l. Cutting-edge, secondary cutting-edge, and spine-row of left mandible.
prp.₁. (gn.) First peraeopod.
prp.₂, prp.₃. Second and third peraeopods.
tels. + urop. Sixth pleon segment, telson and uropods.

PLATE XXVII. C.

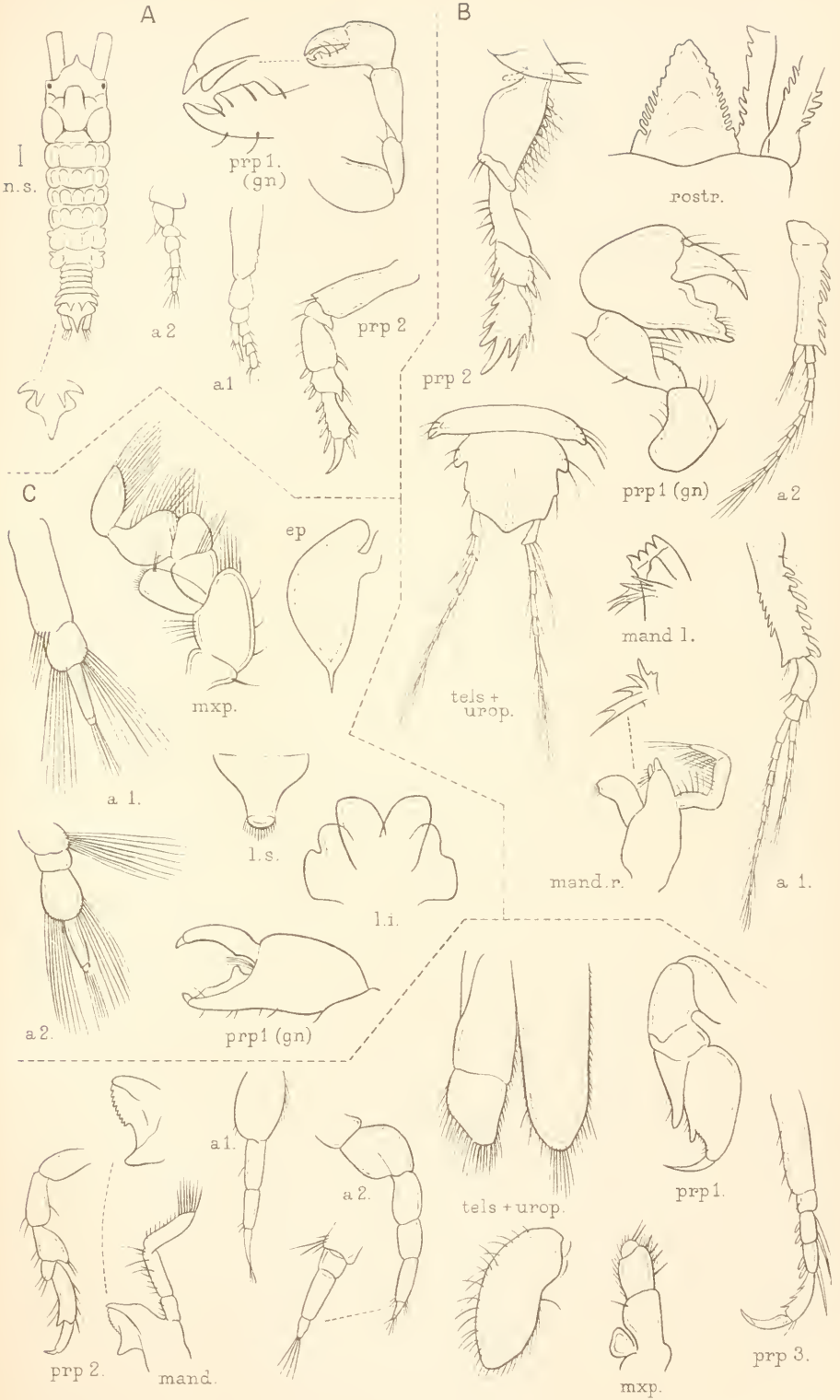
Tanaïs annectens, n. sp.

- a.₁, a.₂. First and second antennae.
l.s. Upper lip.
l.i. Lower lip.
mxp. ep. Maxilliped with epipod.
prp.₁. (gn.). Sixth and seventh joints of 1st peraeopod.

PLATE XXVII. D.

Cyathura estuarius, n. sp.

- a.₁, a.₂. First and second antennae with flagellum of 2nd further enlarged.
mand. Mandible with cutting-plate further enlarged.
mxp. Maxilliped.
prp.₁, prp.₂. First and second peraeopods.
tels. + urop. Telson with inner and outer rami of uropods.



K.H.B. del.

West, Newman lith.

A. *APSEUDES AVICULARIA* n. sp.
 C. *TANAIS ANNECTENS* n. sp.

B. *APSEUDES DELTOIDES* n. sp.
 D. *CYATHURA ESTUARIUS* n. sp.

PLATE XXVIII. A.

Eranthura macrura, n. g. et sp.

- a.₁, a.₂. First and second antennae.
mand. Mandible with cutting-plate further enlarged.
mxp. Maxilliped.
prp.₁. First peraeopod.
tels. + urop. Seventh peraeon segment, pleon, telson, and inner and outer rami of uropods.

PLATE XXVIII. B.

Anthelura remipes, n. sp.

- a.₁, a.₂. First and second antennae with flagellum of each further enlarged.
mand. Mandible with cutting-plate further enlarged.
mxp. Maxilliped with 5th and 6th (?) joints further enlarged.
prp.₁. First peraeopod with inner margin of 5th joint further enlarged.
prp.₂. Second peraeopod.
tels. + urop. Telson with inner and outer rami of uropods.

PLATE XXVIII. C.

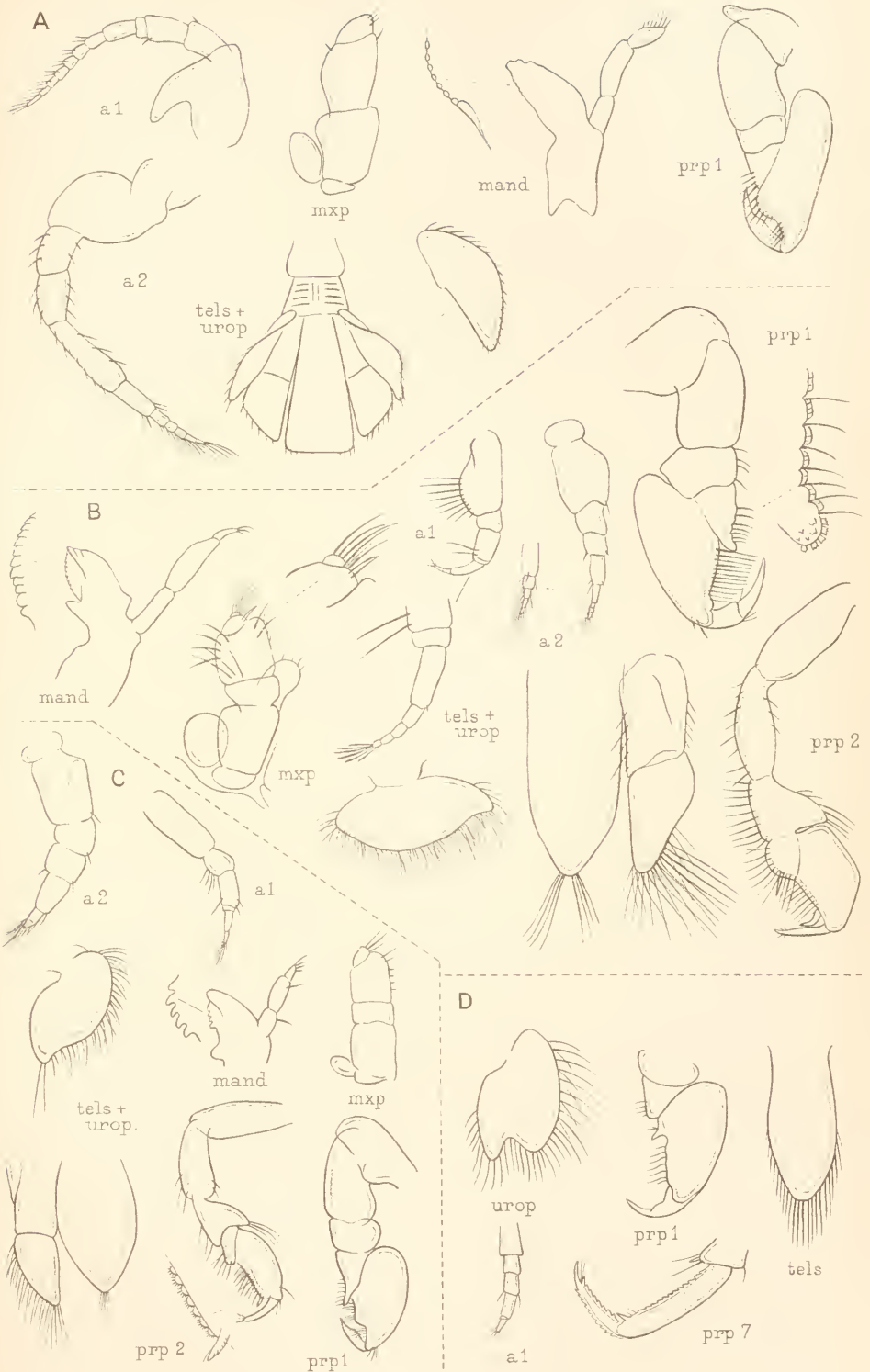
Apanthura africana, n. sp.

- a.₁, a.₂. First and second antennae.
mand. Mandible with cutting-plate further enlarged.
mxp. Maxilliped.
prp.₁, prp.₂. First and second peraeopods with inner margin of 6th joint of 2nd further enlarged.
tels. + urop. Telson with inner and outer rami of uropods.

PLATE XXVIII. D.

Apanthura dubia, n. sp.

- a.₁. First antennae.
prp.₁. Fifth, sixth, and seventh joints of 1st peraeopod.
prp.₇. Sixth and seventh joints of 7th peraeopod.
tels. Telson.
urop. Outer ramus of uropod.



K.H.B. del.

West, Newman lith.

A. EXANTHURA MACRURA *n. sp. et sp.*

B. ANTHELURA REMIPES *n. sp.*

C. APANTHURA AFRICANA *n. sp.*

D. APANTHURA DUBIA *n. sp.*

PLATE XXIX. A.

Mesanthura catenula (Stimpson), n. g.

- a.₁ ♂. First antenna of ♂.
a.₂ ♂. Flagellum of 2nd antenna of ♂.
a.₁ ♀, a.₂ ♀. First and second antennae of ♀.
mand. l. Left mandible.
mand. r. Right mandible with cutting-plate further enlarged.
mxp. Maxilliped.
prp.₁, prp.₂, prp.₇. First, second and seventh peraeopods, with inner margin of 6th joint of 2nd further enlarged.
tels. + urop. Telson with inner and outer rami of uropods.

PLATE XXIX. B.

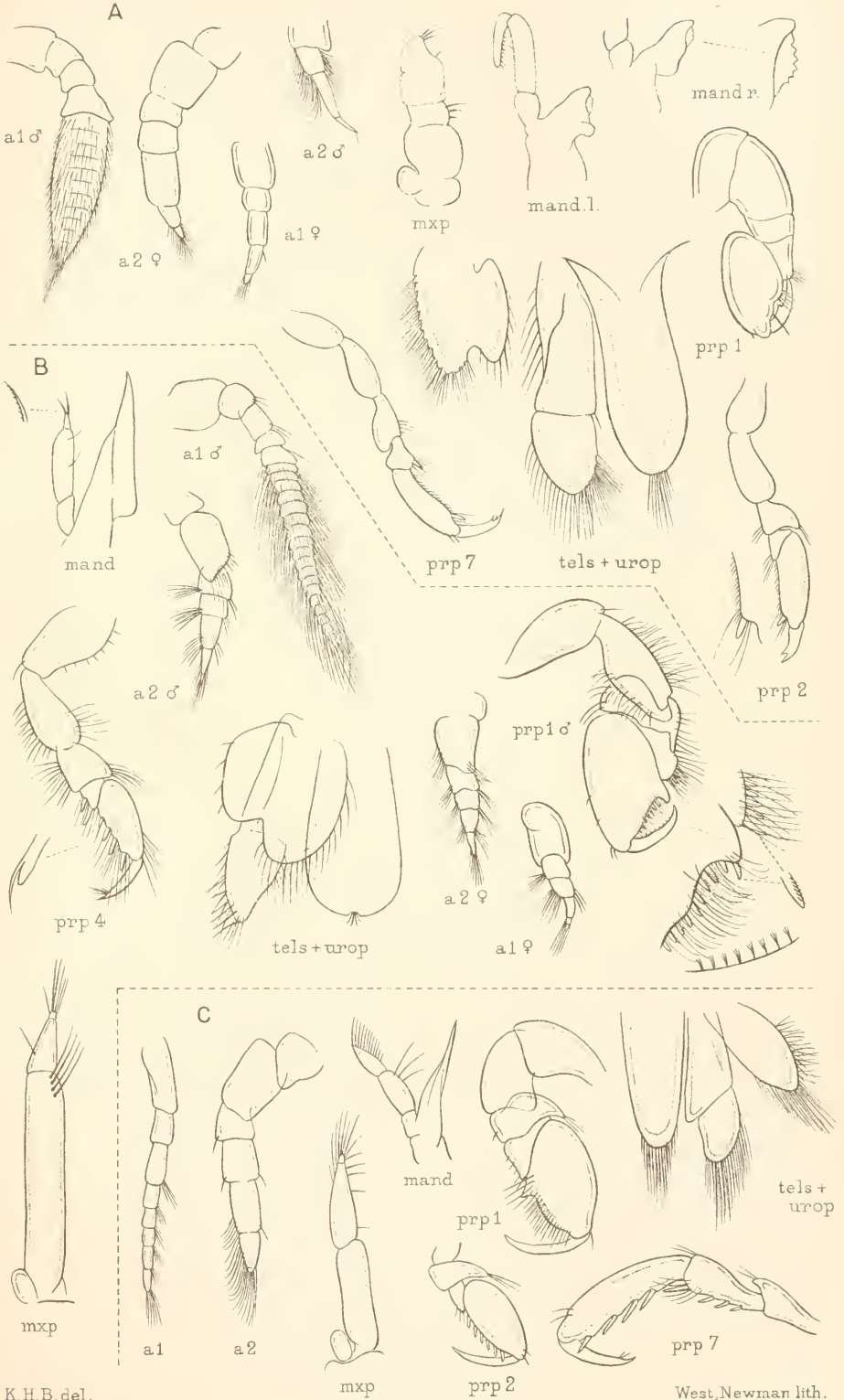
Leptanthura faurei, n. sp.

- a.₁ ♂, a.₂ ♂. First and second antennae of ♂.
a.₁ ♀, a.₂ ♀. First and second antennae of ♀.
mand. Mandible with seta from apex of palp further enlarged.
mxp. Maxilliped.
prp.₁ ♂. First peraeopod of ♂ with inner margins of 5th, 6th and 7th joints and a spine from inner margin of 5th and 6th joints further enlarged.
prp.₄. Fourth peraeopod with spine from inner margin of 6th joint further enlarged.
tels. + urop. Telson with inner and outer rami of uropods.

PLATE XXIX. C.

Paranthura punctata (Stimpson).

- a.₁, a.₂. First and second antennae.
mand. Mandible.
mxp. Maxilliped.
prp.₁, prp.₇. First and seventh peraeopods.
prp.₂. Fourth-seventh joints of 2nd peraeopod.
tels. + urop. Telson with inner and outer rami of uropods.



K. H. B. del.

West, Newman lith.

A. MESANTHURA CATENULA (*Stimpson*) n.g.

B. LEPTANTHURA FAUREI n.sp. C. PARANTHURA PUNCTATA (*Stimpson*)

PLATE XXX. A.

Cirolana undulata, n. sp.

tels. + urop. Telson with inner and outer rami of uropods, with the apices of telson and both rami further enlarged.

PLATE XXX. B.

Cirolana vicina, n. sp.

prp.₂, prp.₇. Second and seventh peraeopods.

tels. + urop. Telson with inner and outer rami of uropods.

urop. Inner and outer rami of uropod with apex of inner ramus further magnified.

PLATE XXX. C.

Pontogeloides latipes, n. g. et sp.

hd. + a.₁, a.₂. Head and 1st peraeon segment, with 1st and 2nd antennae.

f.l. + ep. Frontal lamina, epistome and upper lip.

mand. Mandible.

mxp. Maxilliped with seta from inner plate further enlarged.

prp.₁, prp.₇. First and seventh peraeopods.

plp.₂. Second pleopod of ♂.

tels. + urop. Telson and uropods with apical margin of telson further enlarged.

urop. Right uropod.

PLATE XXX. D.

Corallana africana, n. sp.

l.i. Lower lip.

mand. Mandible.

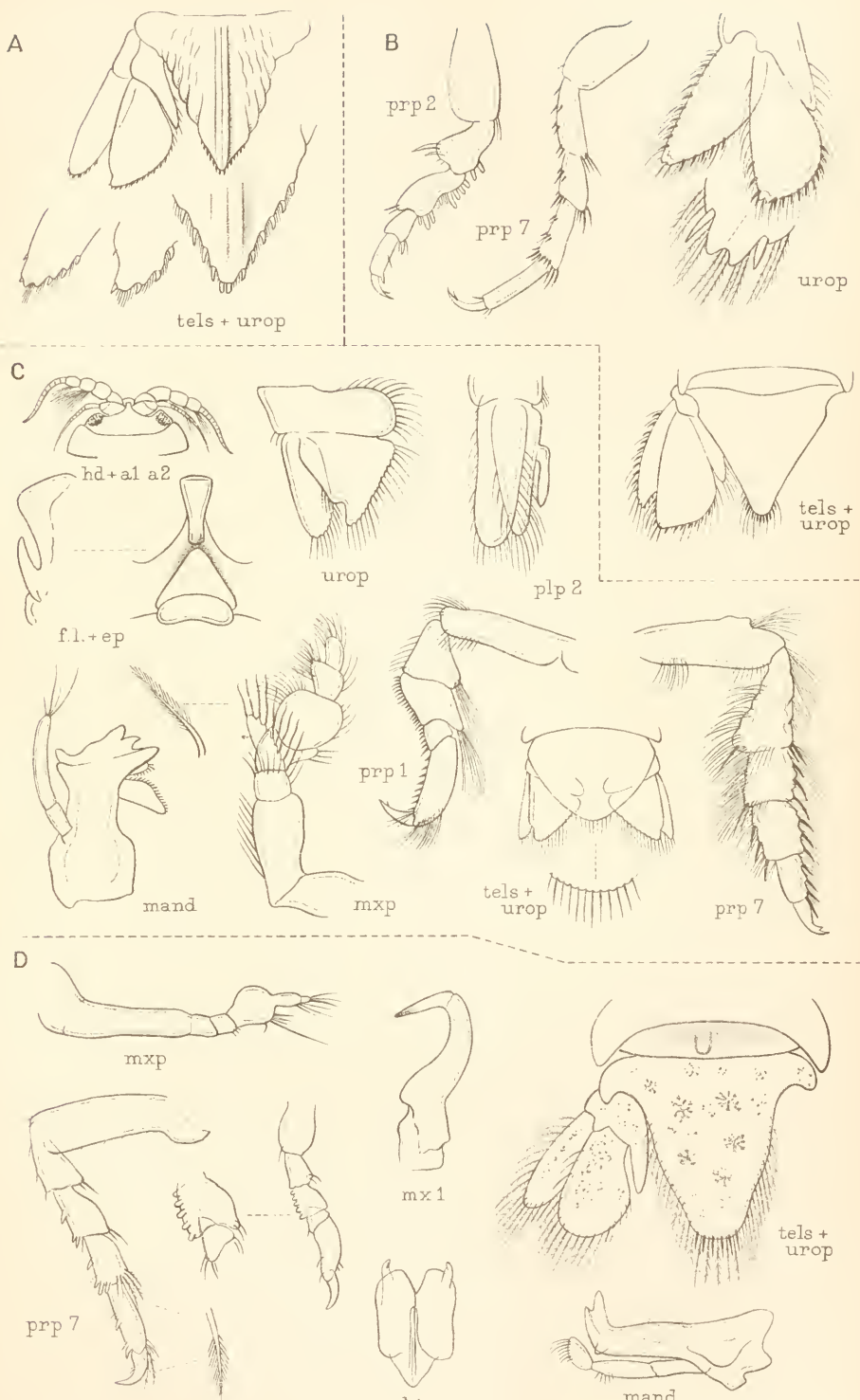
mx.₁. First maxilla.

mxp. Maxilliped.

prp.₁. First peraeopod with 4th and 5th joints further enlarged.

prp.₇. Seventh peraeopod with setae from 5th and 6th joints further enlarged.

tels. + urop. Fifth pleon segment, telson and inner and outer rami of uropods.



K.H.B.del.

West, Newman lith.

A. CIROLANA UNDULATA n.sp.

B. CIROLANA VICINA n.sp.

C. PONGOGELOIDES LATIPES n.g.et sp.

D. CORALLANA AFRICANA n.sp.

PLATE XXXI. A.

Lanocira capensis, n. sp.

- mand. l. Left mandible with molar further enlarged.
mand. r. Apex of right mandible with secondary cutting-edge and molar further enlarged.
mx.₁, mx.₂. First and second maxillae.
mxp. Maxilliped of ♀ with setae from inner plate and epipod further enlarged.
prp.₁. Third-seventh joints of 1st peraeopod.
prp.₂. Third-seventh joints of 2nd peraeopod.
plp.₂. Second pleopod ♂ with apical seta from ramus further enlarged.

PLATE XXXI. B.

Aega monophthalma, Johnston.

- a.₁, a.₂+f.l. Anterior portion of head with 1st and 2nd antennae and frontal lamina.
mand. Mandible.
mx.₁, mx.₂. First and second maxillae with apex of 1st further enlarged.
mxp. Maxilliped with 4th-7th joints further enlarged.
prp.₂. Second peraeopod.

PLATE XXXI. C.

