
NEMO ME IMPUNE LACESSIT

REPORT

ON THE

SCIENTIFIC RESULTS

OF THE

VOYAGE OF S.Y. "SCOTIA."

SCOTTISH NATIONAL ANTARCTIC EXPEDITION.

REPORT

ON THE

SCIENTIFIC RESULTS

OF THE

VOYAGE OF S.Y. "SCOTIA"

DURING THE YEARS 1902, 1903, AND 1904,

UNDER THE LEADERSHIP OF

WILLIAM S. BRUCE,
LL.D., F.R.S.E.

Volume VI.—ZOOLOGY.

PARTS I.–XI.—INVERTEBRATES, by Dr CLÉMENT VANEY; JAMES RITCHIE, M.A., B.Sc.; Dr E. L. TROUESSART; WILLIAM EVANS HOYLE, M.A., D.Sc.; JAMES COSMO MELVILL, M.A., D.Sc., F.L.S.; ROBERT STANDEN; J. WILFRID JACKSON, F.G.S.; CHAS. CHILTON, M.A., D.Sc., M.B., C.M., LL.D., F.L.S.; JOHN RENNIE, D.Sc.; ALEXANDER REID, M.A.; JAMES MURRAY; Dr EUGÈNE PENARD; THOMAS SCOTT, LL.D., F.L.S.

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EDITORIAL NOTE.

Volume VI. is the second of "Scotia" Reports, the publication of which has been aided by a Government grant, the first instalment of which was paid on September 15th, 1911. It is a further contribution to Antarctic and Atlantic Invertebrate Zoology. Special thanks are again due to those who have voluntarily given their time and who have put their best work into its pages.

The same principle has been followed as in the case of Volume V., there being no distinction of nationality made where a zoologist is recognised as being *facile princeps* in his group. France, Switzerland, New Zealand, Wales, England, and Scotland have all taken part in the compilation of Volume VI. The cost of publication has again been considerably reduced by the co-operation of the Royal Society of Edinburgh, that has, in most cases, passed the communications through its *Transactions*, and has thus helped in bearing the primary cost of setting up type and illustrations. "Microscopic Life" and "Rhizopoda" of Gough Island have been passed through the *Proceedings* of the Royal Physical Society, and the expensive Entomostraca monograph of Dr Scott has been aided by a grant of £56 from the Carnegie Trust of the Universities of Scotland. At the head of each monograph the actual dates of publication, communication, and issue appear, also the original source of publication. Original pagination is recorded at the foot of each page independently of the pagination of the Volume.

Most of the communications deal with Antarctic and sub-Antarctic species, but some deal with tropical and sub-tropical forms collected on the outward and homeward passages of the "Scotia." Some of the communications are supplementary to those in Volume V.

WILLIAM S. BRUCE,
Editor.

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PART I.

HOLOTHURIANS.

I.—THE HOLOTHURIANS OF THE SCOTTISH NATIONAL ANTARCTIC EXPEDITION.

By CLÉMENT VANEY.
Professor of Zoology at the Faculty of Sciences, Lyon.

(*WITH FIVE PLATES.*)

I.—Les Holothuries de l'Expédition Antarctique Nationale Écossaise.

Par Clément Vaney, Maître de conférences de Zoologie à la Faculté des Sciences de Lyon. *Présentées par M.* W. S. Bruce, LL.D. (Avec cinq planches.)

(MS. received May 20, 1908. Read June 15, 1908. Issued separately October 15, 1908.)

La *Scotia* a rapporté de son expédition au pôle sud une très importante collection d'Holothuries ; nous remercions bien vivement M. W. S. Bruce de l'honneur qu'il nous a fait en nous en confiant l'étude.

Cette collection ne renferme pas moins de trente-quatre espèces, dont vingt et une, c'est à dire près des deux tiers, sont nouvelles. Cette proportion aurait été probablement plus grande, mais par suite de l'action de quelques agents conservateurs employés (formaldéhyde et acide acétique glacial) certains échantillons sont indéterminables : leurs corpuscules calcaires ayant été complètement dissous par les liquides acides. Pour la même raison nous avons décrit quelques nouvelles espèces sans pouvoir fournir dans la diagnose les caractères de leurs spicules. Mais la majeure partie des exemplaires et surtout ceux de grandes profondeurs sont en bon état et très bien préparés.

Cette collection de l'expédition écossaise est actuellement une des plus importantes au point de vue des Holothuries de grandes profondeurs des mers antarctiques. Elle renferme deux espèces de Synallactidés et onze espèces d'Elasipodes, comprenant quatre Elpiidés et sept Psychropotidés, parmi lesquelles dix sont nouvelles.

La *Scotia* a recueilli un grand nombre de Cucumariidés, dont dix espèces nouvelles proviennent en majeure partie des Orcades du Sud. Nous avons déjà eu l'occasion * de signaler deux nouvelles Thyone de ces mêmes îles. Ces faits prouvent la grande variété de faune de cette région.

Certaines de ces nouvelles espèces de Cucumariidés : le *Psolidium Coatsi* et les *Cucumaria psolidiformis* et *C. conspicua*, constituent de curieux termes de transition entre les genres *Cucumaria* et *Psolidium*. Les deux *Cucumaria*, qui appartiennent à l'ancien genre *Semperia*, possèdent de gros pédicelles disposés suivant des rangées radiales et de nombreux petits pédicelles disséminés sur tout le corps ; leur trivium présente une ébauche de sole ventrale souvent mal délimitée. Ce dernier caractère les rapproche des *Psolidium convergens* (Hérouard), *Ps. panamense* Ludwig et *Ps. ornatum* (E. Perrier), dont la sole n'est pas limitée latéralement. Une autre forme de *Cucumaria*, la *C. armata*, présente de grandes affinités avec le genre *Colochirus*.

L'expédition antarctique nationale écossaise a retrouvé les *Cucumaria antarctica*, *C. grandis* et *C. lateralis*, rapportées pour la première fois par l'expédition du

* "Deux nouvelles Thyone des Orcades du Sud (*Thyone Scotiæ* et *Thyone turricatus*)," *Bull. Mus. Hist. Nat. Paris*, 1906, p. 400.

(REPRINTED FROM THE TRANSACTIONS OF THE ROYAL SOCIETY OF EDINBURGH, VOL. XLVI., PP. 405–441.)

Dr Charcot ; ces nouveaux exemplaires nous ont permis de compléter nos descriptions antérieures.

A son retour, la *Scotia* a recueilli au cap de Bonne Espérance une nouvelle espèce de *Thyone*, la *T. articulata*, et les *Cucumaria discolor* et *C. insolens* de Théel.

Nous indiquons dans le tableau suivant la répartition des différentes espèces d'Holothuries rapportées par la *Scotia*.*

	Lat. S.	Long. W.	Profondeur.
Synallactidés—			Brasses.
Pseudostichopus villosus, Théel	69 33	15 19	2620
	67 33	36 35	2500
Synallactes Robertsoni, nov. sp.	66 40	40 35	2425
Elpidés—			
Scotoplanes globosa, Théel	39 48	2 33 E.	2645
Peniagone Mossmani, nov. sp.	69 33	15 19	2620
,, *Piriei*, nov. sp.	66 40	40 35	2425
,, *Wiltoni*, nov. sp.	69 33	15 19	2620
Psychropotidés—			
Benthodytes spuma, nov. sp.	69 33	15 19	2620
,, *Browni*, nov. sp.	48 06	10 05	1742
,, *recta*, nov. sp.	67 39	36 10	2500
Euphronides Scotiæ, nov. sp.	62 10	41 20	1775
Psychropotes longicauda, Théel, var. *antarctica*, nov. var.	71 22	16 34	1410
Psychropotes laticauda, nov. sp.	67 39	36 10	2500
	39 48	2 33 E.	2645
,, *Brucei*, nov. sp.	67 33	36 35	2500
Cucumaridés—			
Psolus antarcticus (Philippi)	Port Stanley, Iles Falkland		5 à 10
Psolidium convergens (Hérouard)	,, ,,		...
Psolidium (*Cucumaria*) *Coatsi*, nov. sp.	Baie de la Scotia		9 à 10
Thyone articulata, nov. sp.	Baie de Saldanha, Afrique du Sud		9 à 10
Cucumaria antarctica, Vaney	Baie de la Scotia, Orcades du Sud		9 à 10
,, erocea (Lesson)	Port Stanley, Iles Falkland		3 à 4
	51° 7′ S.	9° 31′ W.	2103
,, discolor, Théel	Baie de Saldanha, Afrique du Sud		rivage
,, grandis, Vaney	Baie de la Scotia, Orcades du Sud		9 à 10
,, lateralis, Vaney	,, ,,		9 à 10
,, lævigata, Verrill	Banc de Burdwood		56
,, leonina, Semper	Port Stanley, Iles Falkland		...
,, insolens, Théel	Baie de Saldanha, Afrique du Sud		...
Cucumaria analis, nov. sp.	Baie Jessie, Orcades du Sud		...
,, *armata*, nov. sp.	Port William, Iles Falkland		6
,, *aspera*, nov. sp.	Baie de la Scotia, Orcades du Sud		10
,, *conspicua*, nov. sp.	,, ,,		9 à 10
,, *croceoïda*, nov. sp.	Banc de Burdwood		56
,, *perfida*, nov. sp.	Baie de la Scotia, Orcades du Sud		9 à 10
,, *periprocta*, nov. sp.	,, ,,		...
,, *psolidiformis*, nov. sp.	,, ,,		10
,, *secunda*, nov. sp.	,, ,,		9 à 10

* Les espèces nouvelles sont en italiques.

ASPIDOCHIROTES.

SYNALLACTIDÉS.

Pseudostichopus, Théel.

Pseudostichopus villosus, Théel.

Station 420, 21 Mars 1904 ; lat. S. 69° 33′, long. W. 15 19′ ; profondeur 2620 brasses. Un exemplaire.

Station 291, 7 Mars 1903 ; lat. S. 67 33′, long. W. 36° 35′ ; profondeur 2500 brasses. Un exemplaire.

Cette espèce paraît avoir une répartition géographique assez grande : le *Challenger* l'a recueillie en une dizaine de stations comprises entre 62° 26′ et 38° 6′ de latitude sud et 2° 56′ et 35° 22′ de latitude nord, à des profondeurs variant de 1375 à 2900 brasses. Théel signale simplement que les exemplaires de l'hémisphère nord diffèrent peut-être un peu de ceux de l'hémisphère sud par les corpuscules calcaires et la forme des pédicelles. Nos exemplaires sont franchement antarctiques, puisqu'ils ont été recueillis entre 67 et 69 33′ de latitude sud ; par suite, il est intéressant d'en donner une description assez complète pour permettre ultérieurement les comparaisons avec les échantillons septentrionaux.

Leur corps est ovale, un peu aplati dorso-ventralement ; leur longueur est de 100 millimètres et leur plus grande largeur, située vers le milieu du corps, atteint 50 millimètres. La bouche est ventrale et est à 10 millimètres du bord antérieur. L'anus est ventral mais presque terminal ; il est encadré par les deux lobes latéraux, caractéristiques du genre *Pseudostichopus*, de forme hémisphérique et ayant 5 à 6 millimètres de diamètre.

Les téguments sont souples et minces ; leur coloration est marron, les côtés et les extrémités du corps sont de teinte plus foncée que les faces dorsale et ventrale. Les pédicelles ont leur extrémité brunâtre, ils sont très abondants et disséminés irrégulièrement sur les parties latérales du corps. Sur la face ventrale, ces appendices forment une double série de pointillés ; ils s'étendent, de part et d'autre de la ligne médiane, sur les deux quarts moyens du corps et laissent complètement nu le radius médian ventral. Les appendices de la face dorsale sont difficiles à observer, leur répartition paraît irrégulière.

Les corpuscules calcaires ont été complètement dissous par le liquide conservateur.

L'intérieur des téguments est blanchâtre ; les bandes musculaires longitudinales sont marron clair, elles ont toutes la même importance, et atteignent 5 à 6 millimètres de largeur. L'anneau calcaire est composé de dix pièces : les radiales sont massives, elles ont 5 millimètres de longueur et les interradiales, en forme de chevron, ont 3 à 4 millimètres. La vésicule de Poli unique est transparente et mesure 10 à 12 millimètres de

longueur. Le tube digestif a 10–12 millimètres de diamètre et présente un estomac différencié de 30 millimètres de longueur.

Vers le milieu du corps sont disposées deux grappes de follicules ovariens jaunâtres, embrassant plus ou moins le tube digestif ; l'oviducte est long et mince.

Les organes arborescents sont brunâtres avec des ramifications brun foncé ; ils affectent la forme d'un **Y** dont la branche commune a 15 millimètres de longueur et les branches latérales 35 et 45 millimètres.

Synallactes, Ludwig.

Synallactes Robertsoni, nov. sp. (Pl. III. fig. 34, 35 et 36.)

Station 295, 10 Mars 1903 ; lat. S. 66° 40′, long. W. 40° 35′. Un exemplaire.

L'état de conservation de cet exemplaire laisse beaucoup à désirer : il est en partie pelé et éviscéré ; cependant malgré ces défectuosités nous pouvons en fournir une diagnose assez complète.

L'échantillon est de couleur blanc jaunâtre avec des pédicelles de teinte plus foncée. Son corps est aplati dorso-ventralement ; sa longueur est de 75 millimètres et sa largeur atteint 15 à 18 millimètres. L'extrémité postérieure est légèrement atténuée et arrondie. La bouche et l'anus sont franchement terminaux.

La face ventrale est légèrement convexe ; elle présente suivant ses radius des pédicelles brunâtres. Sur les radius latéro-ventraux, nous trouvons une seule rangée composée de trente à quarante pédicelles, très rapprochés les uns des autres vers le région anale mais assez écartés dans la région antérieure. On constate en quelques points l'indication d'une double rangée. Suivant le radius médian, on trouve sur le quart postérieur une dizaine de pédicelles, irrégulièrement disposés sur deux rangées ; les deux quarts médians paraissent dépourvus de pédicelles, mais sur le quart antérieur une dizaine de ces appendices sont disposés en une double rangée.

La face dorsale est en majeure partie pelée, mais dans les régions intactes on distingue des papilles peu élevées, à base élargie, réparties uniformément sur toute la face dorsale et au nombre d'une huitaine dans le sens de la largeur.

La couronne tentaculaire est plus ou moins recouverte par un repli péribuccal ; elle comprend seize tentacules se terminant chacun par un disque muni sur son pourtour de six à huit digitations repliées sur elles-mêmes.

Les corpuscules calcaires des téguments sont constitués par des tourelles à base tétraradiée (fig. 34 et 35), dont chacune des branches a son extrémité distale aplatie, élargie et percée d'une grande ouverture centrale accompagnée d'une ou deux perforations plus petites. Au centre de la base s'élève une tige simple terminée en pointe et offrant quelques piquants disséminés sur toute sa longueur.

La paroi des pédicelles renferme des bâtonnets (fig. 36) à extrémités bifides portant latéralement quelques piquants.

Les muscles longitudinaux sont jaunâtres : ils ont deux millimètres de largeur. L'organisation interne semble indiquer l'existence d'une bordure latérale.

La vésicule de Poli unique a 6 millimètres de longueur et possède des parois transparentes. Les organes génitaux sont composés d'un faisceau d'une vingtaine de tubes simples, jaunâtres, qui atteignent 10 à 15 millimètres de longueur.

Dans le même flacon nous trouvons un tube digestif muni à l'une de ses extrémités de deux organes arborescents, presque égaux, mesurant 20 millimètres de longueur et offrant chacun deux séries longitudinales de cœcums latéraux. Il est très probable que ces viscères sont ceux de cette Synallactidé.

Rapports et Différences.—L'ensemble de l'organisation et la forme des corpuscules calcaires nous amènent à considérer cet échantillon comme appartenant au genre *Synallactes*.

Les Synallactidés recueillies dans la région antarctique comprennent actuellement les *Pseudostichopus mollis* Théel et *Ps. villosus* Théel, les *Mesothuria bifurcata* Hérouard, *M. magellani* (Ludwig) et *M. Thomsoni* (Théel), les *Synallactes Challengeri* (Théel) et *S. Carthagei* Vaney, le *Bathyplotes Moseleyi* (Théel).

Le *Synallactes Robertsoni* et le *Synallactes Challengeri* (Théel) offrent entre eux quelques points communs par suite de la répartition des pédicelles et de la forme des corpuscules ; mais dans notre espèce les rangées de pédicelles médians ventraux ne sont pas continues et la tige centrale des corpuscules est élancée et présente une série de piquants sur toute sa longueur.

ELPIDIIDÉS.

Scotoplanes, Théel.

Scotoplanes globosa, Théel. (Pl. III. fig. 25, 26, 27 et 28.)

(? Synonyme : *Sc. Murrayi*, Théel.

Station 468, 29 Avril 1904 ; lat. S. 39° 48′, long. E. 2° 33′ ; profondeur 2645 brasses. Quatre exemplaires.

Ces exemplaires sont très bien étalés et conservés, quoiqu'une grande partie des corpuscules calcaires aient été dissous par le liquide conservateur (formol à 2½%). Les téguments sont minces et transparents, les tentacules et les appendices sont légèrement rosés. La longueur du corps est comprise entre 70 et 120 millimètres et la largeur oscille entre 30 et 55 millimètres ; ces échantillons sont donc de plus petite taille que ceux rapportés par le *Challenger*. Comme dans le type décrit par Théel on trouve, sur la face dorsale, trois paires de papilles dont les deux premières sont très développées et dissymétriques et la troisième, très postérieure, est rudimentaire.

Ces échantillons ne présentent que six pédicelles sur chaque radius latéro-ventral : le deuxième, le troisième et quelquefois le quatrième sont les plus grands, les cinquième et sixième sont les plus petits. Ce nombre invariable de six paires de pédicelles latéro-ventraux sépare la plupart de nos exemplaires de l'espèce type, qui présente toujours sept paires de ces appendices. En nous basant sur cette différence nous pensions tout d'abord que les exemplaires de la *Scotia* représentaient les types d'une nouvelle variété de la *Scotoplanes globosa* Théel, à laquelle nous aurions donné le nom de *sexpedata*. La création de cette nouvelle variété pouvait aussi être basée sur ce que les corpuscules calcaires sont de plus petite taille que ceux décrits par Théel. Les téguments renferment des corpuscules en C (fig. 27) de 0·08 millimètres, des corpuscules mamelonnés (fig. 28) et des bâtonnets très épineux dont les plus grands (fig. 25) atteignent 0·40 millimètres de longueur, tandis que les petits (fig. 26), généralement moins épineux, n'ont que 0·15 millimètres. Théel avait observé dans sa *Sc. globosa* des corpuscules en C de 0·16 millimètres et des bâtonnets épineux de 0·92 millimètres, c'est à dire des corpuscules qui sont deux fois plus grands que ceux que nous trouvons dans nos échantillons. Les tentacules de nos exemplaires offrent aussi quelques particularités : leur disque terminal a une dizaine de prolongements périphériques et comme dans l'espèce type deux sont plus importants, mais leur surface externe présente une série de papilles.

Tout cet ensemble de caractères différentiels nous autorisaient à créer la variété *sexpedata* de la *Sc. globosa*, mais un exemplaire, qui nous a été communiqué récemment, a modifié notre opinion. Cet échantillon est dissymétrique ; il présente sur la face ventrale sept pédicelles à droite et six seulement à gauche ; il sert d'intermédiaire entre les types du *Challenger* et la plupart des exemplaires de la *Scotia*. Il est donc inutile d'établir une variété spéciale pour les exemplaires à six paires de pédicelles. Nous en déduisons simplement que la *Sc. globosa* peut subir des réductions dans le nombre de ses pédicelles : tous les échantillons du *Challenger* ont sept paires de ces appendices, presque tous ceux de la *Scotia* n'en ont que six paires. Il est très probable que la *Sc. Murrayi*, établie par Théel sur un unique exemplaire, correspond à une variété de la *Sc. globosa* qui n'aurait que cinq paires de pédicelles, car ses corpuscules calcaires sont presque semblables à ceux de la *Sc. globosa*.

Les nombreux exemplaires de la *Sc. globosa* rapportés par le *Challenger* avaient été recueillis : les uns à 1950 brasses de profondeur par 53° 55′ de lat. S. et 108° 35′ de long. E., les autres à 2160 brasses par 33° 31′ de lat. S. et 74° 43′ de long. W. Les échantillons de la *Scotia* ont été recueillis à une profondeur plus considérable et à une latitude intermédiaire. Le type de la *Sc. Murrayi* provenait de 60° 52′ lat. S. et de 1260 brasses de profondeur.

Peniagone, Théel.

Peniagone Mossmani, nov. sp. (Pl. I. fig. 10 et 11 ; Pl. II. fig. 19 ; Pl. III. fig. 32 et 33.)

Station 420, 21 Mars 1904 ; lat. S. 69° 33′, long. W. 15° 19′; profondeur 2620 brasses. Un exemplaire.

L'exemplaire est en mauvais état de conservation : il est pelé et recouvert de vase. Son corps, ovale et allongé, mesure 70 millimètres de longueur et 25 millimètres de plus grande largeur vers le tiers antérieur. La face dorsale est légèrement convexe ; la face ventrale (fig. 10) est aplatie et présente, en avant, un disque buccal saillant de 8 à 9 millimètres de diamètre. Au centre de ce disque se trouve l'ouverture buccale, qui est probablement entourée d'une dizaine de tentacules. Une rangée de pédicelles, bien visible sur le côté gauche, est disposée de chaque côté de la sole ventrale. La première paire de ces appendices est à 20 millimètres du bord antérieur, la deuxième à 15 millimètres de la première ; quant aux autres, au nombre de cinq à six, ils sont plus petits et très rapprochés les uns des autres ; ils semblent former par leur ensemble une bordure périanale. Sur la face dorsale (fig. 11) le disque buccal est surmonté d'un capuchon ou voile étalé en éventail et s'insérant à 10 millimètres du disque suivant toute la largeur du corps. Ce capuchon présente (fig. 19) trois paires de pointes latérales ; sa plus grande hauteur est de 8 millimètres. Les téguments dorsaux étant en partie enlevés, nous n'avons pu distinguer s'il y avait d'autres appendices.

Les corpuscules calcaires ont été altérés par la formaldéhyde, leurs contours sont devenus crénelés. Ces corpuscules sont des croix à quatre branches (fig. 32 et 33) plus ou moins incurvées ; vers le centre de la croix et à la base de deux branches opposées, se trouvent deux courts mamelons coniques. La plupart de ces corpuscules cruciformes paraissent lisses, pourtant quelques-uns offrent quelques denticulations à l'extrémité des bras. Il existe deux vésicules de Poli inégales ayant l'une 7 et l'autre 4 millimètres de longueur. Les organes génitaux sont formés de deux glandes en grappe de couleur brunâtre.

Rapports et Différences.—La *Peniagone Mossmani* se rapproche de la *Kolga furcata* Hérouard (*Periamma furcatum* d'après R. Perrier) provenant des Açores. Ces deux espèces ont un voile formé de trois paires de papilles, mais chez l'espèce d'Hérouard elles sont plus nettement séparées les unes des autres que dans notre espèce et le voile ne s'étend pas sur toute la largeur du corps. Les corpuscules calcaires sont différents dans les deux espèces.

La seule forme d'Elpiidé antarctique qui puisse être comparée avec notre *Peniagone Mossmani* est la *Peniagone Challengeri* Théel recueillie à 50° 1′ de latitude sud et à 1800 brasses de profondeur ; mais cette espèce est plus allongée que notre *Peniagone* et son voile est formé par la coalescence d'une paire de papilles dorsales ; d'ailleurs ses corpuscules calcaires sont épineux et bien différents de ceux de notre espèce.

Peniagone Piriei, nov. sp. (Pl. I. fig. 4 et 5.)

Station 295, 10 Mars 1903 ; lat. S. 66° 40′, long. W. 40° 35′ ; profondeur 2425 brasses. Un exemplaire.

Cet exemplaire est bien épanoui, mais malheureusement, par suite de l'action de la formaldéhyde, tous les corpuscules calcaires ont été dissous.

Le corps est ovale et mesure 100 millimètres de longueur ; sa plus grande largeur se trouve au niveau du tiers postérieur et atteint 40 à 45 millimètres. La face ventrale (fig. 4) est aplatie et présente en avant la bouche entourée de dix tentacules placés sur un cercle de 15 millimètres de diamètre. L'anus est nettement terminal. A 40 millimètres en arrière de l'ouverture buccale commencent les rangées latéro-ventrales de pédicelles ; celles-ci sont disposées en un fer à cheval dont chaque branche se compose d'une seule série de huit pédicelles. La taille de ces appendices va en décroissant d'avant en arrière : les antérieurs ont 5 millimètres de longueur, les pédicelles de la dernière paire sont de petite taille et réunis l'un à l'autre par une sorte de crête transversale. La distance entre les appendices latéro-ventraux d'une même rangée va aussi en diminuant d'arrière en avant : les antérieurs sont à 10 millimètres les uns des autres, les postérieurs à 5 millimètres seulement.

La face dorsale (fig. 5) est fortement convexe et la plus grande hauteur du corps atteint 40 millimètres. Sur le côté dorsal et à 15 millimètres du bord antérieur émerge un gros appendice conique dirigé d'arrière en avant et ayant 20 millimètres de longueur ; il est légèrement aplati dans le sens frontal ; sa base a 15 millimètres de largeur et 10 millimètres d'épaisseur. Ce gros appendice dorsal se termine en une pointe bifide et à une petite distance de son sommet se trouve de chaque côté une petite papille latérale : il semble être formé par la fusion de quatre papilles dorsales. A 20 millimètres en arrière de ce gros appendice se trouve, sur la face dorsale, une paire de petites papilles de 3 à 4 millimètres de longueur et distantes l'une de l'autre de 10 millimètres.

Les tentacules, au nombre de dix, sont composés chacun d'un pédoncule de 3 millimètres de longueur et de 4 millimètres de diamètre terminé par un disque plus ou moins convexe de 5 millimètres de diamètre et dont la surface externe est recouverte de nombreuses petites papilles.

La vésicule de Poli, unique, est brunâtre et a 20 millimètres de longueur. La glande génitale est située à droite ; elle est en grappe compacte et a une longueur de 25 millimètres.

Rapports et Différences.—La *Peniagone Piriei* peut être rapprochée de la *Peniagone vitrea* Théel, recueillie par le *Challenger* par 42° 43′ de latitude sud et à 1450 brasses de profondeur, et de la *P. intermedia* Ludwig provenant de l'océan Pacifique. Toutes ces espèces ont un voile dorsal avec deux lobes médians saillants, mais notre *Peniagone* a la bouche moins infléchie vers la face ventrale que chez les deux autres formes. D'ailleurs

la forme subantarctique, *P. vitrea*, s'en distingue par la présence de deux paires de papilles dorsales et d'une collerette périanale.

Comme autre *Peniagone* subantarctique pouvant être comparée à la *P. Piriei*, nous avons la *P. purpurea* Théel, recueillie par le *Challenger* par 46° 16′ et 53° 55′ de latitude sud, à une profondeur de 1950 brasses. Cette forme de Théel est de petite taille et présente un voile dorsal composé par deux appendices très grêles et séparés l'un de l'autre sur une grande partie de leur longueur.

Nous devons aussi comparer la *P. Piriei* avec la *Scotoplanes robusta* Théel, recueillie par le *Challenger* par 53° 55′ de latitude sud et à 1950 brasses de profondeur. Cette *Scotoplanes* est une Elpiidé de grande taille, mesurant 133 millimètres de longueur et dont les pédicelles latéro-ventraux, au nombre de onze paires, ont une disposition assez semblable à celle observée dans notre espèce ; mais son voile dorsal est bien différent de celui de la *Peniagone Piriei* : il est composé par deux paires de papilles de taille presque identiques et ayant 10 millimètres de longueur.

Peniagone Wiltoni, nov. sp. (Pl. I. fig. 6 et 7 ; Pl. III. fig. 29, 30 et 31.)

Station 420, 21 Mars 1904 ; lat. S. 69° 33′, long. W. 15° 19′ ; profondeur 2620 brasses. Un exemplaire.

Cet échantillon est en partie pelé ; les téguments blanc grisâtre se détachent en certains points et sont recouverts de vase sur presque toute leur surface.

Le corps (fig. 6) est obovale, il mesure 85 millimètres de long et sa plus grande largeur, qui se trouve vers le quart antérieur, atteint 40 millimètres. La face ventrale est aplatie et la face dorsale légèrement bombée. L'extrémité postérieure du corps est arrondie; l'extrémité antérieure présente une région buccale de 10 millimètres de diamètre, assez bien séparée du reste du corps et portant sur sa face ventrale l'ouverture buccale.

Les pédicelles ne semblent pas avoir été conservés dans leur intégrité : sur la face ventrale, nous en trouvons un plus grand nombre à droite qu'à gauche. A droite, ces appendices, au nombre de quatre, sont disposés en une rangée le long du radius latéro-ventral ; le premier est à 20 millimètres de la région buccale, le deuxième à 12 millimètres du premier, le troisième et le quatrième à 20 millimètres des appendices les précédant immédiatement. Chacun de ces appendices a 8 à 10 millimètres de longueur et 4 à 5 millimètres de diamètre. Sur le côté gauche, nous ne trouvons plus que deux pédicelles correspondant aux appendices moyens du côté droit. L'anus, qui est terminal mais légèrement dorsal, paraît bordé par une petite collerette.

Nous observons une semblable dissymétrie sur la face dorsale (fig. 7). On trouve tout d'abord en avant et sur la région buccale une sorte de petit capuchon triangulaire de 5 millimètres de hauteur en mauvais état de conservation. A 10 millimètres en arrière se présente une paire de gros appendices coniques, très rapprochés l'un de l'autre et mesurant 20 millimètres de longueur et 7 à 8 millimètres de diamètre à la base.

A 10 millimètres en arrière de cette paire d'appendices dorsaux et un peu sur le côté gauche, on distingue une unique papille de 10 millimètres de longueur et de 3 millimètres de diamètre.

La couronne tentaculaire parait se composer d'une dizaine de tentacules qui ont tous disparus.

Les téguments renferment des bâtonnets épineux sur toute leur surface (fig. 31) et des corpuscules étoilés à quatre branches. Tantôt ceux-ci ont des bras simples recouverts de nombreux piquants (fig. 30), tantôt les branches sont surmontées vers leur base d'un petit mamelon épineux (fig. 29).

Les organes génitaux constituent deux glandes en grappe à parois transparentes.

Rapports et Différences.—Il est difficile de préciser la place générique de cette nouvelle Elpiidé ; mais par suite de la présence d'un voile très réduit et de corpuscules tétraradiés nous pouvons la considérer comme appartenant au genre *Peniagone*.

Nous devons comparer cette *P. Wiltoni* à la *Kolga nana* Théel. Le *Challenger* avait recueilli cette dernière espèce, soit dans les régions arctiques soit dans les régions antarctiques, mais il est très probable que la forme antarctique est simplement *analogue* à celle des régions arctiques ; d'ailleurs Théel indique qu'elle n'était représentée que par un seul individu incomplet recueilli à 60° 52′ de latitude sud et à 1260 brasses de profondeur. Sa longueur est de 28 millimètres et ses pédicelles latéro-ventraux sont au nombre de neuf paires : ils sont donc plus nombreux que dans notre espèce. La face dorsale de la *K. nana* présente quatre papilles disposées en une rangée transversale, les médianes étant les plus larges. Les corpuscules calcaires sont aussi différents dans les deux espèces.

PSYCHROPOTIDÉS.

Benthodytes, Théel.

Benthodytes spuma, nov. sp. (Pl. I. fig. 1 ; Pl. II. fig. 20.)

Station 420, 21 Mars 1904 ; lat. S. 69° 33′, long. W. 15° 19′ ; profondeur 2620 brasses. Un exemplaire.

Cet unique échantillon a un aspect gélatineux ; il nous a rappelé à ce point de vue le *Pelopatides gelatinosus* (Walsh). La coloration est grisâtre sur la face dorsale et d'un noir violacé sur la face ventrale. Le corps est légèrement aplati sur la face ventrale, mais le radius médian est assez saillant, surtout dans sa région moyenne ; l'aplatissement est bien marqué dans les régions antérieure et postérieure du corps. La face dorsale est un peu convexe ; les téguments ont un aspect plus gélatineux dans cette région que dans les autres parties de l'animal. Cet exemplaire mesure 155 millimètres de longueur et 45 millimètres de plus grande largeur.

L'anus est terminal ; la bouche est nettement ventrale, et est située à 20 millimètres du bord antérieur. Elle est entourée de seize tentacules noir violacé munis de courts pédoncules ; le disque terminal de ces tentacules a 4 millimètres de diamètre, il est convexe et présente de nombreuses petites papilles périphériques.

La région antérieure du corps (fig. 1) offre une collerette péribuccale de 30 millimètres de largeur, composée d'une quarantaine de petites papilles en forme de festons à bords arrondis. Entre la collerette péribuccale et le cercle tentaculaire, les téguments de la face ventrale sont recouverts de nombreuses petites verrucosités ou plissements. A la collerette buccale, fait suite, de chaque côté du corps, une rangée longitudinale de petits appendices noir violacé, nettement séparés les uns des autres et ne constituant pas par leur ensemble de bordure latérale. On retrouve de semblables petites papilles noir violacé disséminées sans ordre sur toute la face dorsale (fig. 20). Dans la région postérieure, on distingue une collerette périanale, s'arrêtant au niveau de l'anus et formée d'un certain nombre de festons plus ou moins turgescents.

A 15 millimètres en arrière de la bouche commencent les rangées de pédicelles du radius médian ventral qui s'arrêtent à 10 millimètres en avant de l'anus. Ces appendices sont au nombre de quatre-vingt-cinq disposés en deux rangées plus ou moins alternantes et ils sont très rapprochés les uns des autres.

Malgré toutes nos recherches nous n'avons pu trouver de corpuscules calcaires soit dans les parois du corps soit dans les tentacules et les organes génitaux. Il est très probable qu'ils ont été dissous par les liquides conservateurs.

La vésicule de Poli unique a 20 millimètres de longueur.

Les organes génitaux sont constitués par deux glandes de 40 millimètres de longueur présentant chacune un canal central grisâtre portant de distance en distance des faisceaux de cæcums plus ou moins arborescents.

L'intestin est de coloration grisâtre, le rectum est noir violacé et il présente un petit cæcum sur la moitié de sa longueur.

Rapports et Différences.—Nous ne pouvons guère rapprocher la *Benthodytes spuma* que de la *B. abyssicola* Théel ; mais celle-ci s'en distingue facilement parce qu'elle a quinze tentacules, des processus dorsaux de petite dimension mais répartis au nombre d'une dizaine par radius dorsal ; elle possède aussi une bordure latérale composée de pédicelles plus développés que ceux du radius médian ventral.

On a déjà signalé dans les régions antarctiques deux espèces de *Benthodytes* : la *B sanguinolenta* Théel et la *B. sordida* Théel. La *B. sanguinolenta* a dix-huit tentacules, une bordure latérale formée de nombreux appendices et elle est pourvue de minuscules papilles dorsales. Le *B. sordida* a quinze tentacules, une bordure latérale formée de nombreux appendices et des appendices dorsaux de différentes tailles. Les deux espèces antarctiques de *Benthodytes* déjà décrites sont donc bien distinctes de notre *B. spuma*.

Benthodytes Browni, nov. sp. (Pl. I. fig. 2 et 3.)

Station 451, 13 Avril 1904 ; lat. S. 48° 06′, long. W. 10° 05′ ; profondeur 1742 brasses. Un exemplaire.

Le corps de cet exemplaire est plus ou moins cylindrique, avec les régions antérieure et postérieure arrondies. La face ventrale est légèrement aplatie, surtout dans sa région médiane, tandis que la face dorsale est fortement bombée. La longueur de cet individu est de 200 millimètres, sa largeur est de 50 millimètres et sa hauteur 35 millimètres. Les téguments sont plissés et fortement pigmentés, leur coloration est d'un noir uniforme.

La bouche (fig. 3) est ventrale et située à 10 millimètres du bord antérieur, l'anus est terminal. La bouche est entourée de quatorze tentacules, tous de même grandeur. Chaque tentacule se compose d'un pédoncule d'une dizaine de millimètres de long, surmonté d'un disque convexe de 10 millimètres de diamètre, à surface terminale papilleuse et présentant sur son pourtour quelques digitations assez fortement rétractées.

Les radius dorsaux (fig. 2) sont très saillants et ils sont nettement séparés l'un de l'autre par une région déprimée, surtout dans la moitié postérieure du corps. Sur presque toute la longueur de chaque radius sont disposés, en une seule rangée, une vingtaine d'appendices coniques, à peu près tous identiques et ayant une base d'une dizaine de millimètres de diamètre. Dans la région antérieure ces papilles sont de taille plus petite et, sur le radius droit, nous en trouvons deux au même niveau. Une rangée de seize pédicelles s'étend sur toute la longueur de chaque radius latéro-ventral (fig. 3) ; chacun de ces pédicelles présente une base élargie conique, dont le diamètre atteint 12 millimètres ; cette partie est plus ou moins plissée et elle est surmontée d'un petit mamelon cylindrique et rétractile de 5 millimètres de longueur et de 2 millimètres de diamètre. Les deux rangées ambulacraires latéro-ventrales sont parallèles et ne sont reliées par aucune bordure postanale.

Le radius médian ventral est marqué par deux bandes longitudinales, en dépression sur le reste de la sole, et sillonnées par de nombreux traits transversaux. A un premier examen externe nous ne trouvions aucun appendice sur ce radius, mais l'étude interne décèle dans le quart postérieur une huitaine de pédicelles disposés sur deux rangées plus ou moins alternantes.

Les téguments sont épais ; leur coloration est noirâtre à l'extérieur et violacée à l'intérieur. Ils ne renferment aucune trace de corpuscule, mais cela est très probablement dû à l'action du formol.

Les organes génitaux sont constitués de deux houppes de très nombreux tubes grêles de 20 à 35 millimètres de longueur et de couleur rouge violacé. L'unique vésicule de Poli mesure 30 millimètres de longueur ; elle est de couleur gris violacé.

Rapports et Différences.—La *Benthodytes Browni* est nettement caractérisée par la

forme de ses gros appendices latéro-ventraux et dorsaux et par la localisation des pédicelles médio-ventraux sur le quart postérieur du corps.

Dans le groupe des *Benthodytes* pourvues de quatorze tentacules, la *B. curiosa* doit être comparée à la *B. Janthina* Marenzeller trouvée dans l'Atlantique nord ; mais celle-ci se distingue de notre espèce par des différences de taille entre les diverses papilles dorsales et par le grand nombre de pédicelles de la région marginale et du radius médian ventral. La *B. curiosa* s'éloigne aussi de la *B. mamillifera* Théel, espèce qui peut n'avoir aussi que quatorze tentacules, mais dont le pourtour est bordé par de nombreux pédicelles de petite taille et dont le radius dorsal offre cinquante petits processus coniques disposés suivant deux rangées plus ou moins alternantes.

Benthodytes recta, nov. sp. (Pl. II. fig. 23 ; Pl. III. fig. 37 et 38.)

Station 291, 7 Mars 1903 ; lat. S. 67° 33′, long. W. 30 35′ ; profondeur 2500 brasses. Trois exemplaires.

Parmi ces trois exemplaires un est complètement pelé, les deux autres, quoique en assez mauvais état, peuvent pourtant servir à caractériser cette nouvelle espèce. Les dimensions respectives de ces deux échantillons sont : pour l'un, 150 millimètres de longueur et 30 millimètres de largeur, et, pour l'autre, 110 millimètres de longueur et 20 millimètres de largeur. Leur corps est plus ou moins aplati, la face ventrale quoique légèrement convexe est beaucoup moins bombée que la face dorsale.

La coloration générale est rouge violacé, mais la face ventrale est de teinte plus foncée que la face dorsale. La bouche est franchement ventrale et plus ou moins saillante ; elle est entourée par seize tentacules grisâtres, dont le disque terminal est convexe et à surface externe pustuleuse. L'anus est plutôt ventral que terminal.

On distingue une collerette péribuccale qui se continue de chaque côté du corps par une bordure peu saillante formée d'une cinquantaine de papilles ou festons. En arrière, ces bordures latérales se réunissent l'une à l'autre par une collerette périanale formée de deux lobes se séparant au niveau de l'anus.

Le radius médian ventral possède un grand nombre de pédicelles disposés en deux rangées longitudinales, alternant irrégulièrement l'une avec l'autre et s'étendant sur toute la longueur du radius.

Chaque radius dorsal (fig. 23) peut posséder au plus quatre papilles ; les trois antérieures sont de plus petites dimensions que la postérieure ; elles atteignent, chez le petit exemplaire, 2 à 4 millimètres de longueur, tandis que la papille postérieure a 10 millimètres. Le petit échantillon présente la première papille à 14 millimètres du bord antérieur, la seconde papille à 8 millimètres de la première, la troisième à 23 millimètres de la deuxième et la dernière à 40 millimètres de la précédente. Chez le grand exemplaire ces distances respectives sont 30 millimètres, 20 millimètres, 25 (?) millimètres et 45 millimètres.

Les téguments sont minces et renferment des corpuscules calcaires en forme de croix (fig. 37) à quatre branches inégales et incurvées, présentant sur leur longueur quelques piquants massifs. Dans les tentacules sont des bâtonnets arqués (fig. 38), quelquefois à extrémités bifides ; leur taille varie beaucoup.

Rapports et Différences.—La *Benthodytes recta* est une espèce de *Benthodytes* à seize tentacules, qui se sépare nettement des espèces déjà décrites. Parmi les espèces antarctiques, elle a quelques affinités avec la *B. sordida* Théel, mais cette dernière a quinze tentacules, trois paires de grands processus dorsaux entre lesquels sont des papilles plus petites, et une bordure latérale bien différente de celle de notre espèce.

Euphronides, Théel.

Euphronides Scotiæ, nov. sp. (Pl. I. fig. 8 et 9 ; Pl. III, fig. 39 et 40.)

Station 313, 18 Mars 1903 ; lat. S. 62° 10′, long. W. 41° 20′ ; profondeur 1775 brasses. Un exemplaire.

Cet exemplaire a une longueur de 140 millimètres et une largeur de 45 millimètres environ. La face dorsale est légèrement bombée, sa coloration est blanc grisâtre avec quelques reflets rosés. La face ventrale est aplatie ; sa coloration générale est brunâtre, mais son pourtour et sa portion médiane sont verdâtres. La bouche est ventrale et se trouve située à 10 millimètres du bord antérieur ; l'anus est aussi compris dans la sole ventrale et est aussi à 10 millimètres du bord postérieur.

La sole ventrale (fig. 9) est entourée, sur tout son pourtour, par une bordure festonnée. La partie circumorale comprend une vingtaine de festons de faible épaisseur et très peu échancrés ; les portions latérales sont composées, de chaque côté, par une quarantaine de festons faisant peu de saillie et infléchis du côté ventral ; mais à 30 millimètres environ, en avant de l'anus, la bordure s'étale à nouveau pour constituer la collerette périanale ; cette dernière est formée par une trentaine de festons peu découpés.

Le radius médian ventral fait légèrement saillie sur une largeur de 10 millimètres environ et, suivant toute sa longueur, se trouvent répartis soixante-cinq pédicelles disposés en deux rangées plus ou moins irrégulièrement alternantes. De chaque côté de ce radius, la sole ventrale présente toute une série de paires de stries transversales.

Le cercle tentaculaire est entouré par un repli brunâtre ; il comprend seize tentacules brunâtres. Chaque tentacule se termine par un disque offrant à sa surface un grand nombre de petites verrucosités.

La face dorsale (fig. 8) est fortement plissée et présente à 105 millimètres du bord antérieur un gros appendice impair de 20 millimètres de largeur à sa base et de 15 millimètres de hauteur ; son extrémité libre est arrondie. En avant de ce gros appendice se trouve, vers le milieu du corps, une paire de petites papilles de 2 millimètres de longueur, plus ou moins cachées par les replis des téguments. Ces petites papilles sont

à 15 millimètres l'une de l'autre. L'ouverture génitale est à 20 millimètres du bord antérieur.

Les téguments sont minces et flexibles ; ceux de la face dorsale sont légèrement rugueux, ils renferment des corpuscules tri- et tétraradiés (fig. 39 et 40) dont les branches, souvent un peu incurvées, offrent quelques piquants ; ils sont de différentes tailles et présentent tous un piquant central.

L'organisation interne montre bien que le gros appendice dorsal provient de la soudure de deux papilles. Des fragments calcaires, en mauvais état de conservation placés autour de la bouche, semblent être les restes d'un anneau calcaire. La vésicule de Poli unique est de couleur rose violacé et mesure 30 millimètres de longueur.

Les ovaires sont constitués par deux petites grappes s'étendant sur 20 millimètres de longueur.

Rapports et Différences.—Notre *Euphronides Scotiæ* doit être comparée d'une part avec les *E. Tanneri* Ludwig et *E. depressa* Théel, espèces à un seul grand appendice dorsal, mais qui s'en distinguent par la présence de dix-huit tentacules, et d'autre part, avec les *E. verrucosa* Ludwig et *E. bifurcata* Koehler et Vaney, qui possèdent comme elle seize tentacules, mais dont les téguments sont fortement verruqueux.

L'*Euphronides Scotiæ* est plus antarctique que l'*E. depressa* proprement dite * recueillie par le *Challenger* sur les côtes de Patagonie.

Psychropotes, Théel.

Psychropotes longicauda, Théel, var. *antarctica*, nov. var.

Station 417, 18 Mars 1904; lat. S. 71° 22′, long. W. 16° 34′; profondeur 1410 brasses. Un exemplaire.

Cet exemplaire diffère de l'espèce type de Théel par quelques caractères secondaires, cependant nous n'avons pas cru devoir l'en séparer complètement par suite du manque de corpuscules calcaires ; ceux-ci ont été probablement dissous par la formaldéhyde.

Cet échantillon a 280 millimètres de longueur et seulement 50 millimètres de largeur ; il est donc plus allongé que le type de Théel, dont la largeur est environ le tiers de la longueur. Le corps est plutôt cylindrique, sa largeur reste constante suivant toute la longueur ; les extrémités antérieure et postérieure sont légèrement arrondies. La face ventrale est aplatie, la face dorsale est convexe, mais elle n'offre pas en arrière la surélévation indiquée par Théel dans son *Ps. longicauda*. La coloration est gris violacé, les bords marginaux sont brun foncé.

La région caudale s'insère à 4–5 millimètres en avant de l'extrémité postérieure; elle est conique et mesure 100 millimètres de longueur et 25 millimètres de largeur à sa base d'insertion. Son extrémité libre se termine par deux digitations presque égales :

* Voir R. Perrier, *Holothuries : Exp. Sc. du "Travailleur" et du "Talisman,"* 1902, p. 434.

l'une de 8 millimètres de longueur, l'autre de 6 millimètres seulement. La bouche et l'anus sont tous deux dans la sole ventrale ; la bouche est à 15 millimètres du bord antérieur et l'anus à 5 millimètres du bord postérieur. Le radius médian ventral renferme une cinquantaine de pédicelles brunâtres, rétractés et répartis en deux rangées alternantes. Sur le pourtour de la sole ventrale, on trouve, en avant, une collerette péribuccale de faible épaisseur, formée par quinze petits festons, qui se continue de chaque côté par une simple rangée d'une quarantaine de pédicelles assez distants les uns des autres. En arrière, ces deux rangées se réunissent l'une à l'autre par une sorte de collerette périanale à festons mal définis.

La face dorsale présente, comme le type de *Ps. longicauda*, quatre paires de petites papilles situées successivement à 50, 60, 80 et 100 millimètres du bord antérieur.

Les téguments sont minces mais malheureusement complètement débarrassés de leurs corpuscules calcaires.

Les glandes génitales sont composées de deux glandes en grappe de 60 millimètres de longueur, formée chacune d'une série de vésicules de couleur gris violacé. La vésicule de Poli unique est blanc grisâtre et mesure 70 millimètres de longueur.

Cet exemplaire appartient au *Ps. longicauda* Théel, car il possède, comme cette espèce, dix-huit tentacules, quatre paires de papilles dorsales, mais ici la région caudale se termine par deux digitations presque égales, le corps est plus élancé et il ne présente ni bordure latérale ni surélévation postérieure.

Les exemplaires rapportés par le *Challenger* avaient été recueillis en trois stations différentes : l'une située à 62° 26′ lat. S. et 95° 44′ long. E. et à 1975 brasses de profondeur, l'autre à 53° 55′ lat. S. et 108° 35′ long. E., à 1950 brasses de profondeur, et enfin la troisième à 34° 7′ lat. S. et 73° 56′ long. W., à 2225 brasses de profondeur.

Théel avait déjà séparé, parmi les exemplaires de la deuxième station, deux variétés : la variété *monstrosa* et la variété *fusco-purpurea*.

Quoique la taille de notre échantillon et la longueur de sa région caudale atteignent presque celles du type de la variété *montrosa*, il en diffère par la forme générale du corps et l'absence de bordure latérale. Notre exemplaire est beaucoup plus antarctique que cette variété et par ses divers caractères il paraît être le type d'une nouvelle variété à laquelle nous donnons le nom d'*antarctica*.

Psychropotes laticauda, nov. sp. (Pl. II. fig. 14 et 24.)

Station 290, 6 Mars 1904 ; lat. S. 67° 39′, long. W. 36° 10′ ; profondeur 2500 brasses. Un exemplaire.

Station 468, 29 Avril 1904 ; lat. S. 39° 48′, long. E. 2° 33′ ; profondeur 2645–2900 brasses. Un exemplaire.

Les deux exemplaires, quoique provenant de deux stations assez distantes l'une de l'autre, appartiennent sans aucun doute à la même espèce. L'un des échantillons est

rempli de vase et semble avoir conservé sa forme primitive ; c'est sur celui-ci que nous établirons les caractères de la nouvelle espèce. Comme le *Ps. longicauda* Théel, notre nouveau *Psychropotes* est surélevé en arrière, où sa hauteur atteint 45 millimètres, tandis qu'il offre en avant un aplatissement très marqué. La largeur du corps est sensiblement la même sur toute la longueur et est comprise entre 50 et 55 millimètres ; la longueur atteint de 185 à 190 millimètres. La coloration générale des téguments est violet rougeâtre ; la teinte est foncée sur la face ventrale et grisâtre sur la face dorsale ; les pédicelles ont leurs extrémités brunâtres.

La face ventrale (fig. 14) est aplatie et forme une sole aux extrémités de laquelle sont la bouche et l'anus ; la bouche est à 30 millimètres du bord antérieur et l'anus à 10 millimètres du bord postérieur ; chacune de ces ouvertures est entourée d'une collerette. La collerette péribuccale se compose d'une vingtaine de pédicelles très élargis à la base et terminés par une digitation de 4 à 5 millimètres de long ; elle s'infléchit assez fortement en arrière de la bouche. La collerette périanale comprend quatorze festons très larges à contours presque arrondis ; seules les papilles postérieures offrent un petit mamelon. Les extrémités correspondantes de ces collerettes sont réunies l'une à l'autre par une rangée d'une dizaine de pédicelles latéro-ventraux de grosse taille et bien séparés.

Le radius médian ventral présente une trentaine de pédicelles répartis irrégulièrement sur deux rangées alternantes. Dans la moitié postérieure les pédicelles sont très rapprochés ; il en est de même vers le voisinage immédiat de la bouche ; mais dans le reste de ce radius médian, ils sont très largement espacés.

Sur la face dorsale se trouvent deux paires de petites papilles ; la première est à 80 millimètres du bord antérieur, l'autre à 100 millimètres de cette extrémité. L'appendice caudal est placé tout à fait à l'arrière, il est aplati dorso-ventralement et est terminé par une pointe arrondie semblant provenir de la soudure intime de deux papilles égales. La queue a une longueur de 60 millimètres et une largeur à la base de 35 millimètres.

Le cercle tentaculaire est composé de dix-huit tentacules brunâtres. Chacun de ceux-ci présente un pédoncule violet de 10 millimètres de long, terminé par un disque violet brunâtre de 8 millimètres de diamètre dont la partie distale est convexe, à surface rugueuse et porte, sur son pourtour, une vingtaine de papilles plus ou moins rétractées.

Les téguments sont plus minces sur la face dorsale que sur la face ventrale ; ils renferment des corpuscules étoilés (fig. 24) à quatre ou six branches plus ou moins incurvées, sur lesquelles sont disposées de distance en distance quelques piquants. Au centre du corpuscule s'élève toujours un piquant plus développé que les autres et à pointe mousse.

Les muscles longitudinaux sont marron brunâtre, l'intestin est grisâtre. La vésicule de Poli unique est grisâtre et mesure 40 millimètres de longueur.

Les organes génitaux sont constitués par deux grappes d'une vingtaine de vésicules blanc jaunâtre, placées à l'extrémité d'un canal de 35 millimètres de longueur.

Rapports et Différences.—Le *Psychropotes laticauda* se rapproche du *Ps. longicauda* Théel ; il s'en distingue par le petit nombre et la taille des pédicelles latéro-ventraux, par la répartition hétérogène des pédicelles médio-ventraux et par la forme et la terminaison de la région caudale.

Cette nouvelle espèce rappelle aussi le *Ps. raripes* Ludwig, car tout deux ont des pédicelles latéro-ventraux bien séparés les uns des autres ; mais dans le *Ps. raripes*, les corpuscules calcaires sont beaucoup plus épineux que dans notre *Ps. laticauda*, d'ailleurs les pédicelles du radius impair sont répartis différemment dans ces deux espèces, de plus notre *Ps. laticauda* a des appendices dorsaux alors que le *Ps. raripes* en est dépourvu.

La répartition inégale des pédicelles médio-ventraux, le petit nombre d'appendices dorsaux et l'absence de toute bordure latérale reliant les pédicelles latéro-ventraux sépare le *Ps. laticauda* du *Ps. buglossa* Perrier ; les corpuscules calcaires sont d'ailleurs différents dans ces deux espèces.

Psychropotes Brucei, nov. sp. (Pl. I. fig. 13 ; Pl. II. fig. 21 et 22 ; Pl. III. fig. 41 et 42.)

Station 291, 7 Mars 1903 ; lat. S. 67° 33′, long. W. 36° 35′ ; profondeur 2500 brasses. Un exemplaire.

Le corps est allongé et de coloration gris jaunâtre ; sa longueur est de 170 millimètres et sa largeur de 50 millimètres environ. La face ventrale aplatie (fig. 21) est de couleur plus foncée que la face dorsale, celle-ci est légèrement bombée. La bouche et l'anus sont nettement ventraux. En avant, l'exemplaire présente une collerette péribuccale de 40 à 44 millimètres de diamètre formée de vingt-six papilles assez saillantes. Autour de l'anus, on trouve une série de huit paires de petites papilles jaunâtres disposées sur un cercle de 30 millimètres de diamètre. Sur le côté, le corps présente une bordure latérale qui déborde d'un centimètre environ vers la région antérieure et de quelques millimètres seulement vers la région postérieure. Sous cette bordure s'étend, de chaque côté du corps, de la collerette péribuccale à la collerette périanale, une rangée d'une huitaine de pédicelles bien séparés entre eux, dont les trois premiers sont assez distants les uns des autres. Le radius médian ventral est fortement rétracté et plissé ; malgré nos recherches faites en étalant cette région ou en examinant la face interne, nous n'avons pu distinguer aucun appendice.

La bouche est située à 22 millimètres du bord antérieur ; elle est entourée de dix-huit tentacules brun rougeâtre disposés un peu irrégulièrement. Chaque tentacule se termine par un disque de 7 millimètres de diamètre, à surface externe convexe, papilleuse et bordée de festons périphériques plus ou moins rétractés ; leur pédoncule est court et blanc jaunâtre.

Vu de côté (fig. 22), le corps se termine, dans sa région postérieure, par une sorte de talon surmonté d'une région caudale très saillante, aplatie latéralement, terminée en

pointe, cintrée en avant et offrant une double inflexion telle que la pointe est reportée presque au-dessus du talon. La hauteur de cette région caudale est de 60 millimètres et sa longueur à la base atteint 35 millimètres. Sur la face dorsale (fig. 13) se trouvent l'ouverture génitale, située à 40 millimètres du bord antérieur et, plus en arrière, deux paires de petites papilles. La première paire est à 5 millimètres de l'ouverture génitale et présente un écartement de 10 millimètres ; la deuxième paire est à 15 millimètres plus en arrière et offre un écartement de 20 millimètres.

Les téguments renferment des corpuscules cruciformes (fig. 41 et 42) dont les branches sont fortement épineuses. Au centre du corpuscule s'élève toujours un piquant.

Le tube digestif est marron clair, mais le rectum est noirâtre. Les muscles longitudinaux des radius sont de couleur marron.

Les organes génitaux sont composés de deux faisceaux d'une dizaine d'ampoules. Chaque faisceau aboutit à un canal de 20 millimètres de longueur. Les plus grosses ampoules sont ovales et ont 10 millimètres de plus grand diamètre.

Rapports et Différences.—Si réellement le radius médian ventral du *Psychropotes Brucei* est dépourvu de pédicelles, cette espèce se rapprocherait du *Ps. Grimaldii* Hérouard de l'Atlantique, qui possède aussi dix-huit tentacules. Mais notre nouveau *Psychropotes* se sépare très nettement de la forme décrite par Hérouard par sa bordure périanale et par l'absence de bordure latérale festonnée. D'ailleurs le *Ps. Grimaldii* ne possède pas de papilles dorsales et a une queue très développée. De plus les corpuscules calcaires sont différents dans les deux espèces.

Si notre espèce possède des pédicelles sur le radius médian, nous devrons la rapprocher des *Psychropotes raripes* Ludwig, *Ps. buglossa* R. Perrier, *Ps. fucata* R. Perrier et *Ps. longicauda*.

Le *Ps. raripes* a une disposition des pédicelles latéro-ventraux et une structure des corpuscules calcaires assez semblables à celles de notre espèce, mais il ne possède aucune papille dorsale et ses pédicelles latéro-ventraux sont bien plus développés que ceux du *Ps. Brucei*.

Les *Ps. buglossa* et *Ps. fucata* se distinguent du *Ps. Brucei* par la forme et le nombre des pédicelles latéro-ventraux, l'allure de la région caudale, le nombre des papilles dorsales et la forme des corpuscules calcaires.

Le *Ps. longicauda* a un plus grand nombre de papilles dorsales, de quatre à cinq paires, de nombreux pédicelles latéro-ventraux, et sa région caudale se termine par deux prolongements digitiformes. Cet ensemble de caractères l'éloigne donc de notre nouvelle espèce.

DENDROCHIROTES.

CUCUMARIIDÉS.

Psolus, Oken.

Psolus antarcticus (Philippi).

Pour la bibliographie voir :

1905. R. Perrier, "Holothuries antarctiques du Muséum d'histoire naturelle de Paris," *Ann. Sc. nat. : Zoologie*, 9e S., t. i., p. 55.
1907. C. Vaney, *Holothuries : Expédition antarctique française*, p. 21.

Port Stanley, Iles Falkland ; profondeur 4 brasses. Un exemplaire.

Ce petit exemplaire est de forme elliptique ; son plus grand axe atteint 15 millimètres de longueur et le plus petit axe a 10 millimètres. La coloration est blanchâtre. Les plaques péribuccales sont beaucoup plus développées que les périanales. Le pourtour de la sole a deux rangées d'ambulacres. On distingue de petites granulations sur les grandes écailles dorsales.

Psolidium, Ludwig.

Psolidium convergens (Hérouard).

1905. R. Perrier, "Holothuries antarctiques du Muséum d'histoire naturelle de Paris," p. 38.
1906. E. Hérouard, *Holothuries : Expédition antarctique belge de la "Belgica,"* p. 13.

Janvier 1903, Port Stanley, Iles Falkland ; profondeur 4 brasses. Un exemplaire.

Cet unique exemplaire est blanchâtre ; il mesure 22 millimètres de longueur et 7 millimètres de plus grande largeur ; son extrémité postérieure est conique et légèrement relevée du côté dorsal. La disposition des pédicelles et la forme des corpuscules calcaires correspondent exactement aux descriptions d'Hérouard et de R. Perrier.

Psolidium (*Cucumaria*) *Coatsi*, nov. sp. (Pl. IV. fig. 47, 48, 49 et 50.)

Station 325, Baie de la Scotia, Orcades du Sud ; profondeur 9 à 10 brasses. Un exemplaire.

Le corps est presque cylindrique, mais faiblement incurvé ; l'extrémité postérieure est conique et l'extrémité antérieure est tronconique. La bouche et l'anus sont terminaux. Cet exemplaire mesure 25 millimètres de longueur et 10 millimètres de diamètre ; ses téguments sont blanc grisâtre. Les pédicelles du trivium sont localisés sur une sole ventrale aplatie mais encore un peu convexe et qui n'est pas nettement circonscrite.

Les rangées de pédicelles, bien visibles, ne semblent commencer qu'à 6 millimètres en arrière de l'ouverture buccale et se terminer qu'à 4 millimètres de l'anus, mais en réalité elles se prolongent plus en avant et plus en arrière par des rangées de pédicelles de plus petite taille. Le radius médian ventral est saillant et présente une cinquantaine de pédicelles répartis en deux rangées plus ou moins alternes; les radius latéro-ventraux offrent aussi une cinquantaine de pédicelles répartis en deux rangées: la rangée interne a parfois un plus grand nombre d'appendices que la rangée externe; celle-ci possède des régions dépourvues d'appendices et d'autres présentant de petits pédicelles.

La surface dorsale est plissée et les appendices s'y trouvent répartis sans ordre sur presque toute son étendue. Ces pédicelles ont la même importance que ceux du trivium. L'ouverture anale est bordée par cinq pédicelles.

Dans les téguments du corps sont de nombreuses plaques, plus ou moins imbriquées, ovales, à surface courbe et présentant de nombreuses perforations; l'une de leurs extrémités est pourvue d'un prolongement plus ou moins épineux. Les plaques de la sole (fig. 47) sont de plus grande taille que celles de la paroi dorsale (fig. 49). On trouve aussi des bâtonnets à ramification plus ou moins arborescente (fig. 48). Les corpuscules des pédicelles ventraux (fig. 50) sont des plaques allongées et même ramifiées, à surface courbe et offrant de nombreuses perforations.

L'anneau calcaire est composé de dix pièces triangulaires de 2 millimètres de hauteur et d'un millimètre de base; le sommet des parties radiales est tronqué, tandis que celui des interradiales est pointu. Les muscles rétracteurs s'insèrent vers le milieu du corps. La vésicule de Poli unique est vésiculeuse et a 5 millimètres de longueur. L'unique tube madréporique est court et terminé par une grande plaque madréporique. Les organes génitaux sont constitués par deux faisceaux d'une vingtaine de tubes simples, blanc jaunâtre, de 15 à 20 millimètres de longueur.

Rapports et Différences.—Ce *Psolidium* (*Cucumaria*) *Coatsi* pourrait être classé indifféremment dans les genres *Psolidium* ou *Cucumaria*. Pourtant il offre beaucoup d'analogie avec le *Psolidium convergens* (Héroard) et c'est pourquoi nous en faisons plutôt un *Psolidium* qu'une *Cucumaria*. Comme le *Ps. convergens*, notre nouvelle espèce présente une sole ventrale peu différenciée et des corpuscules calcaires de la face ventrale non semblables à ceux de la face dorsale; mais chez le *Ps. Coatsi*, les plaques sont toutes munies d'un prolongement à l'une de leurs extrémités et cette espèce ne possède que des corpuscules superficiels arborescents et aucune des cupules treillissées décrites chez le *Ps. convergens*; de plus les pédicelles de la région dorsale ont la même importance que ceux de la sole.

Parmi les *Cucumaria*, le *Ps. Coatsi* se rapproche de nos nouvelles *C. psolidiformis* et *C. conspicua*. Ses corpuscules calcaires présentent un prolongement épineux et ressemblent à ceux des *C. Steinen* Ludwig et *C. laevigata* Verrill, mais la disposition de ses pédicelles est bien différente de celle de ces deux espèces. Notre nouvelle espèce de *Psolidium* offre aussi quelques affinités avec la *C. parva*.

THYONE, Oken.

Thyone articulata, nov. sp. (Pl. IV. fig. 43 et 44.)

Mai 1904, Baie de Saldanha, Afrique du Sud; profondeur 9 à 10 brasses. Deux exemplaires.

Ces exemplaires sont fusiformes; leurs téguments sont marron brunâtre et présentent des taches plus foncées réparties sur tout le corps, mais principalement sur la face dorsale. La bouche et l'anus sont terminaux et sont entourés d'une aire blanchâtre. Les dimensions de ces deux échantillons sont les suivantes: 20 et 45 millimètres pour leur longueur, 10 et 15 millimètres pour leur plus grand diamètre.

Les pédicelles sont répartis sur toute la surface du corps et ne présentent pas de rangées radiales distinctes. Les tentacules sont au nombre de dix. Les téguments sont peu épais et renferment de nombreux corpuscules calcaires. Ceux-ci (fig. 43) sont des bâtonnets aplatis, dont les extrémités élargies présentent généralement une grosse perforation accompagnée quelquefois d'une ou deux ouvertures de plus petite dimension. Les pédicelles ont une plaque terminale avec de nombreuses petites perforations centrales et de grandes ouvertures rayonnantes placées à la périphérie.

L'anneau calcaire (fig. 44) est très développé et atteint jusqu'à 10 millimètres de longueur. Il est composé par un grand nombre de petits articles se poursuivant en arrière par dix prolongements grêles et contournés en spirale. Chacun de ces prolongements postérieurs est formé par deux séries alternantes d'articles, juxtaposées l'une à l'autre sur les deux tiers de leur longueur, mais se séparant bien nettement vers le tiers postérieur. Dans sa partie antérieure, l'anneau calcaire offre cinq prolongements coniques interradiaux et cinq prolongements radiaires biarticulés.

Les muscles rétracteurs s'insèrent au quart antérieur du corps. L'unique vésicule de Poli a 5 millimètres de longueur; le canal madréporique est infléchi en avant. Les tubes génitaux sont simples, jaunâtres et disposés en houppes vers le milieu du corps.

Rapports et Différences.—La *Thyone articulata* se rapproche de la *Thyone spectabilis* Ludwig par suite de ses corpuscules binoculaires, mais elle s'en sépare nettement par la forme de son anneau calcaire muni de longs prolongements postérieurs.

La structure de l'anneau calcaire rapproche notre espèce de la *Thyone sacellus* Selenka, mais les corpuscules calcaires sont bien différents dans ces deux formes.

Cucumaria, Blainville.

Cucumaria antarctica, Vaney.

1907. C. Vaney, *Holothuries : Expédition antarctique française*, p. 6.

Station 325, Baie de la Scotia, Orcades du Sud ; profondeur 9 à 10 brasses. Plusieurs échantillons.

Les différents exemplaires de cette espèce rapportés par la *Scotia* sont absolument identiques à ceux que j'ai déjà décrits dans les Holothuries du *Français*. Leur taille est très variable : les grands échantillons atteignent de 90 à 130 millimètres de longueur et 30 millimètres de diamètre ; les petits ont seulement une vingtaine de millimètres de longueur et une dizaine de millimètres de diamètre. La plupart sont marron brunâtre et ont les pédicelles blanchâtres. Leur couronne tentaculaire est composée de dix tentacules tous égaux, pourvus chacun d'un grand nombre de ramifications blanchâtres. Un unique exemplaire possède douze tentacules non ramifiés.

Les téguments ont une coloration qui peut varier du brun au blanc ; chez un échantillon jeune ils sont très rugueux.

Les corpuscules calcaires sont obovales avec une extrémité plus ou moins pointue, mais jamais ils ne présentent de véritable prolongement. Leurs contours sont profondément découpés ; leur surface est percée d'un grand nombre de perforations et est hérissée de petits tubercules coniques ou arrondis. Chez un échantillon de petite taille les corpuscules calcaires sont très allongés et présentent une surface hérissée d'un grand nombre d'aspérités.

Cucumaria crocea (Lesson).

Voir pour la bibliographie :

1898. H. Ludwig, *Holothuries der Hamburger Magalhaensische Sammelreise*, Hamburg, p. 15–24.
1904. H. Ludwig, "Brutpflege bei Echinodermen"; Festschrift Aug. Weismann, *Zool. Jahrb. Suppl.*, Bd. vii., p. 683–699.

17 Janvier 1905, Port Stanley, Iles Falkland ; profondeur $3\frac{1}{4}$ brasses. Nombreux exemplaires.

9 Avril 1904, lat. 51° 7′ S., long. 9° 31′ W. ; profondeur 2103 brasses. Nombreux exemplaires.

8 Janvier 1903. Port Stanley, Iles Falkland ; profondeur 4 brasses. Trois exemplaires.

Les dimensions de ces divers exemplaires sont très variables : certains sont de petite taille et atteignent seulement 5 à 6 millimètres de longueur ; tandis que d'autres ont 60 à 70 millimètres de longueur. Sur les échantillons de petites dimensions, les

pédicelles des radius du trivium sont seuls développés ; chez les grands les ambulacres dorsaux sont très petits et très nombreux, formant par leur ensemble une petite crête longitudinale.

Les téguments sont minces, translucides, de couleur blanc jaunâtre ou blanc rosé. La *Scotia* a recueilli un exemplaire de 50 millimètres de longueur auquel étaient fixés des jeunes de 8 millimètres de longueur.

Cucumaria discolor, Théel.

Synonyme : *C. australis*, Ludwig.

1886. Théel, *Reports of the "Challenger" : Holothurioidea*, ii., p. 64.

19 Mai 1904, Baie de Saldanha, Afrique du Sud, rivage. Deux échantillons.

L'aspect général de ces deux exemplaires les rapproche des *Colochirus*. Leur corps est fusiforme à contour vaguement pentagonal. Leurs longueurs respectives sont 40 et 50 millimètres et leur plus grand diamètre 15 millimètres. La face ventrale est blanchâtre mais tachetée de bandes longitudinales brunâtres ; la face dorsale et les parties latérales sont marron brunâtre et parsemées de petites punctuations. Tous les radius n'ont qu'une double rangée de pédicelles. Les corpuscules calcaires des téguments sont très nombreux : ce sont de gros ovules treillissés, dix fois plus gros que les autres corpuscules ; ceux-ci sont de deux sortes : les uns sont des coupes à quatre perforations et présentant une douzaine de gros tubercules, les autres, plus superficiels, sont des plaques perforées, très grêles avec de petites tubérosités. Dans les pédicelles sont des corpuscules allongés, quelquefois incurvés, présentant de nombreuses perforations et quelques prolongements médians. Tous ces corpuscules rappellent ceux décrits par Théel dans sa *Cucumaria discolor*.

L'anneau calcaire est composé de dix pièces coniques de 4 millimètres de hauteur ; les pièces radiales sont plus fortes que les interradiales.

L'échantillon décrit par Théel provenait de Simon's Bay.

Cucumaria grandis, Vaney. (Pl. IV. fig. 45 et 46.)

1907. C. Vaney, *Holothuries : Expédition antarctique française*, p. 12.

Station 325, Juin 1903 ; Baie de la Scotia, Orcades du Sud ; profondeur 9 à 10 brasses. Quatre exemplaires.

La *Scotia* a rapporté un assez grand nombre d'échantillons de cette espèce que nous avions établie sur un unique exemplaire recueilli par le *Français* et malheureusement traité à la formaldéhyde. Il nous est maintenant possible de compléter notre première description.

Tous les échantillons de la *Scotia* sont de grandes dimensions : leur longueur oscille

entre 70, 100 et 120 millimètres et leur plus grand diamètre est compris entre 50 et 70 millimètres.

La face dorsale est marron foncé, mais sur les parties latérales la coloration s'atténue et passe insensiblement au gris clair, qui est la couleur de la face ventrale. Les pédicelles sont blanchâtres et localisés sur les radius où ils sont disposés suivant deux rangées placées à une petite distance l'une de l'autre. Les dix tentacules sont tous semblables et offrent de courtes ramifications. Dans les régions rétractées la peau est épaisse, mais dans les parties étalées les téguments sont beaucoup plus minces et paraissent tachetés en certains points.

Aucun échantillon ne présente d'anneau calcaire. La vésicule de Poli unique est très grande et atteint 45 millimètres de longueur.

Les téguments renferment une seule espèce de corpuscules calcaires (fig. 45 et 46) : ce sont des plaques ovales, incurvées et perforées ; leur contour est irrégulier ; elles sont munies, à l'une de leurs extrémités, d'un grand prolongement offrant quelques pointes vers son extrémité libre.

Cette *Cucumaria grandis*, par suite de ses corpuscules calcaires, appartient au groupe des *Cucumaria* antarctiques renfermant dans leurs téguments seulement des plaques perforées munies d'un prolongement épineux. A ce groupe appartiennent les *C. lævigata* Verrill et *C. Steineni* Ludwig, mais la forme des corpuscules calcaires caractérise bien notre nouvelle espèce.

Cucumaria lateralis, Vaney.

1907. C. Vaney, *Holothuries : Expédition antarctique française*, p. 15.

Station 325, Avril 1903 ; Baie de la Scotia, Orcades du Sud ; profondeur 9 à 10 brasses. Deux exemplaires.

Malgré quelques différences au point de vue des corpuscules calcaires, nous rapportons ces deux échantillons à notre *Cucumaria lateralis*, dont les exemplaires types avaient été recueillis par l'expédition antarctique française. La coloration des téguments et la répartition des pédicelles sont semblables à celles des types ; dans un échantillon nous retrouvons même les deux poches incubatrices, l'une latéro-dorsale droite et l'autre latéro-ventrale droite ; mais les corpuscules calcaires de ses téguments sont des plaques à nombreuses perforations mais dépourvues de tubercules. L'autre exemplaire possède de très grandes plaques ayant chacune de nombreuses perforations entre lesquelles sont placés des tubercules en grand nombre qui se développent et se rejoignent en certains points pour former les ébauches d'un second réseau de travées.

Ces deux échantillons ont respectivement 27 et 30 millimètres de longueur et 18 et 20 millimètres de diamètre.

Cucumaria lævigata, Verrill.

Voir pour la bibliographie :

1905. R. Perrier, *Holothuries antarctiques du Muséum d'histoire naturelle de Paris*, p. 22.
1906. E. Hérouard, *Holothuries de l'Expédition antarctique belge*, p. 12.

Banc de Burdwood, lat. S. 54° 25′, long. W. 57° 32′ ; profondeur 56 brasses. Huit exemplaires.

Ces divers échantillons ont une longueur comprise entre 11 et 24 millimètres ; leur plus grand diamètre varie entre 5 et 9 millimètres. Les tentacules, au nombre de dix, sont tous semblables et les pédicelles sont disposés, sur chaque radius, suivant deux rangées plus ou moins alternantes. Les téguments sont rugueux et blanchâtres ; ils ne renferment qu'une seule espèce de corpuscules calcaires. Ces corpuscules sont des plaques ovales, allongées, munies à l'une des extrémités de leur grand axe d'un prolongement épineux, quelquefois très court et parfois bifide. La partie élargie du corpuscule présente un grand nombre de perforations entre lesquelles sont des tubercules ; les protubérances de la région moyenne de la plaque calcaire sont de plus grande dimension que ceux des extrémités.

Cucumaria leonina, Semper.

Voir pour la bibliographie :

1905. R. Perrier, *Holothuries antarctiques du Muséum d'histoire naturelle de Paris*, p. 25.
1906. E. Hérouard, *Holothuries de l'Expédition antarctique belge*, p. 11.

Station 118, Port William, Iles Falkland ; profondeur 6 brasses. Sept exemplaires.
Station 118, Port Stanley, Iles Falkland ; profondeur 4 brasses. Un exemplaire.

Les exemplaires provenant de Port William ont l'apparence de *Thyone* ; ils sont blanc rosé, fusiformes ; leur longueur varie de 40 à 60 millimètres et leur plus grand diamètre est compris entre 12 et 18 millimètres. Les pédicelles semblent répartis uniformément dans toute la région médiane ; pourtant certains échantillons montrent encore de nombreuses rangées alignées suivant les radius, mais vers la région tentaculaire l'on observe, chez tous les exemplaires, que deux rangées de pédicelles par radius.

L'exemplaire de Port Stanley est de couleur grisâtre ; il a 22 millimètres de longueur et 7 millimètres de diamètre ; ses dix tentacules, tous semblables, sont brunâtres ; les pédicelles du trivium sont disposés sur chaque radius suivant deux rangées plus ou moins alternantes ; sur la face dorsale ces appendices sont disséminés.

Tous les échantillons renferment les corpuscules typiques de la *Cucumaria leonina* : des plaques ovales perforées, couvertes de forts tubercules et terminées à l'une des extrémités par un processus épineux simplement perforé et des boucles régulières à

quatre orifices et pourvues d'une dizaine de gros tubercules. Les pédicelles ont des bâtonnets aplatis, perforés, recourbés en arc, à contours irréguliers et offrant en leur milieu un prolongement plus ou moins épineux.

Cucumaria insolens, Théel.

1886. Théel, *Reports of the "Challenger": Holothurioidea*, ii., p. 70.

Baie de Saldanha, Afrique du Sud ; profondeur 4 brasses. Quatre exemplaires.

Ces divers échantillons ont une longueur comprise entre 15 et 30 millimètres et leur diamètre varie entre 7 et 10 millimètres. Leur coloration est tantôt d'un blanc grisâtre uniforme ou bien elle est blanchâtre sur la face ventrale et d'un brun plus ou moins noirâtre sur la face dorsale. Le corps est parfois cylindrique avec les extrémités arrondies, quelquefois il offre une région ventrale aplatie en une sorte de sole rampante et une région caudale légèrement relevée vers la face dorsale.

La répartition des pédicelles est assez variable. Les trois radius du trivium possèdent toujours chacun une double rangée de pédicelles ; ceux-ci sont quelquefois de plus petite taille aux extrémités du corps que vers la région médiane. Sur la face dorsale ces pédicelles sont ou localisés sur les radius ou plus ou moins disséminés sur toute la surface.

Les gros corpuscules calcaires ovuliformes ne sont quelquefois surmontés que d'un très court prolongement épineux ; parfois celui-ci peut même faire complètement défaut. Nous constatons tous les termes de passage entre ces ovules et les coupes avec tubérosités.

Un des échantillons, par suite de l'esquisse d'une sole ventrale, a absolument l'allure d'un *Psolidium*, les autres se rapprocheraient plutôt des *Colochirus*.

Cucumaria psolidiformis, nov. sp. (Pl. II. fig. 17 et 18 ; Pl. IV. fig 51, 52 et 53.)

Station 325, Juin 1903, Baie de la Scotia, Orcades du Sud ; profondeur 10 brasses. Un exemplaire.

Cet unique exemplaire (fig. 17 et 18) mesure 35 millimètres de longueur ; il est presque cylindrique avec une face ventrale légèrement aplatie constituant une sole mal délimitée ; son plus grand diamètre est de 10 à 12 millimètres. L'extrémité postérieure est conique et présente l'anus à son sommet, l'extrémité antérieure est infléchie de telle sorte que l'ouverture buccale est tournée vers la région postérieure.

Le corps est couvert sur toute sa surface de petits pédicelles assez rapprochés les uns des autres. De gros pédicelles sont répartis le long de chaque radius ; leur disposition varie d'une région à l'autre. Sur le bivium, ces séries radiales s'étendent de la bouche à l'anus et renferment vingt-cinq pédicelles par radius disposés sur deux rangées alternantes.

Sur le trivium s'est constituée une sole : les rangées de gros pédicelles ne commencent qu'à 3 millimètres de la bouche et se terminent à 5 millimètres de l'anus ; suivant le radius médian, on compte vingt-quatre de ces appendices disposés sur deux rangées alternantes et sur chaque radius latéral on trouve une cinquantaine de pédicelles très rapprochés les uns des autres et placés sur une seule rangée ; pourtant cinq à six de ces appendices, échelonnés d'un côté de cette rangée, forment l'ébauche d'une rangée externe.

L'anus est bordé de cinq papilles. La couronne tentaculaire comprend dix tentacules jaunâtres munis de nombreuses arborescences ; les deux tentacules ventraux sont plus petits que les autres.

Les téguments sont minces, blanchâtres et transparents. Ils renferment d'assez nombreuses plaques calcaires (fig. 51), à contours irréguliers, percées de plusieurs ouvertures ; des tubercules arrondis sont disséminés sur les travées. Les petits pédicelles ont des plaques terminales réticulées et de petits bâtonnets incurvés (fig. 53). Les gros pédicelles possèdent des bâtonnets ramifiés (fig. 52) ou des plaques semblables à celles des parois du corps.

L'anneau calcaire est peu développé. Il se compose de dix pièces dont la hauteur est d'un millimètre et la largeur un demi-millimètre. Les radiales offrent une pointe médiane antérieure bifide ; les interradiales, légèrement plus petites, ont une pointe médiane simple. Les muscles rétracteurs s'insèrent vers le quart antérieur du corps.

L'unique vésicule de Poli est tubuleuse et mesure 3 à 4 millimètres de longueur. Les organes arborescents s'étendent jusqu'à la région antérieure du corps, ils se composent chacun d'un tube principal portant de distance en distance quelques ramifications de grande taille.

Rapports et Différences.—La présence de petits pédicelles disséminés sur tout le corps et la localisation de gros pédicelles suivant des rangées radiales, nous amène à considérer la *Cucumaria psolidiformis* comme se rattachant à l'ancien groupe des *Semperia*.

Cette espèce est intéressante, car, a priori, on pourrait la considérer comme un *Psolidium* par suite de la formation d'une sole ventrale à bords marqués simplement par les rangées latérales de pédicelles. Elle semble être un terme de transition entre les deux genres *Psolidium* et *Cucumaria*. Elle doit être comparée au *Psolidium convergens* (Hérouard) et à la *Cucumaria georgiana* Lampert.

La *C. psolidiformis*, ne possédant ni coupes treillissées, ni boucles à quatre mailles et son anus étant plutôt terminal, se sépare par suite des vrais *Psolidium*. Sa sole est encore moins marquée que chez le *Ps. convergens* (Hérouard), espèce dont elle se distingue d'ailleurs par la disposition des pédicelles et par la forme des corpuscules calcaires.