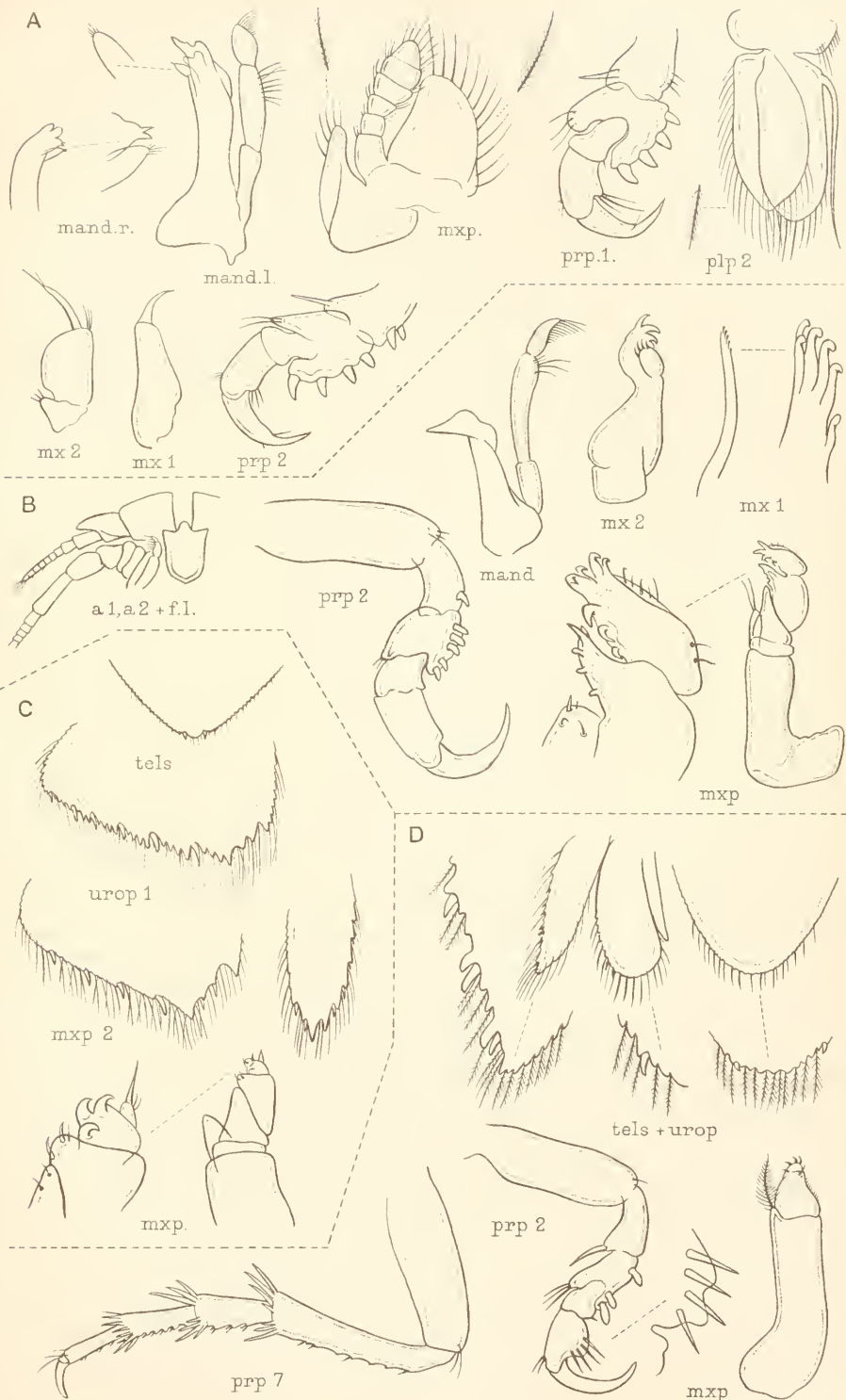
Aega monilis, n. sp.

- mxp. Second-seventh joints of maxilliped with 4th-7th joints further enlarged.
tels. Apical margin of telson.
urop.₁. Apical margin of inner ramus of uropod of East London specimen.
urop.₂. Apical margins of inner and outer ramus of uropod of Cape specimen.

PLATE XXXI. D.

Rocinela granulosa, n. sp.

- mxp. Maxilliped.
prp.₂, prp.₇. Second and seventh peraeopods, with inner margin of 6th joint of 2nd further enlarged.
tels.+urop. Apices of telson and inner and outer rami of uropods, with the margins further enlarged.



K.H.B. del.

West, Newman lith.

A. LANOCIRA CAPENSIS *n. sp.*

B. AEGA MONOPHTHALMA *Johnston.*

C. AEGA MONILIS *n. sp.*

D. ROCINELA GRANULOSA *n. sp.*

PLATE XXXII. A.

Aega urotoma, n. sp.

tels. + urop. Telson and uropods.

PLATE XXXII. B.

Exosphaeroma brevitelson, n. sp.

tels. + urop. ♂ ♀. Seventh peraeon segment, pleon, telson and uropods of ♂
and ♀.

ep. + l.s. Epistome and upper lip.

PLATE XXXII. C.

Exosphaeroma varicolor, n. sp.

tels. + urop. ♂. Seventh peraeon segment, pleon, telson and uropod of ♂.

ep. + l.s. Epistome and upper lip.

PLATE XXXII. D.

Exosphaeroma kraussi, Tattersall.

tels. + urop. ♂. Sixth and seventh peraeon segments, pleon, telson and uropod
of ♂.

ep. + l.s. Epistome and upper lip.

PLATE XXXII. E.

Exosphaeroma porrectum, n. sp.

n.s. Line representing natural size of specimen drawn magnified 7 times.

ep. + l.s. Epistome and upper lip.

PLATE XXXII. F.

Exosphaeroma planum, n. sp.

n.s. Line representing natural size of specimen drawn magnified 3 times.

ep. + l.s. Epistome and upper lip.

PLATE XXXII. G.

Parisocladius stimpsoni (Heller), n. g.

tels. + urop. ♂ ♀. Seventh peraeon segment, pleon, telson and uropod of ♂ and ♀.

lat. tels. ♂. Lateral view of 7th peraeon segment, pleon and telson of ♂.

tels. juv. Apex of telson of young ♂.

ep. + l.s. Epistome and upper lip.

pen. ♂ appendages on 7th peraeon segment.

PLATE XXXII. H.

Parisocladius perforatus (M. Edw.).

n.s. Line representing natural size of ♂ specimen drawn magnified 5 times.

lat. tels. ♂. Lateral view of 7th peraeon segment, pleon and telson of ♂.

lat. tels. ♀. Lateral view of pleon and telson of ♀.

tels. ♀. Hind view of telson of ♀.

ep. + l.s. Epistome and upper lip.

mand. l. mand. r. Left and right mandibles.

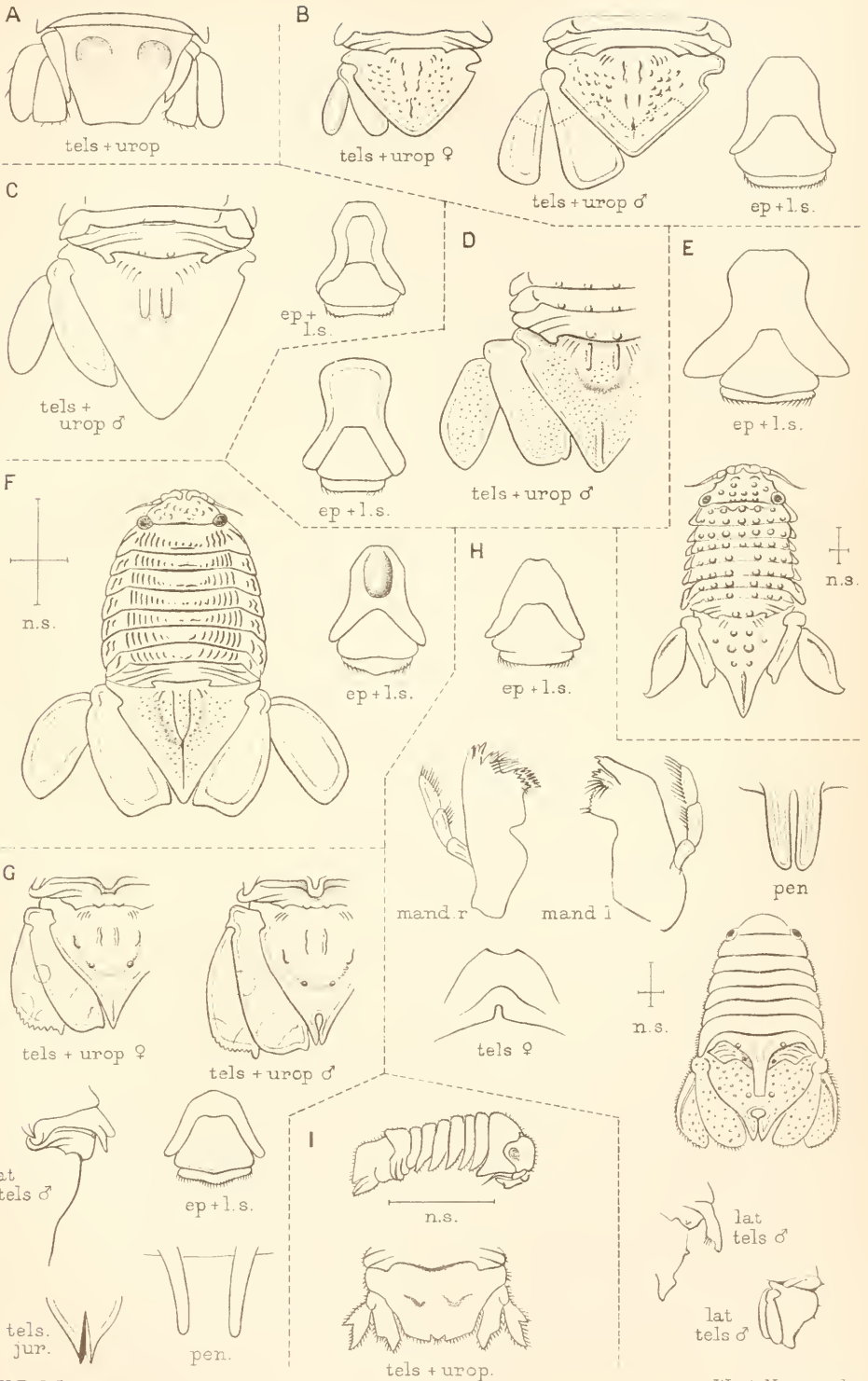
pen. ♂ appendages on 7th peraeon segment.

PLATE XXXII. I.

Cilicæa latreillei, Leach.

n.s. Line representing natural size of ♀ specimen drawn in profile magnified
 $1\frac{2}{3}$ times.

tels. + urop. Pleon, telson and uropods.



K.H.B. del.

West, Newman litn.

- A. AEGA UROTOMA *n. sp.* B. EXOSPHAEROMA BREVITELSON *n. sp.*
 C. EXOSPHAEROMA VARICOLOR *n. sp.* D. EXOSPHAEROMA KRAUSSI *Tatters*
 E. EXOSPHAEROMA PORRECTUM *n. sp.* F. EXOSPHAEROMA PLANUM *n. sp.*
 H. PARISOCLADUS PERFORATUS (*Edw.*) G. PARISOCLADUS STIMPSONI (*Heller*) *n. g.*
 I. CILICAEA LATREUILLEI *Leach.*

PLATE XXXIII. A.

Sphaeramene polytylotos, n. g. et sp.

- n.s. Line representing natural size of σ specimen drawn magnified nearly 2 times.
 tels. ♀. Apex of telson of ♀.
 ep. + l.s. Epistome and upper lip, with proximal part of epistome drawn in profile.
 mand. Mandible.
 pen. σ appendages on 7th peraeon segment.

PLATE XXXIII. B.

Isocladus tristensis (Leach).

- tels. + urop. σ ♀. Seventh peraeon segment, pleon, telson and uropods of σ and ♀.
 ep. + l.s. Epistome and upper lip.
 pen. σ appendages on 7th peraeon segment.

PLATE XXXIII. C.

Cymodoce valida (Stebbing).

- tels. + urop. σ . Pleon, telson and uropods of σ .
 lat. tels. σ . Lateral view of pleon, telson and uropod of σ .
 tels. + urop. ♀. Telson and uropods of ♀ with margin of telson further enlarged.
 l.i. ♀. Lower lip
 mand. ♀. Mandible
 mx.₁ σ , mx.₂ ♀. First and second maxillae
 mxp. σ . Maxilliped
 pen. σ appendages on 7th peraeon segment.
- } of modified ovigerous ♀.

PLATE XXXIII. D.

Cymodoce comans, n. sp.

- tels. + urop. σ . Seventh peraeon segment, pleon, telson and uropods of σ .
 lat. tels. σ . Lateral view of same.
 tels. + urop. ♀. Telson and uropod of ♀ with inner and outer rami of uropod further enlarged.
 ep. + l.s. Epistome and upper lip.

PLATE XXXIII. E.

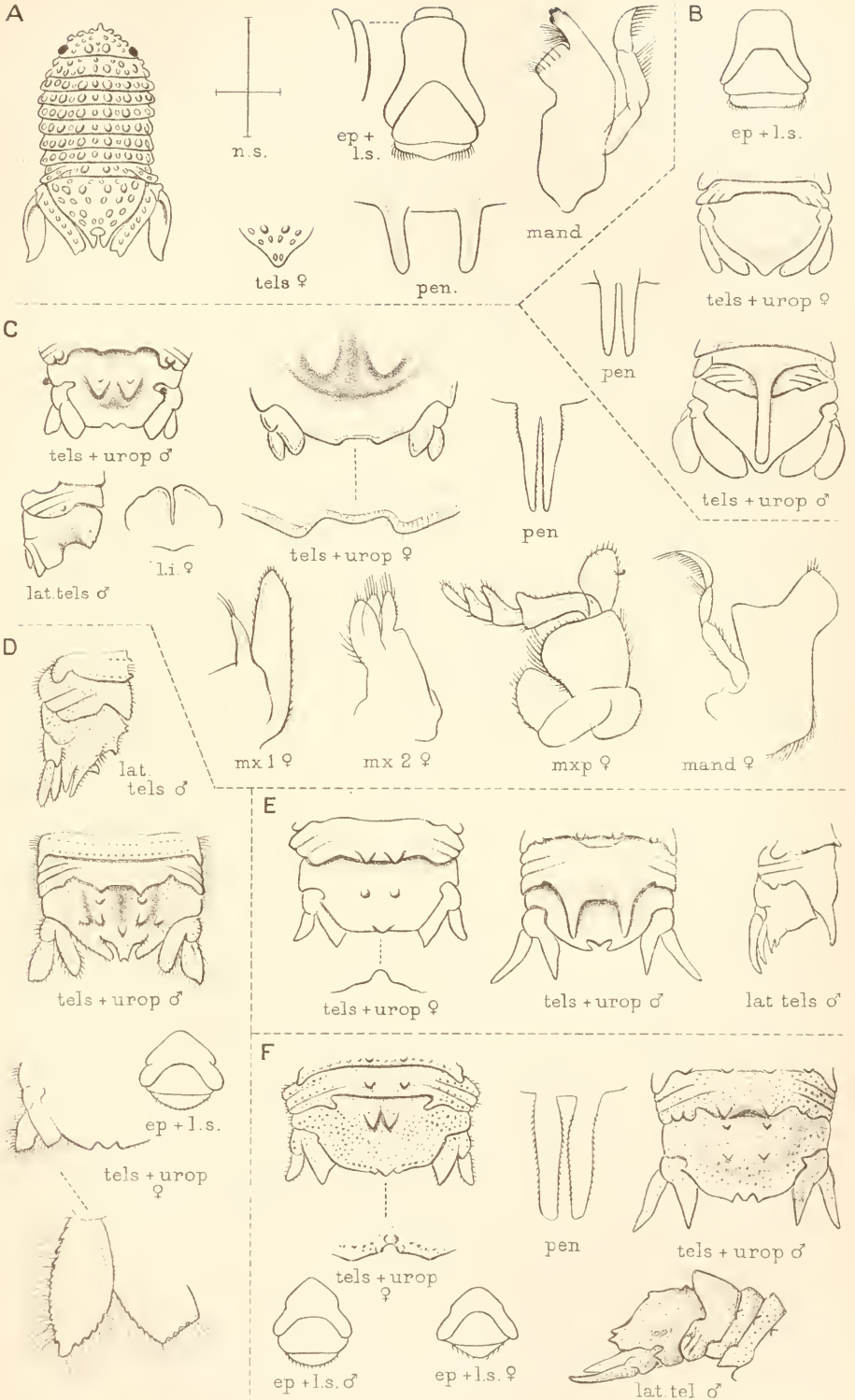
Cymodoce acanthiger, n. sp.

- tels. + urop. σ . Seventh peraeon segment, pleon, telson and uropods of σ .
 lat. tels. σ . Lateral view of same.
 tels. + urop. ♀. Seventh peraeon segment, pleon, telson and uropods of ♀, with apex of telson seen also in hind view.

PLATE XXXIII. F.

Cymodoce africana, n. sp.

- tels. + urop. σ . Seventh peraeon segment, pleon, telson and uropods of σ .
 lat. tels. σ . Lateral view of same.
 tels. + urop. ♀. Seventh peraeon segment, pleon, telson and uropods of ♀, with apex of telson seen also in hind view.
 ep. + l.s. σ , ♀. Epistome and upper lip of σ and ♀.
 pen. σ appendages on 7th peraeon segment.



K.H.B.del.

West, Newman lith.

A. SPHAERAMENE POLYTYLOTOS *n.g et sp.* B. ISOCLADUS TRISTENSIS (*Leach*)
 C. CYMODOCE VALIDA (*Stebbing*). D CYMODOCE COMANS *n.sp.*
 E. CYMODOCE ACANTHIGER *n.sp.* F CYMODOCE AFRICANA *n.sp.*

PLATE XXXIV. A.

Cymodoce falcata, n. sp.

- tels. + urop. ♂. Seventh peraeon segment, pleon, telson and uropods of ♂.
lat. tels. ♂. Lateral view of same.
pen. ♂ appendages on 7th peraeon segment.

PLATE XXXIV. B.

Cymodoce unguiculata, n. sp.

- tels. + urop. ♂. Pleon, telson and uropods of ♂.
lat. tels. ♂. Lateral view of same.
tels. + urop. ♀. Telson and uropod of ♀, with apex of telson seen also in hind view and outer ramus of uropod further enlarged.
e. urop. ♀. Variation in outer ramus of uropod of ♀.
pen. ♂ appendages on 7th peraeon segment.
plp.₂. Second pleopod of ♂ with apex of ♂ stylet further enlarged.

PLATE XXXIV. C.

Cymodoce umbonata, n. sp.

- tels. + urop. ♂. Pleon, telson and uropods of ♂.
lat. tels. ♂. Lateral view of same.
tels. ♂ juv. Apex of telson of young ♂.
tels. + urop. ♀. Pleon, telson and uropods of ♀.

PLATE XXXIV. D.

Paracilicua mossambicus, n. sp.

- tels. + urop. Pleon, telson and uropods.
lat. tels. Lateral view of same.
ep. + l.s. Epistome and upper lip.

PLATE XXXIV. E.

Dynamenella diorus, n. sp.

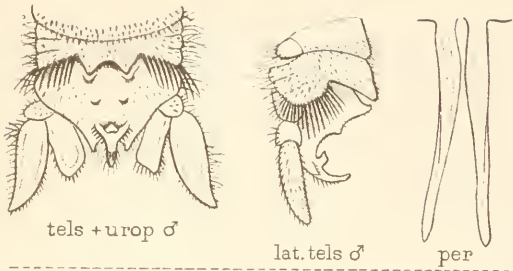
- n.s. Line representing natural size of ♂ specimen drawn magnified 6 times.
lat. tels. ♂. Lateral view of 7th peraeon segment, pleon, telson and uropod of ♂.
ep. + l.s. Epistome and upper lip.
mand. Mandible.
mxp. Maxilliped.
plp.₁, plp.₂. First and second pleopods of ♂.

PLATE XXXIV. F.

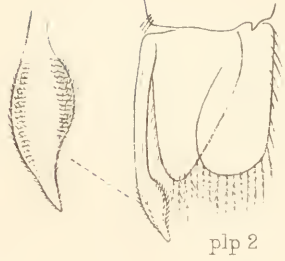
Dynoides serratisinus, n. g. et sp.

- n.s. Line representing natural size of ♂ specimen drawn magnified $4\frac{3}{4}$ times.
tels. + urop. Apices of telson and inner and outer rami of uropod further enlarged.
mand. Mandible.
mxp. Maxilliped.
pen. ♂ appendages on 7th peraeon segment.
plp.₂. Second pleopod of ♂.
plp.₄, plp.₅. Fourth and fifth pleopods.

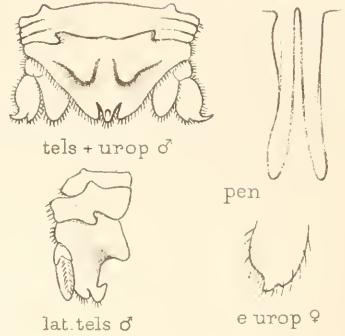
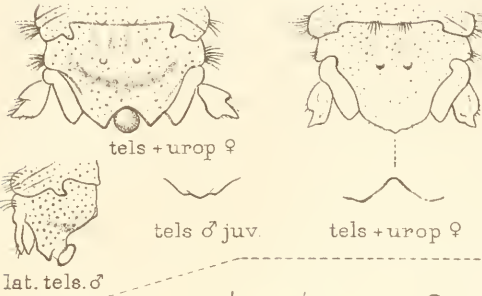
A



B



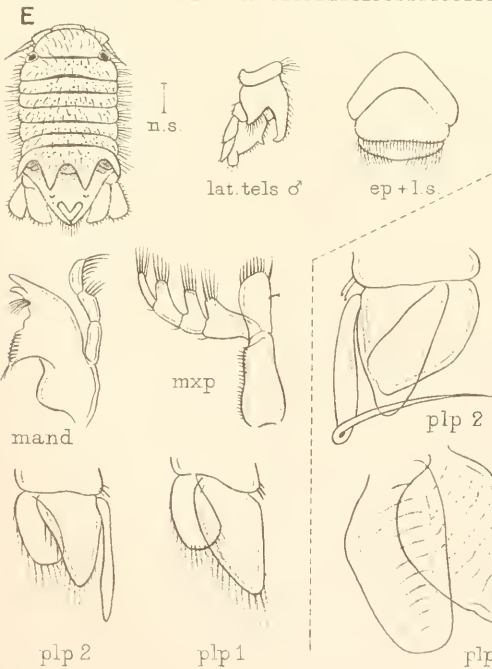
C



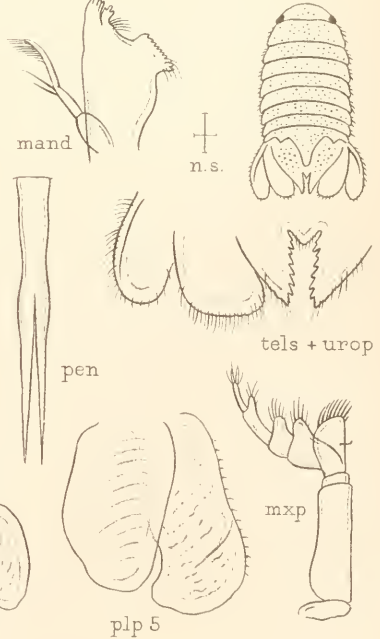
D



E



F



K.H.B.del.

West, Newman lith.

A. CYMODOCE FALCATA n.sp.

B. CYMODOCE UNGUICULATA n.sp.

C. CYMODOCE UMBONATA n.sp.

D. PARACILICÆA MOSSAMBICUS n.sp.

E. DYNAMENELLA DIOXUS n.sp.

F. DYNOIDES SERRATISINUS n.g. et sp.

PLATE XXXV. A.

Dynamenella scabricula (Heller).

- n.s. Line representing natural size of σ specimen drawn magnified $2\frac{1}{4}$ times.
lat. tels. σ . Lateral view of 7th peraeon segment, pleon and telson of σ .
a.₁. First antenna.
ep. + l.s. Epistome and upper lip.
l.i. Lower lip.
mand. Mandible.
mx.₁. First maxilla with apex of outer plate further enlarged.
mxp. Maxilliped.
pp.₁. First peraeopod with 7th joint further enlarged.
pp.₆. Second and third joints of 6th peraeopod.
pen. σ appendages on 7th peraeon segment.
plp.₁, plp.₅. First pleopod and outer ramus of 5th pleopod.
plp.₂. Second pleopod of σ .

PLATE XXXV. B.

Dynamenella kraussi, n. sp.