La forme des plaques calcaires des téguments peut permettre un rapprochement entre la *C. psolidiformis*, la *C. georgiana* Lampert et notre *C. lateralis* et *C. attenuata*, mais ces trois dernières espèces n'ont aucune sole ventrale.

Cucumaria conspicua, nov. sp. (Pl. II. fig. 15 et 16 ; Pl. V. fig. 67.)

Station 325, Mai 1903 ; Baie de la Scotia, Orcades du Sud ; profondeur 9 à 10 brasses. Un exemplaire.

Ce petit exemplaire a une coloration marron brunâtre, la face ventrale étant beaucoup plus claire que la région dorsale. Le corps (fig. 15 et 16) est ovale, avec une face dorsale fortement convexe et une région ventrale aplatie ; sa longueur est de 10 millimètres et sa plus grande largeur est de 6 millimètres. La bouche et l'anus sont terminaux.

A un premier examen, un peu superficiel, les pédicelles semblent seulement localisés sur les radius, certains atteignent un très grand développement et peuvent mesurer jusqu'à 5 millimètres de long. Ils présentent tous une plaque terminale de couleur foncée. Les pédicelles dorsaux sont moins nombreux et plus courts que les ventraux. Tandis que, sur chaque radius du bivium, nous comptons une dizaine d'appendices répartis sur deux rangées, alternant plus ou moins irrégulièrement l'une avec l'autre ; sur la face ventrale, le radius médian possède une vingtaine de pédicelles et chaque radius latéral en a une douzaine.

Un examen plus complet montre de nombreux petits appendices répartis sur tout le corps entre les pédicelles de grande taille ; mais ces appendices sont bien plus visibles sur la face dorsale que sur la face ventrale. Vers les extrémités anale et buccale, les papilles sont nombreuses et constituent des écailles s'imbriquant plus ou moins les unes sur les autres et terminée chacune par une petite pointe foncée.

Dans les parois du corps se trouvent des plaques calcaires (fig. 67) ovales, à contours irréguliers, à nombreuses perforations et présentant un prolongement muni de piquants. Dans les pédicelles nous n'avons jamais pu obtenir qu'un fragment de corpuscule.

Le pharynx est volumineux, ses muscles rétracteurs viennent s'insérer vers le tiers postérieur du corps. L'anneau calcaire est constitué par dix arceaux munis chacun d'un prolongement médian antérieur, plus fort dans les radiales que dans les interradiales.

L'unique tube madréporique est infléchi en avant. Les tubes génitaux simples brunâtres sont disposés en faisceaux.

Rapports et Différences.—La *Cucumaria conspicua* se rapproche de notre *C. psolidiformis*, car, comme celle-ci, elle est un terme de transition entre les *Psolidium* à sole ventrale peu différenciée et les *Cucumaria* du groupe des *Semperia*.

Les corpuscules calcaires de cette *Cucumaria* avec le prolongement épineux à l'une de leurs extrémités la rapprochent des *C. Steineni* Ludwig et *C. lævigata* Verrill, mais la présence de petites papilles entre les gros appendices l'en sépare complètement.

Cucumaria aspera, nov. sp. (Pl. I. fig. 12 ; Pl. IV. fig. 54, 55 et 56.)

Station 325, Avril 1903 ; Baie de la Scotia, Orcades du Sud ; profondeur 10 brasses. Un exemplaire.

Le corps (fig. 12) est légèrement incurvé ; il a une région centrale renflée et des extrémités légèrement atténuées. Il mesure 11 millimètres de longueur et 4 à 5 millimètres de plus grande largeur. Cet exemplaire est d'un marron jaunâtre avec une face dorsale plus foncée que la face ventrale. Toute la surface du corps est hérissée de piquants ayant l'aspect de villosités.

Les pédicelles sont localisés sur les radius en doubles rangées plus ou moins alternantes ; ils se détachent assez bien du fond par suite de leur coloration blanc jaunâtre ; dans certaines régions ils offrent deux tailles assez différentes. Le radius médian ventral renferme de vingt-trois à vingt-quatre pédicelles ; chaque radius latéral en possède une vingtaine et chacun des radius dorsaux un nombre beaucoup plus faible, une douzaine seulement. Les tentacules sont au nombre de dix ; ils sont blanc jaunâtre et présentent des ramifications très grêles ; les deux ventraux sont de plus petite taille que les autres.

Les téguments renferment de nombreux corpuscules calcaires s'imbriquant les uns sur les autres et disposés en deux couches. Ceux de la couche profonde sont des plaques ovales, à contours irréguliers (fig. 54) et à nombreuses perforations ; les corpuscules superficiels sont des tourelles (fig. 55). La base de ces tourelles est irrégulièrement ovalaire, percée d'un grand nombre d'ouvertures et supporte en son centre une tige massive présentant trois à quatre étages de perforations. Les pédicelles renferment des plaques (fig. 56) allongées, irrégulières, percées d'un grand nombre de perforations.

L'anneau calcaire est grêle et formé de dix pièces : les radiales sont quadrangulaires et échancrées en avant ; les interradiales sont triangulaires avec une pointe antérieure bien marquée.

Les muscles rétracteurs s'insèrent vers le milieu du corps ; l'extrémité fixée sur le pharynx est épaissie, celle fixée à la paroi est au contraire très grêle. La vésicule de Poli unique est tubulée et atteint 5 à 6 millimètres de longueur. Il n'existe qu'un canal madréporique qui est infléchi en arrière. L'intestin a un aspect moniliforme. Les organes génitaux sont formés de deux faisceaux d'une dizaine de tubes simples placés dans la région moyenne du corps.

Rapports et Différences.—La *Cucumaria aspera* se rapproche des *C. chiloensis* Ludwig et *C. tubulifera* R. Perrier par suite de ses corpuscules calcaires en forme de tourelles, mais la base irrégulière et la tige massive de ses corpuscules la distingue de ces deux espèces.

Cucumaria croceoïda, nov. sp. (Pl. V. fig. 64, 65 et 66.)

Station 346, 1er Décembre 1903 ; Banc de Burdwood, lat. S. 54° 25′, long. W. 57° 32′ : profondeur 56 brasses. Un exemplaire.

Cet exemplaire est en mauvais état, la majeure partie des tégnments sont pelés. Il est ovoïde et de couleur blanchâtre. Il mesure 25 millimètres de longueur et 14 millimètres de diamètre. D'après l'examen des quelques parties intactes la répartition des pédicelles rappelle celle de la *Cucumaria crocea*. Les radius dorsaux paraissent avoir trois à quatre rangées de nombreux pédicelles très courts et peu saillants, tandis que les radius ventraux et peut-être les interradius du trivium possèdent des pédicelles de grande taille munis d'une plaque terminale. Les tentacules, au nombre de dix, sont tous semblables.

Les téguments renferment de nombreux corpuscules calcaires ayant des formes assez variées mais se rattachant les unes aux autres. Certains de ces corpuscules (fig. 66) sont des bâtonnets à surface épineuse ou mamelonnée et dont les extrémités aplaties et élargies ont un certain nombre de perforations, entre lesquelles sont disséminés quelques tubercules. D'autres (fig. 65) ont la forme de plaques ovales à contours irréguliers et présentant de nombreuses perforations dont les plus grandes sont situées dans la région médiane. On trouve tous les termes de passage entre ces deux sortes de corpuscules. Les plaques terminales des pédicelles ventraux (fig. 64) sont convexes, à nombreuses perforations, entre lesquelles sont disséminés un grand nombre de mamelons.

Les muscles longitudinaux sont légèrement jaunâtres et ont un millimètre de largeur. La vésicule de Poli unique a 10 millimètres de longueur. Le canal du sable offre quelques circonvolutions et est dirigé en avant. L'anneau calcaire est composé de dix pièces d'un millimètre de largeur et ne possédant chacune qu'un prolongement médian antérieur ; le prolongement des pièces interradiales est plus grêle que celui des parties radiales. Les organes génitaux se composent de deux faisceaux de nombreux tubes jaunâtres, simples et moniliformes. Les organes arborescents sont grêles et à parois minces.

Rapports et Différences.—La *Cucumaria croceoïda* rappelle beaucoup la *C. crocea* Lesson ; mais les pédicelles des radius dorsaux forment des rangées plus nombreuses que dans la *C. crocea*, les interradius paraissent posséder quelques pédicelles et de plus ses téguments renferment de nombreux corpuscules calcaires.

Cucumaria armata, nov. sp. (Pl. V. fig. 57 et 58.)

Janvier 1903, Port William, Iles Falkland ; profondeur 6 brasses. Un exemplaire.

Le corps est ovale, un peu incurvé, avec une face dorsale bombée et une face ventrale légèrement concave. La bouche et l'anus sont terminaux. Cet exemplaire

mesure 24 millimètres de longueur et 9 millimètres de plus grande largeur ; sa coloration est blanchâtre.

Le radius médian ventral fait saillie et sur toute sa longueur se trouvent répartis une cinquantaine de pédicelles, disposés sur une seule rangée dans la région antérieure et en deux rangées irrégulièrement alternantes sur la plus grande partie du radius. Les radius latéro-ventraux présentent une disposition des pédicelles à peu près semblable à celle du radius médian, mais peut-être un peu moins nette.

Toute la face dorsale est hérissée de papilles très nombreuses ; en certains points on distingue par transparence les muscles longitudinaux.

Les téguments sont minces et plus ou moins transparents ; ils renferment de grandes plaques épaisses à contours irréguliers et à nombreuses perforations (fig. 57). Dans les espaces interradiaux du trivium ces plaques sont imbriquées les unes sur les autres. Les corpuscules calcaires des pédicelles (fig. 58) sont des bâtonnets à extrémités ramifiées, pouvant se réunir parfois pour constituer des plaques binoculaires à nombreux tubercules.

L'anneau calcaire est grêle ; il se compose de dix pièces en arceaux présentant chacune en avant une pointe médiane échancrée ; les pièces radiales sont un peu plus fortes que les interradiales. Les muscles rétracteurs s'insèrent au tiers antérieur du corps. La vésicule de Poli est unique. Les organes génitaux se composent de deux faisceaux de tubes simples, noirâtres, placés dans le tiers antérieur du corps.

Rapports et Différences.—La *Cucumaria armata* rappelle le genre *Colochirus* par la disposition des pédicelles du trivium en rangées radiales, tandis que ceux du bivium sont disséminés sur toute la surface dorsale, mais elle ne possède pas une région buccale pentaradiée et elle n'a qu'une seule sorte de corpuscules dans ses téguments. La présence de grandes plaques calcaires à contours irréguliers la sépare de la *Cucumaria georgiana* Lampert et de nos *Cucumaria lateralis* et *attenuata*. Elle présente aussi quelques affinités avec les *Psolidium*.

Cucumaria analis, nov. sp. (Pl. V. fig. 63.)

Station 326, 5 au 26 Décembre 1904 ; Baie Jessie, Orcades du Sud ; profondeur 10 brasses. Six exemplaires.

Les dimensions de ces divers échantillons varient entre 5 et 25 millimètres de longueur et 3 à 15 millimètres de diamètre. Leur corps est ovale, blanchâtre. Les pédicelles sont localisés sur les radius, où ils sont disposés suivant deux rangées par radius. Chaque rangée comprend une vingtaine de pédicelles et vers le milieu du corps, en certains points, elle présente un dédoublement. Chez un jeune échantillon, nous ne trouvons dans certaines régions qu'une unique rangée radiale. L'anus est bordé de cinq ou dix petits pédicelles. Les tentacules, au nombre de dix, sont tous semblables et possèdent des ramifications latérales assez importantes.

Les corpuscules calcaires (fig. 63) sont des plaques ovales, à contours irréguliers et présentant de nombreuses perforations. Dans les grands échantillons, ces plaques sont incurvées. Leur réseau présente parfois à la surface quelques tubercules peu saillants.

L'anneau calcaire est composé de dix pièces en chevrons, à pointe médiane antérieure bifide ; les parties radiales sont un peu plus fortes que les parties interradiales.

Les muscles rétracteurs s'insèrent vers le milieu du corps. L'unique vésicule de Poli a 5 millimètres de longueur. Les glandes génitales sont composées de deux faisceaux de tubes simples.

Rapports et Différences.—Cette *Cucumaria analis* est du groupe de la *C. georgiana* Lampert. La répartition des pédicelles le long des radius, la présence de cinq à dix pédicelles périanaux et la forme des corpuscules calcaires la séparent nettement des autres espèces de ce groupe. Par la disposition des pédicelles, la *C. analis* rappelle notre *C. antarctica*, mais elle s'en distingue par la forme des corpuscules calcaires.

Cucumaria periprocta, nov. sp. (Pl. V. fig. 62.)

Station 325, Avril 1903 ; Baie de la Scotia, Orcades du Sud ; profondeur 9 à 10 brasses. Un exemplaire.

Le corps est obovale avec l'extrémité antérieure élargie et l'extrémité postérieure tronquée. Il mesure 10 millimètres de longueur et 5 millimètres de plus grande largeur. Sa coloration générale est marron jaunâtre ; la face dorsale est de teinte un peu plus foncée que la face ventrale.

Les pédicelles sont localisés sur les radius, où ils sont disposés en deux rangées alternantes dans lesquelles on distingue de gros et de petits appendices, ces derniers étant quelquefois peu visibles. Des séries de cercles concentriques de petites papilles sont disposées de distance en distance autour de l'anus.

Les téguments renferment des plaques calcaires à contours irréguliers et à nombreuses perforations ; sur les travées sont disséminés de distance en distance des tubercules ou des piquants. Dans les pédicelles nous trouvons des plaques terminales et de petites plaques latérales assez semblables à celles des parois du corps.

L'anneau calcaire est composé de dix arceaux simples. Les muscles rétracteurs s'insèrent vers le tiers antérieur du corps. On trouve une seule vésicule de Poli.

Rapports et Différences.—La *Cucumaria periprocta* appartient encore au groupe de la *C. georgiana* Lampert. Elle se distingue de cette espèce par le petit nombre de pédicelles de chaque radius et par ses plaques calcaires fortes et à grand nombre de perforations. La présence de cercles concentriques de petites papilles périanales et la disposition des pédicelles la caractérisent très nettement et la séparent de nos *C. lateralis*, *C. attenuata* et *C. analis*.

Cucumaria perfida, nov. sp. (Pl. V. fig. 59 et 60.)

Station 325, Avril 1903 ; Baie de la Scotia, Orcades du Sud ; profondeur 9 à 10 brasses. Un exemplaire.

Cet exemplaire est de petite taille : il mesure 6 millimètres de longueur et 2·5 millimètres de largeur. Sa coloration est blanchâtre. Son corps est ovale, presque cylindrique, il est légèrement incurvé.

La couronne tentaculaire est épanouie ; elle se compose de dix tentacules allongés, dont les deux ventraux sont réduits à l'état de moignons. Les pédicelles sont localisés sur les radius. Chaque radius en renferme de huit à dix, disposés suivant deux rangées plus ou moins alternantes ne commençant qu'à une certaine distance de la région antérieure. Les appendices du bivium paraissent de plus petite taille que la plupart de ceux du trivium.

Les téguments sont rigides ; ils renferment de nombreuses plaques imbriquées les unes sur les autres et présentant chacune un grand nombre de perforations (fig. 59). Les pédicelles possèdent des bâtonnets aplatis (fig. 60) n'ayant qu'une seule perforation.

L'anneau calcaire se compose de dix arceaux. Il nous a été impossible de voir d'autres détails de l'organisation interne.

Rapports et Différences.—La *Cucumaria perfida* appartient aussi au groupe de *Cucumaria* antarctiques dont le type est la *C. georgiana* Lampert. Elle se distingue de cette espèce par le petit nombre de pédicelles de chaque radius et par ses plaques calcaires percées d'un grand nombre d'ouvertures et dépourvues de tubercules.

Si on la compare à notre *C. attenuata*, on voit qu'elle s'en distingue par la disposition des pédicelles et par ses corpuscules calcaires pourvus d'un grand nombre de petites perforations.

Cucumaria secunda, nov. sp. (Pl. V. fig. 61.)

Station 325, Mai 1903 ; Baie de la Scotia, Orcades du Sud ; profondeur 9 à 10 brasses. Un exemplaire.

Cet exemplaire est bien épanoui. Il mesure 50 millimètres de longueur et 20 millimètres de plus grand diamètre. Le corps est cylindrique avec la région postérieure distendue et arrondie, tandis que la partie antérieure est plus ou moins plissée. La coloration générale est blanchâtre.

Les pédicelles sont localisés sur les radius en rangées qui ne débutent qu'à 10 millimètres en arrière de la couronne tentaculaire et qui s'arrêtent à 5 millimètres de l'anus. Le radius médian ventral renferme une cinquantaine de pédicelles répartis pour la plupart en deux rangées plus ou moins alternes ; quelques-uns de ces appendices sont placés en dehors de ces rangées. Dans les radius latéro-ventraux, les pédicelles sont

disposés, en avant et en arrière, suivant deux rangées ; mais dans la région moyenne ils sont placés sur quatre rangées.

Les radius dorsaux offrent quatre à six rangées de pédicelles sur la plus grande partie de leur longueur, sauf pourtant aux extrémités antérieure et postérieure. L'interradius dorsal est par suite couvert de pédicelles sur un centimètre de longueur dans sa région moyenne. L'anus est entouré par de petits pédicelles.

La couronne tentaculaire se compose de dix tentacules, dont les deux ventraux sont plus petits que les autres et ne présentent à leur sommet que deux branches terminales munies chacune de quelques ramifications. La papille génitale fait saillie dans le cercle tentaculaire.

Les téguments renferment des plaques (fig. 61) imbriquées les unes sur les autres, à contours irréguliers et présentant huit à dix perforations. Un petit mamelon se trouve au centre de certaines de ces plaques. Ces corpuscules calcaires sont surtout abondants dans les pédicelles.

L'anneau calcaire se compose de dix arceaux de 5 millimètres de largeur. Chaque arceau présente une pointe médiane, de 5 millimètres, dirigée en avant ; cette pointe est simple dans les pièces interradiales et bifide pour les radiales.

Les muscles rétracteurs sont grêles et s'insèrent sur le milieu du corps. La vésicule de Poli, unique, a 5 à 6 millimètres de longueur. Les organes génitaux sont formés de deux faisceaux de tubes simples, de couleur blanc jaunâtre, atteignant 20 à 30 millimètres de longueur.

Rapports et Différences.—La *Cucumaria secunda* appartient au groupe des *C. georgiana* Lampert, *C. lateralis* Vaney et *C. attenuata* Vaney, dont les corpuscules calcaires sont des plaques perforées sans prolongement épineux. Dans cette nouvelle espèce les plaques sont nombreuses et imbriquées les unes sur les autres ; elles ressemblent un peu à celles décrites chez la *C. pithacnion* Lampert (= *C. georgiana* Lampert), mais elles n'offrent qu'un seul tubercule central. D'ailleurs la disposition des pédicelles est différente de celle de la *C. georgiana* et l'anneau calcaire est bien plus fort que celui de cette espèce. Cette *C. secunda* présente quelques caractères communs avec notre *C. analis*, mais leurs corpuscules calcaires sont différents et la disposition des pédicelles n'est pas la même dans ces deux espèces ; d'ailleurs la *C. analis* a ses tentacules tous semblables, tandis que dans la *C. secunda* la couronne tentaculaire présente deux tentacules ventraux plus petits que les autres.

EXPLICATION DES PLANCHES.

Planche I.

Fig. 1. *Benthodytes spuma*, nov. sp. Face ventrale. Réduct. = $\frac{1}{2}$ env.
Fig. 2. *Benthodytes Browni*, nov. sp. Face dorsale. Réduct. = $\frac{1}{2}$.
Fig. 3. „ „ Face ventrale. Réduct. = $\frac{1}{2}$.
Fig. 4. *Peniagone Piriei*, nov. sp. Face ventrale. Réduct. = $\frac{1}{2}$.
Fig. 5. „ „ Vue de profil. Réduct. = $\frac{1}{2}$.
Fig. 6. *Peniagone Wiltoni*, nov. sp. Face ventrale. Réduct. = $\frac{1}{2}$.
Fig. 7. „ „ Région antérieure de la face dorsale. Gr. = 1.
Fig. 8. *Euphronides Scotiæ*, nov. sp. Face dorsale. Réduct. = $\frac{1}{2}$.
Fig. 9. „ „ Face ventrale. Réduct. = $\frac{1}{2}$.
Fig. 10. *Peniagone Mossmani*, nov. sp. Face ventrale. Réduct. = $\frac{1}{2}$.
Fig. 11. „ „ Région antérieure vue de profil. Gr. = 1.
Fig. 12. *Cucumaria aspera*, nov. sp. Vue de profil. Gr. = 2 env.
Fig. 13. *Psychropotes Brucei*, nov. sp. Région antérieure de la face dorsale. Réduct. = $\frac{1}{2}$.

Planche II.

Fig. 14. *Psychropotes laticauda*, nov. sp. Face ventrale. Réduct. = $\frac{1}{2}$.
Fig. 15. *Cucumaria conspicua*, nov. sp. Face dorsale. Gr. = 2 env.
Fig. 16. „ „ Face ventrale. Gr. = 2 env.
Fig. 17. *Cucumaria psoliidiformis*, nov. sp. Vue de profil. Gr. = $\frac{1}{2}$.
Fig. 18. „ „ Face ventrale. Gr. = $\frac{1}{2}$.
Fig. 19. *Peniagone Mossmani*, nov. sp. Région antérieure de la face dorsale. Réduct. = $\frac{3}{4}$.
Fig. 20. *Benthodytes spuma*, nov. sp. Région antérieure de la face dorsale. Réduct. = $\frac{1}{2}$.
Fig. 21. *Psychropotes Brucei*, nov. sp. Face ventrale. Réduct. = $\frac{1}{2}$.
Fig. 22. „ „ Région caudale vue de profil. Réduct. = $\frac{1}{2}$.
Fig. 23. *Benthodytes recta*, nov. sp. Face dorsale. Réduct. = $\frac{1}{2}$.
Fig. 24. *Psychropotes laticauda*, nov. sp. Corpuscules cruciformes à quatre ou cinq branches. Gr. = 300.

Planche III.

Fig. 25. *Scotoplanes globosa*, Théel. Bâtonnet épineux de grande taille. Gr. = 180.
Fig. 26. „ „ Bâtonnets épineux de petite taille. Gr. = 180.
Fig. 27. „ „ Corpuscule en C. Gr. = 130.
Fig. 28. „ „ Corpuscule mamelonné. Gr. = 180.
Fig. 29. *Peniagone Wiltoni*, nov. sp. Corpuscule tétraradié muni de mamelon. Gr. = 300.
Fig. 30. „ „ Corpuscule tétraradié, vu de face. Gr. = 300.
Fig. 31. „ „ Bâtonnet épineux. Gr. = 300.
Fig. 32. *Peniagone Mossmani*, nov. sp. Corpuscules cruciformes, vus de face. Gr. = 180.
Fig. 33. „ „ Corpuscule cruciforme, vu de profil. Gr. = 180.
Fig. 34. *Synallactes Robertsoni*, nov. sp. Base du corpuscule calcaire, vue de face. Gr. = 300.
Fig. 35. „ „ Corpuscule vu de profil. Gr. = 300.
Fig. 36. „ „ Bâtonnets des pédicelles. Gr. = 180.
Fig. 37. *Benthodytes recta*, nov. sp. Corpuscule cruciforme. Gr. = 300.
Fig. 38. „ „ Bâtonnets des tentacules. Gr. = 67.
Fig. 39. *Euphronides Scotiæ*, nov. sp. Corpuscules tri- et tétraradiés vus de face. Gr. = 180.
Fig. 40. „ „ Corpuscule vu de profil. Gr. = 180.
Fig. 41. *Psychropotes Brucei*, nov. sp. Corpuscule vu de profil. Gr. = 180.
Fig. 42. „ „ Corpuscules tétraradiés vus de face. Gr. = 180.

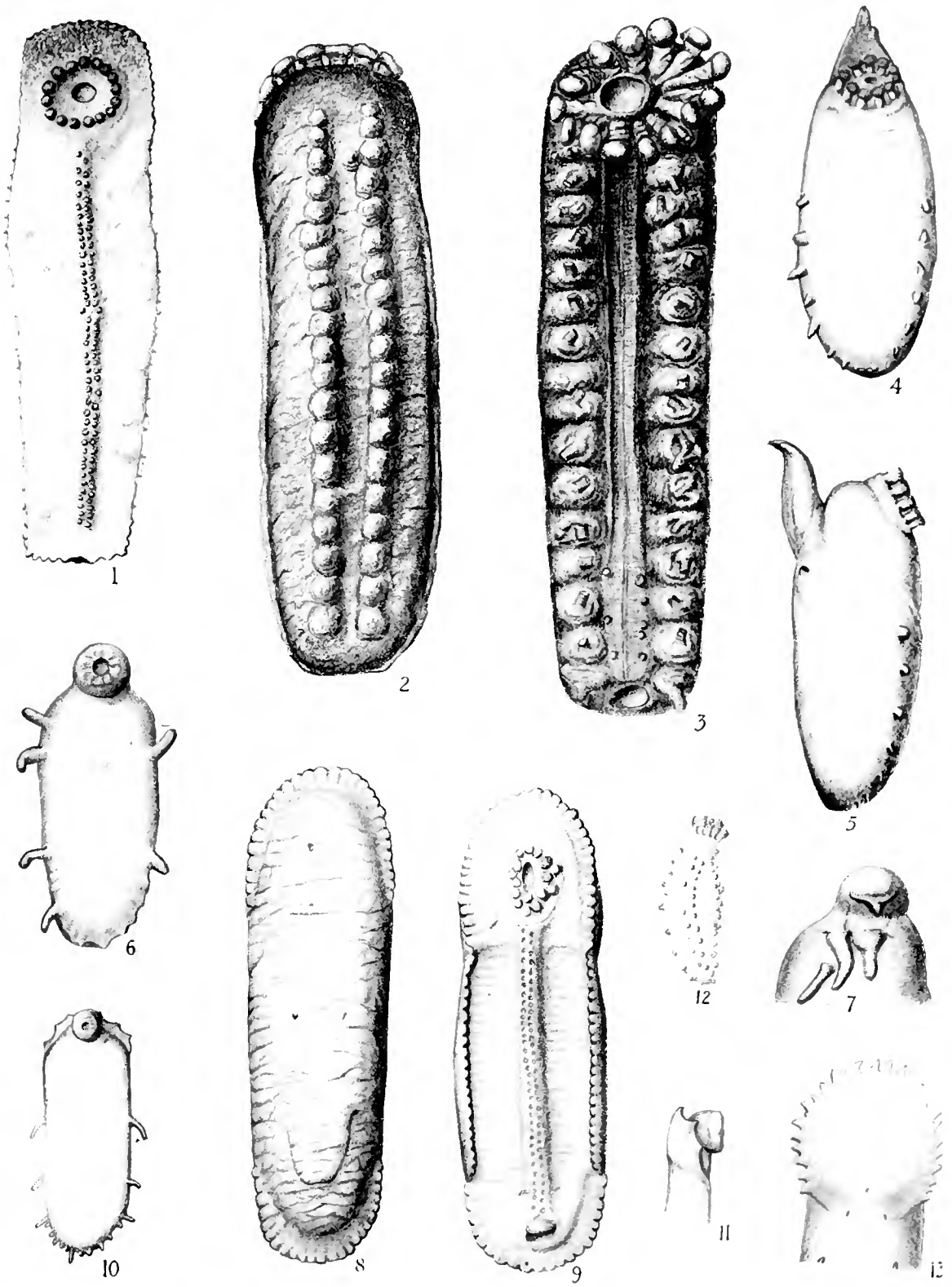
Planche IV.

Fig. 43. *Thyone articulata*, nov. sp. Corpuscules calcaires des téguments. Gr. = 300.
Fig. 44. ,, ,, Anneau calcaire. Gr. = 3.
Fig. 45. *Cucumaria grandis*, Vaney. Corpuscules des téguments vus de face. Gr. = 180.
Fig. 46. ,, ,, Corpuscule des téguments vu de profil. Gr. = 180.
Fig. 47. *Psolidium Coatsi*, nov. sp. Plaques calcaires de la paroi ventrale du corps. Gr. = 180.
Fig. 48. ,, ,, Corpuscules aborescents de la paroi dorsale. Gr. = 180.
Fig. 49. ,, ,, Plaque de la paroi dorsale du corps. Gr. = 180.
Fig. 50. ,, ,, Corpuscules des pédicelles ventraux. Gr. = 180.
Fig. 51. *Cucumaria psolidiformis*, nov. sp. Plaque des parois du corps. Gr. = 180.
Fig. 52. ,, ,, Corpuscules des gros pédicelles. Gr. = 180.
Fig. 53. ,, ,, Plaque terminale et bâtonnet des petits pédicelles. Gr. = 180.
Fig. 54. *Cucumaria aspera*, nov. sp. Corpuscules de la couche profonde des téguments. Gr. = 180.
Fig. 55. ,, ,, Corpuscules de la couche superficielle des téguments. Gr. = 180.
Fig. 56. ,, ,, Corpuscules des pédicelles. Gr. = 180.

Planche V.

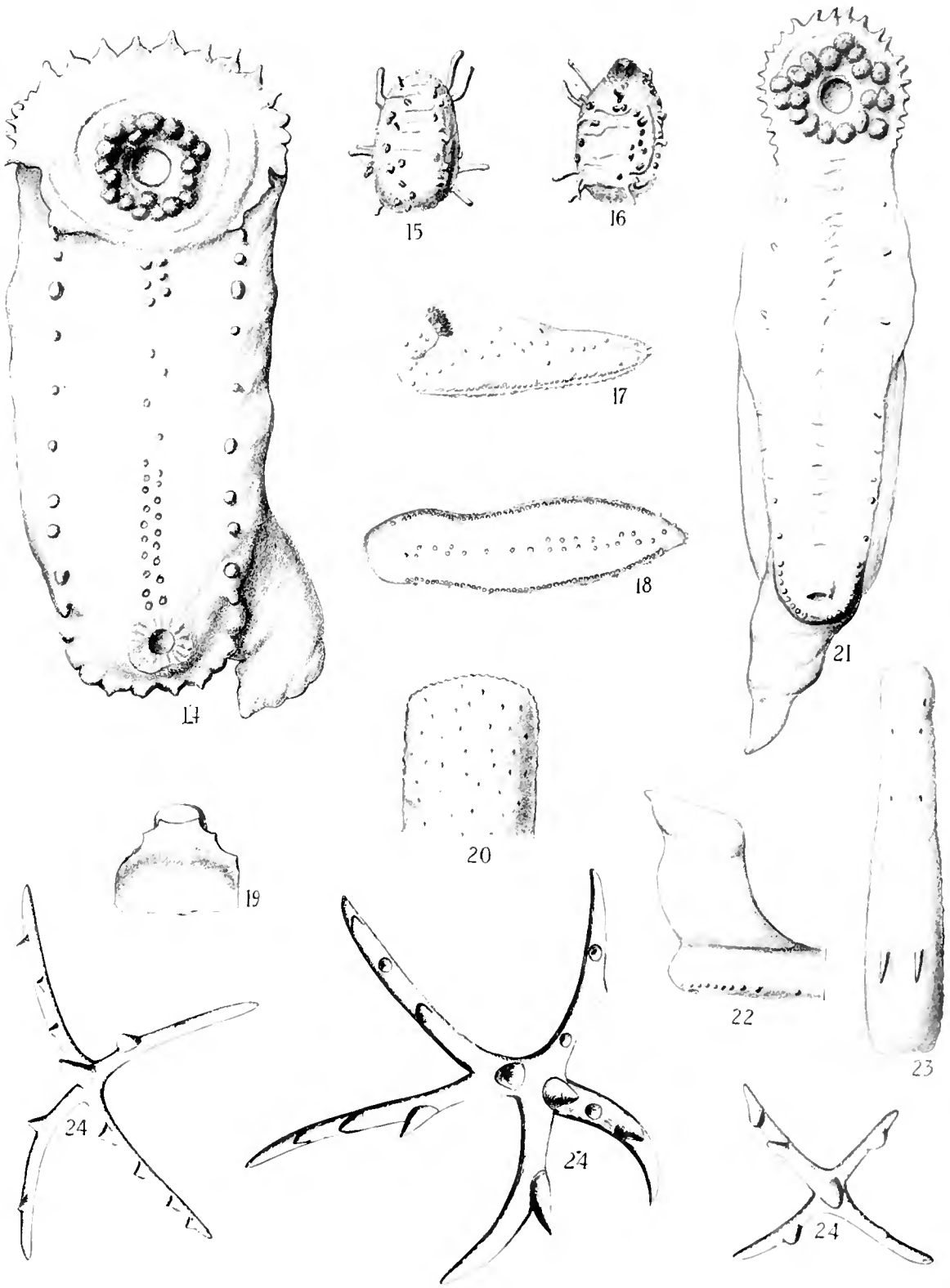
Fig. 57. *Cucumaria armata*, nov. sp. Corpuscules des téguments. Gr. = 180.
Fig. 58. ,, ,, Corpuscules des pédicelles. Gr. = 180.
Fig. 59. *Cucumaria perfida*, nov. sp. Corpuscules des téguments. Gr. = 180.
Fig. 60. ,, ,, Corpuscule des pédicelles. Gr. = 300.
Fig. 61. *Cucumaria secunda*, nov. sp. Corpuscules des téguments. Gr. = 180.
Fig. 62. *Cucumaria periprocta*, nov. sp. Corpuscules des téguments. Gr. = 180.
Fig. 63. *Cucumaria analis*, nov. sp. Plaques des téguments. Gr. = 180.
Fig. 64. *Cucumaria crocoïda*, nov. sp. Plaque terminale des pédicelles ventraux. Gr. = 180.
Fig. 65. ,, ,, Plaque ovale et perforée des téguments. Gr. = 300.
Fig. 66. ,, ,, Bâtonnets aplatis des téguments. Gr. = 300.
Fig. 67. *Cucumaria conspicua*, nov. sp. Plaques des téguments. Gr. = 180.

Vaney : Les Holothuries de l'Expédition Antarctique Nationale Écossaise.—Planche I.



C. Vaney : del.

VANEY: Les Holothuries de l'Expédition Antarctique Nationale Écossaise.—PLANCHE II.



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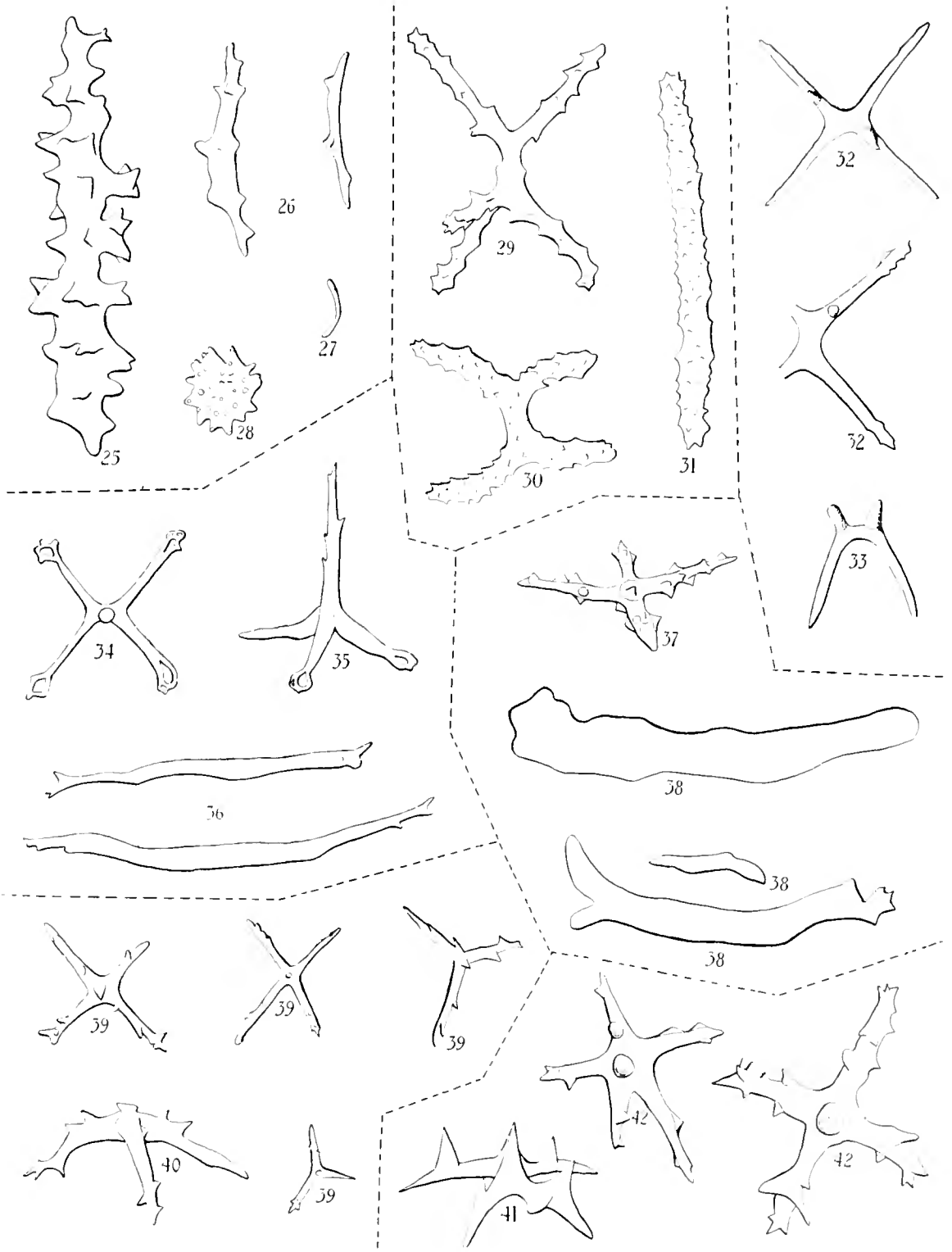

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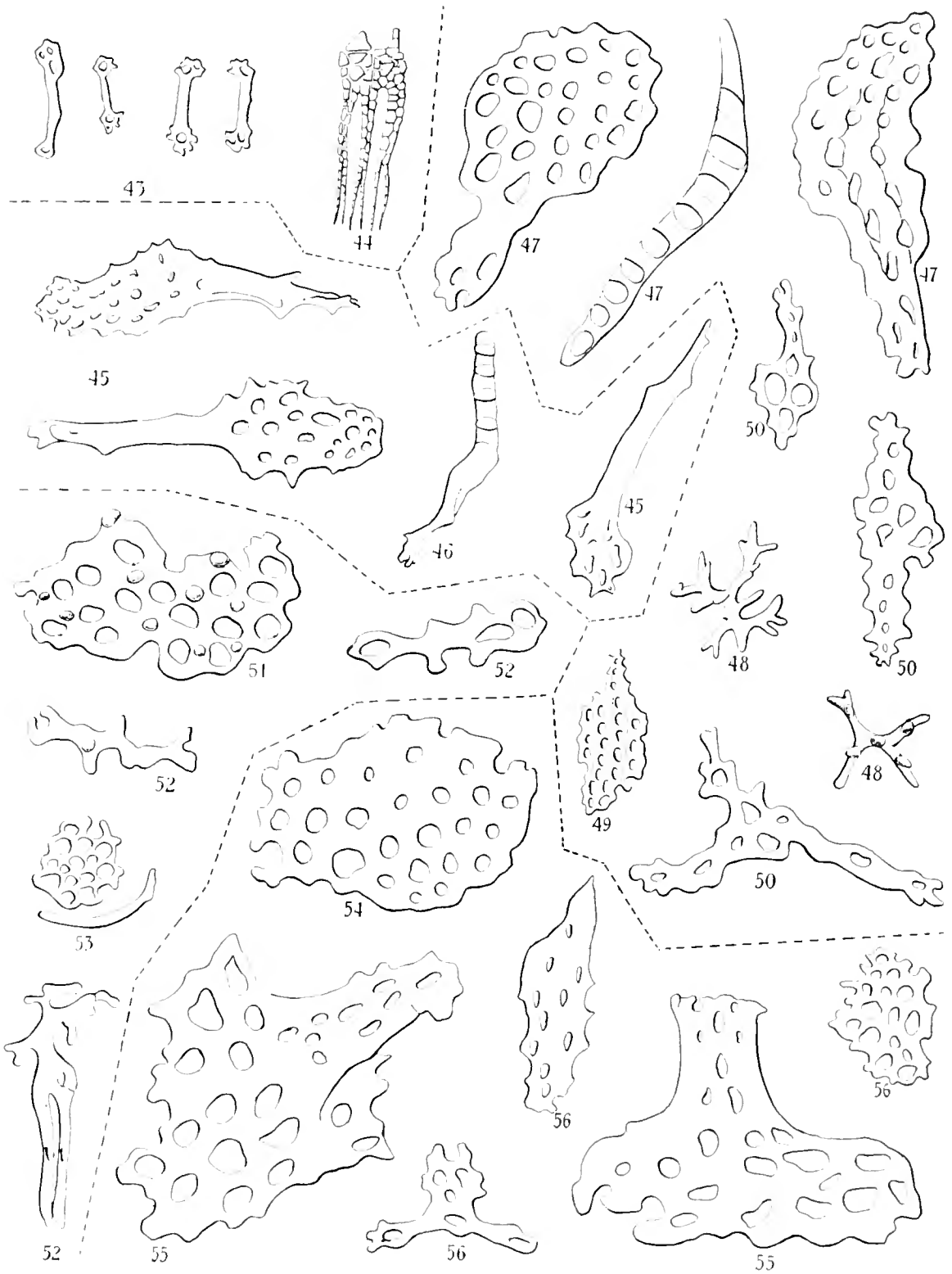
VANEY : Les Holothuries de l'Expédition Antarctique Nationale Écossaise.—PLANCHE IV.