- tels. + urop. Third-seventh peraeon segments, pleon, telson and uropods, with apex of telson seen also in hind view.
a.₁. First antenna.
ep. + l.s. Epistome and upper lip.
mand. r. Right mandible, with apex further enlarged, the secondary cutting-edge still more so.
mand. l. Secondary cutting-edge and spine-row of left mandible.
pp.₁. First peraeopod with 7th joint further enlarged.
pen. σ appendages on 7th peraeon segment.
plp.₁. First pleopod.
plp.₂. Second pleopod of σ .

PLATE XXXV. C.

Dynamenella macrocephala (Krauss).

- n.s. Line representing natural size of specimen drawn magnified $3\frac{2}{3}$ times.
lat. Lateral view of specimen.

PLATE XXXV. D.

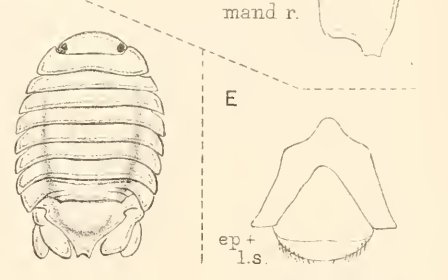
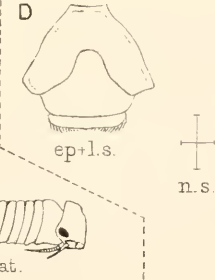
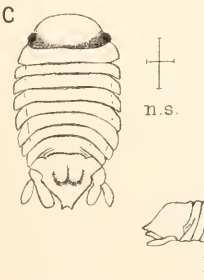
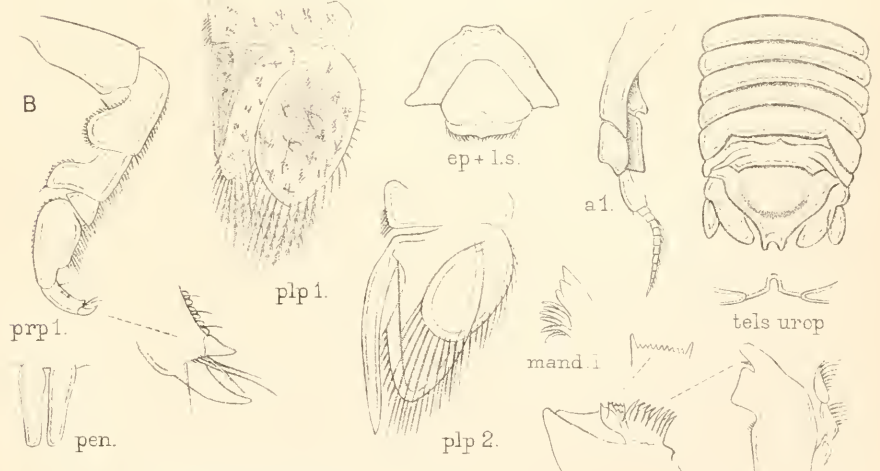
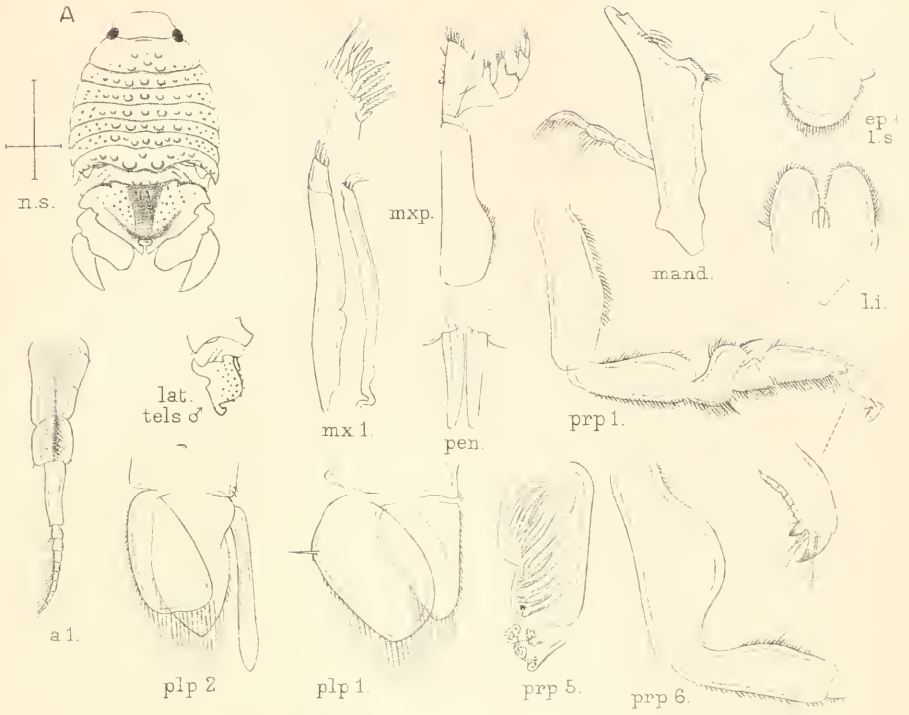
Dynamenella ovalis, n. sp.

- n.s. Line representing natural size of specimen drawn magnified 4 times.
ep. + l.s. Epistome and upper lip.

PLATE XXXV. E.

Dynamenella australis, Richardson.

- ep. + l.s. Epistome and upper lip.



K.H.B. del.

West, Newman lith.

A. DYNAMENELLA SCABRICULA (Heller). B. DYNAMENELLA KRAUSSI n.sp.
 C. DYNAMENELLA MACROCEPHALA (Krauss). D. DYNAMENELLA OVALIS n.sp.
 E. DYNAMENELLA AUSTRALIS Richardson.

PLATE XXXVI. A.

Dynamenella bicolor, n. sp.

tels. + urop. Sixth and seventh peraeon segments, pleon, telson and uropods.
ep. + l.s. Epistome and upper lip.

PLATE XXXVI. B.

Cymodocella subleris, n. sp.

n.s. Line representing natural size of specimen drawn magnified 8 times.
lat. tels. Lateral view of pleon and telson.
ep. + l.s. Epistome and upper lip.
l.i. Lower lip.
mand. r. Right mandible.
mxp. Maxilliped.
prp.₁. First peraeopod with spine from inner margins of 4th-6th joints further enlarged.
prp.₂. prp.₇. Second and seventh peraeopods.
pen. ♂ Appendages on 7th peraeon segment.
plp.₁, plp.₃, plp.₄, plp.₅. First and third-fifth pleopods.
plp.₂. Second pleopod of ♂.

PLATE XXXVI. C.

Cymodocella pustulata, n. sp.

n.s. Line representing natural size of specimen drawn magnified $5\frac{1}{2}$ times.
lat. tels. Lateral view of 7th peraeon segment, pleon and telson.
pen. ♂ Appendages on 7th peraeon segment.
plp. 2. Second pleopod of ♂.

PLATE XXXVI. D.

Paridotea reticulata, n. sp.

tels. r. Telson.
urop. r. Uropod.
st. r. Seventh sternal plate.

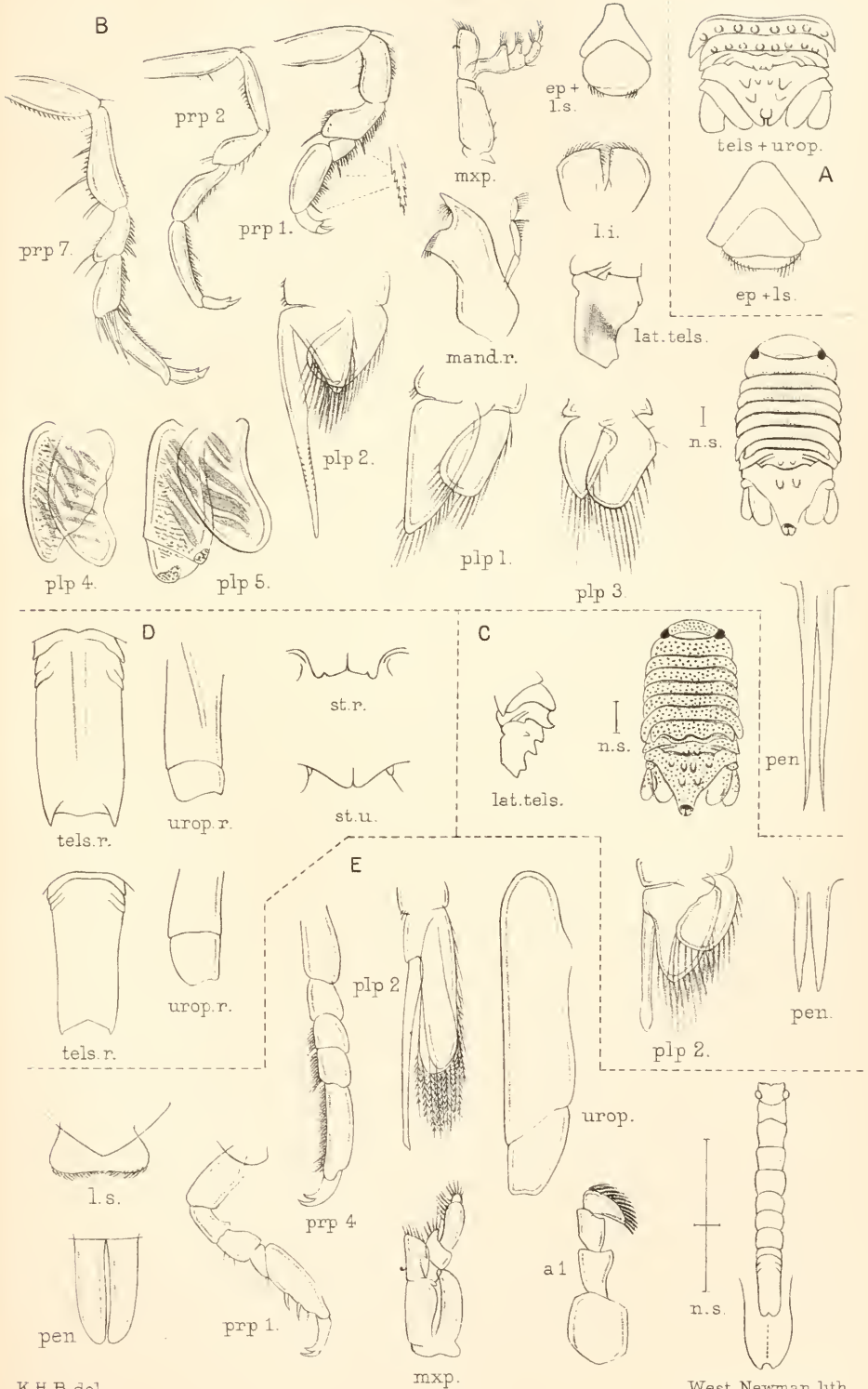
Paridotea ungulata (Pallas).

tels. u. Telson.
urop. u. Uropod.
st. u. Seventh sternal plate. } For comparison with those of *P. reticulata*.

PLATE XXXVI. E.

Paridotea fucicola, n. sp.

n.s. Line representing natural size of ♂ specimen drawn magnified $1\frac{1}{2}$ times, with apex of telson further enlarged.
a.₁. First antenna.
l.s. Upper lip.
mxp. Maxilliped.
prp.₁, prp.₄. First and fourth peraeopods.
pen. ♂ Appendages on 7th peraeon segment.
plp.₂. Second pleopod of ♂.
urop. Uropod.



K.H.B. del.

West, Newman lith.

A. DYNAMENELLA BICOLOR *n.sp.* B. CYMODOCELLA SUBLEVIS *n.sp.*
 C. CYMODOCELLA PUSTULATA *n.sp.* D. PARIDOTEA RETICULATA *n.sp.*
 & P. UNGULATA (*Pallas*). PARIDOTEA FUCICOLA *n.sp.*

PLATE XXXVII. A.

Paridotea rubra, n. sp.

- n.s. Line representing natural size of ♂ specimen drawn magnified $1\frac{1}{4}$ times.
prp.₁. Fifth, sixth and seventh joints of 1st peraeopod.
urop. Distal portion of uropod.

PLATE XXXVII. B.

Idarcturus platysoma, n.g. et. sp.

- n.s. Line representing natural size of ♀ specimen drawn magnified $5\frac{1}{2}$ times.
a.₁. First antenna.
l.i. Lower lip.
mand. l. Left mandible.
mxp. ♀. Maxilliped of ♀.
prp.₁, prp.₇. First and seventh peraeopods with 7th joint of 7th further enlarged.
prp.₄ ♀. Fourth peraeopod of ♀ with marsupial plate, apex of 6th and 7th joints further enlarged.
per. ♂ appendage on 7th peraeon segment.
plp.₁. First pleopod.
plp.₂. Second pleopod of ♂ with apex of ♂ stylet further enlarged.
urop. Uropod.

PLATE XXXVII. C.

Iais pubescens (Dana).

- l.i. Lower lip of ♂.
mand. Mandible of ♂.
mxp. Maxilliped of ♂.
plp.₁. First pleopod of ♂.
plp.₂. Second pleopod of ♂.
operc. ♀. Operculum of ♀.

PLATE XXXVII. D.

Rocincla orientalis, Sch. & Mein.

- prp.₂. Second peraeopod with inner margin of 6th joint further enlarged.

PLATE XXXVII. E.

Gnathia africanus, Brnrd.

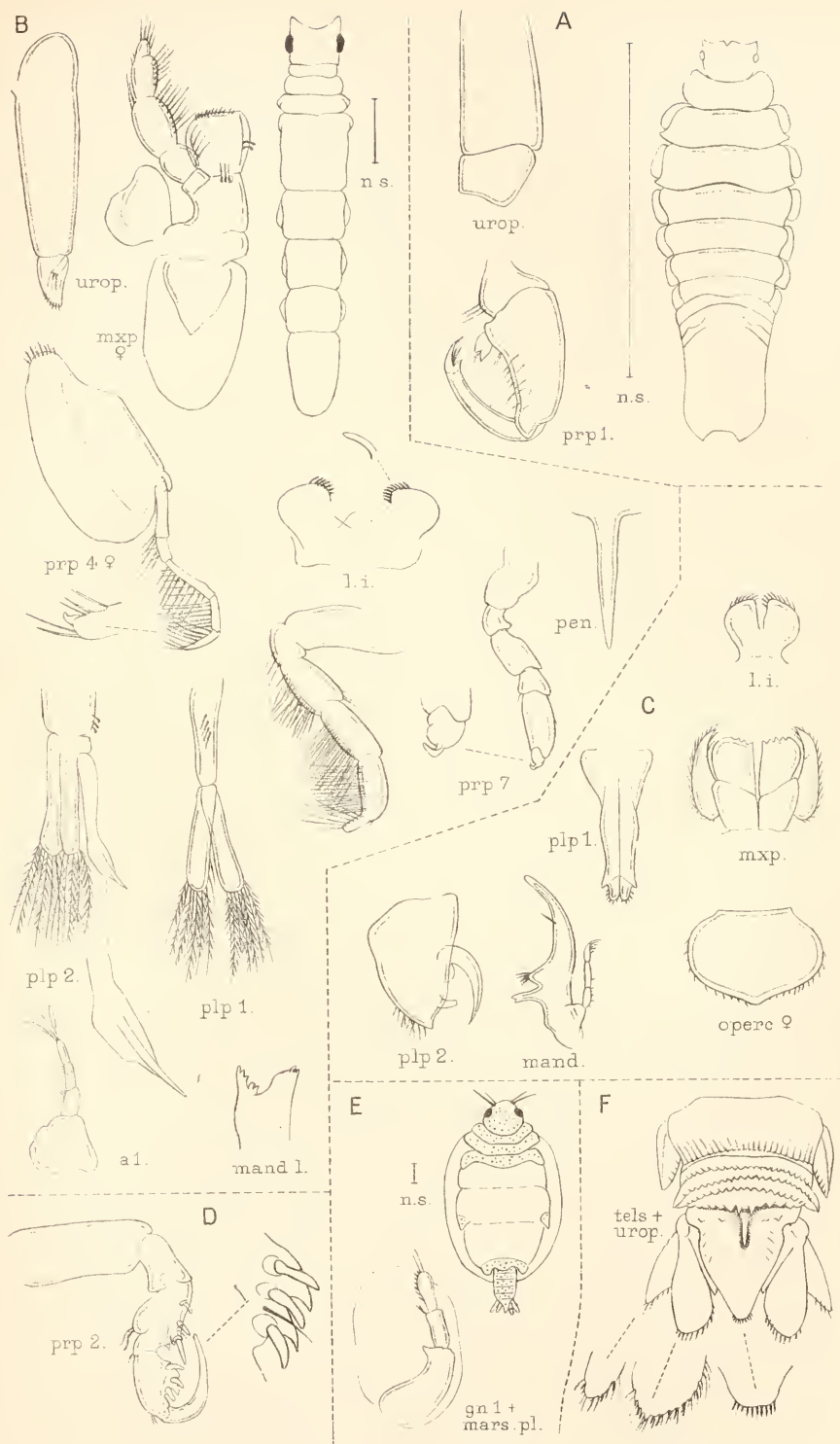
- n.s. Line representing natural size of ovigerous ♀ drawn magnified $9\frac{1}{2}$ times.
gn.₁. + mars. pl. First gnathopod with marsupial plate of ♀.

PLATE XXXVII. F.

Cirolana venusticanda, Stebbing.

Var. *simplex*, n.

- tels. + urop. Seventh peraeon segment, pleon, telson and uropods with apices of telson and inner and outer rami of uropods further magnified.



K.H.B. del.

West, Newman lith.

- A. *PARIDOTEA RUBRA* n. sp.
 B. *IDARCTURUS PLATYSOMA* n. g. et sp.
 C. *JAIS PUBESCENS* (Dana)
 D. *ROCINELA ORIENTALIS* Sch & Mein.
 E. *GNATHIA AFRICANUS* Brard.
 F. *CIROLANA VENUSTICAUDA* Stebb.
 var. *SIMPLEX* n.

PLATE XXXVIII, A.

Jaera serrata, n. sp.

n.s. Line representing natural size of specimen drawn magnified 14 times.

hd. + a.₁, a.₂. Head with 1st and 2nd antennae and upper lip.

mand. Mandible.

mxp. Maxilliped.

plp.₁, plp.₂, plp.₃, plp.₄, plp.₅. First-fifth pleopods of ♂.

tels. + urop. Telson and uropods with uropod further enlarged.

PLATE XXXVIII, B.

Janira exstans, n. sp.

hd. + a.₁, a.₂. Head with 1st and 2nd antennae.

mand. Mandible with cutting-edge further enlarged.

mxp. Maxilliped.

prp.₁ ♂, prp.₁ ♀. First peraeopod of ♂ and ♀.

plp.₁, plp.₂. First and second pleopods of ♂ and ♀.

plp.₃. Third pleopod.

operc. ♀. Operculum of ♀.

tels. + urop. Telson and uropod.

PLATE XXXVIII, C.

Kuphomunna rostrata, n. g. et sp.

n.s. Line representing natural size of specimen drawn magnified 20 times.

l.s., l.i. Upper and lower lips.

mand. l. Left mandible.

mand. r. Right mandible with cutting-edge further enlarged.

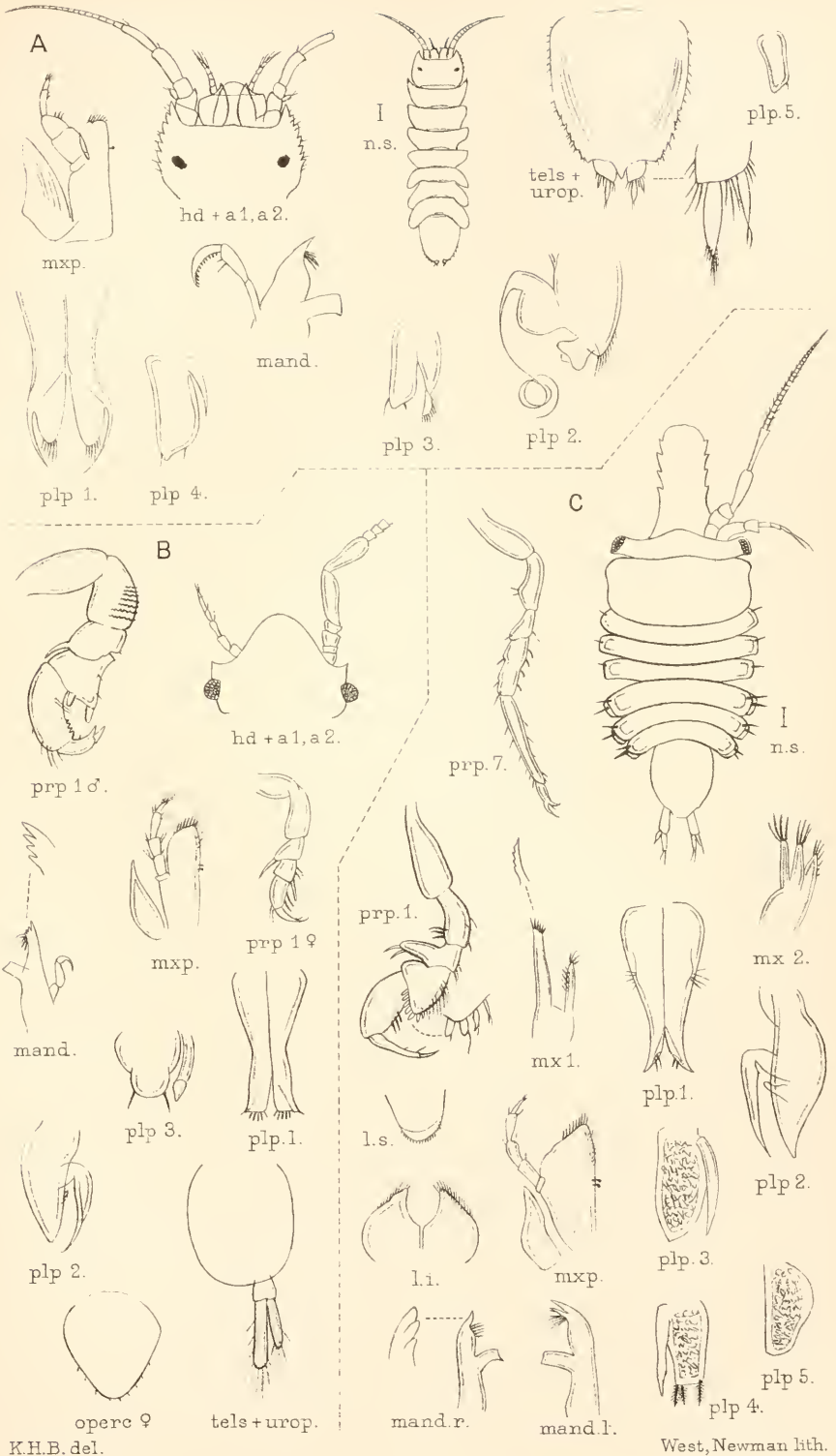
mx.₁, mx.₂. First and second maxillae with spine from apex of 1st further enlarged.

mxp. Maxilliped.

prp.₁. First peraeopod with spines from apex of 5th joint further enlarged.

prp.₇. Seventh peraeopod.

plp.₁, plp.₂, plp.₃, plp.₄, plp.₅. First-fifth pleopods of ♂.



K.H.B. del.

West, Newman lith.

A. JAERA SERRATA *n.sp.* B. JANIRA EXSTANS *n.sp.*
 C. KUPHOMUNNA ROSTRATA *n.g. et sp.*

17.—*Contributions to the Crustacean Fauna of South Africa.*—
By K. H. BARNARD, M.A., *Assistant.*

4.—A NEW SPECIES OF *Nebalia*.

(Plate XXXIX.)

No representatives of the *Phyllocarida* (or *Leptostraca*) have hitherto been recorded from South African waters; the following form is interesting therefore in that it fills a gap in the distribution of the group and also is distinct from any of the known species.

PHYLLOCARIDA.

1879. *Phyllocarida*, Packard, Amer. Natur. Feb., 1879, and
A.M.N.H. (5), vol. 3, p. 459.
1880. *Leptostraca*, Claus. Grundzüge d. Zool. ed. 3.
1887. *Phyllocarida*, G. O. Sars, Challenger Rep. vol. 19, pt. 56, p. 3.
1896. „ id. Fauna Norvegiae, vol. 1, p. 4.

FAMILY NEBALIIDAE.

1850. *Nebaliadae*, Baird, Brit. Entomotr. Ray. Soc. p. 31.
1857. *Nebaliidae*, G. O. Sars, l.c. p. 6.
1896. „ id. l.c. p. 6.

GEN. NEBALIA, Leach.

1874. *Nebalia*, Leach, Zool. Misc. vol. 1, p. 99.
1879. „ G. M. Thomson, A.M.N.H. ser. 5, vol. 4, p. 418.
1896. „ G. O. Sars, l.c. p. 7.
1901. „ Ohlin, Crust. Swed. Arct. Exp. Bih. Svenska Akad.
vol. 26, 4, No. 12.

1904. *Nebalia*, Thiele, Wiss. Ergebn. D. Tiefsee. Exp. vol. 8, pt. 1, p. 9.
 1905. ,, id. Deutsche Südpolar Exp. vol. ix. (Zool. vol. 1, pt. 1), p. 61.
 1909. ,, Chilton, Subantarctic Is. N. Zeal. vol. 2, p. 669.

NEBALIA CAPENSIS, n. sp.

Carapace oval, smooth, glabrous, without row of setae on hind margin. Rostrum linguiform, $2\frac{1}{2}$ times as long as broad, apex rounded without spiniform projection. Pleon with posterior margins of second to seventh segments dentate, the teeth not triangular but oblong with bluntly rounded apices, placed very closely and regularly, posterior margin on underside of fifth and sixth segments excavate on either side of a median pointed projection, posterolateral angles of fourth segment acutely pointed, eighth segment with two triangular flaps below the uropods.

First antenna: first joint shortest, second joint longest, fourth joint with two spines and three setae on outer apical angle, inner angle with a very long and stout seta extending beyond the antennal scale, which is bluntly rounded and strongly setose on outer and apical margins, flagellum equal in length to peduncle, 7-jointed; the length is nearly the same in both sexes.

Second antenna: in ♂ as long as entire animal, in ♀ reaching to about base of 1st pleopods, first and second joints subequal, third and fourth coalesced, outer margin proximally with spines and longer setae, both inner and outer apices with plumose setae, flagellum as long as peduncle, 11-jointed, the first joint long and probably composed of several joints coalesced.

Eyes as figured by Sars for *N. bipes* (l.c. pl. 2, fig. 4), perhaps a little broader, without prominence on upper margin, the pointed squamiform plate at the base a little smaller.

Mandibles: the small prominence representing the cutting-edge is feebly bifid, without trace of the "comb-like lamella" figured by Thiele for *N. bipes* var. *valida* (l.c. pl. 4, fig. 75). The molar portion has a series of finely fluted transverse lamellae. The palp has the joints gradually increasing in length, setae on third joint in two series, the distal one much shorter than the other.

First maxilla: outer masticatory lobe larger, setae on its margin mostly bifid, palp long, setose.

Second maxilla: masticatory lobes three, the middle one smaller than either of the other two, the small rounded projection at the

base of the endopod with 4 plumose setae, endopod stout, slightly wider at distal end than at base consisting of only one joint, exopod shorter ending in a long spine.

Peraeopods: endopod very obscurely segmented, apex recurved, with long plumose setae, scarcely reaching beyond margin of carapace; endopod broad with median longitudinal rib, outer margin with a few setae; epipod well developed, apex subacute, outer margin emarginate.

First pleopod: peduncle with a spine at each apical angle, and a seta on the inner margin near apex, another on outer margin near base; endopod as long as peduncle, apex with one long spine, inner margin glabrous, outer margin setose; exopod shorter and stouter, inner margin setose, outer margin with short serrate spine-setae, apex with 4, 2 long alternating with 2 short, stout spines; retinaculum oblong.

Second and third pleopods: peduncle with one spine on outer apex and a seta near base, inner margin with two groups of 2-4 setae, one near base, the other near apex; endopod with both margins setose; exopod with 6 pairs of spines on outer margin and 3 spines at apex; scale between exopod and endopod lanceolate; retinaculum with one margin expanded and serrate.

Fourth pleopod: similar to second and third but outer apex of peduncle with a quadrate projection and no spine, inner margin with one seta near base.

Fifth pleopod: basal joint short, second joint twice as long, inner margin setose, the truncate apex with ca. 6 spines and a few setules.

Sixth pleopod: smaller than fifth, 1-jointed, 4 strong spines on outer distal margin and one small one on inner apex.

Uropods: in ♂ equal to last two segments combined, in ♀ nearly half as long again as last pleon segment, regularly narrowed to subacute apex, inner margin with long plumose setae, outer margin spinose, apex with two long spines, the inner one being rather stouter than the outer.

Length: 7 mm. from rostrum to end of uropods.

Colour: Yellowish white, eyes dark red.

Locality: Cape Town, sewage outlet, July, 1896. 2 ♀ ♀, one with embryos. (Dr. J. D. F. Gilchrist.) Sea Point, near Cape Town. 15/11/13. 1 ♂. 15 ♀ ♀ with ova and embryos. (K.H.B.) (S.A.M. Nos. A1574 and A2618.)

This species is well distinguished from both the other species of the genus: *N. bipes* (Fabr.) with its several subspecies (Thiele) and *N. longicornis*, G. M. Thomson, by the character of the dentation on

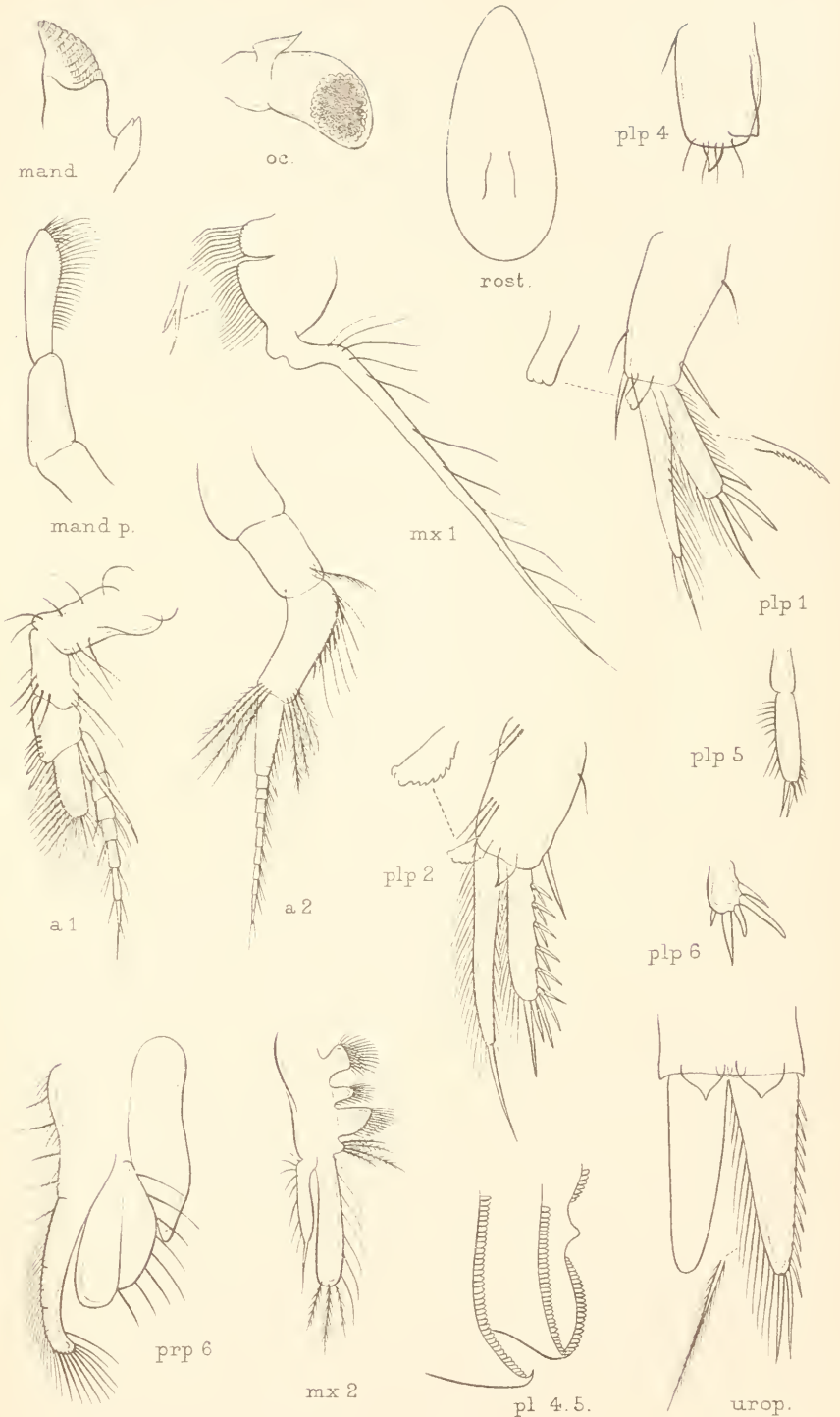
the pleon segments, the number of spines on the fourth joint of the first antenna, the proportionately shorter uropods and the unjointed endopod of the second maxilla.

This last character is of generic value according to the table given by Thiele (l.c. 1904, p. 24). In *Paranebalia*, *Nebaliopsis* and *Neballiella* the endopod is unjointed, so that there is nothing very remarkable in a species of *Nebalia* also possessing this feature. In all other respects the present species cannot be separated from *Nebalia*.

PLATE XXXIX.

Nebalia capensis, n. sp.

- rost. Rostrum.
- oc. Eye.
- a.₁, a.₂. First and second antennae.
- mand. Mandible.
- mand. p. Palp of mandible.
- mx.₁, mx.₂. First and second maxillae.
- pp.₆. Sixth peraeopod.
- plp.₁. First pleopod with retinaculum and a spine from exopod further enlarged.
- plp.₂. Second pleopod with retinaculum further enlarged.
- plp.₄. Peduncle of 4th pleopod.
- plp.₅, plp.₆. Fifth and sixth pleopods.
- pl.₄, 5. Median and lateral portions of 4th and 5th pleon segments.
- urop. Eighth pleon segment and uropods with seta from inner margin further enlarged (the setae omitted from the one uropod).



K.H.B. del.

West, Newman lith.

NEBALIA CAPENSIS *n.sp.*

- 18.—*List of South African Tabanidae (Diptera) in the South African Museum, with Descriptions of New Species.*—By MISS G. RICARDO.

PANGONINAE.

GENUS PANGONIA, Latr.

Hist. Nat. d. Crust. et. d. Ins. iii. p. 437 (1802).

PANGONIA HOTTENTOTA, n. sp.

TYPE, female, and another female from Cape Colony (Bushmanland, Jackals Water, and Een Riet, R. M. Lightfoot).

A species allied to *Pangonia bifasciata*, Wied. Abdomen yellowish with black median spots on the anterior half, the posterior half blackish with a grey band. Antennae and legs black. Wings tinged with brown, the first posterior cell closed. Length 15–16½ mm., proboscis 8 mm. *Face* covered with greyish white tomentum and with yellowish or white pubescence, which is thickest and longest on the cheeks. Beard the same colour. Palpi black, pubescent, pointed. Proboscis black. *Antennae* black, the first two joints with a few hairs on their upper borders. *Forehead* wide, darker coloured than the face, with some scattered white and black hairs, width at vertex 1½ mm. Eyes naked. *Thorax* dark olive green, covered with short ferruginous pubescence, anteriorly with some longer whitish hairs, a tuft of white hairs above wings; breast with a broad stripe of white hairs similar to the tuft. *Scutellum* covered with ferruginous pubescence. *Abdomen* reddish yellow, the first segment with a small black spot below the scutellum, the second with a large median spot, the third with a similar spot, a faint whitish tomentose band is apparent on the posterior border of the second segment, on the third segment at sides appears another black spot, the fourth segment reddish yellow with a grey tomentose posterior border, anteriorly it is largely black, last segments wholly black, the pubescence yellowish or white on the lighter parts and on grey band, elsewhere black: underside inflated, reddish yellow, reddish brown on the anterior borders of third and fourth segments, the grey band

distinctly marked on the fourth segment, apex black, pubescence largely white anteriorly, then black at apex. *Legs* blackish, with long white hairs on the coxae and short white pubescence on femora. *Wings* hyaline, tinged with yellowish brown on fore border and several veins. Appendix present.

PANGONIA BIFASCIATA, Wied.

Dipt. Exot. i. p. 102 (1828).

A female from Cape Colony (Table Mountain) and a male and female from Cape Peninsula.

In these specimens the first posterior cell is not closed at or before the border of the wing, but is open, though very narrow, and very nearly closed on one wing. The male has no prolongation on the second joint of fore tarsi.

PANGONIA ROSTRATA, Linn.

Mus. Lud. Utr. p. 421 (1764). (*Tabanus*.)

Females from Cape Colony (Springbok, Namaqualand, and Cape Town).

PANGONIA CONJUNTA, Walker.

List Dipt. i. p. 135 (1848).

A female from Cape Colony (Kalk Bay).

PANGONIA ATRICORNIS, Wied.

Dipt. Exot. i. p. 58 (1821).

Females from Cape Colony (Grootfontein, W. F. Purcell; Stellenbosch, L. Péringuey; Wyk's Vley, E. G. Alston; Dumbrody, J. A. O'Neil, 1902; Kentani, H. P. Abernethy).

PANGONIA ADJUNTA, Walker.

List Dipt. i. p. 135 (1848).

Transvaal (Potchefstroom, T. Ayres).

PANGONIA ANGULATA, Fabr.

Syst. Antl. p. 91 (1805).

Cape Town, Stellenbosch, Paarl, Caledon, Bushmanland.

PANGONIA OLDII, Austen.

Ann. Mag. Nat. Hist. (8) i. p. 215 (1908).

Southern Rhodesia (Lomagundi, R. Jack).

SUB-GENUS CORIZONEURA, Rond.

Archivio per la Zool., Modena iii. 85 (1863).

CORIZONEURA BRUNNIPENNIS, Loew.

Dipt. Süd. Afrik. p. 18 (1860). (*Pangonia*.)

Two females from Transvaal (Barberton, H. Edwards).

CORIZONEURA SPILOPTERA, Wied.

Dipt. Exot. i. p. 57 (1821). (*Pangonia*.)

Females from Cape Colony (Grootfontein, W. F. Purcell; Klipfontein, Namaqualand, Aug., 1892; Giftberg, Van Rhynsdorp, Sept., 1912, R. M. Lightfoot).

CORIZONEURA AETHIOPICA, Thunberg.

Nov. Act. R. Soc. ix. Sci. Upsala, p. 67 (1827) (*Tanyglossa*); see Austen, Ann. Mag. Nat. Hist. (8) i. p. 345 (1908).

Syn. *Pangonia varicolor*, Wied., and *Pangonia appendiculata*, Macq.

Females from Cape Colony (Knysna, Graham's Town, East London, Kentani); males and females from Durban, Natal, etc.

CORIZONEURA LATERALIS, Fabr.

Syst. Antl. 91 (*Pangonia*) 1805.

One male from Cape Colony (Stellenbosch).

CORIZONEURA PALLIDIPENNIS, Ricardo.

Ann. Mag. Nat. Hist. (7) vi. p. 110 (1900).

A series of females from Transvaal (Barberton, H. Edwards, Nov., 1911); Natal (Durban), Cape Colony (Dunbrody, Rev. O'Neil, 1900; Seymour, L. Péringuey); Zululand (M'fongosi, W. E. Jones); and two males from Transvaal (Barberton, H. Edwards, Nov., 1911).

The males are similar to the females. Palpi reddish yellow, the second joint conical, with black pubescence. Eyes do not actually join for more than half their length, barely that in one

specimen, the large facets occupy the upper part, reaching the apex of the frontal triangle and attaining the vertex.

CORIZONEURA ALEIFACIES, n. sp.

Type (female) from Cape Colony (Hex River); and another female from Triangle (L. Péringuey).

A small blackish species, with a short stout abdomen marked with grey tomentose bands. Antennae and palpi blackish, forehead very wide. Face covered with long white hairs. Legs red. Length 13 mm., proboscis 5 mm. *Face* covered with grey tomentum and with long white hairs, beard thick and white. *Palpi* small, the first as long as the second joint which is narrow and conical, reddish yellow in colour, dusky at tips, with some grey tomentum, pubescence white below, black at apices. Proboscis stout, pointing downward. *Antennae* black, the first two joints yellowish red, the first with two or three long yellow hairs on its upper borders, both with shorter black hairs. *Forehead* quite a third the width of head, about $1\frac{1}{2}$ mm. wide at vertex where it becomes narrower, covered with a rather yellowish tomentum becoming duskier near ocelli, the pubescence very noticeable, consisting of white hairs anteriorly above and around the antennae, posteriorly of short erect black hairs, with white hairs on back of head and around eyes. *Thorax* black covered with thick fulvous tomentum and with pale fulvous pubescence, white tufts of hair are apparent above and below the root of wings, and a few white hairs are intermixed with the fulvous pubescence on dorsum. *Scutellum* same as thorax. *Abdomen* stout, convex above and below, the ground colour black, the first four segments with greyish white tomentose bands on their posterior borders, on the first narrow in centre becoming broad at the sides, leaving no black colour visible, but a reddish ground colour appears beneath it, the second band almost equal in width taking up more than the width of the segment, the third band narrower, inclined to be reddish in colour (owing to denudation only), the fourth slightly broader than the third band, the fifth and sixth bands narrow, the last segment has no band, pubescence on dorsum not very noticeable, chiefly white on the pale bands and elsewhere black, underside similar, but the second segment is wholly covered with greyish white tomentum, the pubescence is thicker and almost wholly white and yellow. *Legs* pale reddish, duskier at apices, the pubescence black, white on the femora. *Wings* hyaline, the veins shaded pale brown, most noticeable on the transverse

veins, yellowish on fore border; veins reddish, a short appendix present. In the second females, the thorax has five distinct fulvous narrow stripes, hardly noticeable in the type.

CORIZONEURA DISSIMILIS, n. sp.

Type (female) and two other females from Cape Colony (Van Wyk's Vlei, E. G. Alston, 1890).

A species nearly allied to *Corizoneura albifacies* n. sp. but at once distinguished by the blackish legs and absence of a whitish band on the third segment, the forehead is not so broad, and the long white hairs on face are absent. Length of type, 13 mm., others $10\frac{1}{2}$ mm.

Face blackish, covered with greyish tomentum, with a few short silvery white hairs, intermingled with darker ones, becoming numerous on the cheeks. Beard white, scanty. *Palpi* black, the first joint longer than the second, which is small, swollen at base, ending in a short point. Proboscis 2 mm. long, pointing outwards. *Antennae* black, the first two joints with a few pale hairs. *Forehead* same colour as the face, the same width throughout, barely $1\frac{1}{2}$ mm. wide, the pubescence on forehead short and white. *Thorax* black, covered with short but dense white pubescence, which becomes slightly fulvous posteriorly, sides with fulvous pubescence. *Scutellum* same as thorax. *Abdomen* not so stout and convex as thorax in *Corizoneura albifacies* n. sp., the colour not such a deep black, the first segment almost wholly covered by the whitish tomentose band, the second band not half as wide as the segment, the third segment with no band, the fourth segment with a narrow band, the next segment transparent yellow on its posterior border, and the last two segments largely yellow, pubescence on dorsum black, not noticeable, the bands with longer silvery white hairs; underside reddish with the grey bands reduced to a minimum, those on the second and fourth segments discernible. *Legs* blackish, the tibiae and knees dull reddish brown, pubescence on femora yellow, elsewhere black. *Wings* hyaline, very faintly tinged yellow, veins yellow, appendix present.

GENUS RHINOMYZA, Wied.

Nova Dipt. Gen. 8 (1820).

RHINOMYZA COSTATA, Loew.

Dipt. Süd Afrik. i. p. 26 (1860).

Three males from Cape Colony (Hex River, Clanwilliam, Dunbrody); one female (O'Okiep, E. Warden).

Male.—This species, described very briefly by Loew, is easily distinguished by its uniform black colour, hyaline wings and the palpi tipped with red. The antennae are *Tabanus*-like in shape, the third joint broad at its base and red in colour, situated on a tubercle formed by the subcallus. The face is concave in the centre, the cheeks swollen and covered with black hairs. Proboscis 2 mm. in length. Eyes hairy, ocelli and spines on hind tibiae are present. The species does not appear to have been noticed by any author since Loew described it, and though its appearance is totally unlike that of the typical species of *Rhinomyza* it does not appear to belong to any other genus as yet described. The female mentioned above has not been examined by me.

The type, a male, came from the Cape of Good Hope.

RHINOMYZA ZOULOUENSIS, n. sp.

Type (female) from Zululand (M'fongosi, W. E. Jones). A typical species of this genus, distinguished by the black markings on the first four abdominal segments forming four broken and irregular stripes. Antennae red with long upper branch of third joint. Abdomen and legs yellowish. Wings brown at base with a brown band across wing. Length 15 mm., proboscis barely 2 mm.

Face shining, pale yellow-ochre colour, cheeks with some grey tomentum, very few hairs discernible on face. Beard composed of scanty yellowish hairs. *Palpi* long, more than half the length of proboscis, the first joint the colour of cheeks, the second reddish yellow with black short hairs, almost the same width throughout, more than twice as long as the first joint. *Antennae* reddish yellow, the first two joints paler, the third dusky at its apex, the long upper branch as long as the first division of joint. *Forehead* same colour as face, shining, a little narrower at vertex, nearly twice as long as it is broad anteriorly. *Eyes* bare, ocelli distinct on black triangle. *Thorax* dull yellowish with three mahogany-coloured stripes, some grey tomentum on dorsum and scattered short yellowish pubescence. *Scutellum* mahogany coloured, with a paler border. *Abdomen* pale yellow on the first two segments, then dull reddish brown, the black marks consist of four spots on the first segment, those at the sides taking up the whole width of segment, inclined inwards from their bases, the two in centre shorter, on the second segment the four spots are united at their bases by a narrow dark band, the two median ones large, irregular in shape, not quite reaching the anterior border of segment, the

side ones much narrower, but nearly as long, on the third segment each lateral spot is united to the median spot near it, leaving a clear and round spot in the middle, the median spots leave a semi-circular yellow space in the middle which almost reaches the posterior border of segment, the fourth and fifth segments have a black lateral spot, and the sixth has the trace of a similar spot, dorsum of abdomen almost bare, some short black pubescence visible on the first two segments, and yellow on the posterior ones; underside the same colour but no black markings are present. *Legs* pale yellow, the femora reddish, apical joints of tarsi reddish. *Wings* hyaline, yellow on foreborder, brown on the basal halves of the basal cells, brown in the extreme base of anal cell, in the apex of which is a paler brown spot, the dark band begins at the stigma and reaches across the apex of discal cell into the fifth posterior cell, the foreborder is still narrowly yellow above the stigma melting into a brown spot at the apex of wing; stigma and veins yellow.