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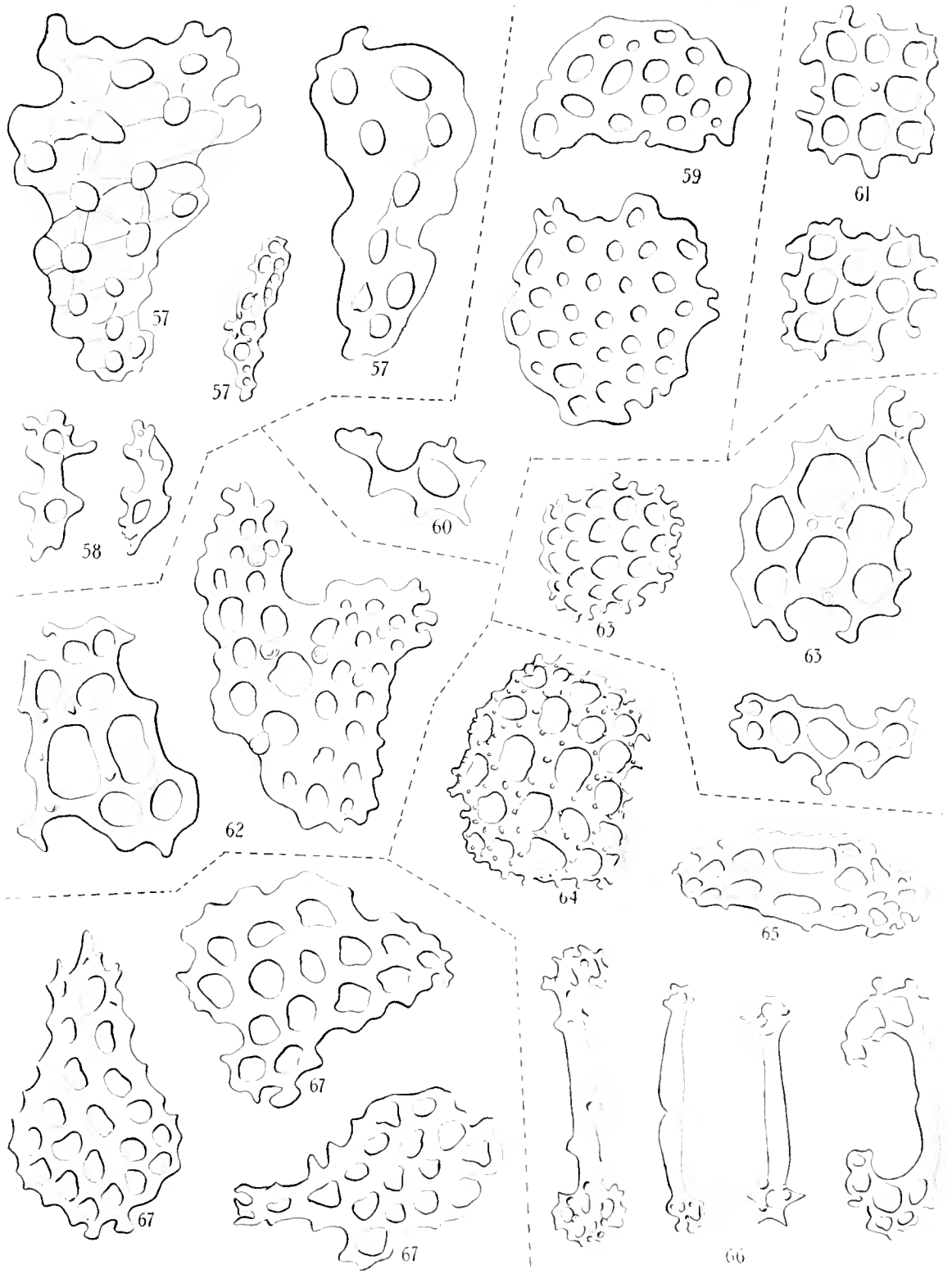
VANEY : Les Holothuries de l'Expédition Antarctique Nationale Écossaise.—PLANCHE V.



C. Vaney : del.

PART II.

HYDROIDS.

(*SUPPLEMENT.*)

II.—THE HYDROIDS OF THE SCOTTISH NATIONAL ANTARCTIC EXPEDITION.

By JAMES RITCHIE, M.A., B.Sc.,
Natural History Department, The Royal Scottish Museum, Edinburgh.

(SUPPLEMENT.)

Supplementary Report on the Hydroids of the Scottish National Antarctic Expedition.

By James Ritchie, M.A., B.Sc., Natural History Department, The Royal Scottish Museum. *Communicated by* W. S. Bruce, LL.D.

(MS. received December 8, 1908. Read January 4, 1909. Issued separately May 27, 1909.)

Since the report on the Hydroids collected by the *Scotia* was completed, almost three years ago, I have had an opportunity, thanks to the kindness of Dr W. S. Bruce, of looking through the enormous mass of material brought together by him during his Antarctic voyages. The search, begun in the hope of finding a few minute species which, since many are epizoic on other forms of marine life, might readily be overlooked on cursory examination—has resulted in the addition of no less than 25 forms to the 36 already recorded. Deducting from this total of 61 forms two varieties, it appears that the *Scotia* collection contains in all 59 distinct species. Few, indeed, of these have been obtained in truly Antarctic latitudes—subantarctic or temperate seas having furnished the greater number—but this result is in accordance with the findings of the majority of the recent Antarctic expeditions.* Dr Billard, in summarising the results of the Belgian, Swedish, and French expeditions, states that the known Hydroid fauna of Antarctic regions comprises only 32 species. But from his list he has, I think unjustly, excluded South Georgian records. His list, moreover, published before the valuable paper by Professor Hickson and Mr Gravely on the *Discovery* Hydroids was issued, necessarily makes no reference to the large number of forms recorded by them from Victoria Land.

The following figures indicate the wealth in species of the Hydroid fauna of Antarctic seas, the Antarctic area being defined as the region lying in "higher southern latitudes than the extreme limit of floating ice, according to the most recent research" (Bruce, 1894, p. 208); that is, an area corresponding to the Antarctic Circumpolar Subregion of Ortmann (1906). To this region belong the 14 species collected by the Belgian expedition (Hartlaub, 1904), 24 of the Swedish collection of 50 species (Jäderholm, 1905), the 8 species of the French expedition (Billard, 1906, (2)), and 24 of the 25 English records (Hickson and Gravely, 1907). From the same area the *Scotia* obtained only 9 species, although some of the most fruitful stations, Burdwood Bank, the Falkland Islands, and Gough Island, lay just beyond its boundary. Extracting the distinct species from those lists, we find that their number amounts to 68.

The Hydroid Zoophytes, then, are represented in the Antarctic circumpolar seas,

* The report on the Hydroids of the German expedition has not yet been published.

(REPRINTED FROM THE TRANSACTIONS OF THE ROYAL SOCIETY OF EDINBURGH, VOL. XLVII., PP. 65–101.)

according to our present knowledge, by 68 different species, 21 of which are Gymnoblasts, 47 Calyptoblasts, while of the total, 36 must, so far, be regarded as peculiar to the Antarctic region. As regards the number of individuals as distinct from variety of species, recent results indicate that the area is a thinly populated one, for comparatively few Hydroids were brought up in any one haul of trawl or dredge, a strong contrast to the abundance of tangled masses which occur in such temperate areas as the North Sea. On the whole, the Antarctic Hydroid fauna may be looked upon as a rather meagre one, comprising comparatively few species belonging to well-established genera.

From the point of view of geographical distribution the collection to be described is of a miscellaneous character, for Dr BRUCE collected material on his outward and homeward voyages as well as at his southern stations. Thus specimens from tropical seas—from the Cape Verde Islands, from Brazil, and from St Helena—are recorded alongside specimens from subantarctic and Antarctic localities, but so little is known regarding the Hydroid fauna of those places that it seemed better to include them here, at the same time furnishing a record of all the Hydroids brought together by the *Scotia*.

Two species, *Thyroscyphus tridentatus* and *Plumularia lagenifera*, hitherto recorded only from the South and North Pacific respectively, have been found in the South Atlantic, while the known ranges of several other species have been considerably extended.

Of new forms there have been described the trophosome and gonangium of *Sertularia heterodonta* from off Brazil, the trophosomes of *Antenella quadriaurita* from Gough Island, and of a variety of *Lafoëa gracillima* from deep water to the south of the South Orkneys, while the gonangia of *Sertularia rathbuni* and *Antennopsis scotiæ* have been described for the first time.

Some additions have been made to the existing descriptions of rare species, and noteworthy variations have been recorded in the hope that the realisation of the considerable limits within which variation is possible may tend to the better understanding of reliable specific characters.

I gladly seize this opportunity of setting right several unfortunate errors which occurred in the earlier report on the *Scotia* Hydroids. There should be substituted HINCKS for HINKS, LAMARCK for LAMARK, JOHNSTON for JOHNSTONE, and *Halecium* for *Hudecium* on p. 523. *Aglaophenia dichotoma* of the former report I now identify with *A. heterodonta*, Jäderholm (*infra*, p. 74).

In the following list, which takes the place of that in the original report, I have included all the species collected by the Scottish expedition, those discussed in the present paper being indicated by an asterisk:—

GYMNOBLASTEA.

Family Podocorynidæ.

Podocoryne carnea, Sars, 1846.

Family Myriothelidæ.

* *Myriothela austro-georgiæ*, Jäderh., 1904, p. 47.

Family Eudendridæ.

* *Eudendrium annulatum* (?), Norman, 1864, p. 48.

Family Atractylidæ.

* *Perigonimus repens* (?), (Wright, 1858), p. 48.

CALYPTOBLASTEA.

Family Halecidæ.

Halecium arboreum, Allman, 1888.
(= ,, *robustum*, Allman, 1888.)
,, *beanii* (Johnston, 1838).
Halecium halecinum (Linn., 1758).
,, *interpolatum*, Ritchie, 1907, (1).
,, *tenellum*, Hincks, 1861.

Family Campanularidæ.

* *Clytia johnstoni* (Alder, 1857), p. 49.
Campanularia angulata, Hincks, 1861.
* ,, *clytioides* (Lamx., 1824), p. 49.
,, *tincta*, Hincks, 1861.
,, sp., Ritchie, 1907, (1).
* *Obelia geniculata* (Linn., 1758), p. 50.
* ,, *hyalina*, Clarke, 1879, p. 50.
* ,, *longissima* (Pallas, 1766), p. 50.
* *Eucopella crenata* (?), Hartlaub, 1901, p. 51.
Silicularia hemisphærica (Allman, 1888).
Hebella striata, Allman, 1888.
,, ,, var. *plana*, Ritchie, 1907, (1).
Calycella syringa (Linn., 1758).
* *Campanulina chilensis*, Hartlaub, 1905, p. 52.
* *Thyroscyphus tridentatus* (Bale, 1893), p. 52.

Family Lafoëidæ.

Lafoëa antarctica, Hartlaub, 1905.
,, *gracillima* (Alder, 1857).
* ,, ,, var. *benthophila*, n. var., p. 54.
Grammaria magellanica, Allman, 1888.
Brucella armata, Ritchie, 1907, (1).

Family Sertularidæ.

Sertularella arborea, Kirchenpauer, 1884.
,, *contorta*, Kirchenpauer, 1884.
,, *filiformis*, var. *reticulata*, Ritchie, 1907, (1).
* ,, *fusiformis* (?), Hincks, 1861, p. 55.
* ,, *gayi* (Lamx., 1821), p. 56.
,, *rectitheca*, Ritchie, 1907, (1).
,, *tenella* (Alder, 1857).
,, *tricuspidata* (Alder, 1856).
* *Sertularia cornicina* (M'Crady, 1859), p. 56.
* ,, *heterodonta*, n. sp., p. 57.
* ,, *mayeri*, Nutting, 1904, p. 59.
* ,, *operculata*, Linn., 1758, p. 60.
* ,, *rathbuni*, Nutting, 1904, p. 61.
* *Thuiaria articulata* (Pallas, 1766), p. 62.
(= ,, *pectinata*, Allman, 1888.)
Synthecium robustum, Nutting, 1904.
Staurotheca reticulata, Ritchie, 1907, (1).

Family Plumulariidæ.

* *Plumularia curvata*, Jäderholm, 1904, p. 64.
(= ,, *magellanica*, Hartlaub, 1905.)
* ,, *echinulata*, Lamarck, 1836, p. 65.
* ,, *lagenifera*, var. *septifera*, Torrey, 1902, p. 65.
,, *pinnata* (Linn., 1758).
* ,, *setacea* (Ellis, 1755), p. 67.
,, *unilateralis*, Ritchie, 1907, (1).
Antennularia hartlaubi, Ritchie, 1907, (1).
* *Antennopsis scotiæ*, Ritchie, 1907 (1), p. 68.
* *Monostæchas quadridens* (M'Crady, 1859), p. 69.
* *Antenella quadriaurita*, n. sp., p. 70.
* *Aglaophenia allmani*, Nutting, 1900, p. 71.
* ,, *dubia*, Nutting, 1900, p. 73.
* ,, *heterodonta*, Jäderholm, 1904, p. 74.
(= ,, *dichotoma*, of first *Scotia* Report.)
* ,, *minima*, Nutting, 1900, p. 75.
* ,, *latecarinata*, Allman, 1877, p. 76.
* *Halicornaria longicauda*, Nutting, 1900, p. 76.

The localities from which the species recorded in this paper have been obtained are so scattered that, for convenience of reference, I have brought them together in list form.

Station 313, 62° 10′ S., 41° 20′ W. (S. of South Orkneys).
Lafoëa gracillima, var. *benthophila*, n. var.

Scotia Bay, South Orkneys.
Myriothela austro-georgiæ, Jäderholm.

Burdwood Bank, 54° 25′ S., 57° 32′ W.
Campanulina chilensis, Hartlaub.

Port Stanley, Falkland Islands.
Perigonimus repens (??) (Wright).
Plumularia curvata, Jäderholm.

Gough Island.
Obelia longissima (Pallas).
Thyroscyphus tridentatus (Bale).
Antenella quadriaurita, n. sp.

Cape Colony.
Houtjes Bay (Saldanha Bay).
Plumularia echinulata, Lamk.
Saldanha Bay, entrance to.
Endendrium annulatum (?), Norman.
Obelia geniculata (Linn.).
Sertularia operculata, Linn.
Thuiaria articulata (Pallas).
Plumularia lagenifera, var. *septifera*, Torrey.
Antennopsis scotiæ, Ritchie.
Aglaophenia heterodonta, Jäderholm.

St Helena.
Sertularella gayi (Lamx.).

Station 81, Abrohlos Bank, Brazil, 18° 24′ S., 37° 58′ W.
Sertularia cornicina (M'Crady).
,, *heterodonta*, n. sp.
,, *rathbuni*, Nutting.
Monostæchas quadridens (M'Crady).
Aglaophenia allmani, Nutting.
,, *dubia*, Nutting.
,, *minima*, Nutting.
Halicornaria longicauda, Nutting.

St Vincent, Cape Verde Islands.

Eucopella crenata (?), Hartlaub.
Sertularella fusiformis (?), Hincks.

Lat. 27° 54′ N., long. 33° 17′ W.

Clytia johnstoni (Alder).
Sertularia mayeri, Nutting.

Station 537, 29° 54′ N., 34° 10′ W.

Campanularia clytioides (Lamx.).
Obelia hyalina, Clarke.

Station 538, 32° 11′ N., 34° 10′ W.

Plumularia setacea (Ellis).
Aglaophenia tatecarinata, Allman.

Myriothela austro-georgiæ, Jäderholm, 1904.

Several specimens of this bizarre Hydroid have to be recorded. All came from a single neighbourhood, Scotia Bay in the South Orkneys, but the depths at which the specimens were obtained varied. Some of the examples have already been described by Professor J. Arthur Thomson in a short paper in which he regards them, not without hesitation, as the separated gonostyles of some unknown giant Siphonopore (Thomson, 1904). There can be no doubt, however, that these specimens are identical with those found by both the Swedish and the French Antarctic expeditions, and recorded by Drs Jäderholm and Billard (1906, p. 4) as *Myriothela austro-georgiæ*. The length, the thickened basal portion on which the blastostyles (each bearing its male or female gonophores and a distal tentacle or two) are massed, and, most characteristic of all, the capitate tentacles scattered irregularly over the whole hydranth, even amongst the blastostyles—these features show that our examples belong to the same species as theirs. Nor can there be any doubt that Jäderholm was correct in regarding his specimens as belonging to the genus *Myriothela*, for their resemblance to the northern forms is striking,—solitary hydranths, absence of hydrocaulus, capitate tentacles scattered over the body, blastostyles grouped at the base of the hydranth, the presence of longitudinal folds of endoderm lining the inner cavity.

Professor Thomson remarks that some of the colonies bore solitary gonophores, while one had as many as seven on its blastostyles, and suggests the possibility of the presence of two species. Since, however, the specimens examined by Jäderholm had generally from one to three, but sometimes as many as six female gonophores, while the male gonophores occasionally numbered even ten on a single blastostyle, the variation is so great that little stress can be laid on this as a specific character.

A water-colour sketch made on the capture of one of the specimens indicates that their colour was a stronger and brighter orange than is shown by Jäderholm's figure. (Jäderholm, 1905, pl. i.).

Locality.—Scotia Bay, South Orkneys; dredged in 10 fathoms, April 1903; dredged in 9 to 10 fathoms, May 1903; dredged among mud and pebbles, 18th December 1903.

One specimen was found "on the surface of the water, in a hole which had been cut in the ice. The depth of the water at that place was 20 to 30 fathoms; the temperature was 29° F."

M. austro-georgiæ has previously been recorded from Cumberland, South Georgia, (JÄDERHOLM), and from Flanders Bay and Booth-Wandel Island (BILLARD).

Eudendrium annulatum (?), Norman, 1864.

Two small clumps of bushy colonies appear to belong to this species, but the weathering of our specimens, and the indefiniteness of the characters which differentiate the species of *Eudendrium*, render certainty impossible. The colonies are 5 cm. high, and agree with Canon NORMAN's species in being bushy and beset with very numerous branchlets; in possessing thick, rugged stems, on the surface of which, near the base, the fascicular tubes are more or less contorted; in having branches closely covered with strongly marked rings; and in bearing hydranths with about from 16 to 18 tentacles. On the other hand the gonophores, all of which are female, are borne on tentacle-bearing hydranths and not on atrophied individuals. So many, however, are the gonophores and so closely are they packed around the hydranth, that in not a few cases it was difficult to distinguish the presence of tentacles. Since, in some species at least, the loss of the tentacles is a degenerative change keeping pace with advancing maturity, their presence in this case may be of less significance than at first one tends to regard it.

These measurements were made:—The diameter of the unfascicled branches and branchlets is almost constant, about 0·18 mm. The hydranths are about twice as long as broad, the breadth being measured at the level of the bases of the tentacles (0·57 mm. long, 0·28 mm. broad).

Locality.—Entrance to Saldanha Bay, Cape Colony. Depth, 25 fathoms. 21st May 1904.

Eudendrium annulatum is a North Atlantic form which has been recorded from Shetland (NORMAN, 1864); Jan Mayen (MARKTANNER-TURNERETSCHER, 1890); Pas-de-Calais (BÉTENCOURT, 1899); Norwegian Coast (BONNEVIE, 1899).

Perigonimus repens (??) (Wright, 1858).

Scanty material which I have, not without doubt, referred to the above species was collected on the shore at Port Stanley. The stems, with a diameter of from 0·04 to 0·05 mm., arise from a stolon creeping upon an encrusting Polyzoon, and reach a height of 10 mm. They bear a considerable number of branches which leave the stem at a sharp angle and carry secondary, and these sometimes twigs of tertiary degree, in such a way as to give the colonies the appearance of being dichotomously branched. The offshoots can always be distinguished, however, by the presence of a slight constriction at their bases. The stems bear distinct rings at their bases and here and there through-

out their course, while the intermediate portions are more or less corrugated. A delicate chitinous envelope surrounds the cœnosarc and is adorned with minute sand particles, fragments of sponge spicules, etc., this coating being continued over the lower part of the hydranth. The hydranths, which are in poor condition, appear to be rather globular in shape and have from 12 to 15 tentacles. Short-stalked gonophores occur scattered over the hydrocaulus, but they are far from mature and offer no characters of significance.

I have no hesitation in identifying my specimens with those collected by PAESSLER at Port Stanley in 1895 and described by HARTLAUB (1905, p. 530), although our examples bear more numerous branches than his "gar nicht oder nur schwach verzweigten Hydrocauli." And I follow HARTLAUB, but with considerable hesitation, in referring the colonies to the *Perigonimus repens* of WRIGHT, an almost unbranched form with a maximum height of "$\frac{1}{4}$ inch" (HINCKS, 1868, p. 90), contenting myself merely with adding a second mark of interrogation to that which expresses HARTLAUB's doubt.

Locality.—Growing on an encrusting Polyzoon, from seaweed found on the shore at Port Stanley, Falkland Islands. January 1903.

Clytia johnstoni (Alder, 1857).

Of this common European species only a few stems occur on Saragassum weed. They resemble miniature British examples of *C. johnstoni*, structurally alike in every detail, but altogether on a much smaller scale. They are even less in some measurements than the small variety found by Dr BILLARD (1907,[1] p. 168) on material from the Saragassum Sea.

Measurements:—

Stem, length	1·6 –2·1	mm.
„ diameter	0·63–0·71	„
Hydrotheca, length	0·66–0·7	„
„ diameter at margin	0·41–0·48	„

Locality.—Off Saragassum weed, from lat. 27° 54′ N., long. 33° 17′ W. 28th June 1904.

Campanularia clytioides (Lamouroux, 1824).

Several specimens of this minute species have been found creeping on Saragassum fronds. The stems are short, measuring from 0·74 mm. to 0·95 mm. in length and 0·1 mm. in diameter, and are marked by about eight compact rings at the base of the hydrocaulus and about six less compact rings beneath the hydrotheca. The intermediate portion of the stem is smooth or only slightly corrugated. The hydrothecæ are short (0·34 mm.), rather broad at the mouth (0·38 mm.), and taper rapidly to the base. Their walls are thick, but vary considerably in different individuals and even in the various parts of the same individual. At the margin of the shelf which divides the

cavity of the hydrotheca proper from the small globular cavity at its base is a ring of bright dots, indicating the points at which the base of the polyp was attached to the hydrothecal wall.

The gonosome is not present.

Locality.—On gulf weed from Station 537. Lat. 29° 54′ N., long. 34° 10′ W. 29th June 1904.

Obelia geniculata (Linnæus, 1758).

In addition to the Gough Island locality given in the former report, this widely distributed species occurs from another station. Gonophores are present on the colonies from habitat (*b*).

Locality.—(*a*) Entrance to Saldanha Bay, Cape Colony. Depth, 25 fathoms. 21st May 1904. (*b*) Growing plentifully, along with *Plumularia lagenifera*, var. *septifera*, on the segments and telson of a lobster, *Palinostus lalandii*, from the same locality.

Obelia hyalina, Clarke, 1879.

Many small, 6-mm. high colonies of this species occur creeping over the fronds of Saragassum weed in association with *Campanularia clytioides*. The characters are as described and figured by Clarke, and the dimensions of our specimens appear to agree more closely with those of the type than do the corresponding measurements of the large-sized *Talisman* examples described by Dr A. Billard (1907, p. 170).

Measurements:—

Hydrotheca, depth	0·2 mm.
,, maximum diameter	0·18 ,,
Peduncles, length	0·36–0·45 mm.
Stem internodes, length	0·54 mm.

No gonangia were present.

Locality.—Creeping on gulf weed from Station 537. Lat. 29° 54′ N., long. 34° 10′ W. 29th June 1904.

Obelia longissima (Pallas, 1766).

In addition to the colonies already recorded from the South Orkney Islands, a small fragment whose characters agree with those of the above species has been found at Gough Island.

Measurements:—

Hydrotheca, depth	0·38–0·45 mm.
,, diameter at margin	0·38–0·45 ,,

Locality.—Off Gough Island. Depth, 25 fathoms. Bottom, rock. 23rd April 1904.

Eucopella crenata (?), Hartlaub, 1901.

A very few examples, whose occurrence has already been mentioned (Ritchie, 1907,[2] p. 488, footnote), were creeping on seaweed obtained on the shore of St Vincent, Cape Verde Islands. The absolute identification of these examples with Professor Hartlaub's *E. crenata* is, in the absence of the gonosome, impossible, and, considering differences which occur in the shape of the hydrotheca and in the ringing of the peduncle, appears to me to be a matter of doubt. Our specimens, however, are identical with those described by Dr A. Billard, 1907, and I follow him in assigning them (with a query) to the above species. The hydrotheca are more conical than those of the type, and their proportions differ slightly from those of Billard's specimens, where the depth exceeds the breadth, for here these dimensions are identical, or the latter may even exceed the former. The margin of the hydrotheca is cut into about thirteen rounded teeth, and above the projecting septum at the base there occurs a circle of from 28 to 31 bright dots (indicated in Hartlaub's fig. 27). The pedunceles bear from 9 to 12 sharply defined rings at the base, and from 1 to 4 annulations at the summit, while the median portion is generally more or less corrugated.

Measurements :—

Length of peduncle	1·01–1·98 mm.
Breadth „	0·07–0·09 „
Depth of hydrotheca	0·32–0·45 „
Breadth „ at margin . . .	0·34–0·40 „

Locality.—Growing on seaweed from the shore to the N.E. of Porto Grande, St Vincent, Cape Verde Islands. 1st December 1902.

Apparent evidences of regeneration are given by some of the specimens. To mention one example. The hydrotheca is borne on a stem 1·68 mm. in length, but this stem is composed of two distinct portions, a basal section 1·04 mm. long with walls 9μ in thickness, of a dark horn colour and deeply stained by eosin. This portion is sharply truncated at the distal end. It is succeeded by a shorter section 0·64 mm. long, with walls only 6μ in thickness, clear and transparent and faintly tinged with eosin. It is apparent that the peduncle has been truncated at a particular point, and that from this point the regenerating hydranth has built a new perisarcal protecting sheath which, as one would expect, differs in density from the older portion. It is interesting to note that the regenerated portion has, instead of continuing the smooth character of the old peduncle, assumed the character of a complete peduncle, for it bears four clean-cut rings above its point of origin, these being followed by a corrugated portion, and this by three rings below the hydrotheca. In all the cases examined the regeneration process has reproduced a complete but miniature peduncle.

Campanulina chilensis, Hartlaub, 1905.

Three minute colonies epizoic on *Halecium beanii* belong to this species. The ringing and branching of the stems and the shape of the hydrothecæ agree with the descriptions and figures of Hartlaub and of Jäderholm (1905), but although the former says of the hydrothecæ that they are "viel weniger conisch als die von *C. repens*, Wright" [! Allman, 1864], I cannot distinguish between the hydrothecæ of the South American and British species. *C. chilensis* is, however, more frequently branched than *C. repens*, but I doubt whether this and the other rather indefinite characters cited by Hartlaub are constant and of specific value. Scarcity of material of both the South American and British forms, however, prevents a comparison sufficiently extensive to warrant me in setting them down as belonging to the same species.

Measurements :—

	C. chilensis.	*C. repens.**
Stem, diameter . . .	0·06 mm.	0·08 mm.
Hydrotheca, length . . .	0·20–0·21 mm.	0·18–0·28 mm.
,, diameter at mouth .	0·09 mm.	0·10 mm.

Locality.—Growing upon *Halecium beanii* from Station 346, Burdwood Bank. Lat. 54° 25′ S., long. 57° 32′ W. Depth, 56 fathoms. 1st December 1903.

Jäderholm has already recorded *C. chilensis* from Burdwood Bank, where it was growing on the carapace of a crab at 137–150 metres. Billard (1906,[2] p. 12), found the species in collections from Flanders Bay and Booth-Wandel Island. Hartlaub's specimens were obtained at Calbuco on *Tubularia* and *Eudendrium*.

Thyroscyphus tridentatus (Bale, 1893).

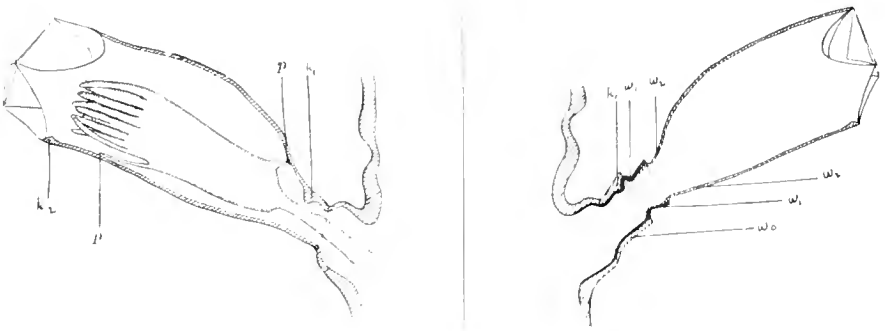
A few colonies have been found at a single locality. Simple, unbranched stems, 10 mm. in height, arise from a creeping hydrorhiza at intervals of some 2 or 3 mm. To the unaided eye the colonies have an erect, rigid appearance, and are seen to bear prominent hydrotheæ placed alternately on the stem. Under the microscope the stem resolves itself into a series of distinct internodes which vary considerably in size, a much shorter being occasionally wedged in between two longer individuals. That the nodes in our specimen are apparently more distinct than those in the examples recorded by Professor Hartlaub (1901, p. 369) from French Pass, to the north of the South Island of New Zealand, is of little importance, as the boundary mark between internodes is liable to considerable variation. The locality of the node is, moreover, rendered more evident in the *Scotia* specimens, because the proximal end of each internode is generally marked by a rude annulation. The hydrothecæ are arranged alternately, and the whole series lies in one plane.

A hydrotheca rests upon a short process at the distal end of each internode. The hydrotheca is separated by a distinct boundary line from the internodal process, and occasionally one, two, or even three short joints intervene between them. The distal

* Specimens from Plymouth in my collection.

margin of such an interpolated joint is always abrupt, and the perisarc of the existing calycle is not directly continuous with this margin, but is found to merge with that of the interpolated joint some distance *within* the joint (see fig. 16). From this it would appear that the joints are not all contemporaneous, but represent the remains of former cups which, broken off by accident, have been replaced once, twice, or oftener by the regenerative power of the cœnosarc. In this case, therefore, they can be of no diagnostic value. Evident knobs of chitin are present on the inner surface of the adcauline wall at the base, and of the abcauline wall at the margin. The former do not seem to be reproduced in regenerated hydrothecæ.

The hydrothecæ are much more deep than broad, and are characterised by an almost straight abcauline and a strongly convex adcauline contour. They are in most cases considerably longer than the stem internodes. The margin is divided into three pro-



a. *b.*

FIG. 1.—*Thyroscyphus tridentatus.* ×70. (*a*) Primary hydrotheca showing k_1 and k_2, knobs of chitin; *pp*, points on hydrotheca to which the hydranth is moored by cœnosarcal strands. (*b*) Internode process and regenerated hydrotheca: k_1, knob of chitin marking base of primary hydrotheca; w_0, wall of original hydrotheca; w_1, wall of first regenerated hydrotheca; w_2, wall of second regenerated hydrotheca.

nounced teeth, separated by three deep and graceful bays, and is furnished with a three-flapped operculum. No trace of a gonosome could be found.

The following measurements give some indication of the variable proportions of our specimens:—

Stem, length	Up to 13 mm.
Internode, length	0·49*–0·91 mm.
,, breadth	0·13–0·22 mm.
Hydrotheca, length	0·60–0·63 ,,
,, breadth (maximum) . . .	0·22–0·28 ,,

Locality.—Gough Island. Depth, 25 fathoms. Bottom, rock. 23rd April 1904.

Distribution.—The species was originally described by BALE from material obtained at Port Phillip, in the south of Australia, as *Campanularia tridentata*. Subsequently it has been recorded by Professor HARTLAUB (1901) from French Pass, north of South Island, New Zealand. These, so far as I am aware, constitute the only records of the species, so that the *Scotia* specimens from Gough Island, midway between Cape of Good Hope and Cape Horn, extend its known range from the South Pacific to the South Atlantic.

* A regenerated internode which succeeded an old truncation of the stem.

Lafoëa gracillima (Alder, 1857), var. *benthophila*,* n. var.

This species has to be recorded from an additional locality, to the south of the South Orkney Islands. The two specimens from this locality are, however, of a type quite distinct from the Burdwood Bank examples. They are both small and incomplete. The larger, 18 mm. high, bears two short branches; the smaller, 9 mm. high, is branchless. Only a trace of fasciculation is exhibited by the latter, but the stem of the former is a typical rhizocaulom. The hydrothecæ, while they closely resemble those of typical examples of *L. gracillima*, differ in being placed at more regular intervals on the stem, in preserving a near approach to alternation, in lying towards the stem at a much smaller angle, and in lacking a twist on the hydranthophore.

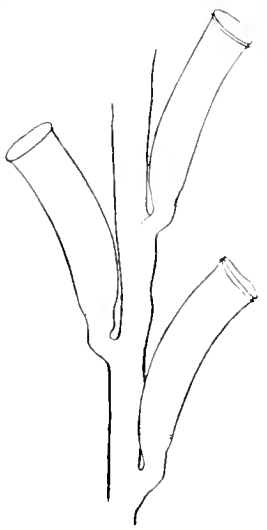


Fig. 2.—*Lafoëa gracillima*, var. *benthophila*. Portion of branch with hydrothecæ. × 30.

I do not lay much stress on this last point, however, since untwisted hydranthophores are not unfrequently present in typical colonies of the species. The most striking difference lies in the robustness of the hydrothecæ, the dimensions being much greater than in any other specimen I have examined. Near the base of the hydrotheca proper is a rude row of minute, refringent prominences on the internal wall, to which the base of the polyp was presumably attached. Occasionally, but only where the margin is reduplicated, two rows of dots occur.

The following table indicates in millimetres the differences, in respect of size, between the present and typical specimens:—

	Coat's Land Specimen.	Burdwood Bank Specimen.	North Sea Specimen.
Hydrotheca, including hydranthophore . .	0·87–1·01	0·63–0·64	0·57–0·76
,, diameter at mouth . . .	0·21–0·25	0·11–0·13	0·11
Diameter of a simple tube	0·16	0·11	0·10

* βένθος, the deeps; and φίλος, loving.

No gonangia were present.

Locality.—Station 313. Lat. 62° 10′ S., long. 41° 20′ W. Depth, 1775 fathoms. Bottom deposit, blue mud and boulders. 18th March 1903.

The distribution of the species is almost world-wide, but it has not hitherto been recorded from Antarctic Seas.

Sertularella fusiformis (?) Hincks, 1861.

A few minute simple stems, 7 mm. high, rising from a stolon creeping upon a seaweed. The slightly geniculate stems are divided into internodes which vary considerably in length, those nearer the base being longer than the more distal, the former 1·08 mm. as against an average of 0·61 mm. for the latter. The internodes are narrow, only

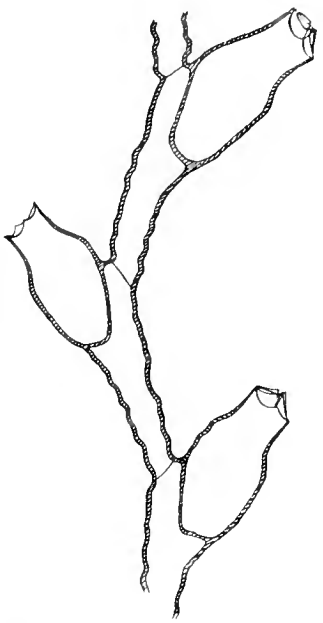


Fig. 3.—*Sertularella fusiformis* (?) Portion of stem. ×40.

0·06 mm. in diameter at the base, but they widen upwards until a ledge is formed upon which the base of the hydrotheca rests. They are separated by slanting nodes, immediately above which occur one or two rings, while the remainder of the internode is more or less definitely wrinkled.

The hydrothecæ lie in the same plane, are alternate, and are placed one on the distal end of each internode. Rather more than half of each is free, the free portion leaning well away from the stem. In shape they are flask-like, bulging proximally, while towards the distal end there is formed by a sudden constriction a distinct "neck," which is surmounted by the four-toothed margin. The walls of the hydrothecæ are smooth externally, but just within the margin the inner surface bears four distinct blunt teeth which lie midway between the marginal teeth.

Dimensions of hydrotheca :—

Length	0·45–0·52 mm.
Diameter where it becomes free from internode .	0·25–0·27 „
Diameter of "neck"	0·14–0·16 „

No gonangia were present.

It is with some doubt that these specimens, their gonangia lacking, have been referred to the *S. fusiformis* of Hincks. The hydrothecæ in our specimens appear to be more robust, to have a more decided "neck." and a more pronounced inclination away from the stem, while the presence of internal teeth is not mentioned in Hincks's description. The present specimens closely approach the very doubtful *S. fusiformis* (??) described by Professor Cl. Hartlaub (1900, pl. 5, fig. 9) from Rovigno on the Adriatic Sea, but the ringing which is absent in his is markedly present in our examples.

Locality.—Growing on seaweed found on the shore to the N.E. of Porto Grande, St Vincent, Cape Verde Islands. 1st December 1902.

Sertularella gayi (Lamouroux, 1821).

In addition to the colony found near Gough Island, another of almost equal dimensions, 12 cm. high, has to be recorded from St Helena. Its minute structure is very similar to that of the Gough Island example, the rugosities on the upper surface of the hydrothecæ being in some cases almost obsolete.

This species, although widely distributed in the Northern Atlantic and in the Mediterranean Seas, has hitherto been recorded south of the equator only from the Cape of Good Hope (Algoa Bay), (Hartlaub, 1905, p. 613). In conjunction with this occurrence the two *Scotia* records, from Gough Island and St Helena, may be taken to indicate a wide distribution for the species in the South as well as in the North Atlantic.

Locality.—Intertwined with an Alcyonarian, *Amphilaphis regularis*, from St Helena. 30th May 1904.

Sertularia cornicina (M'Crady, 1859).

Scanty material, a mere half-dozen colonies, represent this species. The stems arise from a stolon creeping upon the surface of the fragment of *Codium* also invested by *S. rathbuni* and *S. heterodonta*, from the former of which, indeed, they are almost indistinguishable to the unaided eye. The largest is only 6 mm. in height. The specific characters agree with those given by Nutting (1904, p. 58), but the following variations were noted. The stem internodes are proportionally longer than in Nutting's specimens, for while in his examples the "height of the hydrothecæ is usually about equal to that portion of an internode which lies between the hydrothecal base and the node below," in ours the latter distance considerably exceeds the former. Our hydrothecæ, again, have a longer distal portion free from the stem, the result being that the proportion of the anterior adnate part to the whole length of the hydrotheca is

reduced from "about two-thirds" to about one-half. As seen from the anterior aspect the hydrotheca appears to be covered in by only two opercular flaps, the free margins of which run from the tip of one lateral tooth to that of the other; but when a lateral view of the colony is obtained, so that one can look directly on the operculum, another line is seen running from the mid point of the horizontal line connecting the lateral teeth to the median superior point of the aperture. This line presumably marks the margin of two contiguous flaps of the operculum, and it would therefore seem that three, and not two, are present. The determination, however, is one of considerable difficulty owing to the delicacy of the operculum. The downward projecting processes from the base of the hydrotheca are long and evident.

Measurements :—

Internodes, length	0·63–0·78 mm.
,, breadth	0·05–0·06 ,,
Hydrotheca, length of contiguous portion	0·22–0·25 ,,
,, ,, free portion *	0·21–0·22 ,,
,, diameter near base	0·08–0·09 ,,
,, at aperture	0·08–0·09 ,,

Locality.—Growing upon seaweed (*Codium*, sp.) from Station 81, Abrolhos Bank, Brazil. Lat. 18° 24′ S., long. 37° 58′ W. 36 fathoms. Bottom deposit, coral. 20th December 1902.

Sertularia heterodonta,† n. sp.

Growing upon the surface of a seaweed (*Codium*, sp.) in company with *S. rathbuni* and *S. cornicina* are numerous colonies of this more minute form. The simple unbranched stems arise from a creeping stolon and cover the weed as with a coat of delicate hairs. At first glance the colonies are hard to distinguish from those of *S. rathbuni*, but on close examination their minuteness and delicacy render them distinct even to the unaided eye. The largest are only 6 mm. in height, 3·5 to 4 mm. being much more common. The hydrorhizal tube has a diameter a little greater than that of the stem, and is strengthened in places by chitinous processes projecting downwards from its roof or upwards from its floor.

The stems are divided into fairly regular internodes separated by distinct nodes. At the base two oblique nodes occur in succession, cutting off between them a short lozenge-shaped athecate internode. The remainder of the internodes are long and slender, narrower at the proximal end and very gradually increasing in diameter upwards, until by a sudden dilation at the top they form a broad bracket upon which the hydrotheeæ rest. The thecate internodes are separated by straight nodes, but occasionally an oblique node occurs in addition, a small athecate internode being in such a case intercalated between the longer thecate individuals.

* The "free portion" is measured from the line of the stem to the tip of the lateral teeth.

† ἕτερος, other; and ὀδοντος, a tooth, indicating the presence of other than the usual marginal teeth.

An opposite pair of hydrothecæ rests on each internode, six to seven or even ten pairs being found on one colony. The hydrothecæ are set slightly on front of the stem, are always contingent in front for rather more than one-third of their total length, but remain separate behind. The free portion diverges abruptly at a wide angle. Viewed from the anterior aspect the sides of the adherent portion of a hydrotheca are parallel to the long axis of the stem, while those of the free portion converge towards the aperture. The contour lines, especially in the younger hydrothecæ, are remarkably straight and graceful. Beneath the innermost angle of the base there is a minute chitinous thickening, and another projects from the base into the interior of the hydrotheca. The latter appears to be roughly triangular in shape, the apex pointing

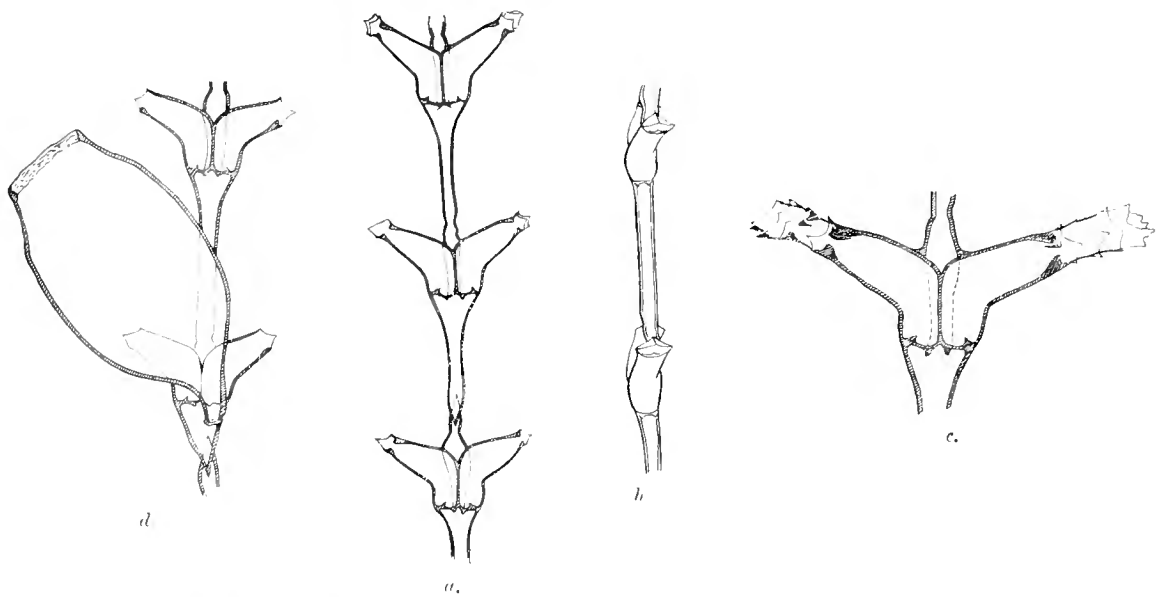


FIG. 4.—*Sertularia heterodonta*. (*a*) Anterior aspect of stem. × 60. (*b*) Lateral aspect of stem showing three-flapped operculum. × 60. (*c*) Hydrothecæ with reduplicated margins, one regenerated margin bearing internal teeth. × 100. (*d*) Gonotheca. × 50.

into the cup, the side towards the centre of the stem being thickened and concave, that remote from the centre sloping gradually till it merges with the hydrothecal floor. This process represents a small ridge bounding the posterior edge of the opening between hydrotheca and stem. The margin of the hydrotheca is divided into three distinct and sharp teeth, the lateral pair the more prominent, the median and superior individual tilted slightly upwards. There are three opercular flaps, difficult to distinguish except when one is looking directly into the aperture of the hydrotheca. Just within the margin and projecting from the inner wall are three prominent internal teeth, triangular in shape, with blunt apices tilted towards the aperture. These alternate with the marginal teeth. In hydrothecæ towards the base of the stem the superior pair appears occasionally to be undeveloped. Frequently the free portion of the tube is much elongated by the reduplication of the margin, and in some cases a new series of internal teeth is produced on the added portion (fig. 4, *c*).

The gonangium, of which I have been able to find only one example, is borne on the front of the stem immediately beneath a hydrotheca. It is oval in shape, tapering below to form a distinct stalk, and truncated above by a wide aperture. This is bounded by an insignificant thickened neck punctuated by small refringent chitinous swellings on the inner surface. The walls of the gonangium are smooth.

Measurements :—

Internodes, length	0·46–0·62 mm.
,, diameter near base	0·03–0·04 ,,
Hydrotheca, length of contiguous portion	0·10–0·14 ,,
,, ,, free portion *	0·14–0·15 ,,
,, diameter at base	0·06–0·07 ,,
,, ,, ,, aperture	0·04 mm.
Gonangium, length	0·74 ,,
,, maximum diameter	0·41 ,,

One colony shows a pair of hydrothecæ at an early stage of development, ere yet the aperture, or the base, or the internal teeth had been formed. The stolon has so regulated itself to the papillated surface of the *Codium* upon which it is growing that the outline of its under surface is made up of a series of crescentic bays.

The three-toothed margin, the three-flapped operculum, the prominent internal teeth, the presence of a projection from the base into the interior of the hydrotheca, together with the straight contours of the hydrothecæ and the length of the internodes, are points which distinguish this species. It has affinities with *S. linealis*, Warren, 1908.

Locality.—Growing upon seaweed from Station 81, Abrohlos Bank, Brazil. Lat. 18° 24′ S., long. 37° 58′ W. Depth, 36 fathoms. Bottom deposit, coral. 20th December 1902.

Sertularia mayeri, Nutting, 1904.

Small colonies, 5 mm. high—less than half the height of the type specimens—occur creeping on Saragassum weed. Their characters agree with Nutting's description and figures, and are identical with those of specimens collected by Mr Crossland at the Cape Verde Islands (Ritchie, 1907,[2] p. 505), although, owing to their smaller size and the consequent restriction of the number of hydrotheca-pairs (in the largest specimen mounted for microscopical examination there are only six pairs), the variation between the proximal and distal pairs is not so marked as in the larger Cape Verde specimens. Even here, however, the distinction between the distal long, narrow, closely forked, gradually separating pairs, and the proximal short, dumpy, wide-spreading pairs is sufficiently distinct and characteristic. It is indicated by the measurements below. In the majority of the calycles two lateral teeth and a smaller median and superior tooth, which succeeds an indentation in the wall of the hydrotheca and curves slightly upwards, are very evident.

* From the line of the stem to the tip of the lateral teeth.

Measurements (*a* and *b* are distinct colonies) :—

	Basal.		Distal.	
	a.	*b.*	*a.*	*b.*
Length of internode	0·42 ;	0·49 mm.	0·56 ;	0·66 mm.
,, hydrotheca	0·29 ;	0·30 ,,	0·38 ;	0·45 ,,
Breadth of hydrotheca-pair from tip to tip .	0·48 ;	0·46 ,,	0·56 ;	0·52 ,,
,, ,, ,, at base . .	0·22 ;	0·25 ,,	0·21 ;	0·20 ,,

Locality.—Creeping on gulf weed, lat. 27° 54′ N., long. 33° 17′ W. 28th June 1904.

Sertularia operculata, Linnæus, 1758.

Several small fragments of this species occur intertwined with other Hydroids from the same locality. The specimens are typical in branching and in minute structure, but a considerable amount of variation occurs not only in the length of the two hydrothecal teeth, but also in their prominence relative to each other (*cf.* Hartlaub, 1905, pp. 665, 666). Of the specimens figured by Professor Hartlaub our examples most nearly approach those from West Patagonia collected by F. P. Moreno; but from those they differ in the proximity of the hydrothecæ, for the teeth of one may reach the level of the base of its successor. The present examples are also characterised by the exceedingly minute portion of the distal extremity of the hydrotheca, which is free, the proximal side of the aperture lying almost against the internode.

The points above refer specially to the younger branches. On the older portions the hydrothecæ are only sub-opposite, their length is less relatively to that of the internode, while a slightly longer distal portion is free.

A few typical gonangia occur on the branches. They exhibit a tendency to asymmetry, the aperture lying towards the outer side of the axis of symmetry.

The following measurements indicate the relations of the various parts :—

Length of branch internode	0·33–0·50 mm.
,, stem internode	0·54–0·61 ,,
,, hydrotheca	0·20–0·25 ,,
,, teeth	0·06–0·12 ,,
Distance from tip to tip of a hydrotheca-pair . .	0·43–0·58 ,,

Locality.—Dredged at the entrance to Saldanha Bay, Cape Colony, in 25 fathoms. 21st May 1904.

The distribution of this species is world-wide. In addition to its European localities it has been recorded from the coasts of North and South America, of Southern Asia, of Australia and New Zealand, and of Africa, although the records from the last continent are few. The African localities other than the *Scotia* record are as follows :—

South Africa (Busk, 1850); Cape of Good Hope (*Eugenie* Expedition, Jäderholm, 1903); Port Natal (Professor J. A. Wahlberg, Jäderholm, 1903); Mauritanian Coast (Billard, 1906 [1]); North-West of Cape Blanc, Soudan (Billard, 1906 [1]).

Sertularia rathbuni, Nutting, 1904.

The specimens occur plentifully on a seaweed (*Codium*, sp.), standing erect and rigid on its surface, so that it appears as if covered with a sparse coating of delicate hairs. They are simple, altogether without branches, herein differing, but immaterially, from the specimens described by Allman (1877), Versluys (1899), and Nutting, some of which bore pinnules, and they attain a height of only 10 mm. The structures of the stem are as previously described. The hydrothecæ are in opposite pairs, the individuals of which, in the distal part of the colony, are contingent for almost half their height, but the line of contact gradually decreases until in the proximal pair the individuals

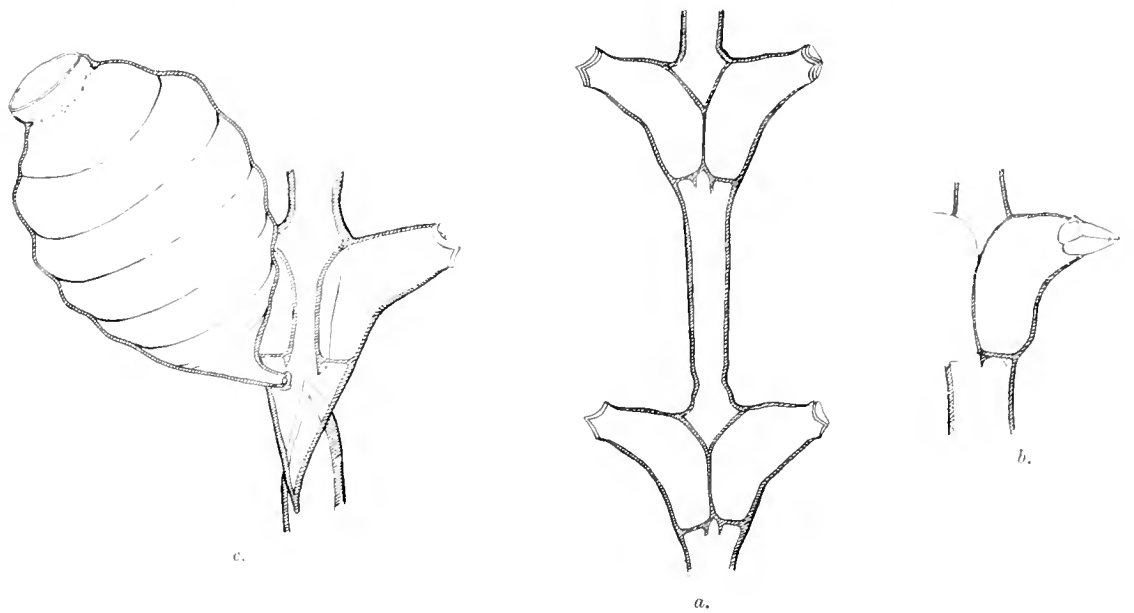


Fig. 5.—*Sertularia rathbuni*. (*a*) Anterior aspect of stem. ×50. (*b*) Three-quarters view of hydrotheca showing three-flapped operculum. ×60. (*c*) Gonangium. ×70.

may be quite apart. Behind the stem the hydrothecæ are always separate. Beneath each hydrotheca, at the corner where base and inner wall meet, are two chitinous processes which project downwards and lie alongside the wall of the internode. These processes are more distinct in the older hydrothecæ. The margin of a hydrotheca is cut into three teeth, the lateral pair longer than the single superior tooth. There are three opercular flaps.

Gonosome.—The gonangia, which have not previously been described, occur on many of the colonies. They are borne on the stem, from one to three in number, and arise immediately beneath hydrothecæ towards the base of the colony. In the specimens which I have examined only one gonangium is apportioned to each hydrotheca-pair. The gonangia are broadly ovate, marked with about six rather indefinite annulations. Proximally they taper into a short stalk, while distally they contract into a short wide neck, ornamented at its base by a circlet of bright spots, thickenings of the

perisare. The contents of the gonangia were frequently missing, and in no case were they in a state fit for minute examination.

Measurements :—

Internodes, length	0·81–0·94 mm.
,, breadth	0·10–0·12 ,,
Hydrotheca, portion free	0·18–0·20 ,,
,, ,, fixed	0·27–0·28 ,,
,, diameter at mouth	0·74 mm.
Gonangium, length	0·60–0·63 ,,
,, maximum breadth	0·45–0·53 ,,

In general build, in possessing chitinous projections from the base of the hydrotheca, and in the structure of its gonangium, this species bears close resemblance to *S. cornicina* (M'Crady) as described by Nutting. The latter species, however, is to be distinguished by the tubular shape of its hydrothecæ, by the number of the marginal teeth and of the opercular flaps, by the narrowly oval outline of its gonangium, and by the fact that the gonangia are borne on hydrorhizal tubes at the base of the colony, and not on the stem.

Locality.—Growing on a Plumularian, *Halicornaria longicauda*, and on seaweed (*Codium*, sp.), both from Station 81, Abrohlos Bank, Brazil. Lat. 18° 14′ S., long. 37° 58′ W. Depth, 40–50 fathoms. Bottom deposit, coral. 20th December 1902.

Previously recorded only from the Gulf of Mexico: Allman, 1877; Versluys, 1899 (Dry Tortugas); Nutting, 1904, lat. 29° 28′ N., long. 87° 56′ W.

Thuiaria articulata (Pallas, 1766), (= *T. pectinata*, Allman, 1888).

In the earlier report, a colony of this species was recorded under Allman's name of *T. pectinata*. The occurrence of an additional colony with gonangia reopened the question of nomenclature, and an examination of Allman's type was made (through the kindness of Mr R. Kirkpatrick, of the British Museum). The examination assures me of the identity of *T. pectinata*, Allman, with *T. articulata*, Pallas.

The larger of our two colonies was some 6 cm. high, the height of Allman's specimens being also "between two and three inches." The colonies are simply pinnate, with a monosiphonic stem about 1 mm. in diameter at the base. The stem is partitioned into regular and well-marked internodes, each bearing three pairs of opposite hydrothecæ, and from between the proximal and median pairs arises a pair of opposite pinnæ. Proximal to the first pinna-bearing internode a few destitute of offshoots occur, and on these the number of hydrothecæ is not constant. Apart from these only one internode has been observed in which three pairs of hydrothecæ have not occurred; and it is clearly abnormal, for it lacks pinnæ, has but one pair of hydrothecæ, and is so short that the hydrothecæ project beyond it, free for nearly half their height. The pinnæ stand out from the stem at a wide angle, and they too are divided into distinct but less regular internodes, each bearing from two to five pairs of sub-opposite hydrothecæ.

(Marktanner-Turneretscher (1890) gives the variation as from three to ten pairs per internode.)

The hydrothecæ are almost wholly immersed, and the "free membranaceous extension of the wall," too prominently figured in Allman's account, has been destroyed (as indeed it was in the *T. pectinata* specimen examined), leaving a jagged edge level with the general outline of the pinna. There is evident on the abcauline wall of the hydrothecæ, just within the opening, a small knob of chitin, and immediately above or upon this rests the

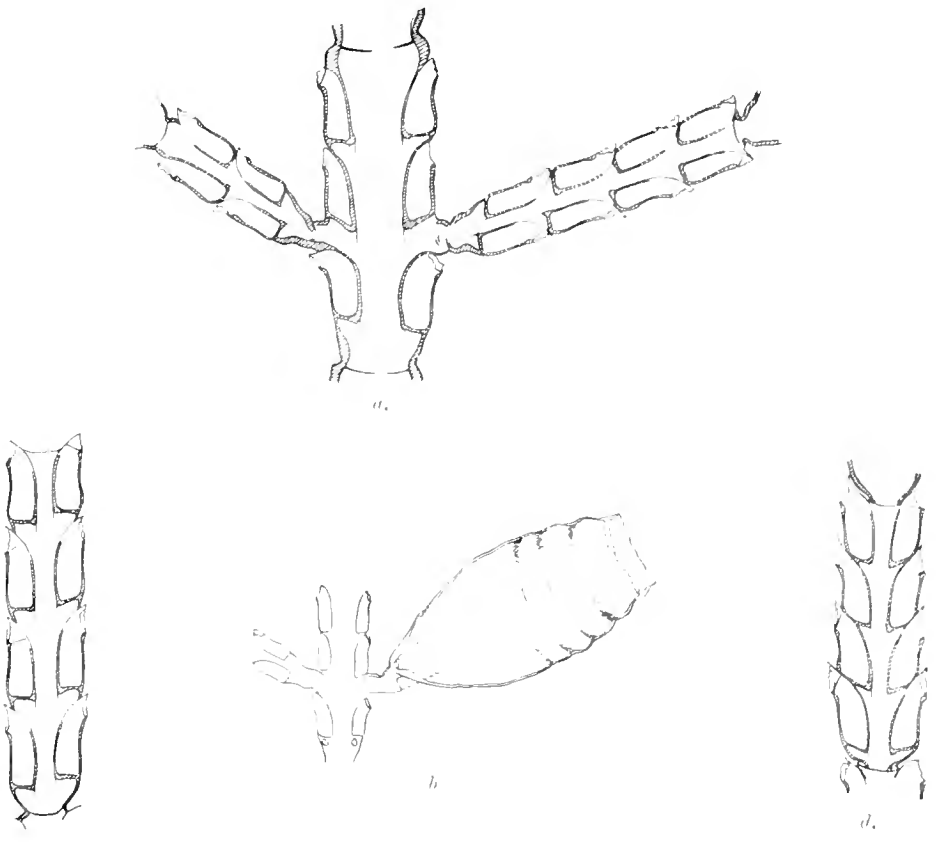


Fig. 6.—*Thuiaria articulata*. (*a*) Single internode of stem with proximal internodes of pinnæ. ×20. (*b*) Gonangium. ×12. (*c*) Internode from *T. pectinata* with hydrothecæ slightly apart. ×20. (*d*) Internode from *T. pectinata* with congested hydrothecæ. ×20.

base of the one-flapped opercnlum. On the stem internodes and on the younger pinnæ the hydrothecæ are slightly apart from each other, but in the older pinnæ they are compressed and lie closely packed, the distal end of one forced against the base of its successor (*cf.* fig. 6, *c* and *d*).

The gonangia are clustered on one face of the stem and on the corresponding faces of the pinnæ. They arise immediately beneath a hydrotheca, are elongate oval in shape, with a wide, circular, distal opening bordered by a distinct neck, and with a tapering proximal end. Their distal half bears more or less indefinite annular rugosities.

Measurements :—

	Scotia Specimens.	Allman's *T. pectinata*.
Stem internodes, length	2·25 mm.	2·75 mm.
Hydrothecæ on stem, length	0·50 ,,	0·52 ,,
,, ,, breadth	0·17 ,,	0·20 ,,
,, on pinna, length	0·45 ,,	0·48 ,,
,, ,, breadth	0·15 ,,	0·18 ,,
Gonangia, length	3 ,,	not present.
,, greatest diameter	1·5 ,,	

Allman's specimens are somewhat more robust than those collected by the *Scotia*.

Locality.—Dredged at the entrance to Saldanha Bay, Cape Colony, at a depth of 25 fathoms. 21st May 1904.

The species has been recorded from Algoa Bay and Cape of Good Hope (Kirchenpauer, 1884); South Africa (Busk, 1850); Simon's Bay, Cape of Good Hope (Allman, 1888).

Plumularia curvata, Jäderholm, 1904 (= *P. magellanica*, Hartlaub, 1905).

Dr Jäderholm has kindly drawn my attention to the fact that the species recorded in my earlier report on the *Scotia* collections as *P. magellanica*, Hartlaub, had been previously described by him as *P. curvata*, which name I therefore substitute for Hartlaub's synonym. A variation which does not seem to have been present in the examples examined by Jäderholm or Hartlaub was described and figured in the earlier report (pl. iii., figs. 1, 1*a*); here I wish simply to add that that variation is more general in the hydroclades than I had at first supposed. My previous description reads :—"In the proximal hydroclades . . . . *two processes* arise below and at the opposite sides of the first hydrotheca, each of which bears a thecate internode, so that after the first hydrotheca the hydroclade possesses two diverging branches each similar to the simple distal hydroclades" (1907,[1] p. 541). But this duplication of the hydroclade occurs not only at the first hydrotheca but sometimes at successive hydrothecæ as well. From beneath the first hydrotheca two diverging internodes spring, each capped by its hydrotheca; from the bases of each of those second pairs arise, and from these again, and so on in a system comparable to the false dichotomy of the Mistletoe, until dichotomous pairs of even the fourth degree may be reached. Some of the hydroclades thus assume a complicated and much-branched appearance, quite distinct from the simple type figured by Jäderholm (1905, pl. 14, fig. 10) and Hartlaub (1905, p. 684, fig. N[5]).

Measurements :—

Stem internode, length	0·42–0·52 mm.
,, ,, breadth	0·11–0·13 ,,
Hydroclade internode, length	0·24–0·28 ,,
Hydrotheca, depth	0·10 ,,
,, diameter at mouth	0·15–0·17 ,,

Locality.—"Growing on a sponge, Port Stanley, Falkland Islands. 3rd February 1904."

Previous records are from Port Louis and Port Albemarle, Falkland Islands (Jäderholm, 1905); Southern Tierra del Fuego, and Island Picton in the neighbouring archipelago (Hartlaub, 1905).

Plumularia echinulata, Lamarck, 1836.

In addition to a previously mentioned occurrence at Cape Town, a second locality, also in Cape Colony, has to be recorded, namely, Saldanha Bay. The specimens from this place, while rather smaller in size than the Cape Town examples, are similar in minute structure, except that in the former the hydrotheca-bearing internodes are rather shorter, and the hydrothecæ therefore more congested, than in the latter.

The gonangia are elongate oval, considerably longer in proportion to their diameter than those figured by Hincks (1868, pl. lxv., fig. 2*b*), and possessing shorter and more regularly arranged spines. They stand out from the median aspect of the stem in a densely packed row.

Locality.—Shore, Houtjes Bay, Saldanha Bay, Cape Colony. 19th May 1904.

Plumularia lagenifera, var. *septifera*, Torrey, 1902.

Whereas typical specimens of *P. lagenifera* are about three inches long, are sometimes branched, and grow in flexuous clumps, the specimens which I have referred to Torrey's variety are short (only 7 mm. high), never branched, and are markedly rigid in habit. The detailed structure is that of a compressed *P. lagenifera*, where the internodes have become shorter and comparatively stouter, while the internal septa have become more distinct. In conjunction with the general shortening it has come about that in the intermediate internodes there is generally but one septum, although our specimens differ from those described by Torrey—where "no intermediate internode has more than one septal ridge"—in that, in several, there are traces of a second ridge on the distal side of the nematophore, while in at least one case the second ridge is quite pronounced. Torrey is equally emphatic that "there is never more than one internode between thecate internodes," but I have observed a case in which two successive athecate internodes occurred, the distal being much the shorter and lacking a nematophore. There was no evidence that this duplication was due to abnormal growth, such as regeneration. These variations, however, only show more clearly the relationship between this form and *P. lagenifera* type, and confirm Torrey's placing of it as a variety of that species.

In one point the *Scotia* specimens differ both from the type and from the variety, for they show no trace of a nematophore on any internode "on side opposite branch [*i.e.* hydroclade] and immediately distal to the proximal septum."

Between the hydroclade and the internode process on which it is set occur from one to three athecate internodes. The hydrorhizal tubes are close-set, are compressed from above downwards, and are supported by thickenings of the perisarc which project into the interior of the tube. Somewhat similar thickenings I have already seen in the hydrorhiza of a species of *Podocoryne* (RITCHIE, 1907,[2] p. 499) which was growing on a minute shell. In both cases it is possible to imagine that the thickenings may be in some way correlated with the peculiar substratum upon which the specimens are growing, for either on a small, readily tossed shell, or on the ever-moving appendages of a Crustacean, hydrorhizal tubes would be submitted to a great amount of buffeting and rough usage. Reaction to such abnormal external factors might result in abnormal

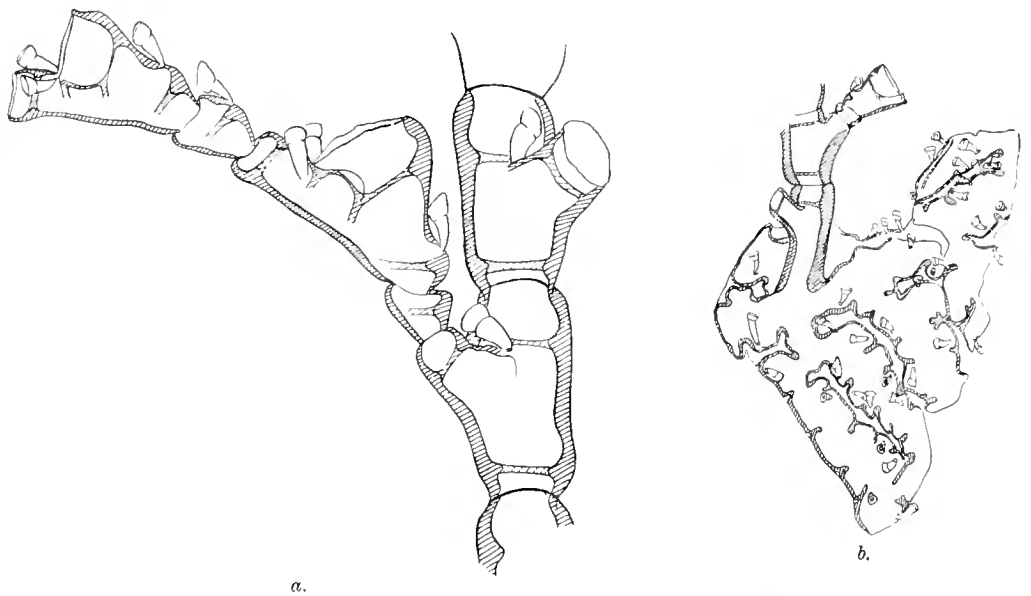


FIG. 7.—*Plumularia lagenifera*, var. *septifera*. (*a*) Portion of stem and hydroclade. × 100. (*b*) Base of stem arising from complicated hydrorhizal growth with scattered nematothecæ.

strengthening of the walls. Should such a supposition be well founded, the thickenings in the hydrorhizal tubes could have little systematic value. Frequent nematophores, similar in structure to those on the remainder of the colony, arise from the hydrorhizal tubes at irregular intervals, but always near their borders.

The differences between this form and *P. lagenifera* in size, in habit, in the intensity of the internal septa, in the absence of a nematophore on each stem internode, and in possessing chitinous thickenings in the hydrorhiza, I do not consider sufficient to warrant the formation of a new species.

Measurements :—

Stem internode, length	0·26 mm.
,, breadth	0·14 ,,
Hydroclade thecate internodes, length	0·24 ,,
,, athecate ,, ,,	0·05 ,,
Hydrotheca, depth	0·066–0·090 mm.
,, diameter at margin	0·105–0·120 ,,

Locality.—A few colonies growing on the telson and under-parts of the body of *Palinostus lalandii* (Lamk.) from Saldanha Bay, Cape Colony. 21st May 1904.

Distribution.—*Plumularia lagenifera*, Allman, has been recorded from various localities off the coast of California by Marktanner-Turneretscher (1890, p. 255), Nutting (1900, p. 65), Torrey (1902, p. 77); from the neighbourhood of Vancouver Island by Allman (1885, p. 157), Nutting (*l.c.*); and from the coast of Alaska by Torrey (*l.c.*). The variety *septifera* has been recorded by Torrey only from Cataline Island, California. The general distribution of the species and its variety is thus along the shores of the Northern Pacific from California northwards to Alaska. That the present specimens should have occurred on the eastern margin of the South Atlantic is indeed remarkable; but, in so mobile a group as the Hydroids, wide distribution is of little significance, and the above record but adds another to the long list of species which spread beyond the bounds of any one ocean.

Plumularia setacea (Ellis, 1755).

Specimens of an exceedingly minute and delicate variety of this species occur creeping on gulf weed in company with *Aglaophenia latecarinata*. They are only 7 or 8 mm. high, and are unbranched, although in one case an appearance of bifurcation at the base (a phenomenon recorded by Billard in this species (1907, p. 210)) was given by a second colony being fixed to the first by its hydrorhiza. The hydroclade internodes, both thecate and athecate, are long and slender and contain two distinct septa, a distal and a proximal. While the rule is that a single athecate internode separates two thecate internodes, very rarely two intermediate internodes occur, in which case one or the other bears a single nematophore, the other lacking such an organ. Yet each of the internodes is complete as regards the internal septa, containing one at each end. They are distinct internodes and seem to be due to spontaneous variation, for no hint could be observed that, as Billard found in his specimens, rupture and subsequent regeneration had taken place.

Our specimens appear to be similar to the "distinct variety" recorded by Professor Nutting from gulf weed (1900, p. 57), although Nutting's specimens differ in being branched.

Detailed measurements indicate that the *Scotia* specimens stand intermediate to the variety found by the *Travailleur* at Cape Spartel and to the south of Madeira, and the typical form whose dimensions Billard records.

Measurements:—

Height of colony	7–8 mm.
Length of stem internodes	0·33–0·39 mm.
Breadth of „ „	0·075–0·09 „
Length of intermediate internodes . . .	0·14–0·21 „
„ thecate internodes	0·31–0·40 „
Breadth of „ „	0·42–0·48 „

Locality.—Creeping on gulf weed found in spawn net at Station 538. Lat. 32° 11′ N., long. 34° 10′ W. 30th June 1904.

Antennopsis scotiæ, Ritchie, 1907[1].

An additional colony of this species from the locality from which it was originally recorded enables me to amplify the diagnosis already given and to add a description of the gonosome. The new colony is of the same height as the larger of our earlier specimens, 9 cm., but it bears more branches and is altogether in better condition, although here also the hydroclades are in many places wanting. Branches are frequent, but are very irregular in position. They may bear secondary branches which are long, of uniform thickness, and are seldom branched. The stem and branches are composed of a thick bundle of tubes with transparent walls and without nodes. From short processes on the outermost of these the hydroclades spring, following one another on the same tube at a

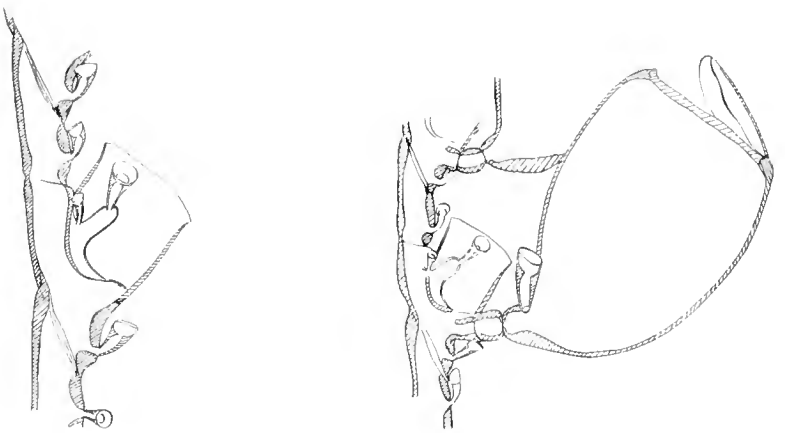


FIG. 8.—*Antennopsis scotiæ*. (*a*) Portion of hydroclade showing thecate and athecate internodes, and arrangement of nematothecæ. × 65. (*b*) Gonotheca. × 45.

distance of some 0·73 mm., and thus forming a close-set coat round the branches. In consequence of the delicacy of the hydrothecal margins a perfect hydrotheca is rare, but where such occurs it shows a slight widening at the mouth.

An important addition has to be made to the previous description of the trophosome as regards the number of the nematophores accompanying the hydrotheca. Besides the median proximal nematophore and the lateral pair surmounting the processes which run alongside the hydrotheca, there is a supplementary lateral pair, the individuals of which, one on each side of the hydrotheca, rest on the upper surface of the lateral process almost in the corner formed between it and the internode (fig. 8). These nematophores, although of similar structure to, are considerably smaller than, the others, and are so delicate that they are frequently absent, their former position being marked only by a small opening in the lateral process. They correspond exactly to the supplementary nematophores described in *Antenella quadriaurita* of the present paper.

The athecate internodes show more variation than in the former specimens, their length in many cases preventing the margin of a hydrotheca from reaching the level of the proximal end of the succeeding thecate internode. Only two

deviations from the normal structure of the athecate internodes have been observed where, instead of one, two nematophores were present.

Gonosome.—The gonangia arise laterally from the hydroclades. They are situated immediately beneath the hydrothecæ on a short process from the hydroclade internode, between which and the body of the gonangium a short internode intervenes. In size a gonangium is three or four times as large as a hydrotheca; in shape it is broadly ovate, tapering proximally into a short stalk which rests upon the intervening internode mentioned above, and abruptly truncated distally, where the large terminal aperture is closed, prior to the maturity of the contents, by a one-flapped operculum attached by its abcauline edge to the wall of the gonangium. Two large nematophores are present, one on each side of the gonangium near its base.

Measurements :—

Athecate internodes, length *	0·28–0·32 mm.
Thecate ,, ,, *	0·36–0·38 ,,
Hydrotheca, length	0·20–0·24 ,,
,, breadth at mouth	0·21–0·24 ,,
Gonangium, length	0·88–0·91 ,,
,, greatest breadth	0·53–0·57 ,,

Locality.—As previously recorded—entrance to Saldanha Bay, Cape Colony. 25 fathoms. 21st May 1904.

Growing on a sponge from the same locality were several simple colonies up to 7 mm. high. Although there are no signs of fasciculation, nor even of true branching, the minute structure corresponds so exactly with that of *A. scotiæ* that I cannot but conclude that the small colonies represent an early stage of that species. They bear no gonangia.

Monostæchas quadridens (M'Crady, 1859).

Two minute colonies of this species were found growing on the leg of a masked crab. They differ from the typical form described by Nutting (1900, p. 75) only in their minuteness—they are less than 1 cm. high—and in the length of the athecate intermediate internodes of their hydroclades. Although each bears two or three hydroclades, neither of the colonies is branched; yet circular holes at the bases of some of the hydrothecæ, indicating the point where a gonangium had been attached, show that the colonies are mature. The unusual position in which the colonies were growing is probably responsible for their smallness, for an unstable foundation is frequently accompanied by a dwarfed fauna.

Measurements :—

Stem, diameter	0·14 mm.
Thecate internodes, length	0·42–0·46 mm.
Intermediate internodes, length . . .	0·56–0·73 ,,
Hydrotheca, depth	0·15–0·17 ,,
,, diameter at opening . .	0·20–0·22 ,,

* Length measured from straight node to furthest point of oblique node.

Locality.—Growing amongst seaweed on the leg of a masked crab. Station 81, Abrohlos Bank, Brazil. Lat. 18° 24′ S., long. 37° 58′ W. Depth, 36 fathoms. Bottom deposit, coral. 20th December 1902.

Antenella quadriaurita,* sp. nov.

A few sparse colonies which cannot be referred to any described species of *Antenella* were trawled off Gough Island. The stems, the largest of which is 14 mm. high, are hairlike and stand out rigidly from a creeping stolon like a group of stiff bristles. To the unaided eye the stem groups much resemble the figure of *A. gracilis* given by Allman (1877, pl. xxii, fig. 6), but in our specimens the stems are more delicate, and,

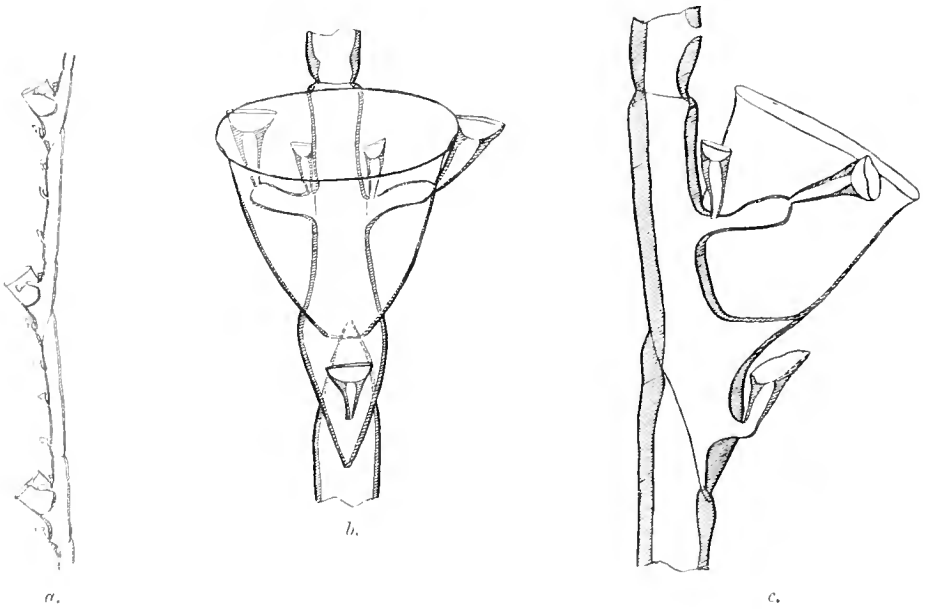


Fig. 9.—*Antenella quadriaurita*. (*a*) Portion of stem. × 25. (*b*) Anterior aspect of a hydrotheca. × 125. (*c*) Lateral aspect of a hydrotheca. × 125.

owing perhaps to mere accident, they are more irregular in size and more straggling in arrangement. The stem is divided into a series of alternating thecate and athecate internodes, the boundary lines between these being oblique and very distinct on the proximal side of the thecate internode, and on the distal, transverse but faintly indicated. On the stems examined the maximum number of hydrothecæ was nine, but that a greater number may be borne is likely, as in both the "nine" colonies the stem was incomplete. The hydrothecæ are borne on every other internode. As seen in profile they are cylindrical, having almost parallel edges, but viewed from in front they seem to be conical in shape, tapering rapidly to the base. A hydrotheca is rather deeper than broad, and for more than half its height is free from the internode. Its profile is straight, and its margin is very slightly everted.

Each thecate internode bears five nematophores: one median, placed on a gently

* *Quattuor*, four; and *auritus*, eared, signifying the presence of two pairs of nematothecæ flanking the hydrotheca.

raised portion of the internode on the near side of the hydrotheca; a supracalycine pair, each individual of which reaches just to the margin of the hydrotheca and rests upon the end of an internodal projection stretching half-way across the hydrotheca; and an additional pair—supplementary nematophores—placed on the upper and exterior surface of the supracalycine process, almost in the angle between that process and the internode. The latter are extremely fragile and readily detached, so that in many cases they are unrepresented but by a small pore in the wall of the supracalycine process, indicating where they had been attached. The intermediate internodes bear a number of nematophores varying from two to four, but three is the most frequent number. Thus, in twenty intermediate internodes examined, eight bore two nematophores, eleven bore three, while only one had four. On the athecate basal internodes, three of which generally follow one another in close succession prior to the first hydrotheca, the nematophores also vary. Of nine such, four had four nematophores, two had five, while series of two, three, and seven nematophores were represented on one internode each.