RHINOMYZA DENTICORNIS, Wied.

Ausszweifel. Ins. i. p. 111 (1828).

From many parts of South Africa.

GENUS CADICERA, Macq.

Dipt. Exot. Suppl. v. p. 42 (1854).

CADICERA CHRYSOPILA, Macq.

Hist. Nat. i. p. 194 (1834). (*Pangonia*.)

[? *Pangonia nobilis*, Wied, Ausszweifel. Ins. ii. p. 662 (1830). See Ricardo, Ann. Mag. Nat. Hist. (8) i. p. 56 (1908).]

A female from Cape Colony (Triangle, L. Péringuey); another female from an unknown locality.

There is a female in the Brit. Mus. Coll. from Transvaal (Barberton).

Judging from the descriptions, Macquart's and Wiedemann's species are probably identical.

CADICERA CHRYSOSTIGMA, Wied.

Ausszweifel. Ins. i. p. 100 (1828).

CADICERA MELANOPYGA, Wied.

Ausszweifel. Ins. i. p. 98 (1828).

Cape Colony (Cape Town, Graham's Town, Dordrecht); Orange River Colony (Smithfield).

CADICERA RUBROMARGINATA, Macq.

Dipt. Exot. Suppl. v. p. 43 (1854).

Cape Colony (Knysna, Triangle); Transvaal (Potchefstroom, T. Ayres); Southern Rhodesia (R. Pillans).

CADICERA QUINQUEMACULATA, Austen.

Ann. Mag. Nat. Hist. (8) i. p. 209 (1908)

Cape Colony (East London).

GENUS SILVIUS, Meig.

Syst. Besch. iii. p. 27 (1820).

SILVIUS DECIPIENS, Loew.

Dipt. Süd. Afrik. p. 25 (1860).

Two females from Southern Rhodesia (Mafungabusi Mts. and Bulawayo, R. Jack).

GENUS CHRYSOPS, Meig.

Nouv. Class. 25-33 (1800).

CHRYSOPS STIGMATICALIS, Loew.

Dipt. Süd. Afrik. p. 29 (1860).

From nearly all parts of South Africa.

CHRYSOPS WELLMANNI, Austen.

Ann. Mag. Nat. Hist. (7), xx. p. 512 (1907).

N. Rhodesia (Chilanga, R. C. Wood).

GENUS ADERSIA, Austen.

Ann. Mag. Nat. Hist. (8) ix. p. 4 (1912).

ADERSIA OESTROIDES, Karsch

Berlin. Ent. Zeit. xxxi. p. 371. pt. iv. fig. 1 (1887). (*Silvius*.)

A female from Cape Colony (Stellenbosch, L. Péringuey); a male and a female from Mossel Bay (Bro. J. H. Power).

This species has only been recorded in the past from E. Africa.

GENUS HINEA, Adams.

Kansas Univ. Sci. Bull. iii. p. 150 (1905).

HINEA PERTUSA, Loew.

Dipt. Süd. Afrik. p. 22 (1860).

Males from S. Rhodesia (Bulawayo, G. Arnold); Zululand (M'fongosi, W. E. Jones).

GENUS TABANUS, Linn.

Syst. Nat 10th Ed. p. 601 (1758).

GROUP I (Surcouf and Ricardo).

TABANUS AFRICANUS, G. R. Gray.

Griffiths, Animal Kingdom, xv. p. 794 (1832).

Females, Cape Colony, Kentani (Miss Pegler), N.W. Rhodesia (C. W. Wood); Mozambique (Lorenzo Marques).

TABANUS FASCIATUS, Fabr.

Syst. Ent. p. 788 (1775).

Female, Damaraland. Female, Sierra Leone.

GROUP III.

TABANUS BIGUTTATUS, Wied.

Ausszweifel. Ins. ii. p. 693 (1830).

Male and females, Cape Colony, Natal, Transvaal, Zululand, Mozambique, S. Rhodesia.

GROUP VI.

TABANUS COMBUSTUS, Bigot.

Ann. Soc. Ent. France (7) i. p. 368 (1891).

A female from Transvaal (Rustenburg, Miss Schunke).

TABANUS MEDIONOTATUS, Austen.

Bull. Ent. Res. iii. (3) p. 329 (1912).

From S. Rhodesia (Kariba Gorge); Mozambique (Inhambane, K. H. Barnard).

TABANUS PAR, Walk.

List Dipt. Brit. Mus. v. Suppl. i. p. 235 (1854).

Mozambique (Lorenzo Marques, J. de Coster); N.W. Rhodesia (Katunga).

GROUP VII.

TABANUS UNITAENIATUS, Ricardo.

Ann. Mag. Nat. Hist. (8) i. p. 312 (1908).

Three females from S. Rhodesia (Moffat), 1910.

TABANUS ALBILINEA, Walk.

List Dipt. i. p. 176 (1848).

A female from Natal (Newcastle), and another from locality not specified.

GROUP VIII.

TABANUS TAENIOLA, P. de Beauvois.

Ins. Recueillis en Afrique et Amérique, p. 56 (1805-21).

A series of females from Mozambique (Delagoa Bay); S. Rhodesia (Moffat), 1910; S.E. Africa (Beira), 1900.

Tabanus socius Walker is now merged in this species.

TABANUS SAGITTARIUS, Macq.

Dipt. Exot. i. p. 127 (1838).

A female from Transvaal (Potchefstroom, T. Ayres), and another from Ovampoland (Omaromba, Erickson. 1888).

TABANUS FRATERNUS, Macq.

Dipt. Exot. Suppl. i. p. 159 (1844).

Female, S. Rhodesia (Victoria Falls).

TABANUS CONIFORMIS, Ricardo.

Ann. Mag. Nat. Hist. (8) p. 321 (1908).

N. Rhodesia (Kafue Riv.; Broken Hill).

TABANUS DISTINCTUS, Ricardo.

Ann. Mag. Nat. Hist. (S) i. p. 326 (1908).

Female from unspecified locality.

GROUP XI.

TABANUS USTUS, Walker.

Zoologist viii. Appendix xciv. (1850).

Three females from Natal (Durban, J. H. Bowker); one female from N.W. Rhodesia (Kafue River).

TABANUS INSIGNIS, Loew.

Dipt. Süd. Afrik. p. 44 (1860).

Female from M'fongosi, Zululand (W. E. Jones).

GROUP XII.

TABANUS DIVERSUS, Ricardo.

Ann. Mag. Nat. Hist. (S) i. p. 330 (1908).

A female from N.W. Rhodesia (Kafue River).

TABANUS ATRIMANUS, Loew.

Dipt. Süd. Afrik. p. 40 (1860).

Female, S. Rhodesia (Umfuli River); Zululand (M'fongosi, W. E. Jones).

GROUP XIII.

TABANUS OBLIQUEMACULATUS, Macq.

Dipt. Exot. i. p. 127 (1838).

T. leucostomus, Loew, Dipt. Süd. Afrik. p. 115 (1860).

A series of females from Cape Colony (Bushmanland, Henkries, R. M. Lightfoot; Wyk's Vlei, E. G. Alston).

TABANUS ALBIPALPUS, Walker.

Dipt. Saund. p. 44 (1850).

Females from Natal (Estcourt and Newcastle, A. E. Hunt), and Cape Colony (Hex River, L. Péringuey).

TABANUS MINUSCULARIS, Austen.

Ann. Mag. Nat. Hist. (8) ix. p. 31 (1912).

Females from Zululand (M'fongosi, W. E. Jones, 1911).

The type came from Portuguese East Africa, Umbelusi River, 20 miles south of Lorenzo Marques.

TABANUS GRATUS, Leow.

Dipt. Süd. Afrik. p. 42 (1860).

Female, S. Rhodesia (Umfuli River).

GROUP XIV.

TABANUS DITAENIATUS, Macq.

Dipt. Exot. i. p. 130 (1838).

A female from Cape Colony (Dumbrody, Father J. O'Neil), and another from Natal (Newcastle, A. E. Hunt).

TABANUS FUSCIPES, Ricardo.

Ann. Mag. Nat. Hist. (8) i. p. 332 (1908).

S. Rhodesia (Salisbury, R. Jack).

GROUP XV.

TABANUS MACULATISSIMUS, Macq.

Dipt. Exot. i. p. 125 (1838).

Females. Cape Colony (Kentani, Miss Pegler). Transvaal (Barberton, H. Edwards).

GROUP XVI.

TABANUS TAENIATUS, Macq.

Hist. Nat. i. p. 207 (1834).

Three females from Cape Colony (Hex River, L. Péringuey; Carnarvon, E. G. Alston); one female from Natal (Newcastle, A. E. Hunt).

TABANUS VEXANS, Loew.

Dipt. Süd. Afrik. p. 34 (1860).

Two females from Port Nolloth. They agree in almost every particular with Loew's description of his type from the Cape.

He speaks of the forehead as relatively narrow. In these females the forehead is hardly three times as long as it is wide. The species may be recognized by the shining subcallus, and by the yellow-haired bands on the abdomen. Length of these females $12\frac{1}{2}$ and 14 mm.

Cape Colony (Namaqualand).

GENUS HAEMATOPOTA, Meig.

Illig. Mag. ii. p. 267 (1803).

HAEMATOPOTA OCELLATA, Wied.

Zool. Mag. iii. p. 38 (1819).

Male and female from Cape Colony (Cape Town, Stellenbosch, Paarl, Worcester, Knysna).

HAEMATOPOTA VITTATA, Loew.

Dipt. Süd. Afrik. p. 50 (1860).

Male and female from Zululand (M'fongosi, W. E. Jones); S. Rhodesia (Bulawayo, Rhodesia Museum).

HAEMATOPOTA MACTANS, Austen.

Ann. Mag. Nat. Hist. (8), ii. p. 106 (1908).

S. Rhodesia (Bembesi, R. Jack; Bulawayo, Rhodesia Museum).

HAEMATOPOTA DISTINCTA, Ricardo.

Ann. Mag. Nat. Hist. (7) viii. pp. 100, 106 (1906).

S. Rhodesia (Mafungabusi, R. Jack).

HAEMATOPOTA SANGUINARIA, Aust.

S. Rhodesia (Victoria Falls); N.W. Rhodesia (Katanga, N'Dola).

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19.—*Description of a New Genus and Species of Termitobious Pselaphidae (Coleoptera).*—By A. RAFFRAY.

GASTEROTROPIS, nov. gen.

OBLONGUS, subparallelus, sat convexus. Caput transversum; fronte angustiore; temporibus valde obliquis et deflexis; cantho post-oculari valido; oculi magni, medio siti. Palpi maxillares validi, articulis 1 minuto, 2 elongato, apice clavato, 3 globoso, 4 magno, ovato, acuminato, apice appendice acuto praedito, 2 et 3 extus appendice minuto, setiformi munitis. Antennae crassae, articulis 1 magno, deplanato, quadrato, sequentibus valde transversis, 9, 10 majoribus, infra deplanatis, 11 magno, apice rotundato, infra dentato et excavato. Prothorax latitudine sua fere aequilongus, capite paululum angustior, subcordatus, trifoveatus. Elytra magna, humeris obliquis; lateribus postice sinuatis; angulis posticis notatis; margine posteriore sinuata; sutura postice utrinque tuberculata; stria suturali fere nulla, sed sutura praesertim basi, depressa; sulco dorsali lato, post medium evanescente. Abdomen elytris subaequale, late marginatum, basi cava transversa, profunda trilobata praeditum; segmentis dorsalibus, 1, 2, 3 subaequalibus, 1, 2 valde tricarinatis, 3 unicarinato, apice angulato, 4 ogivali, brevioribus. Metasternum magnum, postice emarginatum. Segmentis ventralibus 1 brevi, 2, 3 magnis, subaequalibus, 4, 5, 6 brevioribus, 7 (♂) magno, transverso, ovato; pygidio infra conspicuo. Coxis intermediis paululum et posticis magis distantibus, trochanteribus intermediis sat elongatis, apice oblique truncatis; pedes validi; femoribus parum incrassatis; tibiis simplicibus; tarsis mediocribus et gracilibus, articulis 1 minuto, triangulari, 2, 3 cylindricis, 3 secundo longiore; unguibus cinis minutis, aequalibus.

This new genus resembles *Tmesiphorus* by its carinate abdomen, the last antennal joints, deformed and excavated underneath in the ♂, and its general facies, but it is strongly differentiated by the shape of the maxillary palps, the last joint of which is simply ovate

instead of being externally and transversely dilated at apex as in *Tmesiphorus*. It is more closely related to the Indian genus *Aphanetrix*, Raffr., in which the last joint of the palps is also simple, and not dilated, but it differs from it in many points: the palps, also affecting the same shape, are much smaller than in *Aphanetrix* and much more slender, the head is longer than broad instead of being transverse, the antennae are elongated, comparatively slender, with all the joints plainly moniliform, and the club is simple; the abdomen bears traces only of very obsolete costae, which impart to *Aphanetrix* a very different appearance.

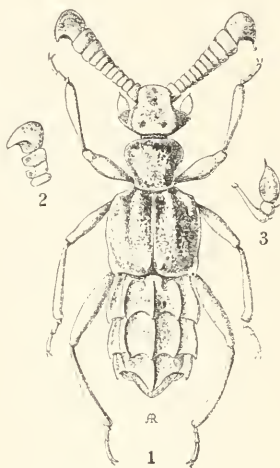
GASTEROTROPIS POWERI, n. sp.

Totus cinnamomeus, elytris paulo dilutioribus, antennis pedibusque obscurioribus, palpis et tarsis dilute testaceis; corpore toto alutaceo et setis squamulosis minutissimis et brevissimis obsito. Caput deplanatum; fronte lata, late sed parum profunde impressa, antice recte truncata; in vertice foveis duabus liberis; temporibus et cantho oculari una valde obliquis, cantho oculari oculos paululum superante et apice obtuso; margine postica leviter sinuata, abrupta; collo conspicuo. Prothorax convexus, lateribus post medium compressus et fovea laterali oblonga leviter sinuatus, foveola ante basali media minuta. Elytra latitudine suo fere aequilonga; humeris valde obliquis; lateribus pone humeros vix perspicue et posticis magis sinuatis; angulis posticis notatis et leviter prominulis; stria suturali fere nulla sed sutura praesertim basi, late depressa; sulco dorsali lato, basi profundo, pone medium evanescente; sutura ante apicem utrinque tuberculo triangulari, deplanato et acuto armata. Abdomen valde carinatum. Metasternum sulcatum. Segmento 7 ventrali, transversim ovato, depresso et albido ciliato. Tibiis anticis ad apicem leviter elevatis, intermediis ante apicem intus perparum sinuatis, postices vix incurvis. ♂.

Long. 3.50 mm.

On the elytra there is a moderately raised but wide and rounded carina formed by the dorsal furrow and the depression of the sutural part, the outer posterior angles are somewhat prominent, and very slightly reflexed obliquely, the posterior border is sinuate, and the sutural angle rounded; above the angle and on each side there is an horizontally directed triangular prominent tubercle which is acuminate behind. The margin of the abdomen is wide and slightly rounded outwardly especially on the first tergite, the carinae are very strong and nearly black at apex.

My friend, Dr. L. Péringuey, the Director of the South African Museum, has sent me a ♂ example of this species, found by Brother J. H. Power, at Kimberley, Cape Province, in the termitarium of *Termes trinervius*.



1. *Gasterotropis poweri*.
2. Ultimate joints of ♂ viewed from underneath.
3. Maxillary palp.

20.—*Descriptions of New Species of Lepidoptera Heterocera in the South African Museum.*—By W. WARREN, M.A., F.E.S.

FAMILY ACRONYCTIDAE.

SUB-FAMILY ACRONYCTINAE.

GEN. THALATHA, Wlk.

1. THALATHA VARICOLOR, spec. nov.

(Plate XL., fig. 12.)

Forewing: Grey, slightly greenish-tinged in places; costal area to beyond middle paler, ochreous with a greenish flush, with oblique black spots at origin of lines; inner line black, connected with base by a black streak in submedian fold and preceded by a black spot in cell; basal area below cell filled in with blackish grey; claviform stigma large, edged with black; orbicular a flattened oval, whitish edged with black, its centre brown; reniform large filled up with grey edged inwardly with chestnut brown, defined by black; median shade black, thick, oblique to reniform stigma, then interrupted, followed in submedian interval by a black blotch to outer line; lower half of median area whitish grey; outer line black, dentate lunulate, double filled in with grey, the lunule on submedian fold with white; area beyond outer line dark grey; subterminal line pale, ill-defined with patches of chestnut brown and dark grey preceding it; a series of black terminal lunules connected by a wavy black line; fringe pale grey, doubly mottled with black.

Hindwing: White in basal half, dark fuscous in terminal, with dark cellspot and traces of dark outer line edged with paler; a black waved terminal line; fringe white.

Underside white at base and along inner margin; the forewing becoming blackish fuscous before termen; cellspot black; fringe as above; hindwing speckled with blackish, with dark outer line and large black cellspot.

Head brownish grey; palpi marked with black externally; tegulae and patagia paler, lichen grey; metathorax tinged with fulvous; dorsum ochreous grey, the segments slightly marked in blackish; palpi below, venter, pectus, and legs white; tarsi and spurs black and white.

Expanse of wings: 34 mm.

1 ♀ from Cape Town, 1911. (P. C. Keytel.)

FAMILY NOCTUIDAE.

SUB-FAMILY EUXOINAE.

GEN. EUXOA, Hbn.

2. *EUXOA* *CONTINGENS*, spec. nov.

(Plate XL, fig. 3.)

Forewing: Pale grey brown; costal edge dark grey above a pale subcostal streak; subbasal line pale with black edges; inner and outer lines black conversely edged with pale, the inner twice acutely angled below costa and there indistinct, outcurved and strong between median vein and vein 1, strongly excurved below vein 1; the subcostal, median, and vein 1 finely pale; cell filled up with brownish fuscous, the orbicular, somewhat flattened, and the reniform brownish with pale annuli outlined with black; the claviform long, dark brown, with black outline; outer line quadrately excurved round cell, touching and forming part of outer edge of reniform; subterminal line whitish, minutely waved, and close to termen, preceded by black wedge-shaped blotches from 6 to 2; a row of black terminal lunules; fringe concolorous.

Hindwing: Luteous white, with darker veins; fringe white.

Underside of forewing ochreous grey, the costa whiter; of hindwing white with large dark cellspot; both wings with traces of dark outer line.

Head grey brown; the tegulae and patagia much mixed with white; the former with black middle line, the latter with black submarginal line angled in front with a white patch beyond it; dorsum pale brownish grey; palpi externally black; legs dark fuscous with the joints white.

Expanse of wings: 36 mm.

1 ♂ from Calvinia District, Loeriesfontein, September, 1891. (G. Alston.)

Antennae strongly pectinated to apex; the truncate conical process of frons somewhat flattened laterally.

3. *EUXOA SORDIDA*, spec. nov.

(Plate XL, fig 1.)

Forewing: Sordid fuscous, darkest in cell; lines black with pale edging; placed much as in the previous species *contingens*; but the outer line is crenulate and well outcurved beyond cell, the reniform being followed by a pale space; cell and stigmata as in *contingens*, but much more obscure; veins black lined with pale; terminal area is dark fuscous, darker before the obscure subterminal line, which preceded by obscure wedge-shaped marks; fringe fuscous with a pale line at base.

Hindwing: Dirty whitish, with costa and apex darker; all the veins dark.

Underside of forewing dull dirty fuscous; of hindwing whitish with the costal area dark grey.

Head and thorax brownish grey; the abdomen paler grey; palpi externally dark fuscous, the terminal segment ochreous.

Expanse of wings: 35 mm.

1 ♂ from Ookiep, Namaqualand, April, 1887. (G. Worden.)

SUB-FAMILY CUCULLIANAE.

GEN. RHIZOTYPE, Hmps.

4. *RHIZOTYPE PALLIATA*, spec. nov.

(Plate XL, fig. 2.)

Forewing: Purplish black in basal two-thirds and again narrowly beyond subterminal line, the intervening area reddish fawn colour; inner margin of basal area pale ochreous with a thick black streak above it; inner and outer lines double, filled in with ochreous; the inner marked on costa by an outwardly oblique whitish mark above orbicular, then obscure and incurved before orbicular stigma to median vein, then distinct, oblique outwards and sharply angled inwards below vein 1; outer from an inwardly oblique white mark above reniform stigma, bent outwards to apex of reniform, outwardly oblique to vein 5, then inwardly and slightly waved; orbicular stigma oval, oblique, ochreous with dark centre; reniform large with

the edges ochreous, elongate, with both edges concave outwards, rectangularly bent on median vein, along which it runs inwards to below orbicular; the median vein showing whitish on the dark interior; the veins in terminal area dotted with white; subterminal line pale, irregularly crenulate, preceded by a brown shade containing black wedge-shaped marks at middle; terminal area purple grey edged by a wavy black terminal line; fringe black brown, with ochreous basal line and rayed with ochreous beyond veins.

Hindwing: Whitish ochreous, with an inwardly diffuse grey sub-marginal border, a crenulate outer line, and dark cellspot; a row of distinct blackish terminal lunules; fringe greyish ochreous.

Underside of forewing dull dark grey, speckled with paler; only the outer line darker, marked by a pale spot at costa; hindwing ochreous, along costa and round apex speckled with dark; a prominent black cellspot; a crenulate outer line and wavy black terminal line.

Head, thorax, and pectus purple blackish; metathoracic tuft ochreous tipped with fuscous: dorsum fuscous becoming pale ochreous at base; legs black, ringed with pale.

Expanse of wings: 40 mm.

1 ♂ from Cape District, Hout Bay, May, 1901. (W. L. Selater.)

SUB-FAMILY AMPHIPYRINAE.

GEN. IAMBIA, Wlk.

5. IAMBIA BRUNNEA, spec. nov.

(Plate XL., fig 13.)

Forewing: Ochreous straw colour, washed with pale brown to outer line, and dusted with blackish; the inner half of inner margin remaining pale, without markings; a thick black streak from base along submedian fold to outer line, interrupted by the pale inner line, which is double, black, filled in with ground colour, obliquely curved to submedian fold, then wavy; outer line also double, black; sharply bent outwards below costa, then vertical, oblique below vein 4, the outer arm blacker; median line black, strongly outcurved and running parallel and close to outer line below middle; orbicular and reniform large, of raised shiny scales edged with black; subterminal line pale, only visible in costal half, where it is preceded and followed by black shading; two black lines in the

intervals on each side of vein 5, confluent internally; black terminal dots between veins; fringe brown with a double black line.

Hindwing: Brownish grey, darker along termen; cellspot dark; fringe pale.

Underside ochreous speckled with dark grey and fuscous; outer lines marked; cellspot of hindwing distinct; apex of forewing dark.

Head and thorax blackish fuscous and ochreous mixed; dorsum dark grey on an ochreous ground; legs ochreous, the tibiae and tarsi black, with pale joints and mottling; palpi black, with the tips paler.

Expanse of wings: 31 mm.

1 ♂ from the Coast District, Natal, 1879. (W. D. Gooch.)

GEN. ACRAPEX, Hmps.

6. ACRAPEX TRISTRIGATA, spec. nov.

(Plate XL, fig. 18.)

Forewing: Shining ochreous with pale brown suffusion; a streak from base along upper half of submedian fold, another from middle of cell to near termen, and an oblique streak from apex to vein 6 dark brown; a slight brown tinge along costa at $\frac{3}{4}$; the median nervure and its nervules, the submedian fold and vein 1, and veins 6 and 7 creamy ochreous; a fine dark terminal line; fringe grey brown with a fine pale line at base.

Hindwing: Pale ochreous.

Underside ochreous suffused with grey brown; the costal half of forewing darkest.

Head, shoulders, patagia, and abdomen ochreous, thorax dark brown.

Expanse of wings: 20 mm.

1 ♂ from Smithfield, Orange Free State, 1910. (Kannemeyer.)

GEN. CENTRARTHRA, Hmps.

7. C. OSSICOLOR, spec. nov.

(Plate XL, fig. 10.)

Forewing: Pale grey tinged along costa and below median vein with pale brownish; a strong black streak from base below median vein to end of cell, edged above by a white streak; the subcostal area whitish, with the veins and cell folds finely marked in grey

brown; patches of white scaling between veins 2 and 3, 3 and 4 at their base, the bases of both veins and the median vein at its extremity thickened with black scales; reniform stigma white with black lateral edges; the cell before it, and the space beyond and below it olive brown; veins towards termen faintly pale, the intervals with black streaks, ending in terminal black spots; an oblique brown grey, dentate-edged, shade from below apex to end of cell, and another, less marked, from vein 4 at termen to submedian fold; the black streak in interval between veins 5 and 6 beyond reniform thicker and edged above with a white streak; vein 1 pale, edged on both sides with black throughout; a black streak on inner margin beyond middle; lines scarcely marked; the outer faintly oblique to vein 7, then vertical, marked by dark dots on veins, inwardly oblique below median and obscurely dentate; fringe white at apex and anal angle, brown grey between, finely rayed with black.

Hindwing: White slightly washed with brownish; the bases of veins 2, 3, and 4 more prominently stained; a broad terminal border pale brownish; fringe white; the terminal dots in the intervals black.

Underside white tinged with luteous; costa and apex of both wings brownish speckled with darker; terminal black dots in the intervals; fringe of hindwing white.

Head grey brown with a mixture of ochreous; tegulae and patagia bone-colour; dorsum dark grey; the anal tuft ochreous with darker tips.

Expanse of wings : 42 mm.

1 ♂ from Murraysburg. Cape.

Antennae with tuberculate fascicles of cilia.

8. CENTRARTHRA FULVITINCTA, spec. nov.

(Plate XL., fig. 9.)

Resembles *C. ossicolor*, but the ground colour of forewing greyer, speckled with blackish; the costal streak blackish grey; the black streak from base, except along base of median vein, more diffused and extending along base of submedian fold and vein 2, without a white streak above it in cell; the veins towards termen edged with black scales; the dark streaks of the intervals hardly marked; the shade before, beyond, and below reniform diffused blackish; an orange mark in cell; the reniform larger white, marked laterally with orange, and obliquely bisected by a black line; the white

patches at base of veins 2 to 4 replaced by orange; a narrow, irregularly waved, dark subterminal shade in the place of the two oblique shades; the streak in interval between 5 and 6 orange; the black terminal dots inwardly edged with orange; the lines more distinct; the inner indicated by a black dot on vein 1, the outer by dots on veins 6, 2, and 1; the fringe blackish grey cut by pale rays beyond the veins; no black streak on inner margin, nor black edging to vein 1.

Hindwing: Uniform brownish fuscous, with black terminal dots and white fringe.

Underside of forewing brownish ochreous, thickly speckled with darker; the dark basal shade and the reniform showing through; hindwing pale ochreous with dark speckling and a large blackish triangular cell mark.

Head, thorax, and pectus whitish with minute dark atoms; abdomen ochreous grey with dark speckling, especially on underside; legs ochreous with darker speckling, the tarsi fuscous with pale joints.

Expanse of wings: 43 mm.

1 ♀ from Calvinia District, Loeriesfontein, Cape, September, 1891. (G. Alston.)

9. CENTRARTHRA CRETACEA, spec. nov.

(Plate XL., fig. 11.)

Forewing: Chalky whitish, speckled with grey; the costa narrowly dark grey; median vein at base and submedian fold finely blackish, containing between them an olive fuscous streak to end of cell with a white streak above it in cell; veins 2, 3, 4 finely edged with black at base, the intervals at extreme base white edged faintly with fulvous; reniform stigma white with black lateral edges; an oblique olive fuscous shade from termen below apex to reniform stigma, and a slighter one from vein 4 to submedian fold, forming patches in the intervals separated by the white veins; distinct black terminal dots in the intervals; fringe white mixed with pale grey; lines brownish grey; the inner vertical to median vein, then strongly and bluntly outcurved and bent on submedian fold; the outer oblique to vein 7, vertical and marked by blackish vein spots to vein 4, thence well marked and wavy to $\frac{2}{3}$ of inner margin.

Hindwing: White; the terminal border broadly grey; inwardly bounded by a line of blackish vein dashes; a black mark at base of veins 3, 4; fringe white.

Underside of forewing dingy white; the cell and broad terminal

space grey; cellspot and a curved outer shade-line darker; costa grey-speckled; veins towards termen pale; hindwing white; the costa and terminal border brown-speckled; a black spot at bases of veins 3, 4; both wings with black terminal dots.

Head, thorax, and abdomen white; palpi externally blackish; tarsi black with the joints white.

Expanse of wings: 42 mm.

1 ♂ Kalk Bay, Cape, April, 1869.

This may be a pale form of *C. ossicolor*, the coloration being assimilated to the chalk environment. Antennae with tuberculate fascicles of cilia.

10. CENTRARTHRA PALLESCENS, spec. nov.

(Plate XL, fig. 8.)

Forewing: Ochreous grey, thickly and finely dusted with dark; median vein, vein 1, and terminal veinlets yellowish ochreous, all dotted with black; a white patch between veins 2 and 3 at base and a smaller one between 3 and 4; lines blackish, obscure; inner at $\frac{1}{3}$ vertical, outcurved above and below median and again below vein 1; outer at $\frac{5}{6}$, outbent below costa, vertical to vein 4, then inwardly oblique, distinctly lunulate dentate; a grey subterminal cloud; terminal spots in the intervals black; fringe concolorous.

Hindwing: Pale luteous, with broad grey marginal border; outer line marked by black vein-dashes; fringe whitish.

Underside of forewing greyish luteous, grey-speckled; a dark outer shade and black terminal dots; hindwing bone colour, dusted with dark along costa and apical region.

Head, thorax, and abdomen ochreous grey; tarsi black with pale joints.

Expanse of wings: 34 mm.

1 ♂ from Smithfield, Orange Free State, September, 1910. (Kannemeyer.)

Antennae pectinated.

11. CENTRARTHRA BRUNNEA, spec. nov.

(Plate XL, fig. 7.)

Forewing: Dark brownish fuscous; the costa narrowly blackish; a short thick black streak from base along median vein; the median vein black in outer half, with a short black blotch below it before vein 2; an obscure black cloud marking reniform towards end of cell; inner line at $\frac{1}{4}$, angled outwards above and below median

vein and below vein 1; outer dentate-lunulate at $\frac{5}{6}$, outbent below costa, vertical to vein 4, thence inwardly oblique and distinct; a faintly darker submarginal shade, oblique above from below apex to reniform; fringe concolorous beyond dark terminal lunules.

Hindwing: Dull luteous grey, clouded with darker along termen; the veins dark brown; a dark grey cellspot on lower half of discocellular; a row of blackish terminal lunules; fringe pale grey, with a darker waved line near base.

Underside paler brown; both wings with dark cellspots and outer lines.

Head, thorax, and abdomen like forewings; palpi blackish.

Expanse of wings: 34 mm.

1 ♂ Saldanha Bay, Cape, October, 1903. (Shortridge.)

Antennae with tuberculate fascicles of cilia.

12. *CENTRARTHRA ALBIAPICATA*, spec. nov.

(Plate XL, fig. 6.)

Forewing: Dark grey; costal vein and subcostal veinlets finely black; a slender black line from base below subcostal vein; a thick black streak from base along median vein; a white streak with some black scales above median vein in cell; reniform stigma grey with lateral black edges; base of veins 2, 3, 4, 5 and 6 grey with black edges, the intervals between 2 and 4 white at base; the terminal veins pale with black edges, the intervals with strong black streaks ending in black terminal spots; a white streak from apex above a dark oblique shade; fringe dark grey.

Hindwing: Fuscous, paler at base; the fringe white.

Underside of both wings whitish in basal half, grey brown in terminal dusted with blackish; a large cell lunule in hindwing; both wings with black terminal spots, those of hindwing large; fringe of forewing dark grey, of hindwing white.

Head and thorax grey mixed with white; abdomen luteous grey.

Expanse of wings: 36 mm.

1 ♀ from Clanwilliam, Cape, November, 1909. (Lightfoot.)

13. *CENTRARTHRA FULVINOTATA*, spec. nov.

(Plate XL, fig. 4.)

Forewing: Tawny grey brown, varied in places with patches of pinkish fulvous; a broad oblique whitish grey streak, from below

apex to upper angle of cell, above a triangular fuscous patch on termen; a pinkish fulvous spot at base of median vein and the median vein itself narrowly fulvous; a patch below median before vein 2, and above it at middle of cell, the reniform stigma, and patches between veins 2 and 4 at base all pinkish fulvous; a fulvous streak along inner margin dusted with black scales; vein 1 and vein 6, and the costa beyond middle also fulvous-tinged; a fulvous shade along termen; outer line only marked, outbent below costa and inwardly oblique below vein 4, indicated by black vein-dashes; the intervals towards termen with irregular black streaks; fringe brown rayed with pale beyond veins.

Hindwing: Somewhat glossy, uniform brownish grey, rather darker along termen; fringe whitish, mixed with grey in costal half.

Underside brownish grey, the hindwing paler.

Head dull fulvous; terminal segment of palpi blackish; tegulae and patagia tawny brown with their edges dull fulvous; abdomen fulvous.

Expanse of wings: 34 mm.

1 ♂ from Kimberley, Cape. (H. Feltham.)

Antennae with tuberculate fascicles of cilia.

14. CENTRARTHRA ARGENTEA, spec. nov.

(Plate XL., fig. 5.)

Forewing: Glossy whitish grey, speckled with blackish; area below median vein greyer; outer line oblique outwards to 7, hardly marked, then vertical and straight, marked only by 4 veinspots on 4, 5, 6, 7, thence incurved and obscure; a slightly darker subterminal band; a row of black dots before termen; reniform stigma irregularly triangular, dark grey with black edging; a slight streak of black scales below base of cell; fringe mottled pale and dark grey.

Hindwing: Dark brownish grey with basal area whitish; a dark diffuse cellspot; fringe white.

Underside dark grey; costal area of both wings, terminal area of forewing and base of hindwing white with black speckling; cellspots dark; fringe of forewing dark brown rayed with white.

Head, thorax, and dorsum whitish grey speckled with dark; the patagia and basal segments of dorsum white.

Expanse of wings: 44 mm.

1 ♀ from Bushmanland, Een Riet, Cape, October, 1911. (Light-foot.)

SUB-FAMILY ERASTRIANAE.

GEN. PENISA, Warr.

15. PENISA ALBIGRISEA, spec. nov.

(Plate XL., fig. 21.)

Forewing: Whitish grey suffused in places with darker grey; basal area pale; subbasal and inner lines black, inwardly oblique, the latter irregularly waved; outer line blackish, oblique outwards to vein 6, then irregularly crenulate and sinuous inwards, finely edged with white; a diffuse dark spot at end of cell followed by a whitish space to outer line; median area dark below middle, especially its basal half; subterminal line diffusely whitish, indented beyond cell and forming a large white spot above anal angle; terminal area with a deeper grey patch on each fold; terminal black spots; fringe pale grey.

Hindwing: Dark grey with narrow wavy median and diffusely waved subterminal white lines.

Underside of forewing dull grey, of hindwing whitish, with obscure markings.

Palpi and frons (worn) brownish white; vertex and thorax pure white; abdomen greased, probably pale grey.

Expanse of wings: 20 mm.

1 ♀ from M'fongosi, Zululand, October, 1911. (W. E. Jones.)

Nearest to *P. leprosa*, Hmps., from India.

GEN. OZARBA, Wlk.

16. OZARBA REGIA, spec. nov.

(Plate XL., fig. 20.)

Forewing: Basal $\frac{2}{5}$ dull deep orange; outer area leaden purplish; costa in basal area with dark spots marking rise of subbasal and inner lines, which can be traced across wing by slightly lustrous scales; an oblique purplish black antemedian band, outwardly toothed on median vein; a dark dot at end of cell; median and outer lines excurved round cell, then incurved; the median very fine; the outer lunulate dentate; the costal area between them orange, and a slight orange band beyond outer line; termen and fringe deep leaden purple.

Hindwing: Purple brown, dull orange towards base.

Underside of forewing dark leaden grey; of hindwing pale grey, dark speckled.

Head and thorax dull greyish orange; dorsum leaden grey.

Expanse of wings: 22 mm.

1 ♀ from M'fongosi, Zululand, September, 1911. (W. E. Jones.)

17. *OZARBA ILLIMITATA*, spec. nov.

(Plate XL., fig. 23.)

Forewing: With nearly the basal half dull orange, its outer margin curved and not limited by a dark band; outer half purplish orange brown, with no distinct lines except a slightly metallic subterminal; fringe leaden grey.

Hindwing: Dull fuscous.

Underside shining purplish fuscous.

Head, tegulae, and patagia orange; thorax greyish; dorsum fuscous.

Expanse of wings: 12 mm.

1 ♀ from M'fongosi, Zululand, October, 1911. (W. E. Jones.)

Smaller and with more acute apex to forewing than in *regia*.

GEN. RHODOTARACHE, gen. nov.

Tongue well developed; frons with a truncate conical prominence with raised rim, containing in centre a small blunt projection; palpi upturned close to face, slender and smooth, the third segment pointed; antennae (♀) broken off; tibiae smooth; forewing elongate triangular; the apex prominent, blunt; termen oblique, curved at tornus only; an areole present; vein 2 from just beyond middle, 3, 4, 5 at even distances apart; hindwing normal. Type *R. roseofusca*, spec. nov.

18. *RHODOTARACHE ROSEOFUSCA*, spec. nov.

(Plate XL., fig. 17.)

Forewing: Deep rosy; two deeper rosy bands oblique from inner margin, the inner close to base, slightly edged outwardly with yellow, not reaching above median vein; the outer before anal angle, broader, edged on both sides with yellowish narrowed off and inangled beyond cell, becoming broad and diffuse before apex; fringe worn.

Hindwing: Brownish grey.

Underside dull grey.

Head and thorax rosy; dorsum brown grey, rosy-tinged at base.

Expanse of wings: 26 mm.

1 ♀ from Albany, Cape, August, 1872.

SUB-FAMILY EUTELLANAE.

GEN. EUTELIA, Hbn.

19. EUTELIA FULVIGRISEA, spec. nov.

(Plate XL, fig. 16.)

Forewing: Pale grey slightly speckled with darker; the inner marginal area washed with pale fulvous and the costal area between outer and subterminal lines with a deeper fulvous patch; a diffuse pale grey streak in cell ending in whitish streaks along vein 3 and above vein 5, limited by dark grey streaks along upper half of cell and of submedian fold forking from base of cell; lines brownish, indistinct except below middle; inner line angled on median vein, brown inwardly edged with pale below middle, grey above, preceded by a similar pale grey line; median line angled at end of cell, brown only below submedian fold; outer line angled on vein 6, then incurved and sinuous, fairly distinct throughout, brown towards inner margin, and externally pale-edged; subterminal line an oblique white bar from costa to vein 6 limiting the fulvous costal patch, interrupted in middle and faintly whitish above anal angle; some dark terminal dashes before the whitish fringe.

Hindwing: Whitish in basal half becoming grey before termen; a sinuous curved grey brown line beyond middle, and a broad fulvous somewhat diffuse band in subterminal area ending in tornus; fringe white beyond a dark terminal line.

Underside with outer and subterminal lines marked in both wings; hindwing with a dark cell lunule; the fulvous costal patch distinct in forewing.

Head, thorax, and dorsum pale grey; the patagia with faint fulvous tinge; legs mottled, fulvous brown and whitish.

Expanse of wings: 32 mm.

1 ♀ from M'fongosi, Zululand, 1911. (W. E. Jones.)

The termen of forewing is strongly oblique below vein 3.

SUB-FAMILY CATOCALINAE.

GEN. EUONYCHODES, gen. nov.

Tongue strongly developed; frons rough-haired; palpi porrect, the second segment shaggily haired beneath, the third long, smooth, and blunt; antennae of ♀ simple; thorax and patagia long-haired; abdomen smooth; pectus and femora with rough woolly hairs; all the tibiae spined; the fore tibiae with a long claw at extremity on the inside and a shorter one on the outside; forewing with veins 7, 8 and 9, 10 stalked, 8 and 9 anastomosing to form a very long areole, 10 rising from its apex; vein 5 from close to 4 in forewing, a little above it in hindwing; costal and subcostal of hindwing approximated for $\frac{3}{4}$ of cell. Type *E. albivenata*, spec. nov.

Differs from *Acanthonyx*, Hmps., by the spined fore tibiae and the two claws at extremity; *Acanthonyx* has only one claw and no spines.

20. EUONYCHODES ALBIVENATA, spec. nov.

(Plate XL., fig. 14.)

Forewing: Olive grey, tinged with olive brown and with black; the veins pale; costal area above subcostal vein as far as outer line and inner margin below vein 1 of the pale ground colour, speckled with darker; the cell black with some olive brown at centre, closed by an oblique deep black lunule, followed by an olive ochreous diffuse patch; submedian interval black with an olive brown streak along middle; the bases of intervals and more slightly their extremities before the pale outer line black; outer and subterminal lines approximated between veins 5 and 2; the intervals before termen blackish with pale centres; terminal black lunules; fringe olive grey.

Hindwing: Olive brown in basal half; a broad black curved outer band, followed by a whitish band before a diffuse blackish subterminal shade with dentate outer edge; terminal area olive before black terminal lunules.

Underside yellowish grey with yellow veins; both wings with black cellspots, black outer bands edged with whitish, and dentate edged dark subterminal shades; hindwing with the termen whitish, forewing with only an apical patch.

Head, thorax, and dorsum olive ochreous mixed with black.

Expanse of wings: 32 mm.

1 ♀ without exact locality label.

GEN. PLECOPTERODES, Hmps.

21. PLECOPTERODES DEPRIVATA, spec. nov.

(Plate XL., fig. 15.)

Forewing: Grey tinged with rufous, especially in terminal half, and finely dusted with dark atoms; inner line thick, dark brown, vertical, slightly waved; outer line slightly outcurved to vein 2, then straight, followed by a pale line; discocellular spot an erect flattened ring with dark outline; subterminal line obsolete; a terminal row of dark spots; fringe dark grey with a clear white line at base.

Hindwing: Greyish white in basal half traversed by a dark median line; terminal third dark fuscous; fringe as in forewing.

Underside whitish, tinged with yellowish along costa, and speckled with grey; terminal border broad, blackish fuscous; faint traces of an outer line.

Head, thorax, and abdomen grey; pectus, legs, and palpi externally whiter.

Expanse of wings: 32 mm.

1 ♀ from Ovampoland.

22. PLECOPTERODES MODERATA, Wlgnrn.

ab. SUBFLAVA, ab. nov.

Differs from the type form in having the upper side of hindwing dull orange; the underside of both wings bright yellow, with broad black terminal border.

2 ♀ ♀ from Bulawayo, S. Rhodesia, February, 1912. (H. C. Peard.)

SUB-FAMILY HYPENINAE.

GEN. NAARDA, Wlk.

23. NAARDA OVALIPLAGA, spec. nov.

(Plate XL., fig. 19.)

Forewing: Purplish fuscous, darker terminally; lines darker, very obscure, subbasal, inner, median, and outer, the last with slightly paler spots below costa; fringe concolorous; a small round yellow spot in cell towards base and a large erect oval one at its end.

Hindwing: Purplish fuscous, the basal half somewhat paler; traces of a pale subterminal line.

Underside luteous whitish, densely brown speckled, with broad dark terminal border; faint cellspots and outer lines.

Head, thorax, and abdomen shining grey.

Expanse of wings: 24 mm.

1 ♀ from Bulawayo, S. Rhodesia, February, 1912. (H. C. Peard.)

GEN. CHUSARIS, Wlk.

24. CHUSARIS VENATA, spec. nov.

(Plate XL., fig. 22.)

Forewing: Paler grey than in *relatalis*, Wlk.; the veins towards termen pale; the outer line more strongly bent outwards beyond cell, oblique to vein 6, vertical to 4, then incurved and again vertical to inner margin, preceded throughout by black spots between the veins; terminal third darker grey traversed by a pale curved line; discocellular vertical, whitish, preceded by a black erect blotch and followed by some black scaling; terminal line black; fringe grey.

Hindwing: Paler grey, with traces of pale outer and subterminal lines; a dark cellspot, and blackish terminal line.

Underside shining pale grey, much speckled with blackish.

Head and shoulders white; thorax and abdomen grey; palpi externally black, the tips of second segment and the third segment, except a subapical ring, white.

Expanse of wings: 22 mm.

1 ♂ from Johannesburg, Transvaal, January, 1912. (H. Feltham.)

FAMILY GEOMETRIDAE.

SUB-FAMILY GEOMETRINAE.

GEN. CAMPSICERAS, gen. nov.

Tongue and palpi very slight; antennae of ♂ bipectinate nearly to apex, the shaft thickened above with scales for $\frac{1}{6}$, then bent outwards; dorsum with depressed crests; legs short and stout; the hind tibiae much swollen, with terminal spurs only; forewing triangular, the termen bent at vein 3; hindwing narrow, the apex rounded, the anal angle rectangular; neuration of forewing; cell half as long as wing, broad; the discocellular concave outwards; vein 2 at $\frac{2}{3}$, 3 just before 4; 5 from just above middle of discocellular; 6 from upper angle of cell; 10, 7, 8, 9 stalked from the same point;

11 separate; in the hindwing 3, 4 and 6, 7 are quite shortly stalked; vein 5 as in forewing; costal approximated to subcostal for about $\frac{1}{2}$ of cell. Type *C. dyschlorata*, spec. nov.

25. *C. DYSCHLORATA*, spec. nov.

Forewing: Slightly scaled; pale pink in colour; the costa and veins a little darker; traces of a curved darker line from costa before middle to before middle of inner margin; outer line at $\frac{2}{3}$, slightly sinuous.

Hindwing: With outer line only; fringe pink in both wings.

Underside whitish.

Upper half of face and tips of palpi deep red; vertex whitish; thorax and abdomen pinkish white; the dorsum, with its tufts, deeper red; fore and middle legs red in front.

Expanse of wings: 30 mm.

1 ♂ from M'fongosi, Zululand, April, 1911. (W. E. Jones.)

SUB-FAMILY STERRHINAE.

GEN. STERRHA, Hbn.

26. *STERRHA FULVILINEA*, spec. nov.

(Plate XLI., fig. 13.)

Forewing: Pale lilac grey sparsely dusted with black; lines oblique, parallel to termen; inner and outer composed of fulvous and black scales; the inner showing two larger spots of mixed scales above and below vein 1; the outer lunulate dentate, preceded by a pale space which is inwardly edged by a very faint median line, and followed by a grey band which is limited by the diffuse pale subterminal line; cellspot and terminal dots small and black.