Measurements:—

Thecate internode, length *	0·46 mm.
Intermediate internode, length * . . .	0·57–0·91 mm.
,, breadth . . .	0·07–0·087 ,,
Hydrotheca, depth	0·21–0·22 ,,
,, diameter at margin . . .	0·17–0·21 ,,

This species is closely related to *Plumularia secundaria* (L., 1789, p. 3854), which, if the genus *Antenella* is to be preserved, and it seems a useful one from the point of view of practical convenience, must be transferred to that genus. The present species has been separated from *A. secundaria* on the strength of observations made by Marktanner-Turneretscher (1890, p. 252), Pictet and Bedot (1900, pp. 27, 28), and Billard (1907, p. 207), all of whom record the presence of a *single* nematotheca *immediately above* the hydrotheca, whereas in our specimens the hydrotheca is *flanked* by a *pair* of nematothecæ in addition to the usual supracalycine pair. The athecate internodes in the *Scotia* species are twice the length of those in *A. secundaria*, and the other parts differ in their relative proportions, but little stress can be laid on so indefinite and so variable a character. I am unable to distinguish *A. natalensis*, Warren, 1908, from *A. secundaria*.

Locality.—Gough Island. Trawled at a depth of 100 fathoms. Bottom deposit, Bryozoa and rock. 23rd April 1904.

Aglaophenia allmani, Nutting, 1900.

Two specimens are referred to this rare species. One is a comparatively small colony, 6·5 cm. high, still retaining some fragments of the hydrorhizal tubes. The other is a strongly fascicled branch, with a diameter of 1·5 mm. at its junction with

* Measured from straight node to furthest point of oblique node.

what is probably part of the main stem, and with a height of 7·5 cm. It bears rather delicate alternate ramuli which leave it almost at right angles.

While the general characters—branching, structure of hydoclades, shape and approximation of hydrotheeæ, position of nematophores—agree with the descriptions of Allman (1877, p. 39, pl. xxiii., as *A. ramosa*) and of Nutting, variations worthy of note have been observed in the last-mentioned organs. These variations seem to be mainly age differences. In the hydrothecæ on the proximal parts of the hydroclades the mesial nematophore reaches to the level of the marginal teeth, and is adnate, all but the very tip. The supracalycine nematophores are generally cylindrical, with two apertures—one terminal, the other a large oval opening on that side of the upper surface which is

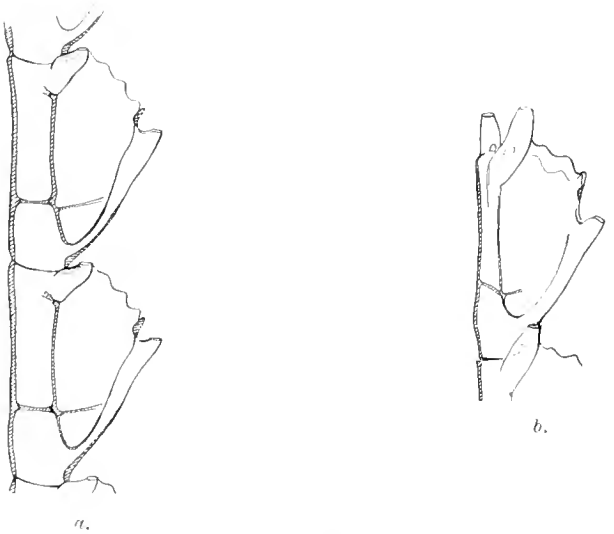


Fig. 10.—*Aglaophenia allmani*, showing variation in hydrothecæ and nematothecæ. (*a*) Hydrothecæ from the proximal end of a hydroclade. ×65. (*b*) Hydrothecæ from the distal end of a hydroclade. ×65.

towards the interior of the hydrotheca. Rarely this opening is much elongated, and extends through the band of perisare which separates it from the terminal opening. In such a case a single continuous opening is formed and the nematophores might be described as "almost cylindrical." The tip of a supracalycine nematophore reaches just to the margin of a hydrotheca. Its axis, viewed from the side, lies at an angle of about 45° with the stem. The nematophores, in general, agree with the type so far described.

In those hydrothecæ which occur towards the tip of the hydroclades, and which are therefore younger, the aperture is less oblique, while the adnate part of the hydrotheca is of the same length as in the older examples. As a consequence the mesial nematophore, although shown by measurement to be constant in length throughout the colony, *appears* to be shorter in the newly formed hydrotheeæ, since its tip falls considerably short of the margin. The supracalycine nematophores are of markedly greater length, overtopping the margin by about 0·056 mm., are quite cylindrical, and lie with their axis (viewed from the side) more nearly parallel to that of the internode. The lateral aperture is smaller and is never continuous with the terminal one, and the

internodal septum which in the older hydrothecæ marks the base of the nematophore is indicated in the terminal individuals only by a minute indentation.

I think, with NUTTING, that the general structure of the trophosome of the colonies resembles that of *Lytocarpus* rather than that of *Aglaophenia*.

Measurements :—

Stem internodes, length	0·39–0·45 mm.
,, ,, breadth	0·22–0·24 ,,
Hydroclade internodes, length	0·38–0·42 ,,
Hydrothecæ, length *.	0·35 mm.
,, diameter at margin	0·17 ,,
Mesial nematophore, length	0·28 ,,

Supracalycine nematophores, length of longest side, 0·11 mm. at base of hydroclade to 0·14–0·17 mm. at distal end of hydroclade.

Locality.—Station 81, Abrohlos Bank, Brazil. Lat. 18° 14′ S., long. 37° 58′ W. Depth, 36 fathoms. Bottom deposit, coral. 20th December 1902.

Distribution.—Only recorded from Florida Reef, in the Gulf of Mexico (by ALLMAN), and from a station in the Caribbean Sea (by NUTTING).

Aglaophenia dubia, Nutting, 1900.

Two specimens of this species, the *A. gracilis* of ALLMAN's Gulf Stream Report (ALLMAN, 1877), were collected in the same locality—one simple, reaching a height of 6 cm., the other sparsely branched and rather longer. The anterior profile of the hydrotheca is not so markedly concave as in ALLMAN's figure, nor is the mesial nematophore quite so long relatively to the height of the hydrotheca. The hydrothecæ have nine teeth (NUTTING says "about eight"), of which one on each side lies behind the supracalycine nematophores and is more acute than the others, while the anterior tooth is usually recurved. The number of the basal nematophores differs from that recorded by ALLMAN and NUTTING, for not only are two present on the front of each stem-internode (one close to the hydroclade and one on the proximal portion of the internode), while another small one lies at the base of the hydroclade, close to the former of those just mentioned—but, in addition, a large cup-shaped nematophore exists on the posterior aspect of internode, immediately behind the base of the hydroclade. Otherwise the specimens agree, point for point, with previous descriptions.

Measurements :—

Stem internodes, length	0·52 mm.
,, ,, breadth	0·31 ,,
Hydroclade internodes, length	0·36 ,,
,, ,, breadth at middle	0·05 ,,
Hydrothecæ, height	0·32 ,,
,, diameter at margin	0·14 ,,
Mesial nematophore, length	0·17 ,,

* Length of hydrotheca measured along the internode from the base of the cavity to the margin.

On the branched specimen two branches, which appear to belong to the colony, since they lie in the same plane and leave the stem at the same angle as the true branches, were found, on microscopic examination, to be specimens of *Halicornaria longicauda*, arising from hydrorhizal tubes climbing upon the stem of the *Aglaophenia* colony.

Locality.—Station 81, Abrohlos Bank, Brazil. Lat. 18° 14′ S., long. 37° 58′ W. Depth, 36 fathoms. Bottom deposit, coral. 20th December 1902.

Aglaophenia heterodonta, Jäderholm, 1903.

Dr Elof Jäderholm has described amongst the extra-European Hydroids in the Swedish Museum specimens of *A. dichotoma* (M. Sars), as distinct from a form with similar habit which he has named *A. heterodonta*. I now regard the specimens which were described in the earlier *Scotia* report under the name of *A. dichotoma* as examples of *A. heterodonta*.

Additional material enables me to add to Jäderholm's description of the general habit of the colonies. His specimens were characterised by irregularly ramified stems bearing short, upward curling twigs. Our specimens exhibit two types. The first, previously described (Ritchie, 1907,[1] pl. iii. fig. 2), is strictly dichotomous, although the branches may not develop equally in all parts of the colony. This type of branching is exactly similar to that of *A. dichotoma*. The dichotomously branched specimens were growing on a sponge, and are considerably taller (10 cm.) than Jäderholm's examples (3·5 cm.). The habit of the second type is distinctly reminiscent of that of *A. conferta*, Kirchenpauer, 1872; that is to say, simple curved stems spring in profusion from a hydrorhiza creeping upon an alga. There is no sign of branching. The largest of those colonies is only 18 mm. high, but that they are fully developed is shown by their sexual maturity, for several bear corbulæ with male gonophores. The minute characters of the two types of colonies are identical, and agree with those of *A. heterodonta*. It may be, however, that this is but a synonym of *A. conferta*, the only characters which seem to separate the latter being the absence of an unpaired anterior reflexed tooth (which, however, appears to be present in Kirchenpauer's figure); the outward, instead of the inward, direction assumed by the pair of teeth nearest the stem; and the angled nature attributed to the supracalycine nematophores. However, it is only by examination of Kirchenpauer's type that such a question could be decided.

That the branched and unbranched colonies are found on two different types of substratum probably indicates that they are environmental modifications; the fixed, settled colony (that on the sponge) becoming luxuriant, while the drifting, unsettled colony (that growing on the alga) tends, as do so many alga-borne Hydroids, to remain dwarfed and of simple habit.

The development of the corbula differs slightly from that of *A. pluma* as described by Allman (1871, p. 59) and Nutting (1900, p. 40), for the leaves develop less simul-

taneously. While in NUTTING's specimens all the leaves had made their appearance before even the primary pair had reached full development, here, when only five pairs are recognisable, the two first-formed pairs are already full grown; and when six pairs are visible the earliest three have reached full development, the later ones being in a state of decreasing perfection.

While some of the corbulæ are wholly closed some remain partially open, their leaves, at least towards the tip, bearing nematophores on each side, and remaining separate from each other. In the latter case the gonophores are always male, in the former no gonophores remained; but since maleness and openness go together, as they do in so many other cases, it seems probable that in this species we have an example of sexual dimorphism of the type described by Mr H. B. TORREY and Miss MARTIN (1906).

The depth of a hydrotheca varies from 0·27 to 0·28 mm., its diameter at the mouth from 0·17 to 0·19 mm.; measurements agreeing with those of JÄDERHOLM.

Locality.—On sponges and algæ from the entrance to Saldanha Bay, Cape Colony. Depth, 25 fathoms. Bottom deposit, sand and kelp. 21st May 1904.

Aglaophenia minima, Nutting, 1900.

Two colonies (the larger 1 cm. high) are distinguished by their cylindrical, keelless hydrothecæ with short projecting mesial nematophores as belonging to this species. In addition to the septal ridge, mentioned by NUTTING, which traverses the hydrotheca-bearing internode at the level of the intrathecal ridge, another is evident opposite the base of the supracalycine nematophores. The opening of the hydrotheca is bordered by nine, instead of by eight teeth; and in the mesial nematophore of some of the hydrothecæ a slight chitinous constriction, almost in line with the profile of the hydrotheca, is apparent. The nematophores on the stem internodes are arranged as follows:—A solitary long nematophore on the front and at the proximal end of the internode; and in the angle between the hydroclade process and the stem, a double nematophore, with two diverging processes each bearing a terminal aperture. Only a single opening, however, connects the cavity of the double nematophore with that of the colony. The hydroclade process itself bears a large simple nematophore on its anterior surface, and to this appears to be due the bifurcated appearance mentioned by NUTTING.

No gonangia were present.

Measurements:—

Stem internodes, length	0·45–0·56 mm.
,, diameter	0·08–0·10 ,,
Hydroclade internodes, length	0·39 mm.
Hydrotheca, depth	0·34 ,,
,, diameter at mouth	0·14 ,,

Locality.—Growing amongst seaweed on the leg of a masked crab. Station 81,

Abrohlos Bank, Brazil. Lat. 18° 24′ S., long. 37° 58′ W. Depth, 36 fathoms. Bottom deposit, coral. 20th December 1902.

Previously recorded from Little Cat Island, Bahamas (Nutting).

Aglaophenia latecarinata, Allman, 1877.

This common tropical species, identical, as shown by the researches of Professor Nutting (1900, p. 96), with the *A. minuta* of Fewkes (1881, p. 132), occurs among the *Scotia* collections in its usual habitat, creeping upon the fronds and bladders of Saragassum weed. The specimens, the largest of which are 13 mm. high, correspond with Nutting's description in all points but one. For while he mentions only two nematophores at the base of each hydroclade. I have observed in all cases four nematophore apertures, the two recorded by Nutting, and, in addition, lying immediately distal to the internodal process from which the hydroclade projects, in the axil between it and the stem, a double nematophore, possessing two apertures, one directed to the right, the other to the left of the hydroclade process. The cœnosarc of this nematophore connects with the general cœnosarc of the colony through a single median perforation in the internode wall. A similar arrangement of nematophores occurred in the specimens examined by Billard (1907) and Versluys (1899). As the following comparative table shows, our specimens are, in all respects, somewhat larger than those described by Billard:—

	Scotia Specimen.	Billard's *Talisman* Specimen.
Length of hydrocaulus . . .	6–13 mm.	5–6 mm.
Breadth of ,, . . .	0·1–0·13 mm.	0·08–0·12 mm.
Length of stem internodes . . .	0·34 mm.	0·25–0·30 ,,
,, hydrotheca . . .	0·31 ,,	0·27–0·30 ,,
Breadth of hydrotheca at mouth (excluding keel)	0·15 ,,	0·135 mm.
Breadth of keel	0·03 ,,	?

Locality.—On floating Saragassum weed, caught in spawn net. Station 538. Lat. 32° 11′ N., long. 34° 10′ W. 30th June 1904.

Halicornaria longicauda, Nutting, 1900.

At first glance one of the specimens which I have referred to this species appears to be a fascicled colony with alternate branches; but closer scrutiny shows that there is present a central axis with the remains of hydroclades, and that around this are grouped tubes which in their distal portions are continued as the so-called branches, and in the proximal appear to form the hydrorhizal tubes of the compound colony. The specimen really consists of a central axis upon which several distinct *Halicornaria* colonies happen

to be creeping. The clustered hydrorhizal tubes of these create the resemblance to fascicling, but the structure is analogous rather to the rhizocaulom often exhibited by *Lafoëa dumosa* than to a truly fascicled stem. The rhizoid nature of this compound stem is confirmed by another specimen (*Aglaophenia dubia*) from the same locality, where the two lower branches, at least so they appear to the eye, turn out to be distinct climbing colonies of *H. longicauda*.

The largest of the colonies found by the *Scotia* is 11 cm. in height. The specific characters agree with those given by Professor NUTTING, but in our specimens the hydrothecæ appear to have undergone a greater degree of tilting forward than his figures indicate, while the lateral teeth are more strongly developed. The aperture is vertical and slightly constricted, with a sharp tooth projecting upwards and outwards on either side. The intrathecal ridge is well marked, arising near the middle of the

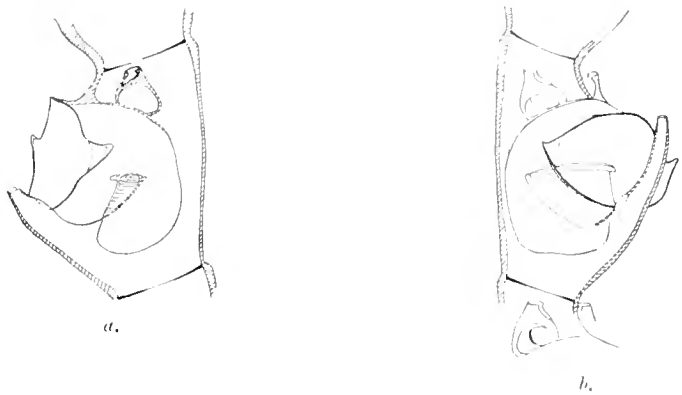


FIG. 11.—*Halicornaria longicauda*. Hydrothecæ showing variation in the length of the median nematophore. × 110.

adnate portion of the mesial nematophore and extending backwards at an angle of 45° with the axis of the hydroclade. Its free edge is slightly rednplicated. The supracalycine nematophores are short and stont, and when viewed from the front appear clearly above the hydrotheca, although they do not reach the margin of the aperture. The mesial nematophore varies greatly in length ; considerable differences may be seen even in two succeeding hydrothecæ. Sometimes shorter than in the examples figured by NUTTING, it may, on the other hand, extend far beyond the margin of the hydrotheca, and, curving gracefully upwards, its tip may reach the level of the upper portion of the rim. There are three cauline nematophores (not two, as NUTTING implies) clustered about the stem process on which the hydrotheca rests. Two lie on the anterior surface, one at the distal, the other at the proximal side of the stem process, while one lies on the posterior aspect of the process itself. They are triangular in shape and large, normally with two apertures, one at each of the free angles of the triangle, but occasionally showing, as a variation, a third aperture, situated medianly between the normal two.

The gonosome is unknown.

Measurements :—

Stem internodes, length	0·29–0·35 mm.
,, breadth	0·13–0·16 ,,
Hydroclade internodes, length	0·25–0·29 ,,
Hydrotheca, depth	0·14 ,,
,, vertical diameter at margin	0·13–0·14 ,,
,, horizontal ,, ,,	0·18 ,,

Locality.—Station 81, Abrohlos Bank, Brazil. Lat. 18° 14′ S., long. 37° 58′ W. Fathoms, 36. Bottom deposit, coral. 20th December 1902.

Distribution.—The only record given by NUTTING is from the Caribbean Sea near the Isthmus of Panama (lat. 9° 32′ N., long. 79° 55′ W. 36 fathoms). The present locality, also a shallow water one, is off the coast of Brazil near Porto Alegre—a considerable southwards extension of the known range.

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Mere mention is here made of the memoirs alluded to in this paper. For their titles reference must be made to such bibliographies as that in HARTLAUB's "Die Hydroiden der magalhaenischen Region und chilenischen Küste" (below 1905), or those in NUTTING's "Monographs of the American Hydroids."

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PART III.

ACARIENS.

III.—THE ACARIENS OF THE SCOTTISH NATIONAL ANTARCTIC EXPEDITION.

By Dr E. L. TROUESSART,
Professor at the Museum of Natural History, Paris.

Acariens de l'Expédition Antarctique Nationale Écossaise. Par le Dr. E.-L. Trouessart, Professeur au Muséum National d'Histoire Naturelle de Paris.

(MS. received April 10, 1912. Issued separately July 1, 1912.)*

La partie des Terres Antarctiques explorée par la Scottish National Antarctic Expedition—les Iles Orcades du Sud—appartient à la même région que celles visitées précédemment par les expéditions Belges et Françaises. Il n'y a donc pas lieu d'être surpris si la faune Acarienne de ces îles, groupées autour de la Terre de Graham, présente une uniformité assez notable, et si nous retrouvons ici, à peu de chose près, les types déjà décrits dans les *Résultats du Voyage de la "Belgica."*

Tous les Acariens dont la détermination nous a été confiée, appartiennent à la faune terrestre. Trois familles y sont représentées : *Oribatidæ*, *Gamasidæ*, *Eupodidæ*.

Oribatidæ.

Une seule espèce, très voisine de *Notaspis antarctica* Michael, trouvée par les naturalistes de la *Belgica* sur les mousses et les lichens des rivages du détroit de Gerlache.†

Notaspis scotiæ, nov. sp.

Semblable à *Notaspis antarctica* Michael, mais en différant par sa forme générale en ovoïde allongé, surtout chez le mâle (et non pyriforme). La couleur est un brun foncé et la texture est plus lisse, plus polie, et plus brillante sur le dos, que chez *N. antarctica* (autant qu'on en peut juger sur des spécimens conservés dans l'alcool).

Mâle en ovale allongé, l'abdomen terminé par une pointe conique très courte, mais très nette, et beaucoup plus large que la très petite pointe figurée par Michael chez *N. antarctica* entre les deux poils terminaux. Cephalothorax, rostre, organes pseudo-stigmatiques, semblables à ceux de *N. antarctica*. Abdomen sans aucun indice d'échancrures à son extrémité. Cadres génital et anal offrant la même disposition que chez cette dernière espèce. Pattes semblables.

Femelle en ovale régulier, plus court que chez le mâle, mais ne présentant aucune trace de la double échancrure qui termine l'abdomen de la femelle de *N. antarctica*.

Nymphe très semblable à celle de *N. antarctica*, et présentant, comme celle-ci, une cuticule dorsale chagrinée, avec des enfoncements en forme de cuvette sur les bords. La plupart des spécimens mâle et femelle venaient d'effectuer leur dernière mue, ou étaient encore renfermés dans leur peau de nymphe (nombreux spécimens).

Dimensions.—Longueur totale : 1 mm. 20 (la femelle plus large que le mâle).

Habitat.—Dans les mousses de l'Ile Saddle (Orcades du Sud), 4 Février 1903.

* Scottish Oceanographical Laboratory Publications.

† *Résultats du Voyage du S.Y. "Belgica"; Zoologie* (1903) : "Acariens libres," par E. Trouessart et A. D. Michael ; *Oribatidæ*, p. 3, pl. ii., fig. 1 à 11.

Gamasidæ.

Gamasellus racovitzai neo-orcadensis, nov. subsp.

Très semblable au type (du détroit de Gerlache), mais en différant par la disposition des tubercules de la patte renflée (deuxième paire), chez le *mâle*. Le grand tubercule falciforme inséré sur le 3e article n'est pas comprimé à son extrémité en forme de fer de hache, mais simplement pointu, en forme de corne. Les autres tubercules sont semblables et semblablement disposés. Les cornicules du rostre ont exactement la même forme.* La taille est un peu plus forte : 1 mm. de longueur totale (au lieu de 0 mm. 90).

Ce n'est pas sans hésitation que je sépare cette forme (un seul spécimen mâle) de *G. racovitzai*, même comme simple sous-espèce ; on sait, en effet, que chez les *Gamasidæ* la forme des tubercules de la 2e paire du mâle est très variable d'un individu à l'autre. Par contre, l'absence du tubercule à la 4e paire de pattes (si elle est constante) aurait une valeur spécifique.

Remarque.—Tragårdh (dans les *Wiss. Ergebniss Swed. Sudpolar Exped.*, v., Zool., 1908, No. 11, p. 7) a créé le genre *Gamasellus*, ayant pour type le *Gamasus racovitzai* Trt. de la *Belgica*. Ce genre diffère très peu de *Gamasus*, et parait renfermer tous les *Gamasidæ* connus de la faune antarctique.

Habitat.—Dans les mousses de l'Ile Laurie, sur une falaise (*cliff*) de 200 pieds d'altitude (mêlé à des *Collembola*). 18 Décembre 1903. Je rapporte à la même espèce deux nymphes, provenant de Scotia Bay, 21 Octobre 1903.

Eupodidæ.

Penthalodes villosus (Trouessart).

Penthaleus villosus Trouessart, *Résultats du Voyage de la "Belgica,"* 1903, "Acariens terrestres," p. 6, pl. i., 2*a* à 2*d*.

Les spécimens des Orcades du Sud ne semblent différer de ceux du détroit de Gerlache que par une pubescence un peu moins prononcée, surtout sur la partie postérieure du notogastre (nombreux spécimens).

Remarque. — Le genre *Penthalodes*, ayant pour type *Penthaleus villosus* Trouessart, 1903, a été créé par Tragårdh (*loc. cit.*, 1908). Il diffère en effet des *Penthaleus* typiques par son corps plus allongé, nettement divisé en région céphalothoracique et région abdominale, etc.

Habitat.—Dans les mousses, sur une falaise de 200 pieds de haut (mêlés à des *Collembola*), Ile Laurie. 18 Décembre 1903.

* Trouessart, *Résultats du Voyage de la "Belgica," loc. cit.*, "Acariens libres," p. 8, pl. i., fig. 3, 3*a*, 3*b*.

PART IV.

CEPHALOPODA.

IV.—THE CEPHALOPODA OF THE SCOTTISH NATIONAL ANTARCTIC EXPEDITION.

By WILLIAM EVANS HOYLE, M.A., D.Sc.
Director of the National Museum of Wales, Cardiff.

(*WITH TEXT ILLUSTRATIONS.*)

The Cephalopoda of the Scottish National Antarctic Expedition.

By William Evans Hoyle, M.A., D.Sc.

(MS. received January 8, 1912. Read February 19, 1912. Issued separately May 28, 1912.)

The Cephalopoda collected by the *Scotia* may, with a few trifling exceptions, be separated geographically into three divisions, coming respectively from South Africa, South America, and the Antarctic.

A. South Africa :

Euprymna sp.
Sepiolid (undetermined).
Loligo reynaudi.
Sepia australis.
Hemisepius typicus.

B. South America :

Polypus brucei, n. sp.
Polypus tehuelchus.
Desmoteuthis sp.

C. Antarctic Regions :

Stauroteuthis sp.
Moschites charcoti.
Onychoteuthis ingens.
Bathyteuthis abyssicola.
Galiteuthis suhmi.

In addition were collected :—

Between the Cape and Tristan da Cunha :

Histioteuthis sp.

Equatorial Atlantic :

Tremoctopus quoyanus.

A considerable number of the horny mandibles of Cephalopods were obtained from the stomachs of various mammals and birds, but the small amount of authentically

(reprinted from the transactions of the royal society of edinburgh, vol. xlviii, pp. 273 283.)

named material available does not justify an attempt to identify them. The animals referred to and the localities were:—

Ross' Seal.—Station 165, 6th February 1903.

Weddell's Seal.—Station 326, Jessie Bay, South Orkneys, May 1903; Station 325, South Orkneys, 21st September 1903.

Albatross.—Station 437, 3rd April 1904.

Sooty Albatross.—Station 376, lat. 64° 38′ S., long. 35° 13′ W. 23rd February 1904.

Emperor Penguin.—Station 248, lat. 69° 46′ S., long. 20° 58′ W. 21st February 1903.

SYSTEMATIC LIST.

Cirroteuthidæ.

Stauroteuthis sp.

Locality.—Station 295, Weddell Sea. Lat. 66° 40′ S., long. 40° 35′ W. 10th March 1903. 2425 fathoms. One specimen [H 956].*

This is probably either *S. meangensis* or *S. hippocrepium*, but in the mutilated condition of the body and the absence of the internal cartilage it is impossible to speak with certainty. It is just possible that it might be one of the species of *Cirroteuthis*, but this is less likely.

A number of fragments and a few fairly complete examples of Crustacea were found in the gizzard of this specimen, and an account of them has been published by Dr Thomas Scott.† The most remarkable appears to be *Pontostratiotes abyssicola*, G. S. Brady, which seems never to have been met with since the unique type was obtained by the *Challenger* in mud from 2200 fathoms in lat. 37° 29′ S., long. 27° 31′ W. This is of interest as furnishing corroborative evidence of the deep-sea habits of the Cirroteuthidæ. By a clerical error Dr Scott gives the date of capture as 1908 instead of 1903.

A water-colour drawing of this specimen, made on the Expedition, shows that the coloration very closely resembles that of *Stauroteuthis hippocrepium*, as depicted in the *Albatross* Report;‡ the colour of the body is, however, more deeply purple. As compared with *Cirroteuthis umbellata*, Fischer,§ the arms are dull red instead of deep purple (though this may be owing to the oral aspect of the arms being depicted in one case and the aboral in the other), and the body is purple instead of pale reddish.

* The numbers in square brackets refer to my own register of specimens examined.

† *Ann. and Mag. Nat. Hist.* (8), vol. v. pp. 51–54, pls. ii., iii., Jan. 1910.

‡ Hoyle, *Bull. Mus. Comp. Zool.*, vol. xliii., No. 1, pl. i. fig. 1. pl. ii. fig. 1, 1904.

§ Joubin, "Céphalopodes de la 'Princesse Alice,'" pl. i., 1900 [1901].

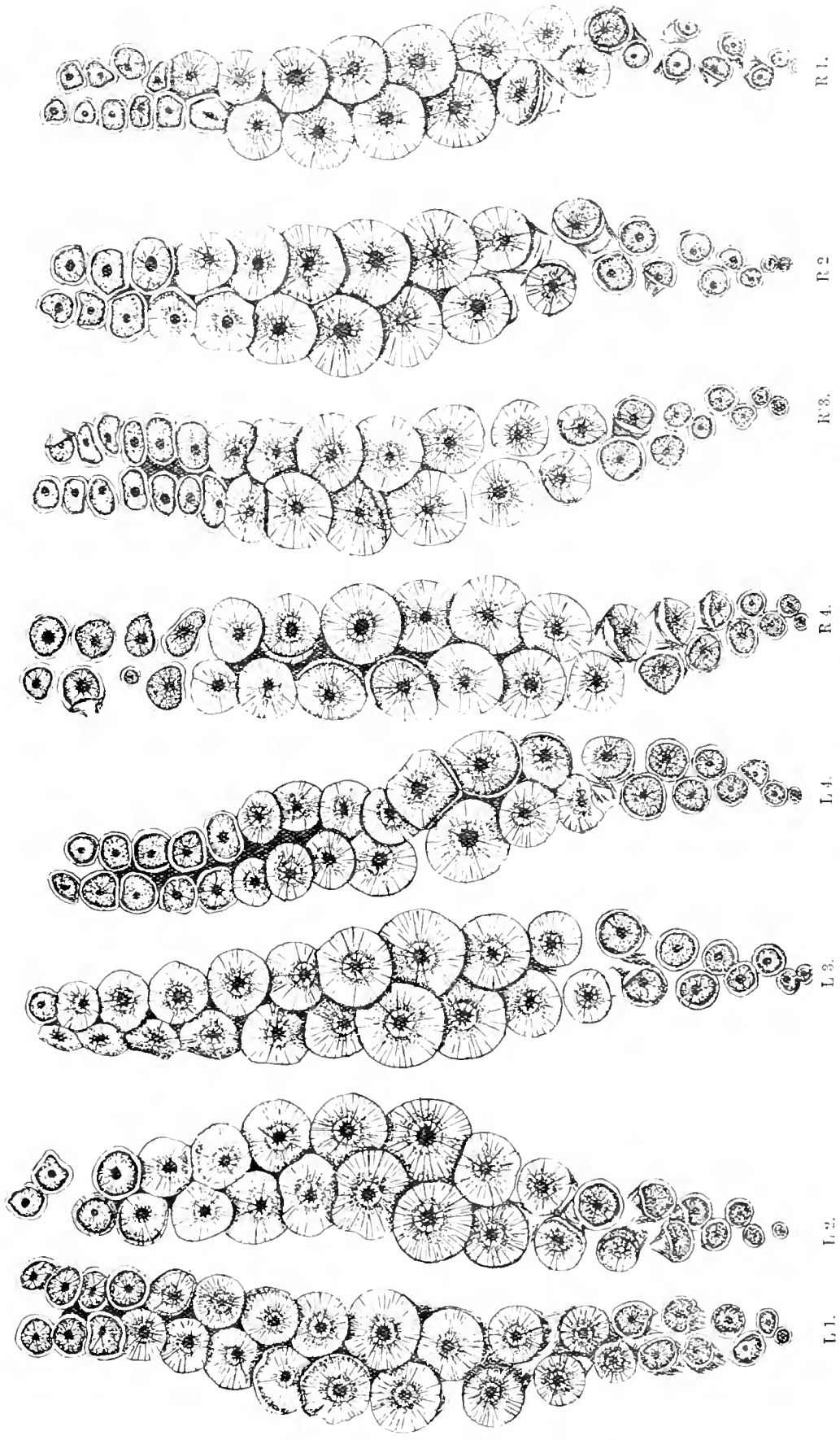


FIG. 1.—Oral aspect of the arms of *Polypus brucei*, to show the arrangement of the enlarged suckers. Natural size.

TREMOCTOPODIDÆ.

Tremoctopus quoyanus, d'Orbigny, 1835.

Locality.—Tow-net, Station 59, Equatorial Atlantic. Lat. 2° 30′ S., long. 32° 42′ W. 12th December 1902. Surface. One specimen, ♀ [H 1366].

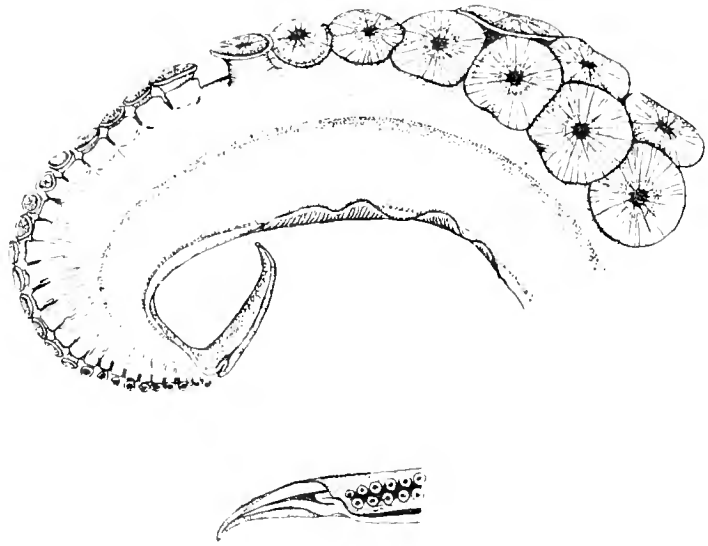
Previous Records.—Atlantic and Pacific Oceans.

POLYPODIDÆ.

Polypus brucei, n. sp.

Locality.—Station 346, Burdwood Bank, off Tierra del Fuego. 1st December 1903. One specimen, ♂ [H 924].

The Body is a flattened ovoid, with a very shallow groove along the middle



a.

FIG. 2.—The hectocotylised arm of *Polypus brucei*. *a*, oral aspect of the extremity. Natural size.

line ventrally. The *mantle opening* extends fully half way round the circumference of the body, terminating immediately below and behind the eyes. The *siphon* is short and broad, and extends less than half way from the margin of the mantle to the edge of the umbrella.

The Head is somewhat narrower than the body, and the *eyes* are but slightly prominent.

The Arms are somewhat unequal, and about four times as long as the body; their order of length is 1, 2 = 3, 4. The *umbrella* is well marked and its arrangement very characteristic. On the dorsal aspect of each arm it is attached as far as a point about one-third up the arm, whilst on the ventral aspect its attachment can be followed to about within 1 cm. of the extreme tip of the arm. The *suckers*

(fig. 1) on all the eight arms are enlarged for the second quarter of the arm; after about the first twelve suckers they enlarge very rapidly for about six suckers, and then gradually diminish. The third arm on the right side is hectocotylised (fig. 2), and is considerably shorter than its fellow on the opposite side. The seminal groove is well marked, but is neither very broad nor very deep; the modified extremity

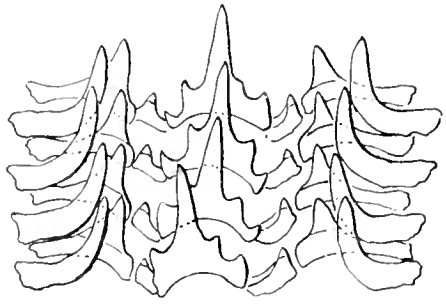


Fig. 3.—Radula of *Polypus brucei* [H 924]. ×25.

is unusually long and narrow, and, instead of the usual transverse ridges, shows a double row of small papillæ along its bottom.

The Surface shows a considerable amount of wrinkling, due apparently to the action of preservative fluids, but was most probably smooth when the animal was alive. There is no trace of any warts or tubercles.

The Colour is dull purplish above, changing gradually into a pinkish stone colour below.

The Radula is shown in fig. 3.

Dimensions in Millimetres.

End of body to mantle margin	58
End of body to eye	75
Breadth of body	60
Breadth of head	50
Eye to edge of umbrella	60
Length of hectocotylus	17
Breadth of hectocotylus	3
Diameter of largest sucker on arm	15

	Right.	Left.
Length of first arm	270	275
Length of second arm	185*	250*
Length of third arm	200	260
Length of fourth arm	255	255

* Mutilated.

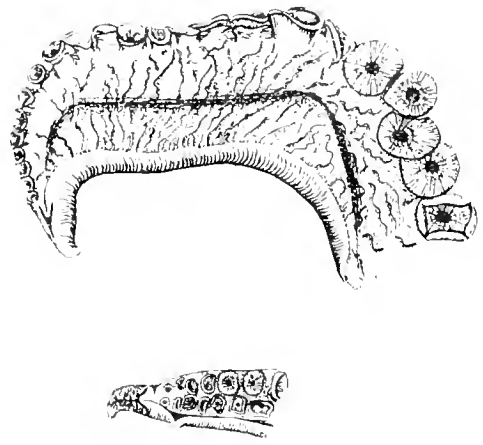
This species is evidently nearly related to *P. megalocyathus* (Gould) from the same geographical region. It differs, however, in the absence of the extremely

marked constriction between the head and umbrella, as well as of the membrane along the sides of the body, and in the fact that the enlarged suckers are found in all the arms. It is impossible to ascertain whether this last peculiarity occurs in GOULD's species, but his comparison with *P. fontanianus*, in which only the lateral arms have enlarged suckers, would lead one to suppose that such was the case in his species also.

I have much pleasure in dedicating this species to my friend Dr W. S. BRUCE, the leader of the expedition.

Polypus tehuelchus, d'Orbigny, 1835 ?

Locality.—Station 118, Falkland Islands. Lat. 51° 49′ S., long. 57° 51′ W. Shore collection. 6th February 1904. One specimen, ♂ [H 1696].



a.

FIG. 4.—Hectocotylised arm of *Polypus tehuelchus*.
a, oral aspect of the extremity. Natural size.

Port Stanley, Falkland Islands. February 1904. One specimen, ♀ [H 926].

Previous Records.—East coast of Patagonia, 40° S.; Strait of Magellan; Punta Arenas; Nicaragua; St Thomas, Danish West Indies.

The skin of the upper part of the body, and especially of the head, is very much wrinkled, but this is probably due to the action of reagents, as no traces of definite papillæ can be found. The animal was most likely smooth in the natural state. The hectocotylised arm of the male (fig. 4) has a very well-developed seminal groove, especially at the proximal end, where the membrane forming it stands out very distinctly from the surface of the arm. The tip is comparatively short and broad, measuring 6 × 3 mm., and of quite normal form; the terminal groove is small and narrow; its margins are deeply folded (perhaps owing to reagents), and there are no transverse ridges across its bottom. The radula is shown in fig. 5.

I believe this specimen to be correctly identified, but there is some little doubt

owing to its colour being neither so dark above nor so pale below as is indicated in D'ORBIGNY's description and figure.

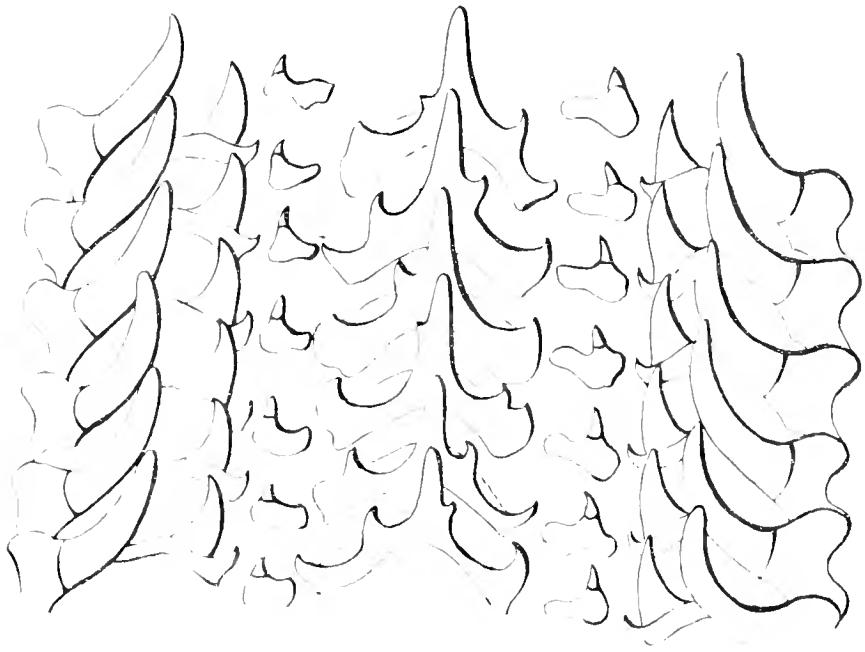


FIG. 5.—Radula of *Polypus tehuelchus*, ♂ [H 1696]. ×52.

Moschites charcoti (Joubin), 1905.

Locality.—Station 325, Scotia Bay, South Orkneys. 7th August 1903. 10 fathoms. One specimen, ♂ [H 929]. Same locality. 30th May 1903. 9–10 fathoms. Temperature about 28°. One specimen, ♀ [H 936].

a.

FIG. 6.—Hectocotylised arms of *Moschites charcoti*. *a*, oral aspect of the extremity. Natural size.

Previous Records.—Booth-Wandel Island. Lat. 65° 05′ S. Among algæ on the beach. 3rd September 1904.

The hectocotylised arm (fig. 6) is short and stout; the ridge bounding the seminal groove is very well marked, and is continuous with the margin of the umbrella. The groove itself is broad and deep, the extremity measures 7 × 5 mm.; the longitudinal groove is triangular in form, and has four transverse ridges in its bottom.

The radula is shown in fig. 7.