Hindwing: Paler grey without speckling; fringe in both wings worn.

Underside shining pale grey; the inner $\frac{2}{3}$ of forewing suffused with darker and towards costa tinged with ochreous.

Head and palpi fulvous brown; thorax and abdomen lilac grey.

Expanse of wings: 24 mm.

1 ♂ from M'fongosi, Zululand, April, 1911. (W. E. Jones.)

GEN. EMMILTIS, Hbn.

27. EMMILTIS BIGEMINATA, Warr.
ab. RUFIFIMBRIA, ab. nov.

The specimens of this species from Barberton in the Transvaal are all slightly reddish tinged, and, in particular, show the fringe reddish; they may, in fact, be specifically distinct; for the hind-wings have the termen more strongly rounded or bent than *bigeminata*, and show an additional line beyond the cellspot.

GEN. SYNELYS, Hbn.

28. SYNELYS MELLIFLUA, Warr.
ab. DISCATA, ab. nov.

Differs from the type in having a large brown cellspot in the forewing, followed by a small diffuse brown cloud; in the hind-wing there is a large diffuse brownish-grey cloud reaching from vein 6 to 2, including the cellspot on its inner edge, and externally reaching beyond the median line; neither the cellspots nor the dark clouds accompanying them are expressed on the underside.

1 ♂ from Durban, Natal, December, 1902. (G. F. Leigh.)

GEN. PALAEASPILATES, Warr.

29. PALAEASPILATES INOFFENSA, Warr.
ab. RUBIDA, ab. nov.

Forewing: Suffused throughout with dull brick red; the outer band thicker.

Hindwing: Tinged with reddish in terminal half.

Head and thorax brick red; the abdomen pale grey, as in the type form.

Underside of both wings dull red; the speckling denser.

1 ♀ from Dunbrody, Cape. (Father J. O'Neil.)

In the British Museum Collection several specimens from the Cape are partially red-tinged.

I originally placed this genus and species in the *Oenochrominae*; they are better referred, as Mr. Prout proposes, to the *Sterrhinae*.

SUB-FAMILY HYDRIOMENINAE.

GEN. PERIZOMA, Hbn.

30. PERIZOMA EVISCERATA, spec. nov.

(Plate XLI., fig. 12.)

Forewing: White speckled with blackish, crossed by three blackish bands; the first limiting the basal patch, curved inwards to base of inner margin, the patch itself traversed by a curved pale line; inner line excurved above and below median vein, the pale interval before it filled with dark dusting leaving the edges white; second band immediately following inner line; outer line strongly angled outwards on 6 and 4, indented on cell fold, and incurved with three sinuses from 4 to inner margin, preceded by the third dark band, which is separated from the second by an oblique pale band containing the dark cellspot; a white band with a black central thread follows the outer line; subterminal line white, interrupted, preceded on costa by a blackish patch; terminal area dark grey; a row of black terminal lunules; fringe mottled black and white.

Hindwing: Grey with a white excurved outer line, and dark cellspot.

Underside of forewing dark grey; the costa white with black spots; costal part of outer line and of the praecostal blotch white; hindwing white black-speckled; an inner and median dark line, and outer and subterminal wavy and curved bands separated by a white band; black cellspots in both wings.

Head, thorax, and abdomen whitish speckled with dark.

Expanse of wings: 18 mm.

1 ♂ from Saldanha Bay, Cape, October, 1912. (Péringuey.)

SUB-FAMILY DEILINIINAE.

GEN. ZAMARADA, Moore.

31. ZAMARADA DECEPTRIX, spec. nov.

Forewing: Hyaline whitish, with a faint greenish tinge; dusted and suffused with brown and blackish, except the space immediately preceding outer line; costa brown with darker striae; basal, inner marginal, and terminal areas brown; inner line black at $\frac{1}{4}$; a large

oval black cellspot on discocellular, followed by a brown median shade, darkest on costa, widened and diffused below middle; outer line at $\frac{2}{3}$, black and slightly lunulate, bent outwards above vein 4 and forming a subquadrate sinus between 4 and 2; submarginal line black, zigzag from costa to vein 4, accompanied by black scales and deeper brown suffusion; veins 2, 3, 4, and the median vein thickly black; a row of black terminal lunules; fringe pale brown.

Hindwing: With cloudy black base, a small dark celldot, with an obscure brown inner line below it to inner margin; the outer line as in forewing; the submarginal dentate lunulate throughout, but darker towards costa; median area slightly tinged with brownish.

Underside whitish; costal and terminal areas dull ochreous blotched with fuscous brown, darkest in apical half; both wings with large black cellspot; costa of both wings with fuscous striae.

Head, thorax, and abdomen ochreous speckled with brown; basal segment of abdomen with a broad black belt; antennae black speckled with white.

Expanse of wings: 28 mm.

1 ♀ from Durban, Natal, September, 1887. (J. H. Bowker.)

32. ZAMARADA METALLICATA, spec. nov.

(Plate XLI., fig. 14.)

Forewing: Hyaline whitish, densely striated throughout with dark, and tinged with bronzy fulvous along costa and inner margin, in basal area, and in the interval between outer and subterminal lines; the median shade fulvous; a distinct black inner line; cellspot ocelloid, with thick black outline and faint metallic centre; outer line black, shortly oblique outwards at costa, obliquely incurved beyond cell and forming a sinus outwards from 2 to 4, then straight to inner margin, edged outwardly by a broad lustrous leaden line; subterminal line metallic, waved, preceded by black scaling below costa and above inner margin, and followed by darker scaling on both folds; an interrupted black terminal line; fringe leaden grey.

Hindwing: With black blotch at base; median area whiter, especially in costal area; the rest as in forewing, but the sinus of outer line slighter, and a small black blotch only before subterminal line in cell fold; the cellspot black and round.

Underside yellowish hyaline with greyish strigae; terminal border

in both wings broadly black brown; cellspots black, that of forewing large; costa of forewing yellow with black strigae.

Head, thorax, and abdomen ochreous thickly speckled with black; the segmental divisions of dorsum black.

Expanse of wings: 22 mm.

1 ♀ from M'fongosi, Zululand, October, 1911. (W. E. Jones.)

SUB-FAMILY BISTONINAE.

GEN. ILLA, gen. nov.

Forewing: Narrow; costa somewhat shouldered at base and indented at middle; the apex bluntly prominent; termen curved, suberenulate; inner margin straight.

Hindwing: With termen rounded, crenulate; the inner margin with slight fold beneath, causing a curved ridge above and fringed with long hairs; cell in both wings more than half the length of wing.

Forewing with the two halves of cell beneath filled with long silky hairs; pectus and femora woolly; hind tibiae greatly swollen; all the tarsi short; palpi shortly rostrate, rough-haired; tongue absent; antennae lamellate with short close curved teeth. Type *Illa nefanda*, spec. nov.

Allied to *Haggardia* and *Omphalucha*.

33. ILLA NEFANDA, spec. nov.

(Plate XLI., fig. 5.)

Forewing: Grey with darker speckling, suffused nearly throughout with purplish fuscous; the grey basal area limited by a curved black line; outer line black, sinuate, subdenticulate above middle, concave outwards between veins 3 and 1, then shortly oblique inwards; a large dark cellspot; subterminal line crenulate, pale grey, preceded by a darker tint, running parallel to outer line and termen; fringe concolorous.

Hindwing: Pale grey, with base more ochreous and termen darker grey; a blackish dash at rise of veins 3, 4, and on vein 2 below it.

Underside of forewing pale slate grey; the costa red mottled with yellowish spots and strigae; fringe slate grey, with the tips deep chocolate brown; hindwing grey dark-speckled, flushed with pale

brown as far as subterminal line; both wings with outer line marked in black below costa and with slight cellspots.

Head and thorax dark like forewings; dorsum not so dark; fore and mid tibiae dark, hind tibiae glossy slate grey; all the tarsi dark with pale joints.

Expanse of wings: 38 mm.

1 ♂ from Cape Town, August, 1903. (Lightfoot.) Bred from larva.

SUB-FAMILY ASCOTINAE.

GEN. MYRIOBLEPHARA, Warr.

34. MYRIOBLEPHARA DECISA, spec. nov.

(Plate XLI., fig. 11.)

Forewing: Whitish, tinged in places with pale brown and slightly speckled with dark atoms; the lines black and well marked, thickened at costa; inner line projecting outwards in cell, vertical to vein 1, then inwardly oblique to inner margin, where it is preceded by a blotch of black scales; median outcurved in upper half, then incurved and marked by black vein spots; outer line outcurved to vein 6, then incurved parallel to median, minutely lunulate dentate, inangled on vein 1, along which it is connected by a fine black line with angle of inner line, then oblique outwards, followed by a pale, brown band, which is swollen into a double blackish blotch between veins 2 and 4; the interval between median and outer lines below subcostal vein white; subterminal line pale, ill-defined, with a brown cloud on costa before it and the terminal area brownish beyond it, with a darker blotch beyond cell; black terminal spots large; fringe grey.

Hindwing: With traces of blackish inner and outer lines on inner margin, the inner preceded by a grey line, the outer followed by a fine ochreous one, the whole wing grey-speckled.

Underside ochreous speckled with brown; costal areas yellowish; the lines on forewing duller; hindwing with straight thick brown inner line, followed by a round black cellspot.

Head, thorax, and abdomen ochreous tinged with yellow and speckled with black.

Expanse of wings: 26 mm.

1 ♂ without locality label.

SUB-FAMILY SEMIOTHISINAE.

GEN. TEPHRINA, Hbn.

35. TEPHRINA CONFERTARIA, spec. nov.

(Plate XLI., fig. 8.)

Forewing: White suffused with brownish grey and thickly striated with fuscous; costa dotted white and blackish; inner and outer lines black, conversely white-edged; the inner strongly curved, black spotted on veins; outer straight to vein 6, then incurved, the veins beyond it thickened with short black striae; subterminal line whitish, inflected on vein 5, above which it is preceded by a blackish cloud; a blackish cellspot, traversed by an obscure sinuous median line; black terminal lunules; fringe brown with slight pale mottlings.

Hindwing: Suffused with pale dull grey; an outer and subterminal darker line; beyond the latter the terminal area is whiter; cellspot and terminal lunules black.

Underside of forewing blurred grey, of hindwing white with grey speckles; cellspots and outer and subterminal lines in both wings, but much clearer in hindwing.

Head, thorax, and abdomen grey brown.

Expanse of wings: 27 mm.

1 ♂ from Montague Baths, Cape, November, 1902. (F. Purcell.)

GEN. TEPHRINOPSIS, Warr.

36. TEPHRINOPSIS BITAENIATA, spec. nov.

Forewing: White, thickly speckled with brown; inner line obsolete; a brown line or shade from below the black cellspot straight to inner margin; a very indistinct outer line, fine and brown, oblique to vein 6, then inwardly oblique and often ill-marked; beyond it a brown submarginal shade, formed of dark lunules between the veins, slightly bent at vein 5, followed by a pale space without speckling; a row of black dashes along termen between veins; fringe with two brown lines.

Hindwing: Similar, but the median line complete; terminal line formed of lunules.

Underside yellowish white; the two bands brown and conspicuous; the freckling brown.

Head, thorax, and abdomen white speckled with brown.

Expanse of wings: 29 mm.

1 ♀ from M'fongosi, Zululand, December, 1911. (W. E. Jones)

GEN. IDIOTEPHRA, Warr.

37. IDIOTEPHRA SIMPLEX, spec. nov.

(Plate XLI., fig. 2.)

Superficially almost exactly like *I. curvivena*, the type of the genus, but the antennae of the ♂ are not bipectinate, but bear pairs of pedicellate fascicles of cilia at right angles to the shaft; and secondly; the neuration of the hindwing is perfectly simple, and no distortion of the veins is visible; the present insect must therefore be placed in a second section of the genus, characterized by this difference in neuration and in the structure of the antennae of the ♂. The type of *curvivena* came from the R. Niger, and I have seen a second from the Gold Coast. The example of *I. simplex* is from Cape District, Kalk Bay, South Africa, captured in March, 1901, by R. Lightfoot. Besides the above-mentioned structural differences, *I. simplex* differs also in being somewhat larger, more densely speckled with dark atoms and with larger black cellspots; the hindwing is grey-speckled throughout, whereas the basal $\frac{2}{3}$ in *curvivena* is dull whitish and the terminal border dark. The lobe at anal angle of hindwing will at once separate *curvivena*.

GEN. PETRODAVA, Wlk.

38. PETRODAVA ATRISIGNATA, spec. nov.

(Plate XLI., fig. 4.)

Forewing: Brownish olive, with a few dark transverse strigae; costal edge whitish; a small black cellspot; a sinuous partially interrupted outer black line, plainest at each extremity; fringe concolorous.

Hindwing: Paler, more yellowish olive, without the brown tinge; a black cellspot and outer line, the latter only plain at extremities, followed at costa by two small brown-black blotches; fringe brown-mottled.

Underside yellowish olive, the strigae thicker and blacker; costa whiter; outer line black throughout, followed by slight grey scaling especially on inner margin of forewing and at costa of hindwing.

Face, second and third segments of palpi, and antennal shaft white; vertex and thorax concolorous with forewings, abdomen with hindwings; legs white thickly freckled with black.

Expanse of wings: 33 mm.

1 ♂ from N'kandhla, Zululand, 1903. (W. E. Jones.)

39. P. LEUCICOLOR, Butl., subsp.

MUSCOSA, subsp. nov.

Differs from typical *leucicolor*, Btlr., in the ground colour of both wings being pale moss green instead of saffron yellow, covered with short transverse olive fuscous and blackish striae; the median and outer bands olive brown,

Underside with the outer chainlike band red brown edged with dark brown, instead of bright rosy edged with carmine.

1 ♂ from M'fongosi, Zululand, April, 1911. (W. E. Jones.)

SUB-FAMILY SCOTOPTERYGINAE.

GEN. CATASCIA, Hbn.

40. CATASCIA APPROXIMANS, spec. nov.

(Plate XLI., fig. 1.)

Forewing: Brownish grey, with numerous dark transverse striae, thickest in the median area; the costa finely dotted with black; inner and outer lines black; the inner, starting from a small black costal spot at $\frac{1}{4}$, is strongly and somewhat squarely excurved between subcostal and median veins, on the latter of which it is inwardly dentate, vertical to submedian fold, then oblique inwards; outer from $\frac{3}{4}$ of costa is irregularly curved inwards and dentate-lunulate, approaching inner line on submedian fold; a black cellspot on a faint dark median shade; subterminal line not marked except by the denser striae of the terminal border.

Hindwing: With the lines less marked, the median shade stronger.

Underside whitish, striated with dark grey; both wings with strong black cellspots and crenulate black outer line, beyond which the dark striae are fewer; costa of forewing ochreous yellow with heavier dark striae.

Head, thorax, and abdomen concolorous with wings.

Expanse of wings: 42 mm.

1 ♂ from the Coast District, Natal, 1879. (W. D. Gooch.)

Most probably a *Catascia*; but the antennae are entirely wanting.

41. CATASCIA RENITENS, spec. nov.

(Plate XLI., fig. 3.)

Forewing: Pale greyish brown, suffused with dark grey to outer line; inner and outer lines black, lunulate dentate; the inner

excurved above and below median vein; the outer curved mainly parallel to termen, the teeth black tipped with white, the line edged with white at costa and inner margin; a large black cellspot; beyond the outer line the dark grey suffusion extends triangularly to costa above vein 6; a slight brown crenulate terminal line; fringe with pale ochreous basal line and dark brown tips.

Hindwing: Luteous whitish, minutely dark dusted, brownish ochreous along termen; a dark cellspot and crenulate curved outer line; fringe dark grey.

Underside pale shining yellowish grey, with minute dark dusting; both wings with large black cellspots and black outer lines; costa of forewing rufous.

Head, thorax, and abdomen dark grey.

Expanse of wings: 44 mm.

1 ♀ from Seapoint, Cape Town, June, 1877. (R. Trimen.)

GEN. DYSCIA, Hbn.

42. DYSCIA UNILINEATA, spec. nov.

Forewing: Wood brown, tinged and heavily striated with blackish from base as far as submarginal line, which is lunulate outwards between the veins and indented on submedian fold, the lunules below middle and that between 6 and 7 blacker; a slight black cellspot; terminal area and fringe paler, with fewer striae; costa with distinct black striations.

Hindwing: Paler, with fewer striae; a black cellspot; outer line marked by veindots only.

Underside paler, the hindwing whitish and more distinctly speckled than the forewing, where the striae are confined chiefly to the costal area; both wings with distinct black cellspots.

Head, thorax, and abdomen brownish speckled with dark.

Expanse of wings: 44 mm.

1 ♂ from Cape Town, 1876. (C. A. Fairbridge.)

SUB-FAMILY FIDONIINAE.

GEN. LOXOPORA, gen. nov.

Tongue very slight; frons slightly rounded; palpi very short, porrect, not reaching in front of face; antennae of ♂ with long slender fascicles of cilia; thorax and abdomen without crests; fore-

wing elongate triangular; costa straight; apex prominent; termen oblique; vein 6 of forewing from upper angle of cell; 7, 8, 9, 10 stalked, but 9, 10 coincident; hindwing with costal approximated to subcostal for half of cell; veins 7 and 3 from before angle of cell.

Type, *L. dentilineata*, spec. nov.

43. LOXOPORA DENTILINEATA, spec. nov.

(Plate XLI., fig. 7.)

Forewing: Pale ochreous, speckled finely with black, in basal area and along costa tinged with pale brown; inner line curved, marked by black spots on costal, subcostal, and median veins, and by a short oblique line at inner margin; the outer line lunulate dentate, straight from beyond middle of inner margin to costa before apex, the lunules filled in with dark brown, the whole becoming faint before costa; subterminal line marked by dark spots in the intervals; terminal spots large and black; fringe ochreous; cellspot black.

Hindwing, with the lines much fainter; the spots the same.

Underside of forewing more discoloured with grey brown, the lines dull; of hindwing brighter, with the lines better marked.

Head and thorax brownish; abdomen ochreous sprinkled with dark atoms; the first four dorsal segments with black saddle-shaped spots; pectus, venter, and legs brownish-tinged.

Expanse of wings: 33 mm.

1 ♂ from Cape Town, April, 1878.

GEN. PERUSIOPSIS, gen. nov.

Forewing: Costa curved; termen curved, with a slight elbow at vein 4.

Hindwing with termen well rounded.

Frons roundly protuberant; palpi short and thick, the terminal segment minute; antennae of ♀ thickened: cell of forewing longer than half; vein 3 well before end; discocellular concave outwards; vein 6 from the depressed end of cell; 7, 8 stalked; 9, 10 stalked, anastomosing with 11, then separating; costal and subcostal of hindwing closely approximated for more than half of cell; vein 3 well before end of cell.

Type, *P. veninotata*, spec. nov.

The type species superficially resembles that of *Loxopora*, but the neuration is very distinct.

44. PERUSIOPSIS VENINOTATA, spec. nov.

(Plate XLI., fig. 10.)

Forewing: Pale straw-colour, slightly grey-speckled along costa; inner line curved, marked only by brown dots on the subcostal, median, and submedian veins and smaller dots on costa and costal vein; outer line brown and nearly straight from just before apex to $\frac{2}{3}$ of inner margin, indistinctly dentate lunulate, the teeth marked by black points on the veins; a small brown cellspot; fringe pale brown.

Hindwing: Faintly tinged with grey, especially terminally; a very obscure straight outer line, slightly marked on the veins; fringe grey.

Underside yellowish; the costa of both wings with brown speckling; outer line marked by vein dashes in both wings.

Head, thorax, and abdomen straw-colour; frons and prothorax slightly browned; palpi and legs, except tarsi, brown.

Expanse of wings: 28 mm.

1 ♀ from Cape Town, September, 1891. (R. M. Lightfoot.)

GEN. LIPOSHEMA, gen. nov.

Tongue present; palpi abraded; antennae subserrate with very long cilia; forewing with cell half as long as wing; veins 7, 8 stalked; 9 and 10 missing; 11 running close to 12; hindwing with costal and subcostal anastomosing for half of cell; no radial.

Type *Liposchema bifasciata*, spec. nov.

45. LIPOSHEMA BIFASCIATA, spec. nov.

(Plate XLI., fig. 9.)

Forewing: Ochreous whitish with a few dark speckles; the costa spotted with black; a diffuse interrupted line of black scales near base; a median black band, somewhat excurved in upper half, including a black cellspot; a black lunulate dentate subterminal line, insinuate on each fold, the sinus beyond cell preceded by a small fulvous patch; black terminal spots; fringe abraded.

Hindwing: The same; the inner margin black speckled.

Underside like upper but duller.

Head and thorax ochreous; dorsum covered with blackish scales.

Expanse of wings: 12 mm.

1 ♂ from Barberton, Transvaal, October, 1911. (H. Edwards.)

GEN. CHLORERYTHRA, Warr.

46. CHLORERYTHRA CARNEA, spec. nov.

Forewing: Ochreous, suffused with rather coarse pale flesh-coloured scales; inner and outer lines and the cellspot rather deeper; inner line curved, very obscure, but marked by a small red spot on the veins; outer line thick, slightly sinuous, faintly bent outwards below costa and insinuate on submedian fold, edged by a paler line; fringe flesh-colour.

Hindwing: Paler, with the outer line and some terminal shading flesh-colour.

Underside paler, more glossy, with outer lines and cellspots marked.

Head, antennae, thorax, abdomen above and beneath, and legs flesh-coloured.

Expanse of wings: 36 mm.

1 ♂ from Bushmanland.

SUB-FAMILY ENNOMINAE.

GEN. PROCYPHA, Warr.

47. PROCYPHA LACTESIGNATA, spec. nov.

(Plate XLI., fig. 6.)

Forewing: Pale flesh-colour; the costa in basal half with a few greyish freckles; lines grey, very indistinct; the inner oblique inwards from median vein, apparently incurved above; outer from a dark costal spot at $\frac{2}{3}$, running outwards to vein 6, there bluntly angled and oblique inwards, approaching inner line on inner margin; the enclosed area below median vein hyaline whitish with a few dark specks, veins 1, 2, and 3 dark-scaled across it; subterminal line indicated by some dark marks between veins, that between 6 and 7 being a hyaline whitish oval outlined with dark; fringe worn, apparently concolorous.

Hindwing: Flesh-colour, dark-speckled at base.

Underside brighter flesh-colour, with the specklings more numerous and blacker.

Head, thorax, and abdomen flesh-colour; the patagia and prothorax paler.

Expanse of wings: 40 mm.

1 ♀ from Kowie, Cape, 1883. (Dr. Becker.)

SUB-FAMILY PROSOPOLOPHINAE.

GEN. AGRAMMODES, Warr.

48. AGRAMMODES MARGARITA, spec. nov.

Forewing : Pearly white ; the costal area faintly tinged with grey, leaving the veins pale ; three bronzy olive streaks ; the uppermost narrow from base along cell, terminating in a point on vein 7 at $\frac{5}{6}$; the middle one also from base, running at first narrowly along vein 1, then parallel to upper streak, bent upwards and broader from above anal angle to a point close below apex ; the lowest quite narrow from apex parallel to termen, bent at anal angle along inner margin and broader, ending in a point at middle ; a very fine dark terminal line preceded by a narrow grey stripe ; fringe grey with the base white.

Hindwing : White, slightly grey tinged towards apex ; fringe white beyond a fine black terminal line.

Underside white with markings of upper side showing through ; costa of forewing shaded with grey brown ; hindwing peppered with black.

Head, thorax, and abdomen whitish dusted with grey ; the legs greyish ochreous.