According to coloured drawings made on the Expedition, the male of this species is dull stone colour above, deepening to brown in the centre of the back; the

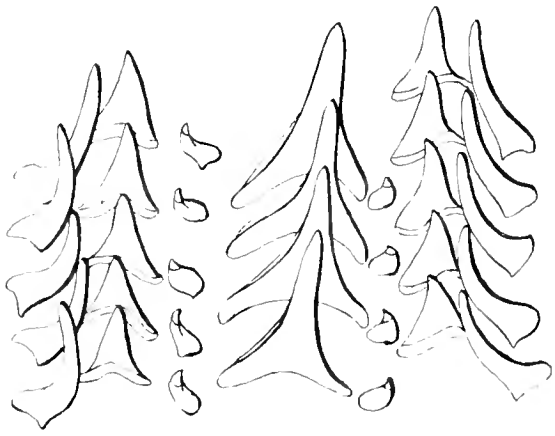


Fig. 7.—Radula of *Moschites charcoti*, ♂ [H 924]. ×50.

female is much paler, with a pinkish tinge above, almost white below. The colours would, however, probably undergo change according to the varying state of contraction of the chromatophores.

Sepiolidæ.

Euprymna sp.

Locality.—Station 482, Saldanha Bay, Cape Colony. 19th May 1904. 8–10 fathoms. Trawled. One specimen, too young to determine [H 934].

Sepiolid gen. et sp. ?

Locality.—Entrance to Saldanha Bay, Cape of Good Hope. 21st May 1904. 25 fathoms.

A head and arms, much macerated [H 1367].

Loliginidæ.

Loligo reynaudi, d'Orbigny, 1845.

Locality.—Station 480, eight miles north of Dassen Island, Cape Colony. 35 fathoms. Between 2 and 2.30 p.m., 18th May 1904. One specimen, ♀ [H 927].

Twenty-six young specimens, thirteen ♂, twelve ♀, one damaged [H 930]. One somewhat damaged specimen, ♀, probably of this species [H 1372].

Previous Records.—Cape of Good Hope; False Bay, Cape Town.

It is quite possible that some of the young specimens recorded as females may be males in which the secondary sexual characters were as yet undeveloped.

Sepiidæ.

Sepia australis, Quoy and Gaimard, 1832.

Locality.—Station 480, eight miles north of Dassen Island, Cape Colony. 35 fathoms. 18th May 1904. One specimen, ♀ [H 932].

Previous Records.—Cape of Good Hope, Agulhas Bank; North Queensland; New South Wales.

This is not *S. australis*, d'Orbigny: that author changed Quoy's name to *S. capensis*, and gave the name *S. australis* to a quite different form.

The tentacular club (fig. 8) shows three suckers much larger than the others, which diminish in size towards the tip, the third being about half the diameter of the first.

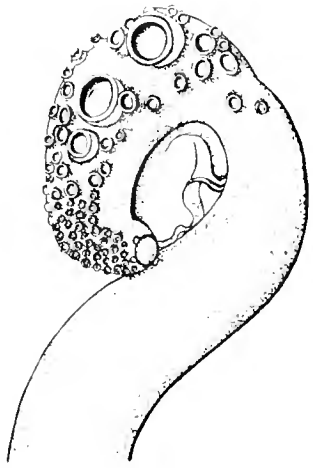


Fig. 8.—Tentacular club of *Sepia australis* [H 932]. ×7·5.

Hemisepius typicus, Steenstrup, 1875.

Locality.—Station 482, Saldanha Bay, Cape Colony. 19th May 1904. 8–10 fathoms; trawled. Two specimens, ♀ [H 933 and 1380].

Previous Record.—Table Bay, Cape Town.

Onychoteuthidæ.

Onychoteuthis ingens, Smith, 1881.

Locality.—Off the South Orkney Islands. Lat. 60° 10′ S., long. 42° 35′ W. 6th February 1903. From the stomach of a Ross' seal: a number of half-digested fragments [H 925].

Station 325, Scotia Bay, South Orkneys. 1st January 1904. One specimen [H 928].

A drawing of the radula is given in fig. 9, as its form differs in a few details from that shown by SMITH.*

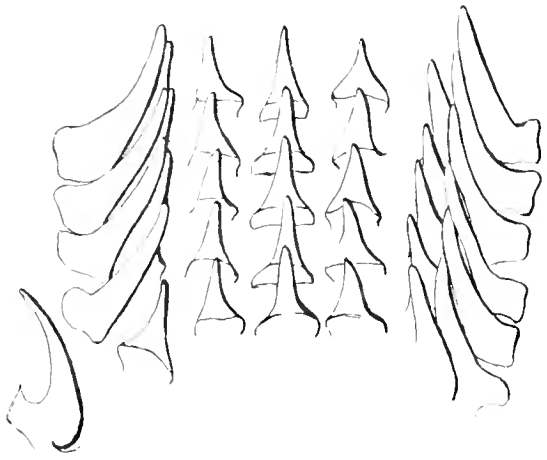


FIG. 9.—Radula of *Onychoteuthis ingens* [H 925]. × 25.

HISTIOTEUTHIDÆ.

Histioteuthis sp. juv.

Locality.—Station 468, South Atlantic. Lat. 39° 48′ S., long. 2° 33′ E. 29th April 1904. 2645 fathoms. One specimen [H 940].

The specimen is somewhat damaged. The interbrachial membrane is slightly developed. One arm shows the pigmented organ at the extremity, which, so far as I am aware, is characteristic (in this family) of the genus *Histioteuthis*, although it is not alluded to in the diagnosis either of PFEFFER or CHUN. In many respects it resembles the *Challenger* specimen called *Histiopsis atlantica*, which was also from the same region, but is pale and semi-transparent, whilst that was opaque and dull reddish in colour.

BATHYTEUTHIDÆ.

Bathyteuthis abyssicola, Hoyle, 1885.

Benthoteuthis megalops, Chun, "Cephalopoden," *Wiss. Ergebn. deutsch. Tiefsee Exped.*, p. 185, pls. xxiv.–xxvii.

Locality.—Station 416, off Coats Land. Lat. 71° 22′ S., long. 18° 15′ W. Surface to 2300 fathoms. 17th March 1904. One specimen [H 938].

Previous Records.—Southern Ocean, lat. 46° 16′ S, long. 48° 27′ E.; off Martha's Vineyard, U.S.A.; off Cape Mala, Gulf of Panama; off Cape Agulhas; Equatorial Indian Ocean.

Professor CHUN has adopted VERRILL'S name *Benthoteuthis megalops* for this species, on the ground that "sheet 50 of the *Trans. Connect. Acad.*, vol. vi., in which VERRILL'S description is contained, bears (p. 399) the note 'April 1885.'" If my friend is content to accept this method of determining dates of publication, he may turn to sheet 34 of the *Narrative of the Challenger Expedition*, vol. i., first part, in which HOYLE'S description is contained, and he will find that it bears

* *Proc. Zool. Soc.*, 1881, pl. iii., fig. 1 *b*.

(p. 265) the date "1884." I was fully aware of both these dates when I prepared the *Report on the "Challenger" Cephalopoda*, but as a matter of fact neither of them is a date of publication. Sheet 50 of VERRILL's *Third Catalogue of Mollusca . . . of the New England Coast* was not published by itself, but along with sheets 51–56, in a wrapper which bears the words, "Newhaven, April to June 1885." Therefore, under the most favourable construction, it cannot possibly have appeared before June, and careful inquiries which I made at the time led me to the conclusion that it did not make its appearance till July. I may further add that in the twenty-five years which have elapsed since the statement was published its accuracy has never been impugned.

CRANCHIIDÆ.

Galiteuthis suhmi, Hoyle, 1886.

? Procalistes suhmii, Lankester, *Quart. Journ. Micr. Sci.*, vol. xxiv. p. 311, 1884.
Taonius suhmi, Hoyle, *Ceph. Challenger Exped.*, p. 192, pl. xxxii. figs. 5–11, 1886.
Taonidium suhmi, Pfeffer, *Synopsis Oegopsid. Ceph.*, p. 192, 1900.
Galiteuthis armata, Joubin, *Ann. Sci. Nat. (Zool.)*, sér. 8, vol. vi. p. 279, 1898.
Galiteuthis (Taonidium) suhmii, Chun, "Cephalopoden," *Wiss. Ergebn. deutsch. Tiefsee Exped.*, p. 382, pl. lix., 1910.

Locality.—Station 422, Weddell Sea. Lat. 68° 32′ S., long. 12° 49′ W. 23rd March 1904. Vertical net; surface to 600 fathoms. One specimen [H 935].

Previous Records.—South of Australia, lat. 47° 25′ S., long. 130° 22′ E.; Mediterranean; Equatorial Atlantic in the Guinea Current.

This specimen has a mantle length of 45 mm., and is, therefore, considerably larger than that described by CHUN (34 mm.); but nevertheless I could find no trace of the modification of the tentacular suckers into hooks as depicted by him (pl. lix. figs. 6, 7); still, the other characters agree so well that I have no doubt that it belongs to the same species as his.

If it could be proved satisfactorily that the embryo described by LANKESTER really belonged to this species, his name would take precedence; but at present it seems advisable to keep the name *Procalistes suhmii* for it, and to call the more mature specimens by the name adopted by CHUN.

Desmoteuthis sp.

Locality.—Station 98, off Rio Grande, South America. Lat. 34° 2′ S., long. 49° 7′ $\frac{5}{5}$W. 28th December 1902. Mantle and fin, cast up by a petrel. Too fragmentary to determine. [H 1368.]

I have not thought it necessary to encumber this Report with full bibliographical references; these will be found in my *Catalogue of Recent Cephalopoda* and its two Supplements.* The drawings have been made by Miss I. M. DAVENPORT, B.Sc., under my supervision.

* *Proc. Roy. Phys. Soc. Edin.*, vol. ix., 1886; vol. xiii., 1897; vol. xvii., 1909.

NATIONAL MUSEUM OF WALES, CARDIFF,
6*th January* 1912.

PART V.

MARINE MOLLUSCA.

V.—THE MARINE MOLLUSCA OF THE SCOTTISH NATIONAL ANTARCTIC EXPEDITION.

BY

JAMES COSMO MELVILL, M.A., D.Sc., F.L.S.,

AND

ROBERT STANDEN,

Assistant Keeper, Manchester Museum.

(*WITH ONE PLATE.*)

The Marine Mollusca of the Scottish National Antarctic Expedition.

By James Cosmo Melvill, M.A., D.Sc., F.L.S., and Robert Standen, Assistant Keeper, Manchester Museum. *Communicated* by Dr W. S. Bruce. (With One Plate.)

(MS. received April 24, 1912. Read June 3, 1912. Issued separately August 26, 1912.)

PART II.

Being a Supplementary Catalogue.

Since we had the pleasure of working out the Mollusca obtained by the Scottish National Antarctic Expedition, Dr W. S. Bruce has kindly transmitted to our care some additional material, overlooked in the first instance, and taken (*a*) from deposits from jars in which Sponges were placed; (*b*) from Algæ and other growths, principally coming from Scotia Bay; and (*c*) from a new species of *Cephalodiscus*.

Of these the last, when macerated out and closely examined, produced the most prolific and interesting results; but, notwithstanding this fact, the condition of many of the specimens extracted leaves much to be desired, so fragmentary and useless for scientific purposes was a very large proportion found to be. A certain few, however, are happily in better condition and recognisable, and, of these, we find several to have been described by Dr Hermann Strebel of Hamburg in 1908, the year subsequent to our first paper upon the subject being published.

Others remain, of which over twenty do not appear to be represented in the collections to which we could obtain access, nor mentioned in any of the treatises yet published on the Antarctic fauna. We are therefore emboldened to consider them new to science in the accompanying supplementary catalogue.

We include afresh in the list of species obtained by this expedition those already catalogued in our first paper, thus rendering it as complete as possible, and signalise with an asterisk (*) those which are amongst the addenda now chronicled.

We would thank Mr Edgar Smith, I.S.O., for having examined some of the material, and likewise would express our indebtedness to the Rev. Lewis J. Shackleford, Messrs B. R. Lucas and J. Wilfrid Jackson, F.G.S., for having aided us in the difficult task of extracting such small and fragile objects from the mass in which they were too often almost hopelessly embedded. Mr T. Iredale has also kindly drawn up the description of a new species of *Chatopleura* for this paper.

We would only add that we have extended the Bibliographical Catalogue of the Antarctic Molluscan Fauna from 1907 to 1912 at the end of this enumeration.

(reprinted from the transactions of the royal society of edinburgh, vol. xlviii., pp. 333–366.)

REVISED LIST OF SPECIES CONTAINED IN THE "SCOTIA" COLLECTIONS.

A. Regio Antarctica—including Gough Island.

Class GASTEROPODA.

Order Amphineura.

Sub-order polyplacophora.

Callochiton illuminatus (Reeve).
Tonicia atrata (Sowb.).
* *Plaxiphora setigera* (King).
* *Chætopleura brucei*, Iredale, sp. n.
* *Hemiarthrum setulosum*, Carpenter.
* *Lepidopleurus pagenstecheri*, Pfeffer.

Order Prosobranchiata.

Sub-order diotocardia.

(*a*) Docoglossa.

Family *Acmæidæ*.

Acmæa ceciliana, Orbigny.

Family *Patellidæ*.

Patella ænea, Martyn, var. *deaurata*, Gmelin.
,, *fuegiensis*, Reeve.
,, *polaris*, Hombron and Jacquinot.

(*b*) Rhipidoglossa.

Section **Zygobranchiata.**

Family *Fissurellidæ*.

Fissurella oriens, Sowb.
,, *picta*, Gmel.
Tugalia antarctica, M. and St.
* *Puncturella noachina* (L.)

Family *Pleurotomariidæ*.

* *Scissurella eucharista*, sp. n.
* ,, *euglypta*, Pelseneer.
* ,, *supraplicata*, Smith
* ,, *timora*, sp. n.

Section **Azygobranchiata.**

Family *Cyclostrematidæ.*

* *Cyclostrema calypso*, sp. n.
* ,, *coatsianum*, sp. n.
* ,, *gaudens*, sp. n.
* ,, *meridionale*, sp. n.

Family *Trochidæ.*

* *Calliostoma modestulum*, Strebel.
Photinula expansa (Sowb.).
,, *tæniata*, Wood.
,, *violacea*, King.
Valvatella antaretica (E. Lamy).

Sub-order MONOTOCARDIA.

Section (*a*) **Ptenoglossa.**

Family *Ianthinidæ.*

Ianthina exigua, Lamarck.

Family *Scalidæ.*

* *Scala magellanica*, Phil.

Section (*b*) **Tænioglossa.**

Family *Naticidæ.*

* *Natica impervia*, Phil.
,, (*Lunatia*), sp. juv.

Family *Trichotropidæ.*

* *Trichotropis antarctica*, sp. n.

Family *Capulidæ.*

* *Calyptræa chinensis*, L.
,, *costellata*, Phil.
,, *dilatata*, Lamk.

Family *Littorinidæ.*

Littorina (*Lævilitorina*) *caliginosa* (Gould).
,, ,, *coriacea*, M. and St.
,, (*Pellilitorina*) *pellita*, v. Marts.
,, ,, *setosa*, Smith.
* *Lacuna abyssicola*, sp. n.

Lacuna divaricata, Fabricius.
,, *notorcadensis*, M. and St.
* ,, *wandelensis*, E. Lamy.

Family *Rissoidæ*.

Rissoa adarensis, Smith.
,, (*Cingula*) *cingillus* (Mont.).
* ,, *deserta*, Smith.
,, *edgariana*, M. and St.
* ,, (*Onoba*) *filostria*, sp. n.
,, *fraudulenta*, Smith.
* ,, (*Onoba*) *fuegoensis*, Strebel.
,, *parva* (Da Costa).
* ,, (*Onoba*) *paucilirata*, sp. n.
,, ,, *scotiana*, M. and St.
* ,, ,, *sulcata*, Strebel.
* ,, (*Ceratia*) *turqueti*, E. Lamy.
,, (*Manzonia*) *zetlandica* (Mont.).
Eatoniella kerguelenensis, Smith.

Family *Litiopidæ*.

Litiopa melanostoma, Rang.

Family *Cerithiidæ*.

Cerithium georgianum, Pfeffer.
,, *pullum*, Phil.
* *Bittium brucei*, sp. n.
* ,, *burdwoodianum*, sp. n.
* *Cerithiopsis macroura*, sp. n.
,, *malvinarum* (Strebel, MS.), M. and St.

Family *Turritellidæ*.

* *Turritella algida*, sp. n.
* *Mathilda rhigomaches*, sp. n.

Family *Tritoniidæ*.

Gyrineum vexillum (Sowb.).

Section (*c*) **Gymnoglossa.**

Family *Eulimidæ*.

* *Eulima antarctica*, Strebel.

Family *Pyramidellidæ*.

* *Turbonilla smithii*, Pfeffer.
* ,, *xenophyes*, sp. n.

Section (*d*) Rachiglossa.

Family *Muricidæ*.

Trophon brucei, Strebel.
,, *cinguliferus*, Pfeffer.
,, *crispus* (Couthouy).
* ,, *falklandicus*, Strebel.
,, *geversianus* (Pallas).
,, *hoylei*, Strebel.
,, *liratus* (Couthouy).
,, *minutus* (Strebel, MS.), M. and St.
,, *philippianus*, Dunker.
* *Antistreptus magellanicus*, Dall.

Family *Nassidæ*.

Nassa (*Ilyanassa*) *Vallentini*, M. and St.

Family *Buccinidæ*.

Chrysodomus (*Sipho*) *archibenthalis*, M. and St.
,, ,, *crassicostatus*, M. and St.
Neobuccinum eatoni, Smith.
Euthria fuscata (Brug.).
,, *magellanica* (Phil.).
,, *michaelseni*, Strebel.
* ,, *rosea*, Hombron and Jacquinot.

Family *Volutidæ*.

Voluta (*Cymbiola*) *ancilla*, Solander.
Guivillea alabastrina, Watson.
* *Mitra* (*Volutomitra*) *porcellana*, sp. n.

Section (*e*) Toxoglossa.

Family *Conidæ*.

Columbarium benthocallis, M. and St.
Mangilia costata (Donovan).
* *Bela anderssoni*, Strebel.
* ,, *fulvicans*, Strebel.
* ? *Thesbia*, sp.
* *Savatieria concinna*, sp. n.

Family *Cancellariidæ*.

Admete magellanica, Strebel.

* ,, *limneæformis*, Smith.

* *Paradmete typica*, Strebel.

Order OPISTHOBRANCHIATA.

Sub-order TECTIBRANCHIATA.

Section **Bulloidea**.

Family *Tornatinidæ*.

* *Retusa antarctica*, sp. n.

,, *truncatula* (Brug.).

Section **Siphonarioidea**.

Family *Siphonariidæ*.

Siphonaria redimiculum, Reeve.

Order PULMONATA.

Sub-order BASOMMATOPHORA.

Family *Auriculidæ*.

Marinula nigra, Phil.

Class SCAPHOPODA.

Dentalium eupatrides, M. and St.

,, *megathyris*, Jousseaume.

Class PELECYPODA.

Order PROTOBRANCHIATA.

Family *Nuculidæ*.

Nucula minuscula, Pfeffer.

* ,, *pisum*, Sowb.

Yoldia eightsii (Couth.).

* ,, *profundorum*, sp. n.

Order FILIBRANCHIATA.

Sub-order ANOMIACEA.

Family *Anomiidæ*.

Anomia ephippium, Linn.

Sub-order ARCACEA.

Family *Arcidæ*.

Arca (*Bathyarca*) *strebeli*, M. and St.

Lissarca notorcadensis, M. and St.

,, *rubrofusca*, Smith.

Limopsis longipilosa, Pelseneer.

Sub-order MYTILACEA.

Family *Mytilidæ*.

Mytilus edulis, Linn.
,, *magellanicus*, Chemnitz.
,, *ovalis*, Lamarck.
Philobrya meridionalis (Smith).
,, *quadrata* (Pfeffer).
* ,, *sublævis*, Pelseneer.
,, *wandelensis*, E. Lamy.
* *Crenella decussata* (Mont.).
Modiolarca mesembrina, M. and St.

Order PSEUDOLAMELLIBRANCHIATA.

Family *Pectenidæ*.

Pecten colbecki, Smith.
,, *multicolor*, M. and St.
,, ? *patagonicus*, King.
,, *pteriola*, M. and St.
Amussium 18-*liratum*, M. and St.

Family *Limidæ*.

Lima goughensis, M. and St.
,, (*Limatula*) *pygmæa*, Philippi.

Order EULAMELLIBRANCHIATA.

Sub-order SUBMYTILACEA.

Family *Carditidæ*.

* *Cardita congelascens*, sp. n.
* ,, *pallida*, Smith, var. *12-costata* nov.

Family *Astartidæ*.

* *Astarte magellanica*, Smith.

Family *Lucinidæ*.

* *Diplodonta lamellata*, Smith.
Cryptodon falklandicus, Smith.
Cyamium antarcticum, Philippi.
* ,, *denticulatum*, Smith.
,, *falklandicum*, M. and St.

Family *Erycinidæ*.

Lasæa consanguinea (Smith).
Kellyia cycladiformis, Desh.

Kellyia lamyi, M. and St. = *australis*, Lamy non Desh.
* ,, *magellanicus*, Smith.
* *Davisia cobbi*, Cooper and Preston.
Scacchia pleniluniun, M. and St.

Sub-order TELLINACEA.

Family *Tellinidæ*.

Tellina (*Mæra*) *pusilla* (Philippi).

Sub-order VENERACEA.

Family *Veneridæ*.

Chione philomela (Smith).
Tapes (*Amygdala*) *exalbida* (Chem.).

Sub-order MYACEA.

Family *Glycimeridæ*.

Saxicava arctica (L.), var. *antarctica*. Philippi.

Sub-order ANATINACEA

Family *Lyonsiidæ*.

Lyonsia cuneata (Gray).

Family *Anatinidæ*.

Anatina elliptica, King and Broderip.

Order SEPTIBRANCHIATA.

Family *Cuspidariidæ*.

Cuspidaria brucei, M. and St.

At Dr BRUCE's request, we also include in the list of Mollusca obtained by the expedition certain species from St Vincent, Cape de Verde Islands, Pyramid Point, Ascension Island, and Funchal, Madeira. None of these call for special remark, beyond the fact that several, *e.g. Arca bouvieri*, are endemic species, and that, so far as we can ascertain, *Calliostoma montagui* and *Pisania maculosa* have not been hitherto recorded from Cape de Verde.

A. FROM ST VINCENT, CAPE DE VERDE ISLANDS.

Chætopleura fulva (Wood).
Patella plumbea, Lamarck.
Fissurella græca (Linné).
Haliotis lamellosa, Lamarck.
Monodonta articulata, Lamarck.
,, *punctulata*, Lamarck.

Monodonta turbinata (Born.).
,, *tamsi* (Dunker).
Calliostoma montagui (W. Wood).
,, *zizyphinus* (Linné).
Phasianella pulla, Linné, var.
Pachypoma (*Bolma*) *rugosa* (Linné).
Natica intricata, Donovan.
Calyptræa sinensis, Linné.
,, (*Infundibulum*) *radians*, Lamarck.
Littorina punctata, Gmelin.
,, *striata*, King.
Cerithium musicum, Sowerby.
,, *vulgatum*, Brug.
Planaxis lineatus, Cost.
Cypræa spurca, Linné.
Trivia arctica, Solander, var. *europæa*, Mont.
Cassis testiculus, Linné.
Obeliscus terebellum, Müll.
Murex rosarium, Chem.
Ocinebra corallina, Scacchi.
Purpura hæmastoma, Linné.
,, *neritoidea*, Linné.
Collumbella rustica, Linné.
,, ,, var. *azorica*, Drouet.
Nassa cornicula, Olivier.
,, *reticulata*, Linné.
,, *curieri*, Payr.
Pisania maculosa, Lamarck.
Leucozonia triserialis, Lamarck.
Conus genuanus, Linné.
,, *guinaicus*, Brug.
,, *mediterraneus*, Brug.
Tethys punctata, Cuvier.
Haminea navicula, Da Costa.
Siphonaria venosa, Reeve.
Arca bouvieri, Fischer.
Barbatia afra, Gmelin.
Pectunculus formosus, Reeve.
,, *concentricus*, Dunker.
Mytilus puniceus, Lamarck.
Pinna rudis, Linné.

Lithodomus aristatus, Dillwyn.
Spondylus gæderopus, Linné.
Cardita senegalensis, Reeve.
,, *ajar*, Brug.
Lucina pecten, Lamarck.
Chama senegalensis, Reeve.
Venus gallina, Linné.
Chione nodosa, Dunker.
,, *verrucosa*, Linné.
Cardium edule, Linné.

B. From Ascension Island. Pyramid Point, 40 fathoms.

Nerita ascensionis, Gmelin.
Pecten miniaceus, Reeve.
Chama, sp.

C. From Funchal, Madeira. Shore.

Patella cærulea, Linné.

Class GASTEROPODA.

Order Amphineura.

Sub-order polyplacophora.

Chiton (*Plaxiphora*) *setiger*, King.

Chiton setiger, King, *Zool. Journ.*, v. p. 338 (1831).
,, ,, Sowerby, *Conch. Illustr.*, p. 17.
,, ,, *Zool. Beechey's Voyage*, pl. xl. fig. 7.
,, ,, Reeve, *Conch. Icon.*, t. ix. fig. 48*a*; t. xiv. fig. 48*c*.
,, ,, Gould, *U.S. Explor. Exped.: Moll.*, p. 330, fig. 425.
Plaxiphora Carmichaelis, Gray, *P.Z.S. Lond.* (1846), p. 68.
,, ,, Haddon, *Challenger Rep.*, p. 32.
,, ,, H. and A. Adams, *Gen. Rec. Moll.*, i. p. 481, and iii., t. 55, fig. 3.
Chætopleura Saratieri, Rochebrune, *Bull. Soc. Phil. Paris* (1880-81), p. 119; *Miss. Sci. du Cap Horn.*
,, *frigida*, Rochebrune, *l.c.*, p. 137, t. 91, figs. 5*a*, 5*b*.

Hab.—Gough Island, April 22, 1904. Station 461.
Scotia Bay, South Orkneys, rarely. Station 325.

Chætopleura brucei, Iredale, sp. n. (Plate, figs. 24, 24*a–d*.)

Shell of medium size, ovate, depressed, girdle fleshy, densely covered with hairs, the longer being very prominent on a bed of shorter ones, appearing to be grouped and longest near the sutures. Valves broad, with a well-marked keel, though not very high, the posterior valve having the mucro about the anterior third.

Shell smooth, the lateral areas being indicated by a very faintly raised ridge.

Down the median keel of the five centre valves is a row of pustules which do not reach to the mucro, and two parallel rows can be seen on either side, these rows showing on the anterior portion of the posterior valve; but on the first median valve this arrangement is not so apparent.

Scattered radiating rows of similar pustules are seen on the anterior valve, where faint ridges are indicated; similar sculpture is seen on the posterior part of the end valve. On the pleural areas of the median valves scattered pustules are also present, whilst the lateral areas have them also few and scattered. Otherwise the only feature is the concentric growth-ridges, which are well marked on each ridge, indicating regular growth in still water.

The internal features are, as noted by Pilsbry for *C. peruviana*, Lamk. (*Man. Conch.*, xiv. p. 29, 1892), the anterior valve with 9, central valves 1, and posterior valve 9 slits.

Hab.—Scotia Bay, South Orkneys. Station 325. One fine specimen only. Agrees closely with *C. peruviana*, Lamk., and seems to be the first record for the genus from east of South America. (T. Iredale.)

Lepidopleurus pagenstecheri, Pfeffer.

Leptochiton pagenstecheri, Pfeffer, *Jahrb. hamburg. wissenschaftlichen Anstalten*, iii Jahrgang, p. 107, t. iii. fig. 3 (1886).

Hab.—Scotia Bay, 9–10 fathoms. Station 325.

Thiele considers this *Chiton* conspecific with *L. kerguelensis*, Haddon, from Kerguelen Island, but Iredale does not accept this conclusion, though admitting the close alliance of the two species.

Hemiarthrum setulosum, Carpenter.

Hemiarthrum setulosum, Carpenter, MS., p. 13.—Dall, *Bull. U.S. Nat. Mus.* ii., (1876), p. 44. —Haddon, "*Challenger*" *Polyplacophora*, p. 14, t. i. fig. 4; t. ii. fig. 4*a*, 1.—Martens and Pfeffer, *Jahrb. des hamburg. wissenschaftlichen Anstalten*, iii. p. 108, t. iii. fig. 4 (1886).

Hab.—Station 325, Scotia Bay, 9–10 fathoms, on Fuci and other Algæ.

Very small and juvenile specimens, probably referable to the above. Iredale also doubts the identity of the South Georgian *Hemiarthrum* with that described by Dall from Kerguelen Land, but more material is wanted for comparison.

Order PROSOBRANCHIATA.

Sub-order DIOTOCARDIA.

Section **Zygobranchiata.**

Family *Fissurellidæ.*

§ Emarginulidæ.

Puncturella noachina (L.).

Patella noachina, Linnæus, *Mantissa*, p. 551.
Puncturella noachina, Lowe, *Zool. Journ.*, iii. p. 78 (1827).
Cemoria princeps, Mighels, *Proc. Boston Soc. Nat. Hist.* (1841), p. 49.
Rimula galeata, Gould, *U.S. Explor. Exped.*, p. 369, t. xxxi. figs. 476, 477.

Hab.—Trawl, Burdwood Bank, Station 346, south of the Falkland Islands, lat. 54° 25′ S., long. 57° 32′ W., December 1, 1903.

Bleached but perfect specimens of a British and North European species, also known to extend to the Falkland Islands and Straits of Magellan. It is likewise recorded by Dr HERMANN STREBEL,* from Berkeley Sound, lat. 51° 53′ S., long. 58° W.

We include under the name *noachina* (L.) various forms, *e.g. conica*, D'Orb., *falklandiana*, A. Ad., *cognata*, Gould, and *galeata*, Gould. It is most probable that the gatherings from Burdwood Bank would come under the name mentioned second, *falklandiana.*

Family *Pleurotomariidæ.*

Scissurella eucharista, sp. n. (Plate, figs. 1, 1*a*).

S. testa perminuta, globulosa, delicatissima, alba, naticoide, paullum elevata, anfractibus 4, quorum apicalis feré immersus, penultimo inflato, tumescente, ultimo epidermide evanida pallidé straminea contecta, infra suturam leniter planato, deinde bicarinato, quarum inter fines scissura extensa, angusta, cætera superficie delicate sub lente spiraliter tenuissime striata usque ad basim supra carinam radiatim leniter plicata, umbilico feré clauso, apertura rotunda, labro rotundo, tenuissimo.

Alt. 1, diam. ·75 mm.

Hab.—Burdwood Bank, 56 fathoms, trawled. Station 346.

A perfect example of one of the smallest shells possible, and yet full of character. We have compared it with the majority of the genus, and find it stands out conspicuously in general roundness of outline, the double carination, within which, towards the aperture, is situate the narrow extended slit, not causing, as is usual, an angular appearance. Indeed, in form it is almost naticoid. Below the carinæ, the surface to the base is transversely very finely striate, the umbilicus appears partly covered, the outer lip is round and extremely thin. Somewhat of the same form as *Sc. conica*, D'Orb., also from Southern waters; but in our species the slit is situate much nearer the suture, that of *conica* being almost median. (εὐχάριστος, elegant, agreeable.)

* *Schwed. Südpolar Exped.* (1908), p. 79.

Scissurella euglypta, Pels.

Scissurella euglypta, P. Pelseneer, *Voy. du S.Y. "Belgica": Zoologie*, p. 17, pl. iv. figs. 43–45 (1903).

Hab.—Trawl, Burdwood Bank, at 56 fathoms. Station 346.

Only one imperfect specimen, but recognisable.

Scissurella supraplicata, Sm.

Scissurella supraplicata, E. A. Smith, *Ann. and Mag. N.H.*, xvi. p. 72 (1875).
" " " *Phil. Trans. Roy. Soc. London*, vol. clxviii. p. 176, pl. ix. figs. 5, 5*a* (1879).

Hab.—Trawl, Burdwood Bank, at 56 fathoms. Station 346.

Several examples, mostly imperfect, of this pretty species, striking on account of its very marked plication above the double keel.

Scissurella timora, sp. n. (Plate, figs. 2, 2*a*).

Sc. testa minuta, tenuissima, alba, epidermide straminea omnino contecta, depresso-effusa, anfractibus 4, apicalibus parvis, ultimo lato, supra ad peripheriam planato, radiatim lineis obliquis tenuibus prædito, scissura angusta, profunda, infra ad basim concentricé trilirato, apertura ovata, intus alba, labro pertenui, columella paullum incrassata, feré recta.

Alt. 1, diam. 1·75 mm.

Hab.—Station 325, Scotia Bay, South Orkneys, 9–10 fathoms, on *Macrocystis pyrifera* and other large Fuci.

A depressed, obliquely effuse little species, of which but few examples occurred, all in live condition, covered with straw-coloured epidermis. The upper part of the body whorl is not so conspicuously radiate as in many species; the slit is narrow, deep, its edges being carinate. (*τιμωρός*, honoured.)

Section **Azygobranchiata.**

Family *Cyclostrematidæ*.

Cyclostrema calypso, sp. n. (Plate, fig. 3).

C. testa perminuta, angusté sed profundé umbilicata, conica, alba, delicatula, anfractibus ad 5, inclusis apicalibus duobus lævibus, cæteris arcté longitudinaliter liratis, et spiraliter decussatim striatulis, numero lirarum ultimi anfractûs ad quadraginta, anfractibus omnibus ventricosis, ad suturas multum impressis, apertura rotunda, peristomate continuo.

Alt. 1, diam. 1·15 mm.

Hab.—Trawl, Burdwood Bank, lat. 54° 25′ S., long. 57° 32′ W., at 56 fathoms. Station 346.

Exceedingly minute, resembling *C. decussatum*, Pelseneer,* in many ways, but differing in (*a*) size, and (*b*) in fine and close longitudinal liration. To *C. conicum*, Watson, collected during the Challenger Expedition (Station 24), it likewise is akin; but in this species, more than double the dimensions to begin with, the lamellæ are much stronger proportionately, and fewer in number than in either *C. decussatum* or *C. calypso*.

* P. Pelseneer, *Voy. du S.Y. "Belgica,"* p. 19, pl. v. fig. 48 (1903).

Cyclostrema coatsianum, sp. n. (Plate, figs. 4, 4*a*).

C. testa parva, alba, solidula, profundé umbilicata, elegantissimé sculpta, anfractibus 4, quorum duo apicales nitidi, albi, læves, duobus cæteris longitudinaliter æquicostatis, costis lævibus, incrassatis, subflexuosis, penultimo suprá planato, ultimo spiraliter quadricarinato, carina obtusa infrá suturas, binis ad peripheriam, prædítis, simul ac ad basim, interstitiis omnibus subquadratis et fenestratis, regione umbilicari profunda, verticali, apertura rotunda, peristomate crassiusculo, continuo.

Alt. 1, diam. 2·25 mm.

Hab.—Trawl, Burdwood Bank, lat. 54° 25′ S., long. 57° 32′ W., 56 fathoms. Station 346.

A very small, solid, white, boldly but elegantly sculptured *Cyclostrema*, the nearest ally being *C. micans*, A. Ad., from the eastern tropics, known in Indian seas as *Liotia pulchella*,* Dunker. This species is somewhat larger, and the pattern of sculpture is different. We name this species in honour of Mr James Coats, of Ferguslie House, Paisley, through whose generosity the Scottish National Antarctic Expedition was equipped with funds, and whose regretted death, by a strange coincidence, occurred just after this description had been drawn up, on March 22, 1912.

Cyclostrema gaudens, sp. n. (Plate, figs. 5, 5*a*, 5*b*).

C. testa minutissima, profundé umbilicata, depresso-discoidali, suprá planiuscula, alba, anfractibus ad 3½, quorum apex ipse depressus, perlævis, ultimo ad peripheriam obtusé carinato, undique longitudinaliter arcte lirato, liris circá viginti-duabus, apud basim circá umbilicum obscuré spiraliter carinato, apertura rotunda, peristomate tenui, feré continuo, opercnlo corneo, multispirali, nucleo centrali.

Alt. ·75, diam. 1 mm.

Hab.—Station 346, trawl, 56 fathoms, Burdwood Bank.

Slightly allied to the preceding, but much differing in sculpture, especially in the suppression of the prominent peripheral keeling of the body whorl. Judging from the figure, there is an affinity to *C. alveolatum*, Jouss.,† described from an unknown locality, the dimensions being only slightly less; the interstices, however, between the flexuous costæ do not appear, in our species, to be spirally striate, as is the case with Jousseaume's species.

Cyclostrema meridionale, sp. n. (Plate, figs. 6, 6*a*, 22, 22*a*).

C. testa minutissima, depresso-trochoide, delicata, tenui, pallidé albo-cinerea, epidermide fugitiva straminea omnino contecta, profundé umbilicata, anfractibus 4, quorum duo apicales tumescentes, albi, perlæves, cæteris duobus—penultimo uni-, ultimo anfractu spiraliter bicarinato, apertura rotunda, peristomate continuo, paullulum incrassato, apud basim circá umbilicum crenello-carinato, operculo multispirali, corneo, nucleo feré centrali.

Alt. ·75, diam. ·50 mm.

Hab.—Gregariously, on various Algæ (*Fucus* and *Macrocystis*), Station 325, Scotia Bay, South Orkneys, 9–10 fathoms.

This well-defined but very minute species is evidently the same as that recorded from the same islands by Dr E. Lamy,‡ and considered a non-adult form of an unknown

* A. Adams, *P.Z.S.* (1850), p. 44; Dunker, *Mal. Blatt.*, vol. vi. p. 225 (1860).

† Guerin, *Mag.*, p. 392, pl. xix. fig. 4 (1872).

‡ *Moll. Reg. Arct. Norv.*, p. 135, pl. xxi. fig. 1 (1908); *Bull. Mus. Nat. d'Hist. Naturelle* (1906), Paris, p. 123, (1910) p. 323.

species of *Margarita*. To us, and several other malacologists who have examined it with care, it not only appears almost full-grown, but with some confidence is now proposed to be included in the genus *Cyclostrema*, at all events provisionally; for this genus is somewhat multifarious already in its component parts, and much needs the services of a special monographer.

The nuclear whorls are, it is true, slightly nepionic, and shapelessly turgid, but the penultimate and body whorls are very well sculptured and defined, being acutely spirally bicarinate. Around the umbilicus, likewise, a third keel, crenulate, and not so acute, revolves. A pale straw-coloured epidermis covers the whole surface uniformly. The operculum, for microscopic aid in the examination of which we are much indebted to Messrs E. A. Smith and Robson of the British Museum (Natural History), is dark red-brown, with nucleus not quite central, and multispiral. This we take the opportunity also to figure (fig. 22*a*).

Calliostoma modestulum, Strebel.

Calliostoma modestulum, H. Strebel, *Schwed. Südpolar Exped.*, p. 70, Taf. i. fig. 13 *a*, *b* (1908).

Hab.—Station 346, Burdwood Bank, 56 fathoms, from Sponge.

Two very young specimens, trochoïd in form, with the upper whorls elegantly spirally lirate, we assign to the above name with a little doubt. The original type came from the West Falklands, lat. 52° 29′ S., long. 60° 36′ W., dredged at 197 metres (Strebel).

With this occurred *Photinula expansa*, Sowb., and one broken example of a beautifully nacreous shell, which, judging from the figure,* may be *Calliostoma möbiusi*, Strebel. Our specimen is more trochoïd than photinuloid, though it possesses some characters of the latter, and is lightly spirally grooved, these being most conspicuous at the periphery of the body whorl. Dimensions: alt. 10, diam. 12 mm. It likewise may be compared with *Photinula Crawshayi*,† Sm., from Christmas Island, but the whorls are not ventricose. It is unfortunately somewhat broken; the operculum is present, being horny and multispiral.

Sub-order MONOTOCARDIA.

(*a*) Ptenoglossa.

Family *Scalidæ*.

Scala magellanica, Phil.

Scalaria magellanica, Philippi, *Archiv für Naturg.*, vol. i. p. 65 (1845).

Hab.—Station 346, Burdwood Bank, 56 fathoms, in Sponge.

Only very imperfect specimens, either very young or broken fragments; enough, however, to identify the species.

* Strebel, *Moll. der Magalhaen. Prov.*, ii. p. 133, Taf. v. fig. 22.

† Smith, *Proc. Malac. Soc. Lond.*, vi. p. 335, fig. 2.

(*b*) Tænioglossa.

Family *Naticidæ*.

Natica impervia, Phil.

Natica impervia, Philippi, *Archiv für Naturg.*, vol. i. p. 65 (1845).

Hab.—Station 346, from Sponge at 56 fathoms.
Only very dead and featureless specimens.

Family *Trichotropidæ*.

Trichotropis antarctica, sp. n. (Plate, fig. 7).