Expanse of wings : 32 mm.

1 ♀ from Smithfield, Orange Free State, 1910. (Kannemeyer.)

GEN. AXIODES, Feld.

49. AXIODES BIPARTITA, spec. nov.

Forewing : Pale lavender grey, suffused from base to outer line, except along costa, with dull olive fuscous ; the costa with irregular dark striae ; the pale terminal area with sparse black dusting, slightly brown-tinged along termen ; median vein and vein 1 reddish to outer line ; inner line hardly visible, except as an oblique outward streak from costa ; outer line oblique from costa close before apex to $\frac{1}{3}$ of inner margin, sinuous, incurved at each fold, blackish edged with whitish ; cellspot black in a pale ring ; the crenulate terminal line finely black ; fringe grey.

Hindwing : Pale grey tinged with darker, the veins dull reddish ; cellspot and a curved outer line dark.

Underside grey, paler, more whitish, along inner margins ; costa of forewing and costal veins of hindwing dull reddish ; some black speckling along costal areas ; both wings with black cellspots.

Head and thorax olive fuscous mixed with grey; the abdomen shining grey; pectus woolly, pinkish grey; legs dark with the joints pale.

Expanse of wings : 34 mm.

1 ♀ from Cape Town, 1911. (P. C. Keytel.)

GEN. EULASIA, Warr.

50. EULASIA VALIDA, spec. nov.

Forewing: Pale canary yellow, sprinkled with fine black atoms; the lines brown; the inner straight and inwardly oblique; from $\frac{1}{3}$ of costa to $\frac{1}{4}$ of inner margin; the outer also inwardly oblique, nearly straight, from a little before apex to $\frac{2}{3}$ of inner margin; a large and conspicuous oval black-brown cellspot; fringe olive brown, darkening towards apex, above vein 6 preceded by a fine black line.

Hindwing: With small black cellspot; outer line brown, curved parallel to termen; fringe brown.

Underside with the speckling coarser, darker, and denser; inner line of forewing hardly marked; outer lines thicker and stronger, that in forewing forked above vein 5; fringes brown tipped with vinous red.

Head, thorax, abdomen, and legs yellow; palpi deeper yellow; legs and venter slightly black-speckled.

Expanse of wings: 34 mm.

1 ♀ from Barberton, Transvaal, May, 1911. (H. Edwards.)

LISSODES, gen. nov.

In general shape of wings and markings resembling *Axiodes*, Feld., but distinguished by the smooth scaling, the thorax, pectus, and femora likewise being wholly without the hairy vestiture of that genus; fore coxæ in front with a thin ridge of scales; palpi short and stout, thickly scaled, the third segment not visible, whereas in *Axiodes* this segment is slender and conspicuous; tongue present; frons smooth; antennae of ♂ bipectinate; thorax and abdomen of more slender build; the neuration also differs; the cell is longer than half of wing and the discocellular vertical; vein 2 at $\frac{2}{3}$, 3 well before end of each cell; 5 from just above middle of discocellular, 6 from upper angle; 7 absent (coincident with 8); 8, 9 stalked from just before end of cell; 10, 11 stalked, 10 anastomosing for a short distance with 8, 9; in the hindwing the costal and subcostal are

approximated for only $\frac{1}{2}$ of cell; the discocellular is concave outwards; veins 3 and 7 well before angles of cell.

Type: *Lissodes strigifera*, spec. nov.

51. LISSODES STRIGIFERA, spec. nov.

Forewing: Pale lavender grey, slightly speckled or striated with black; the lines finely black; inner before $\frac{1}{3}$, oblique outwards from costa and angled below subcostal, then oblique inwards with a small outward curve on submedian fold; outer line lunulate dentate, from $\frac{2}{5}$ of costa to $\frac{2}{3}$ of inner margin, preceded by darker scaling, and joined below middle by a diffuse dark shade from below costa, embracing the small dark cellspot; submarginal line not visible except below middle, where it is preceded by a darker shading with lunulate outer edge, the lunule between veins 3 and 4 being conspicuously blackened; fringe pale grey.

Hindwing: Pale grey, especially towards base, with an outer lunulate dentate line preceded by a brownish suffusion, containing a dark cloud from inner margin, and crossed by broken black lines and striae; the terminal area with the striae less distinct.

Underside of forewing pale grey below submedian fold, darker grey along termen, the rest of the wing, as far as outer line, washed with dull fulvous and marked by coarse blackish transverse striae; hindwing white, thickly covered with grey and black striae; the veins fulvous.

Vertex, thorax, and abdomen pale grey dusted with darker; frons brownish grey above, pale below; palpi fulvous mixed with black; the ridge of scales on fore coxae fulvous; pectus, venter, and legs pale grey.

Expanse of wings: 34 mm.

1 ♂ from Cape Town, 1911. (P. C. Keytel.)

STENOPTILOTTIS, gen. nov.

Forewing: Elongate-triangular; costa faintly sinuous, indented beyond middle; termen obliquely curved, as long as inner margin which is somewhat convex.

Hindwing: Narrow and elongate, twice as long as wide; inner margin very short; termen from anal angle to vein 4 parallel to costa, thence rounded, emarginate throughout, the anal angle slightly lobed. Palpi short, the second segment triangular, the third minute; tongue present; antennae of ♀ bipectinate.

Neuration: Forewing, cell longer than half of wing; discocellular

vertical, concave outwards; vein 2 at $\frac{1}{5}$, 3 close before 4; lower radial from a little above middle of discocellular, upper from upper angle of cell; veins 7, 8, 9 stalked from the angle, 10 and 11 stalked from $\frac{1}{5}$; 10 all but touching but not really anastomosing with 8, 9; hindwing with costal and subcostal closely approximated for $\frac{3}{4}$ of cell; discocellular inangulated; vein 2 at $\frac{2}{3}$, 3 at $\frac{5}{6}$.

Type: *Stenoptilotis eupitheciata*, spec. nov.

52. STENOPTILOTIS EUPITHECIATA, spec. nov.

Forewing: Reddish fawn colour; the central area dark and pale cinereous; costa paler and striated with dark, especially along the grey central area; inner line from $\frac{1}{3}$ of costa, excurved to median vein, then sharply inbent to submedian fold near base, thence sinuate inwards; outer line from $\frac{2}{3}$ of costa to middle of inner margin, curved parallel to termen; lunulate dentate, blackish finely edged with whitish; the central area is much constricted at submedian fold; cellspot black, elongate; a narrow grey band along termen with the veins across it reddish fawn colour; fringe iron-grey mixed with fawn colour beyond veins.

Hindwing: Fawn colour mixed with grey, with traces of a greyer central fascia below median, edged by dark lines; cellspot black; fringe as in forewing. Underside like upper, but the markings blurred; costa of both wings strongly black-speckled.

Palpi, frons, thorax, and abdomen fawn colour; vertex and tegulae grey; third and fourth segments of dorsum with a double black mark, separated by a black ring.

Expanse of wings: 31 mm.

1 ♀ from Smithfield, Orange Free State, 1910. (Kannemeyer.)

FAMILY PYRALIDIDAE.

SUB-FAMILY CRAMBINAE.

GEN. PLATYTES, Guen.

53. PLATYTES AURIPLUMBEA, spec. nov.

(Plate XLI, fig. 16.)

Forewing: Dull golden yellow; the lines metallic lead colour, formed of oblong blotches between the veins; inner line of three blotches, the middle one joined by a leaden streak from base along

median vein, the lowest by a downcurved streak from base to inner margin; the costa narrowly leaden in basal third; median line of four blotches, two in cell, the third at base of vein 2, the fourth on vein 1; above the cell is a narrow linear subcostal mark; cellspot black, of slightly raised scales, followed by two or three irregular leaden blotches; outer line outcurved above, incurved below vein 3, of nine blotches; subterminal line formed of coalescent spots from below apex; fringe lead colour; costa towards apex splashed with leaden black.

Hindwing: Leaden fuscous, paler towards costa, with obscure darker outer and subterminal band; extreme termen and base of fringe yellow; tips of fringe leaden.

Underside dark leaden fuscous on a yellow ground; termen and base of fringe yellow; forewing with black cellspot and whitish inner margin.

Head, palpi, shoulders, patagia, metathorax, and anal segment of abdomen yellow; thorax and dorsum leaden black; antennae black.

Expanse of wings: 16 mm.

1 ♀ from Johannesburg, Transvaal, January, 1912. (H. Feltham.)

Several examples from the same locality in the British Museum Collection.

SUB-FAMILY PHYCITINAE.

GEN. EMATHEUDES, Zell.

54. EMATHEUDES QUINQUEPUNCTELLA, spec. nov.

(Plate XLI., fig. 17.)

Forewing: Pale straw-colour, the costa deeper yellow; inner line represented by two black dots on median vein and vein 1, obliquely placed; the outer also by two rather larger ones at upper and lower end of discocellular; sometimes a very minute point on subcostal vein also in inner line; fringe concolorous.

Hindwing: White, with veins and terminal line dark; fringe white, towards apex yellowish.

Underside of forewing suffused with fuscous, except termen and fringe, both of which remain pure yellow; of hindwing white with costa yellowish.

Head, thorax, and abdomen above and below, also the legs yellow; forelegs fuscous.

Expanse of wings: 20 mm.

2 ♂♂ from M'fongosi, Zululand, March, 1911. (W. E. Jones.)

GEN. ANCYLOSIS, Zell.

55. ANCYLOSIS INANGULELLA, spec. nov.

(Plate XLI., fig. 25.)

ab. RUFITINCTA, ab. nov.

Forewing: Pale ochreous tinged with grey and fuscous; the inner and outer lines pale; the inner externally at costa and on both sides towards inner margin edged thickly with black; the outer preceded by black and deeply indented beyond cell; the area between the lines, especially at costa, suffused with fuscous except in cell and, more broadly, in submedian fold; a black cellspot; a diffuse dark sub-terminal cloud, and blackish terminal line; fringe shining grey.

Hindwing: Pale grey with dark terminal line.

Underside of forewing dark grey, of hindwing paler.

Head, thorax, and abdomen grey; the head and thorax slightly rufous-tinged.

Expanse of wings: 20 mm.

1 ♂ from Smithfield, Orange Free State, 1910. (Kannemeyer.)

A second ♂, from the same locality, smaller, with the forewing suffused throughout with rufous, and with no fuscous shading, may be separated as ab. *rufitincta*, ab. nov.

GEN. BREPHIA, Hein.

56. BREPHIA INCONGRUELLA, spec. nov.

(Plate XLI., fig. 21.)

Forewing: Pale grey, speckled with darker; basal area white; inner line black, interrupted in cell, preceded by a white line, which towards inner margin is itself preceded by black scaling; outer line, quite near termen, black outwardly white-edged, indented on both folds, followed by an ill-defined subterminal cloud; termen grey with a black terminal line; median vein white to beyond cell; a black dash at each end of the discocellular; the median area darker grey than the rest of wing.

Hindwing: Greyish white.

Underside of forewing dull grey, of hindwing whitish.

Head, thorax, and abdomen pale grey.

Expanse of wings: 18 mm.

1 ♂ without exact locality, from the Cape.

GEN. HOMOEOSOMA, Curt.

57. HOMOEOSOMA ANGULILINEA, spec. nov.

(Plate XLI., fig. 20.)

Forewing: Pale overspread with grey brown and in places thickly dark-speckled; the costa diffusely pale between the lines; inner line white, outcurved at costa, obsolete in middle, straight and inwardly oblique from submedian vein to inner margin; outer line white sharply angled outwards on vein 6 and oblique inwards, preceded by a thick brown shade which thins out at inner margin; cell whiter with thick dark speckling, followed by a dark brown spot; another spot, less prominent in submedian fold below base of vein 2.

Hindwing: Whitish; the fringe white.

Underside glossy, of forewing grey, of hindwing white.

Head, thorax, and abdomen grey; the venter dark brown.

Expanse of wings: 26 mm.

1 ♂ from Dunbrody, Cape. (Father J. O'Neil.)

GEN. HETEROGRAPHIS, Rag.

58. HETEROGRAPHIS ALBIPUNCTELLA, spec. nov.

(Plate XLI., fig. 23.)

Forewing: Olive greenish; the costal area speckled with dark; crossed by four rose-red bands, the first and second oblique outwards, the third and fourth oblique inwards; the first broad and nearly touching base at costa, the second outwardly diffuse; the third and fourth united along costa and inner margin; fringe rosy; the third is preceded in cell by a distinct white spot.

Hindwing: Glossy fuscous; fringe fuscous with pale line at base.

Underside bronzy fuscous.

Head, thorax, and abdomen pale olive, with glossy metallic scales.

Expanse of wings: 11 mm.

1 ♀ from M'fongosi, Zululand, January, 1912. (W. E. Jones.)

SUB-FAMILY PYRALIDINAE.

GEN. PYRALIS, Linn.

59. PYRALIS DENTIBASALIS, spec. nov.

(Plate XLI., fig. 24.)

Like *P. basalis*, Wlk., with which it is easily confused; on the average rather larger; generally with a reddish brown flush along

submedian fold; basal area larger and paler, limited by a pale outwardly dark-edged line, which is strongly angled outwards above and below vein 1, the angles followed by wedge-shaped black marks; a black line in basal half of cell, often continued beyond reniform stigma to outer line; the reniform with a pale spot before and beyond it; veins usually defined by black; costa more distinctly spotted black and ochreous; in other respects like *basalis*.

Occurs in several localities in South Africa; the type, a ♀ from Smithfield, Orange Free State, 1910. (Kannemeyer.)

60. *PYRALIS EFFULGENS*, spec. nov.

Forewing: Brownish fulvous; the basal and terminal areas deep red brown; costa dark brown with 8 pairs of yellowish dots, each pair with a red dot at centre; basal area limited by a silvery white line, oblique inwards at $\frac{1}{3}$ from subcostal vein, where it is inbent to costa at the fifth pair of dots; outer line finely yellow edged with black scales, from $\frac{2}{3}$ of costa to close before anal angle, outcurved from vein 8 to submedian fold; a row of black lunules along termen; fringe with a fine pale basal line, the basal third iron-grey, the outer two-thirds dark grey, except between apex and vein 4, where they are yellow.

Hindwing: Dark grey, with two white lines converging towards inner margin above anal angle, conversely edged with blacker grey, and containing a pale yellowish space towards costa; fringe as in forewings.

Underside of forewing blackish grey mixed with reddish, reddish along costa, where the 8 pairs of yellowish dots form 8 semicircles; outer line alone distinct, edged with blackish, and bright yellow above middle; hindwing reddish, with two broad black bands, antemedian and postmedian, the latter edged with yellowish; both wings with the terminal black spots strongly marked.

Head, thorax, and abdomen dull fulvous red; the third segment of dorsum with a black belt.

Expanse of wings: 15 mm.

1 ♀ from M'fongosi, Zululand, April, 1911. (W. E. Jones.)

GEN. *BOSTRA*, Wlk.

61. *BOSTRA FLAVICOSTALIS*, spec. nov.

(Plate XLI., fig. 22.)

Forewing: Yellow, suffused with reddish fulvous, becoming brownish fuscous at termen; the inner margin remains diffusely

yellowish, and the costal area above subcostal vein between the lines concisely yellow; lines slightly darker, but indistinct; the inner outcurved at costa and oblique outwards, the outer incurved at costa and sinuous inwards; both plainer at inner margin where they approximate to each other; cellspot blackish; terminal line and fringe blackish.

Hindwing: Gilded yellow, deeper along termen; terminal line black, the fringe whitish.

Underside brighter and deeper yellow; the costal areas fulvous orange; apex of forewing speckled with blackish, of hindwing sparingly with brown; terminal lines and fringes blackish; cellspot of forewing, and outer line of both wings towards costa indicated.

Head, thorax, and abdomen greyish yellow; palpi fulvous brown; venter and legs greyish fulvous brown.

Expanse of wings: 33 mm.

1 ♀ from Knysna, Cape, October, 1858.

Closely allied to *B. rufimarginata*, Hmps.

62. *BOSTRA CARNICOLOR*, spec. nov.

(Plate XLI., fig. 19.)

Forewing: Deep flesh-colour; the median area slightly darker; outer line at $\frac{2}{3}$, starting from a deeper costal spot and incurved parallel to termen; the inner line at $\frac{1}{4}$, visible only below middle, running parallel to outer; fringe concolorous.

Hindwing: Rather paler.

Underside deeper red.

Head, thorax, and abdomen above and beneath concolorous.

Expanse of wings: 30 mm.

1 ♀ from Durban, Natal, February 1894. (Butler.)

GEN. *CONSTANTIA*, Rag.

63. *CONSTANTIA PALLIDICARNEA*, spec. nov.

(Plate XLI., fig. 15.)

Forewing: Pale pink, the terminal area mixed with yellowish; inner line pale yellow, outwardly oblique; outer line deeper pink, edged with shining white, oblique and straight from costa before apex to vein 6, then irregular and slightly projecting to vein 3, where it is curved inwards to below end of cell and again oblique to inner margin; termen, especially at apex, flushed with pink; fringe yellow.

Hindwing: Pale yellow; fringe the same.

Underside pale yellow, the forewing flushed with dull pink.

Head, thorax, and abdomen, which is greased, yellowish; the prothorax and tips of patagia pinkish; palpi yellow.

Expanse of wings: 28 mm.

1 ♀ from Bushmanland, Henkries, Cape, October, 1911. (Lightfoot.)

64. *CONSTANTIA GRISESCENS*, spec. nov.

(Plate XLI., fig. 18.)

Forewing: Pale grey, speckled with dark grey, the wide median area darker grey; inner line blackish grey, oblique outwards to submedian fold, then inwards, preceded by a diffuse pale band; outer line slightly dentate lunulate, slightly projecting from vein 6 to 3, then incurved to below end of cell and dentate outwards on vein 1, followed by a pale line; fringe grey.

Hindwing: Whitish grey, the terminal area beyond a faint dark line somewhat paler.

Underside dull whitish; the costal area of forewing grey.

Head, thorax, and abdomen pale grey; face and two basal segments of dorsum whitish; palpi grey externally, white internally.

Expanse of wings: 24 mm.

2 ♀ ♀ from Bushmanland, Henkries, Cape, October, 1911. (Lightfoot.)

GEN. *GLYPHODES*, Guen.

65. *GLYPHODES ANGUSTIMARGO*, spec. nov.

Intermediate between *G. clealis*, Wlk., and *G. stenocraspis*, Btlr.; pearly white; the costal streak black brown, narrow at base and widening outwards; the round black orbicular stigma and the larger reniform lying on its lower edge; termen black brown, its inner edge straight; fringe concolorous.

Hindwing: White, with the fringe and narrow terminal border brown black.

Underside, with the dark borders duller; the costal streak narrow to beyond middle.

Face and palpi black brown; tongue in front broadly white; vertex, thorax, and abdomen white; dorsum with 3 pale-brown saddles; the penultimate segment fuscous; the anal segment and tuft deep black; venter and legs white; the knees black brown; antennae white.

Expanse of wings: 32 mm.

1 ♂ from Barberton, Transvaal, May, 1911. (H. Edwards.)

FAMILY HEPIALIDAE.

GEN. GORGOPIS, Hübn.

66. GORGOPIS OLIVACEONOTATA, spec. nov.

(Plate XLI., fig. 28.)

Forewing: Pale grey, marked with rows of olive-brown lunules; costa with a brown white-edged streak at base; then with black subcostal dashes; a dark brown wedge-shaped mark at base of submedian fold, another at base of cell, and a round spot in fold below it; two obliquely placed contiguous olive-brown spots at middle of cell, joining on to an incurved brown mark in the fold; the cell and fold between these spots white; a dark lunule in upper part of cell beyond, and two olive-brown spots at the end, followed by three white blotches coalescing into an oblique streak and then by the outer line formed of five brown contiguous blotches from vein 5 to inner margin, a brown spot on vein 6 with another above it and beyond, and an oblong costal blotch marked on costa by a white spot; subterminal line formed of brown blotches, coalescing from costa to vein 6, and followed above vein 4 by white spots; below vein 1 there are two or three olive-yellow round spots with white scaling interspersed; pairs of short dark dashes at end of veins; fringe shining pale grey with dark basal and middle lines.

Hindwing: Dull olive grey; the costa at apex with two round brown spots.

Underside shining olive grey; the costa of forewing pale grey with dark brown spots at intervals.

Head, thorax, and abdomen olive brown and pale grey intermixed; the antennae dark brown; patagia and shoulders marked with whitish hairs.

Expanse of wings: 32 mm.

1 ♂ from Mowbray, Cape Town. (Miss Lloyd.)

67. GORGOPIS ALBIPLUMIS, spec. nov.

(Plate XLI., fig. 27.)

Forewing: Pale sparsely clothed with olive-grey or olive-brown scales; these are thickest and darkest along costa and cell; this darker area is limited by a diffuse pale space running obliquely from inner margin near base to apex, beyond which there are seen three ill-defined rows of dark blotches between the veins separated by pale

intervals; veins finely dark; a thick dark terminal line, with glossy grey fringe beyond.

Hindwing: Dark olive grey; fringe and terminal line as in forewings.

Underside uniform olive grey, the white marks of forewing showing through.

Head, thorax, and forelegs dark brown; abdomen grey brown, darker on underside.

Expanse of wings: 30 mm.

1 ♂ from "Mossel Bay Division," Cape.

68. *GORGOPIS INTERVALLATA*, spec. nov.

(Plate XLI., fig. 29.)

Forewing: White, semihyaline, marked longitudinally with olive brown; all the veins finely dark brown; costa olive brown, more broadly in basal half; a slight brown cloud along cell fold touching a brown spot at end of cell; broad brown clouding along each vein, especially at inner margin, from base to termen, narrowing and forming an oblique shade from apex; before this veins 6, 7, 8 and 9 are thickened with elliptic brown streaks; fringe brown with white tips.

Hindwing: White, with brown veins and slight grey-brown suffusion, which is deeper along apex and termen.

Underside olive grey brown, the pale spaces only grey.

Head, thorax, and abdomen olive brown; the sides of patagia and basal segments of dorsum with white hairs.

Expanse of wings: 32 mm.

1 ♂ from Fraserburg, Cape, April, 1885. (E. S. Alston.)

69. *GORGOPIS PLURIMACULATA*, spec. nov.

(Plate XLI., fig. 26.)

Forewing: Dull brownish grey with some ill-defined black speckling; the costa marked with black pale-edged spots; inner margin below submedian fold paler grey, apparently without markings; basal two-thirds of wing darker speckled than the rest, limited by an obliquely incurved outer line starting from a black costal spot, which is followed by a subquadrate yellowish white patch on costa; a larger black spot on costa beyond it, bent out into a dash on vein 8, and apparently connected with an obliquely incurved darker band from below apex to inner margin with its edges irregular and marked by

blackish blotches in the intervals; terminal area dark inwardly defined by black spots.

Hindwing: Dull fuscous; the costa with some black marks.

Underside grey brown with a rufous tinge; the costa of forewing mottled grey and dark.

Head and thorax dark blackish brown; abdomen fuscous.

Expanse of wings: 38 mm.

1 ♂ without locality, taken in 1899 by Miss Wilman George.

The type is much worn, and the description consequently somewhat inexact.

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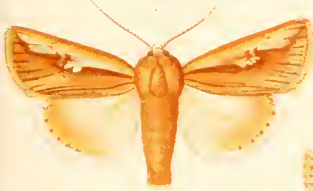
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Harold Steiner, Berkeley

Wm. H. Newell, San Francisco

PLATE XLI.

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