T. testa parva, imperforata, fragili, breviter fusiformi, sordidé alba, anfractibus 6, quorum apicales tres detriti, sublæves, cæteris tenuiter et arcté decussatis, interstitiis quadratulis, ultimo cæteros exsuperante, apertura ovata, labro multum expanso, inflato, margine columellari paullum excavato.
Alt. 5·75, diam. (oris) 3·50 mm.

Hab.—Trawl, Burdwood Bank, at 56 fathoms. Station 346.

A very interesting form, and we deem it worthy of description, albeit the only specimen is imperfect, and the outer lip infested with growth of a Bryozoon. It seems adult, and is comparable with no other member of the genus known to us. It is much smaller in all its parts than *T. inornata*, Hutton, from New Zealand. There is no sign of umbilication, and the epidermis is not present, being completely worn off.

Calyptræa chinensis, L.

Patella sinensis, Linnæus, *Syst. Nat.*, ed. xii., p. 1257 (1769).
C. sinensis, F. and H., ii. p. 463, pl. lx. figs. 3–5, and (animal), pl. B.B. figs. 8–13.

Hab.—Burdwood Bank, south of the Falkland Islands. Station 346.
Indistinguishable from the shell of northern climes, including Great Britain.

Family *Littorinidæ*.

Littorina (*Lævilitorina*) *caliginosa* (Gould).

Hab.—An additional locality is Cape Pembroke, Falkland Islands, shore, February 2, 1904. Station 349.

Littorina (*Pellilitorina*) *pellita*, v. Mts.

Hab.—Additional locality for this species is Station 346, 56 fathoms, December 1, 1903. Lat. 54° 25′ S., long. 57° 32′ W. Obtained from new species of *Cephalodiscus*, occasionally.

Two more examples of *Lacuna notorcadensis*, M. and St., also occurred from the same locality as the type.

Lacuna abyssicola, sp. n. (Plate, figs. 8, 8*a*, 8*b*).

L. testa parva, profundè umbilicata, albo-calcarea, epidermide brunnea contecta, fragili, vix solida, anfractibus 5, quorum apex ipse miré immersus, duobus his proximis cum penultimis tumidulis, ultimo paullum effuso, lævi, omnibus infrá suturas canaliculatis et acute spiraliter carinatis, apud basim, circá umbilicum, crassi-carinato carinis binis, sulco interstitiali prædito, apertura rotunda, labro tenui, margine columellari laté reflexo.

Alt. 2, lat. 2·15 mm.

Hab.—Deposit No. 38, dredged March 18, 1904. Lat. 71° 22′ S., long. 16° 34′ W., 1410 fathoms. Station 417.

One specimen only, but adult and fairly perfect, save for a slight fracture of the outer lip. It appears nearly akin to *L. nautiliformis*, Jeffreys, or *L. cincta* of the same author, from the Atlantic, collected on the *Porcupine* Expedition, especially as regards the sculpture round the umbilical region, the thickened double carination with interstitial sulcus. Another feature of interest is the curiously immersed nucleus, and the strong canaliculation round the upper portion of each whorl, followed by an acute spiral keel. The substance of the shell is chalky white, covered with a dark-brown epidermis. The specific name proposed is given in consideration of the extreme depth at which it was dredged.

Lacuna wandelensis, E. Lamy.

Lacuna wandelensis, E. Lamy, *Expéd. Antarct. Française commandée par le Dr Jean Charcot: Moll.*, p. 5, pl. i. figs. 5, 6, 7 (Paris, 1906).

Hab.—Station 325. Scotia Bay, South Orkneys, 9–10 fathoms, on *Macrocystis* and other large Fuci.

A very few examples, and all in non-adult condition, belong almost certainly to this species.

Family *Rissoidæ*.

Rissoa deserta, Sm.

Rissoa deserta, E. A. Smith, *Nat. Antarct. Exped.: Nat. Hist.*, vol. ii. p. 9, pl. ii. fig. 1 (1907).

Hab.—South Orkney Islands, Scotia Bay, 9–10 fathoms. Station 325.

The specimens are dead, but seem to agree in form with the above species.

Rissoa (*Onoba*) *filostria*, sp. n. (Plate, fig. 9).

R. testa parva, paullum inflata, solidula, parum rimata, anfractibus 4½, quorum apicales duo læves, tumiduli, cæteris ventricosis, apud suturas impressis, arctissimè spiraliter tenuilinatis, apertura ovata, alba, labro paullum effuso, haud multum incrassato, feré continuo.

Long. 2, lat. 1·50 mm.

Hab.—South Orkney Islands, Scotia Bay, 9–10 fathoms. Station 325.

Allied to several *Onobæ*, mostly described of recent years from deep-sea explora-

tions, such as *R. transenna*,* Wats., from Prince Edward Island, and *R. aëdonis*† of the same author, from Nightingale Island. *R. gelida*, E. A. Sm.,‡ is, perhaps, the nearest ally; this is also an Antarctic species, and differs in the possession of an extra whorl, and being longer proportionately to its breadth, also in a lesser degree of ventricosity of whorl. Only two or three examples.

Rissoa (*Onoba*) *fuegoensis* (Strebel).

Rissoa (*? Cingula*) *fuegoensis*, H. Strebel, *Schwed. Südpolar Exped.*, p. 56, Taf. vi. fig. 90 *a*, *b* (1908).

Hab.—Burdwood Bank, Station 346, 56 fathoms.

A straw-coloured, closely spirally lirate *Rissoa*, which we should consider as appertaining to the section *Onoba* in preference to *Cingula*.

Rissoa (*Onoba*) *paucilirata*, sp. n. (Plate, fig. 10).

R. testa ovata, angustè rimata, alba, epidermide tenuiter evanida straminea, interdum iridescente, contecta, anfractibus ad 5, ventricosulis, apud suturas multum impressis, quorum duo apicales nitidi, albi, læves, cæteris duobus fortiter spiraliter pauciliratis, liris penultimi duâbus, ultimi anfractûs septem vel octo, præditis, apertura ovato-rotunda, peristomate tenui, margine columellari ferè recto.

Alt. 2·25, diam. 1·25 mm.

Hab.—Burdwood Bank, Station 346, 56 fathoms.

Conspicuous for its strong, spiral, carinated liræ, which are fewer in number than those possessed by its allies; these spiral ridges seem much the same in the Aleutian species *R. Aurivillii*, Dall,§ or *R. brachia*, Watson,‖ from Culebra Island, West Indies. This last, indeed, seems a very near ally, though quite distinct.

Rissoa (*Onoba*) *sulcata* (Strebel).

Rissoa (*Cingula*) *sulcata*, H. Strebel, *Schwed. Südpolar Exped.*, p. 56, Taf. vi. fig. 86 *a*, *b*, *c* (1908).

Hab.—With the last species named, at 56 fathoms. Station 346. One specimen.

The spiral sulci are interesting. In form it resembles *R. paucilirata*, but the essential characters are quite diverse. Colour inclined to reddish-fuscous.

Rissoa (*Ceratia*) *turqueti*, E. Lamy.

Rissoa (*Ceratia*) *turqueti*, E. Lamy, *Expéd. Antarct. Française Charcot*, p. 6, pl. i. fig. 8 (1906).

Hab.—With the preceding. One fine specimen in live condition, sub-pellucid, with faint relics of thin stramineous epidermis. Station 346.

* *Rep. Challenger Exped.*, xv. p. 620, pl. xlvi. fig. 10.
† *Ibid.*, p. 600, pl. xlv. fig. 5.
‡ Smith, *Nat. Ant. Exped.: N.H.*, vol. ii. p. 9, pl. ii. fig. 5.
§ *Proc. U.S. Nat. Mus.*, p. 309, pl. iv. fig. 8 (1886).
‖ *Rep. Challenger Exped.*, xv. p. 599, pl. xlv. fig. 8.

Eatoniella kerguelenensis, Sm., forma *major*, Strebel.

Eatoniella kerguelenensis, Smith, forma *major*, Hermann Strebel, *Schwed. Südpolar Exped.*, p. 57, Taf. iv. fig. 56 *a–c* (1908).

Hab.—Station 325, Scotia Bay, South Orkneys, 9–10 fathoms.

This larger form of a mollusc already reported by us, in our former paper, as occurring, in its typical condition, at Scotia Bay, South Orkneys, has likewise been discovered in some quantity in Bay A, of greater size and solidity, often encrusted with bryozoic and other growths. Colour very deep plumbeous.

Family *Cerithiidæ*.

Cerithium pullum, Phil. (= *cælatum*, Couthouy).

Hab.—An additional locality is now given for this species, to that mentioned on p. 135 of our former paper, viz. Burdwood Bank, lat. 54° 25′ S., long. 57° 32′ W., in sponge. Station 346.

We do not repeat the synonymy, which will be found at the page just quoted.

Bittium brucei, sp. n. (Plate, fig. 11).

B. testa minuta, solidula, cylindrica, castaneo-brunnea, anfractibus ad 8, apicalibus . . . . (?), cæteris apud suturas impressis, supernis bino, ultimo trino odine granulato regulariter prædito, apud basim excavato, planato, apertura ovata, labro simplice, margine columellari crassiusculo.

Long. 2·75, lat. 1 mm.

Hab.—Dredge, Station 81, lat. 18° 24′ S., long. 37° 58′ W., 36 fathoms.

A minute Cerithioid mollusc, which seems as if it should belong to the sub-genus *Joculator*, Hedley,* proposed for *Cerithiopsis ridicula*, Watson, and certain allies. At the same time it is so like *Bittium minimum*, T. Woods, well figured from a Tasmanian specimen by C. Hedley,† that it had better be included in that genus.

Bittium burdwoodianum, sp. n. (Plate, fig. 12).

C. testa fusiformi, brunneo-rufescente, parva, anfractibus ad 10, quorum apicales tres rufescentes, parum nitidi, læves, vel simpliciter longitudinaliter costulati, cæteris ad suturas multum impressis, trino ordine gemmarum, ultimo quatuor ordinibus similibus, regulariter spiraliter præditis, apertura ovata, labro paullum effuso, columella flexuosa.

Alt. 4, diam. 1 mm.

Hab.—From interior of *Liothyrina*. Station 346, Burdwood Bank, at 56 fathoms, December 1, 1903.

A little species, of simple character, inclined to a reddish hue, particularly as regards the apex and central portion of the various whorls, which are thrice spirally girt with regular rows of close grains, gemmulate and rounded. This might be considered a *Cerithium* by some authors. It is akin to *B. bisculptum*,‡ Strebel, the apical whorls seemingly almost identical, and we consider these two species should stand in the same genus.

* *Proc. Linn. Soc. N.S. Wales* (1909), p. 442.

† *Ibid.* (1909), p. 722, fig. 20.

‡ *Schwed. Südpolar Exped.*, p. 49, Taf. vi. fig. 92 *a–b* (1908).

Cerithiopsis macroura, sp. n. (Plate, fig. 13).

C. testa elongato-fusiformi, parva, angusta, nitida, albo straminea, anfractibus ad 10, quorum apicales duo vel tres nitidi, vitrei, perlæves, bulbosi, cæteris paullum ventricosis, apud suturas impressis, undique longitudinaliter arcte costulatis, costulis anfractuum superiorum pro maxima parte lævissimis, quatuor ultimis anfractibus spiraliter rugoso-liratis, liris ad juncturas costularum granulosis, apertura ovata, labro tenui, columella paullum producta, flexuosa, brevirostri.

Alt. 3·55, diam. 1 mm.

Hab.—Station 346, Burdwood Bank, 56 fathoms.

A small species, but distinguished, as the specific name chosen would show, by its very attenuate, fusiform whorls, the last three or four swollen, caudate, shining, smoothly costulate, not spirally crossed with granose liræ, as are the lower whorls; the columella is only slightly rostrate, the outer lip thin, the colour whitish straw. But few examples occurred. (*μάκρος οὐρα*, long-tailed.)

Cerithiopsis malvinarum, M. and St.

Cerithiopsis malvinarum (Strebel, MS.), Melvill and Standen, *Trans. Roy. Soc. Edin.*, xlvi. pt. i., p. 135, pl. figs. 6, 6*a*. (1907).

" " Strebel, *Schwed. Südpolar Exped.*, Band vi., 1, p. 49, Taf. i. fig. 10 *a–c* (1908).

Hab.—Shore, Hearnden Water, Falkland Islands. Station 349.

As mentioned in our first paper, we issued a description of this species in 1907, using, at Dr H. STREBEL'S request, the name he had given it in manuscript. The following year it was redescribed by him as "sp. nov.," and we are of opinion that he had not at that time seen our paper. The same remarks would apply also to *Trophon minutus*, M. and S.

Family *Turritellidæ*.

Turritella algida, sp. n. (Plate, fig. 14).

T. testa parva, attenuato-fusiformi, alba vel pallidé straminea, solidula, anfractibus ad 9–10, ad suturas multum impressis, quorum apex ipse bulbosus, albus, lævis, vitreus, huic proximus anfractus simili modo tumidus, lævis, cæteris ad medium unicarinatis, carinis acutis, prominulis, antepenultimo et penultimo lira alia minore infra medium præditis, ultimo inter carinam majorem et basim trilirato, apertura ovata, labro tenui.

Long. 6, lat. 2 mm.

Hab.—Trawl, Burdwood Bank, south of the Falklands, at 56 fathoms. Station 346.

Very small, but apparently quite adult. Conspicuous for a distinct and prominent median keel, the three last whorls also being provided with a minor spiral lira below, and the body whorl, between the strong median keel and the base, possessing three such spiral lirations.

Mathilda rhigomaches, sp. n. (Plate, fig. 15).

M. testa minuta, imperforata, fusiformi, delicata, pallidé fuscescente, anfractibus 6½, quorum apicales 2¼ heterostrophi, albi, læves, bulbosi, cæteris apud suturas impressis, pulchré spiraliter carinatis, carinulis tribus anfractuum superiorum, ultimo quatuor, arctissimé lirulis longitudinalibus decoratis, interstitiis quadratis, apertura rotunda, labro tenui, margine columellari paullum excavato.

Long. 2, lat. 1 mm.

Hab.—Trawl, Burdwood Bank, at 56 fathoms. Station 346.

In sculpture this little species resembles a *Lorenella*, especially *L. austrina*, Hedley,* from the opposite shores of Antarctica. It is only about a quarter of the size, however, of this shell, while the apex is heterostrophe, the peristome continuous. Fischer (*Man. de Conch.*, p. 172, 1887) gives a list of Magellanic Mollusca, and includes a "*Mathilda magellanica*." This is evidently a "nomen nudum." No description can be found, and the name rests on no authority. The remarks of M. de Boury † will probably, in connection with this, be found of interest. (ῥιγομάχης, contending with cold.)

(*c*) Gymnoglossa.

Family *Eulimidæ*.

Eulima antarctica, Strebel.

Eulima antarctica, H. Strebel, *Schwed. Südpolar Exped.*, Band vi., 1, p. 65, Taf. vi. fig. 91 *a–c* (1908).

Hab.—Trawl, Burdwood Bank, south of the Falkland Islands, 56 fathoms. Station 346.

One specimen, live, but hardly full-grown.

Family *Pyramidellidæ*.

Turbonilla smithii, Pfeffer.

Turbonilla smithii, G. Pfeffer, MS. in H. Strebel, *Mollusk. der Magalhaen. Prov.*, p. 659, Taf. xxiii. fig. 42 *a–d* (1905).

Hab.—Trawl, Burdwood Bank, at 56 fathoms. Station 346.

One example, immature, but with sufficient characters to pronounce fairly certainly.

Turbonilla xenophyes, sp. n. (Plate, figs. 16, 16*a*).

T. testa aciculato-fusiformi, delicata, subpellucida, albo-lactea vel pallidé straminea, paullum nitente, anfractibus 9, quorum apicales bulbosi, tumidi, leniter heterostrophi, cæteris ventricosulis, ad suturas impressis, sub lente delicatissimé longitudinaliter liratis, in speciminibus quibusdam feré vel omnino lævibus, apertura ovata, peristomate tenui, columella simplice.

Long. 2·75, lat. ·75 mm.

* *Report Brit. Antarct. Exped.*, 1907–9 (Shackleton), vol. ii., part i. p. 5 (pl. i. fig. 7) (1911).

† *Journ. de Conch.*, vol. xxxi. p. 118 (1883).

Hab.—Trawl, Burdwood Bank, south of the Falkland Islands, 56 fathoms. Station 346.

A curious species, and one of which we are not quite sure of the proper position generically. It seems, however, to agree with *Turbonilla* in more than one feature. It is very delicate, resembling a terrestrial *Opeas* or others of the family Stenogyridæ, both in substance and form. Several examples occurred, the live specimens retaining a subpellucid appearance and dull straw-colour. (ξενοφύης, strange of form.)

(*d*) Rachiglossa.

Family *Muricidæ*.

Trophon falklandicus, Strebel.

Trophon falklandicus, H. Strebel, *Schwed. Südpolar Exped.*, Band vi., 1, p. 39, Taf. i. fig. 8 *a–c* (1908).

Hab.—Burdwood Bank, at 56 fathoms. Station 346.

Very young specimens are probably referable to this species. Another, judging alone from the plate (Strebel, *Zool. Jahrbuch*, Band xxi., Taf. vii. fig. 56, 1904), might belong to *T. Paessleri*, Streb. We cannot, however, help feeling that too many species have been created in such a variable assemblage as this section of the genus *Trophon* presents.

Trophon minutus, M. and St.

Trophon minutus (Strebel, MS.), Melvill and Standen, *Trans. Roy. Soc. Edin.*, xlvi., pt. i., p. 137, pl. figs. 7, 7*a* (1907).

„ „ Strebel, *Schwed. Südpolar Exped.*, Band vi., 1, p. 44, Taf. iv. fig. 47 *a*, *b* (1908).

Hab.—An additional locality to that mentioned in our former paper is Scotia Bay, South Orkneys, at 9–10 fathoms. Station 325.

Three or four more examples occurred, but the species is evidently rare. For the nomenclature of this species, and its authorship, see remarks under *Cerithiopsis malvinarum*.

Trophon philippianus, Dkr.

Hab.—Also from Burdwood Bank, at 56 fathoms, all the specimens being in very young condition, and found in Sponge. Station 346.

Antistreptus magellanicus, Dall.

Antistreptus magellanicus, W. H. Dall, *Proc. U.S. Nat. Mus.*, xxiv. p. 532 (1902).

„ „ Dall, *Bull. Mus. Comp. Zool. Harvard*, vol. xliii. p. 315, pl. xv. fig. 14 (1905).

Glypteuthria contraria, H. Strebel, *Schwed. Südpolar Exped.*, Band vi., 1, p. 29, pl. i. figs. 4 *a–c* (1908).

Hab.—Burdwood Bank, Station 346, at 56 fathoms.

Two examples of this small, but curious, sinistral species.

Family *Buccinidæ*.

Chrysodomus (*Sipho*) *crassicostatus*, M. and St.

Chrysodomus (*Sipho*) *crassicostatus*, Melvill and Standen, *Trans. Roy. Soc. Edin.*, vol. xlvi. part i., p. 138, pl. figs. 10, 10*a* (1907).

Sipho (? *Molnia*) *astrolabiensis*, H. Strebel, *Schwed. Südpolar Exped.*, Band vi., 1, p. 31, Taf. iii. fig. 37 *a–d* (1908).

One specimen of *Sipho astrolabiensis* occurred in lat. 63° 9′ S., long. 58° 17′ W., at Astrolabe Island.

From the figure, there can be no doubt of its identity with our *S. crassicostatus*, described the year previously (1907). More examples came to hand from the locality already given by us, viz. Scotia Bay, South Orkneys, at 9–10 fathoms, Station 325; and we have now seen it likewise from Burdwood Bank, at 56 fathoms, Station 346.

Euthria rosea, Homb. and Jacq.

Euthria rosea, Hombron et Jacquinot, *Voyage au Pôle Sud*, v. p. 107, tab. xxv. figs. 4, 5.

,, ,, Strebel, *Mollusk. der Magalhaen. Prov.*, p. 616, Taf. xxi. figs. 1–4 (1905).

Hab.—Burdwood Bank, from Sponge, at 56 fathoms. Station 346.

Family *Mitridæ*.

Mitra (*Volutomitra*) *porcellana*, sp. n. (Plate, fig. 21).

M. (V.) testa eleganter fusiformi, nitidissima, candida, porcellana, anfractibus ad 6 (?), apicalibus . . . ? cæteris nequaquam suturaliter impressis, politissimis, ultimo prolongato, apertura angusté oblonga, labro tenui, columella obliquante, quadriplicata, plicis obliquis.

Long. 14, lat. 6 mm. (sp. imperfecta).

Hab.—Scotia Bay, South Orkneys, 9–10 fathoms, Station 325; also trawl, Burdwood Bank, 56 fathoms, Station 346.

Only two examples of this beautiful, polished white porcellanous shell have as yet occurred, one from each locality, widely differing from other *Volutomitræ* known to us; its narrow aperture, obliquely quadriplicate columella, are distinguishing characteristics. Very unfortunately, in neither specimen, owing to breakage, do the apical whorls appear, so several points remain for the present a matter of conjecture.

(*e*) Toxoglossa.

Family *Conidæ*.

Bela anderssoni, Strebel.

Bela anderssoni, H. Strebel, *Schwed. Südpolar Exped.*, p. 14, Taf. ii. fig. 24 *a–d* (1908).

Hab.—Station 346, at 56 fathoms, December 1, 1903.

Judging from figure and description quoted above, this interesting *Bela* is identical with specimens found at Seymour Island, Grahamland, by the Swedish expedition.

Bela fulvicans, Strebel.

Bela fulvicans, H. Strebel, *Schwed. Sudpolar Exped.*, p. 15, Taf. ii. fig. 25 *a–d* (1908).

Hab.—Burdwood Bank, from Sponge, at 56 fathoms. Station 346.

An imperfect, bleached specimen seems, from the sculpture, to be the above species, which occurred both in South Georgia Islands and in Grahamland.

? Thesbia sp.

Hab.—Burdwood Bank, from Sponge, at 56 fathoms. Station 346.

One example, more imperfect than the preceding, of a bleached shell, showing faint flexuous oblique longitudinal costellation, mouth narrow oblong, whorls fairly smooth, hardly impressed at the sutures. Dimensions: long. 13, lat. 5 mm. It is quite impossible to differentiate it further.

Saratieria concinna, sp. n. (Plate, fig. 17).

S. testa ovato-fusiformi, compacta, solidula, subpellucente, albida, anfractibus 6, quorum apicales duo bulbosi, vitrei, nitidi, perlæves, cæteris apud suturas impressis, subventricosis, longitudinaliter arcte costulatis, costis crassiusculis, gemmatis, ultimo anfractu infra medium evanidis, deinde ad basim spiraliter sulculoso, numero costularum anfractus ultimi circa 22, apertura ovata, labro simplice, columella parum incrassata, canali vix prolongata.

Long. 4·55, lat. 2 mm.

Hab.—Trawl, Burdwood Bank, Station 346, 56 fathoms, December 1, 1903.

Saratieria is a small genus, peculiar to these regions, diagnosed by Rochebrune and Mabille. It is nearly allied to *Bela*, differing principally in the abbreviated canal, whorls peculiarly impressed suturally, and more distinct elaboration of sculpture. Several species have lately been published by Dr Hermann Strebel, and to one of them, *S. molinæ*, our species is akin, differing mainly in sculpture, being supplied with nearly double the number of longitudinal ribs, while the gemmate beading is more pronounced in *S. concinna*. Only one example, happily in first-class condition at the time of description, was procured, though unfortunately it was accidentally broken at the mouth before it could be figured. We consider that *Lachesis meridionalis*, E. A. Sm.,* is synonymic with *Saratieria molinæ*, Strebel, 1905, and has priority of twenty-four years over it.

* *Proc. Zool. Soc. Lond.*, 1881, p. 28, pl. iv. fig. 3.

Family *Cancellariidæ*.

Paradmete typica, Strebel.

Paradmete typica, H. Strebel, *Schwed. Südpolar Exped.*, Band vi., 1, p. 22, Taf. iii. fig. 35 *a–f* (1908).

Hab.—Burdwood Bank, Station 346, at 56 fathoms, December 1, 1903.

Thus showing a considerable extension in range. Only one specimen, but in good condition.

Admete limneæformis, Sm.

? *Admete limneæformis*, E. A. Smith, *Phil. Trans. Roy. Soc. Lond.*, clxviii. p. 172, pl. ix. fig. 4 (1879).

Hab.—Trawl, Burdwood Bank, at 56 fathoms. Station 346.

One example, in good condition, exactly agreeing with the type, from Kerguelen Land. We should hardly be prepared to suggest placing this in Dr Strebel's new genus *Paradmete*. Mr Charles Hedley has lately hinted at its possible reception into the genus *Odostomiopsis*, Thiele, and this is well worthy of consideration. The shell is small, white, semi-transparent, and, as the trivial name, so well chosen, suggests, almost an exact reproduction of *Limnæa peregra*, Müll., in miniature.

Order Opisthobranchiata.

Sub-order tectibranchiata.

(*a*) Bulloidea.

Family *Tornatinidæ*.

Retusa antarctica, sp. n. (Plate, fig. 20).

R. testa delicata, parva, ovato-fusiformi, rimata, pallidissimé livido-virescente, perlævi, subpellucida, anfractibus 4, quorum apicales duo tumescentes, cæteris ad suturas rotundé gradatim impressis, ultimo magno, lævi, apertura ovata, labro sinuato, vix crassiusculo, columella obliqua.

Alt. 3·25, diam. 1·75 mm.

Hab.—Scotia Bay, South Orkneys, 9–10 fathoms. Station 325.

A small, plain, greenish-livid species, translucent, very smooth, with swollen nuclear whorls, and roundly shouldered at the sutures.

Retusa truncatula (Brug.).

This widely distributed species, the full synonymy of which we gave in our last paper (*loc. cit.*, p. 141), and which is hardly distinguishable from the British form, also occurred at the Burdwood Bank locality, Station 346, 56 fathoms.

Fragments of others of this order, belonging to the genera *Cylichna* and *Philine*, were

dredged either from the same or neighbouring localities, but none in a condition to examine seriously.

Sub-order PTEROPODA.

Section Thecosomata, de Blainville.

Cavolinia tridentata (Forskål).

1773. *Anomia tridentata*, Forskål, *Descriptiones animalium quæ in itinere orientali observavit*, p. 124.

1791. *Cavolinia natans*, Abildgaard, "Nyere Efterretning om det Skaldyr som Forskål har beskrevet under Navnet Anomia tridentata," *Skriv. naturhist. Selsk.*, Bd. i., Heft 2, pl. x.

1801. *Hyalæa cornea*, Lamarck, *Système des animaux sans vertèbres*, p. 140.

1804. *Hyalæa papilionacea*, Bary de St Vincent, *Voyage dans les quatre principales îles des mers d'Afrique*, t. i. p. 137, pl. v. fig. 1.

1810. *Hyale teniobranche*, Péron et Lesueur, "Histoire de la famille des Mollusques Ptéropodes," *Ann. Mus. Hist. Nat. Paris*, t. xv., pl. ii. fig. 13.

1813. *Hyalæa peroni*, Lesueur, "Mémoire sur quelques animaux mollusques, etc.," *Nouv. Bull. Soc. Philom.*, t. iii. p. 284.

1813. *Hyalæa chemnitziana*, Lesueur, *ibid.*, p. 284.

1816. *Hyalæa australis*, Péron, *Voyage de découvertes aux terres australes*, t. i , pl. xxxi. fig. 5 (*sine descriptione*).

1821. *Hyalæa forskahlii*, Lesueur, MS., in de Blainville, "Hyale," *Dict. d. Sci. Nat.*, t. xxii. p. 79.

1836. *Hyalæa affinis*, d'Orbigny, *Voyage dans l'Amérique méridionale*, t. v. p. 91, pl. v. figs. 6–10.

1848. *Hyalæa truncata*, Krauss, *Süd-africanische Mollusken*, p. 34, pl. ii. fig. 12 (*non* Lesueur).

1859. *Cavolinia telemus*, A. Adams, "On the Synonyms and Habits of Cavolinia, Diacria, and Pleuropus," *Ann. and Mag. Nat. Hist.*, ser. 3, t. iii p. 44.

1877. *Hyalæa cumingii*, Sowerby, in Reeve, *Conchologia iconica*, t. xx., Pteropoda, fig. 5.

Hab.—Lat. 39° 58′ S., long. 8° 36′ W., tow-net, surface, temp. 55°·2. Many living specimens, large and fine. Between Stations 470 and 471.

Class SCAPHOPODA.

Dentalium eupatrides, M. and St.

Dentalium eupatrides, Melvill and Standen, *Trans. Roy. Soc. Edin.*, vol. xlvi., part i., p. 142, pl. fig. 12 (1907).

Hab.—The original locality of this fine smooth abyssal species was accidentally omitted in our first paper. It occurred, with the other species chronicled, *D. megathyris*, Dall, in lat. 71° 22′ S., long. 16° 34′ W., at 1410 fathoms, Station 417. Many fragmentary portions of probably the same shells have been dredged up from Station 420, at 2620 fathoms.

Dentalium megathyris, Dall.

Dentalium megathyris, Dall, *Proc. U.S. Nat. Mus.*, xii. p. 293, pl. ix. fig. 1 (1889).
„ „ Stearns, *Proc. U.S. Nat. Mus.*, xvi. p. 424 (1893).

Hab.—Lat. 71° 22′ S., long. 16° 34′ W., 1410 fathoms. Station 417.

In our first report we allocated a large Dentalium dredged from 1410 fathoms to *D. Shoplandi*, Jouss., as it agreed with specimens so named in the British Museum from "near Aden." We have since received from the same station a large fragment of the upper part of a living specimen, evidently snapped off by the dredge, and a number of smaller fragments. Critical examination of these has led us to conclude that our specimens are identical with *D. megathyris*, Dall, which has occurred off Chiloe Island and south-east Chili in 1050 and 1342 fathoms, in the Gulf of Panama in 2282 fathoms, and other localities in the Panamic region. It is significant that in company with this Dentalium, both in the Gulf of Panama and in the 1410 fathoms locality, the Brachiopod, *Macandreria diamantina*, Dall, should also occur. The descriptions and figures of *D. megathyris* and *D. Shoplandi*, as given by Tryon, are so widely different in every respect, both as to dimensions and sculpture, and other minor details, that although our specimens agree so well with the British Museum examples purporting to come from Aden, we now are inclined to refer them to *D. megathyris*, as, even if this species should ultimately be proved to be an extreme form of *D. Shoplandi*, that specific name would become a synonym—*D. megathyris*, Dall, having priority of five years. From a careful study of the material and literature at our command we cannot help thinking that *D. megathyris*, Dall, *D. Shoplandi*, Jouss., *D. ceras*, Watson, and perhaps *D. majorinum*, Rocheb. and Mab., may eventually prove to be but forms of one variable gigantic longitudinally costate Dentalium in the southern hemisphere, radiating towards the Atlantic as well as the Pacific Ocean, and inhabiting everywhere very deep water, where the great pressure, darkness, and equable temperature render it possible for it to range through many degrees of latitude.

Class PELECYPODA.

Order Protobranchiata.

Family *Nuculidæ*.

Yoldia profundorum, sp. n. (Plate, figs. 18, 18*a*, 18*b*).

Y. testa parva, tumida, nitida, lævi, inæquilaterali, periostraco plumbeo-olivaceo contecta, anticé rotundata, posticé paullulum producto, umbonibus erosis, approximatis, haud prominulis, ligamento obscuro, lineari, cardinibus utriusque valvæ decem denticulis utrinque præditis, pagina interna nitida, albo-lactea, sinu palliali parvo.

Alt. 3, lat. 4·50 mm.

Hab.—Deposit No. 38, dredged March 18, 1904, lat. 71° 22′ S., long. 16° 34′ W., 1410 fathoms. Station 417.

A small, tumid, smoothish, slightly inequilateral *Yoldia*, the anterior side rounded, the posterior somewhat produced, to which *Y.* (*Sarepta*) *abyssicola*, Smith,* from Station 246, Challenger Expedition, Mid North Pacific, at 2050 fathoms, and also Station 281, Mid South Pacific, at 2385 fathoms, seems somewhat allied. That species, however, appears more distinctly abbreviate posteriorly, and higher in proportion to its width. *Y. ecaudata*, Pelseneer,† may likewise be compared, a species which is closely akin to *Y. abyssicola*. This was obtained during the voyage of the *Belgica* in the Antarctic region, at a depth of 400–500 metres. Again, *Y. Valettei*, Lamy, from the South Orkneys, where an example was found in the stomach of a penguin, is much of the same outward form, but less than half the dimensions (2·2 × 1·65 × 1·5 mm.), and the teeth are only six in number on either side. The epidermis is likewise named as "flava" in contradistinction to "plumbea" or "olivacea."

Nucula pisum, Sowb.

Nucula pisum, Sowerby, *Thes. Conch.*, iii. p. 153, pl. ccxxix. fig. 133.

Hab.—Falkland Islands, local, but gregarious. Station 118.

Order Filibranchiata.

Sub-order arcacea.

Family *Arcidæ*.

Arca (*Bathyarca*) *strebeli*, M. and St.

Arca (*Bathyarca*) *strebeli*, Melvill and Standen, *Trans. Roy. Soc. Edin.*, vol. xlvi., part i., p. 144, pl. figs. 13, 13*a* (1907).

Hab.—Two additional localities can be now given, as follows:—

Station 420. Dredged at 2620 fathoms. One specimen.

,, 291. Lat. 67° 33′ S., long. 36° 35′ W., 2500 fathoms, March 7, 1903.

Limopsis longipilosa, Pels.

Limopsis longipilosa, P. Pelseneer, *Voy. du S.Y. "Belgica": Zoologie*, p. 25, figs. 89, 90 (1903).

Hab.—Dredged in lat. 71° 22′ S., long. 16° 34′ W., at 1410 fathoms, March 18, 1904. Station 417.

One fairly perfect specimen, probably referable to the above.

[Very imperfect examples of another *Limopsis*, solid, small, equilateral, covered with thin, short-bristled epidermis, also occurred at Burdwood Bank, 50 fathoms.]

* *Rep. Challenger Expedition*, "Lamellibranchia," pl. xx. figs. 6, 6*a*, 6*b*.

† *Voy. du S.Y. "Belgica": Zoologie*, par Paul Pelseneer, p. 22, figs. 77, 78 (1903).

Sub-order MYTILACEA.

Family *Mytilidæ*.

Philobrya sublævis, Pels.

Philobrya sublævis, P. Pelseneer, *Voy. du S.Y. "Belgica": Zoologie*, p. 25, figs. 93, 94 (1903).

Hab. Station 346, lat. 54° 25′ S., long. 57° 32′ W., at 56 fathoms, January 1, 1903.

Philobrya wandelensis, Lamy.

Philobrya wandelensis, E. Lamy, *Expéd. Antarct. Française Charcot*, 1903–5, p. 16, pl. i. figs. 15, 16 (1906).

Hab. Trawl, Burdwood Bank, 56 fathoms. Station 346.

Crenella decussata, Mont.

Mytilus decussatus, Montagu, *Test. Brit. Suppl.*, p. 69 (1809).
,, ,, Forbes and Hanley, ii. p. 210, pl. xlv. fig. 2.
Crenella ,, Jeffreys, *Brit. Conch.*, ii. p. 133, v., pl. xxviii. fig. 6.
,, ,, Sowerby, *Ill. Index Brit. Shells*, pl. vii. fig. 17.

Hab. Burdwood Bank, south of the Falkland Islands, at 56 fathoms, December 1, 1903. Station 346.

Very minute specimens, not exceeding 2 × 2 mm., the interior beautifully pale-nacreous; form precisely that of the European and Canadian type, the divaricating sculpture seemingly also identical, as well as the fine marginal crenellations.

Modiolarca mesembrina, M. and St.

Modiolarca mesembrina, Melvill and Standen, *Trans. Roy. Soc. Edin.*, vol. xlvi., part i., p. 146, pl. figs. 15, 15*a* (1907).
Modiolarca picturata, Cooper and Preston, *Ann. and Mag. N. Hist.*, ser. viii, vol. v., pl. iv. fig. 5 (1910).

Hab.—Falkland Islands. Station 118.

We received lately from Mr A. P. Cobb examples of *M. picturata*, Cooper and Preston, and consider it the same as our *mesembrina*, from the same locality, described three years previously. In marking and coloration it is a most variable species: in form it is fairly constant.

Order EULAMELLIBRANCHIATA.

Sub-order SUBMYTILACEA.

Family *Carditidæ*.

Carditella pallida, Sm.

Carditella pallida, E. A. Smith, *Proc. Zool. Soc. Lond.*, p. 43, pl. v. figs. 9, 9*b* (1881).

var. *duodecim-costata*, nov. (Plate, figs. 19, 19*a*).

Hab.—Station 346, Burdwood Bank, at 56 fathoms. Many full-grown specimens, but few perfect.

In all the specimens examined of our proposed variety, the ribs are but twelve in number; in typical *C. pallida*, Sm., they number fourteen to fifteen. The straight angular declivity on either side of the dorsal margin seems likewise more pronounced, the variety thereby assuming a more flabellate or quasi-triangular appearance. The general characters of the shells are identical. As Mr SMITH aptly remarks, the superficial aspect of *Cardita flabellum*, Reeve,* proves it to be nearly allied. This is a native of Valparaiso, Chili.

Cardita congelascens, sp. n. (Plate, fig. 23).

C. testa parva, trapezoide, solidula, umbonibus prominulis, inæquilaterali, æquivalvi, posticé dorsaliter recta, anticé breviter arcuata, deinde ventralem usque ad marginem, leniter subrotundata, superficie radiatim costulata, costulis incrassatis, numero ad 21, pulchré et regulariter nodulosis, nodulis imbricatulis, albis, nitidis pagina intus alba, valva dextra, cardinalibus dentibus duobus crassis, sinistra dente crasso, elongato, præditis.

Alt. 3, diam. 4 mm. (sp. maj.).

Hab.—Burdwood Bank, south of the Falkland Islands, at 56 fathoms. Station 346.

Only disassociated valves occurred of a species of *Cardita* which seems distinct. We have compared it with *C. modesta*, *relutina*, *antarctica*, *astartoides*, and other species of the genus inhabiting these same southern waters, and find it fails exactly to correspond with any of them. At the same time, we doubt if any of our examples are adult. Still, the character of the ribs, and the ornamentation and the general contour of the shell, give us hope that it may be proved eventually to have been established on a sound basis. The specific name alludes to the icy clime where it is endemic.

Family *Astartidæ*.

Astarte magellanica, Sm.

Astarte magellanica, E. A. Smith, *Proc. Zool. Soc. Lond.*, p. 41, pl. v. fig. 7 (1881).
,, ,, ,, *Journ. of Conch.*, iii. p. 227.

Hab.—Burdwood Bank, south of the Falkland Islands, at 56 fathoms. Station 346.

All disassociated valves, but some in good condition, and showing the olivaceous epidermis. The majority possess fewer concentric ribs than the type, but we consider them all referable to *magellanica*. The allied *A. longirostra*, Orb., also found in this region, is more pronouncedly beaked, and the ribbing is far finer. The crenulation of the inner margin of the valves is, as pointed out by the author of the species, another distinctive factor in *A. magellanica*.

* Reeve, *Conch. Icon.*, i., Cardita, pl. ix. fig. 47 (1843).

Family *Lucinidæ*.

Diplodonta lamellata, Sm.

Diplodonta lamellata, E. A. Smith, *Proc. Zool. Soc. Lond.*, p. 38, pl. v. figs. 1–1 *c* (1881).

Hab.—Burdwood Bank, south of the Falkland Islands, at 56 fathoms. Station 346.

A right and left valve, hardly adult, but showing the characteristic generic dentition, as well as the concentric lamellar ornamentation, which led to the bestowal of the trivial name. These lamellæ appear in our small specimens more numerous, but we can but believe them identical, as they agree in form, and every other detail. The type was discovered during the survey of H.M.S. *Alert* in the Straits of Magellan and Patagonian coast.

Cyamium denticulatum, Sm.

Cyamium denticulatum, E. A. Smith, *Nat. Antarct. Exped.: Nat. Hist.*, vol. ii. p. 3, pl. iii. figs. 4, 4*b* (1907).

Hab.—Burdwood Bank, 56 fathoms. Station 346.

A curious though minute species, conspicuous for its marginal denticulation and radiating impressed lines, which are seen more clearly with the aid of a lens.

Cyamium falklandicum, M. and St.

Cyamium falklandicum, Melvill and Standen, *Journ. of Conch.*, ix. p. 104, pl. i. fig. 12 (1898).

? *Cyamium iridescens*, Cooper and Preston, *Ann. and Mag. N.H.*, ser. viii., vol. v. p. 112, pl. iv. fig. 6 (1910).

This is a variable species, and we consider *C. iridescens*, Coop. and Prest., probably one of its extreme forms. We have examined a large number of examples, in all stages of growth. The specimens collected at Hearnden Water, Station 349, are as iridescent as those so named by Messrs Cooper and Preston.

Family *Erycinidæ*.

Kellyia cycladiformis (Desh.).

Erycina cycladiformis, Deshayes, *Trait. élém.*, pl. xi. figs. 6–9; *Proc. Zool. Soc. Lond.*, p. 181 (1855).

Hab.—Burdwood Bank, at 56 fathoms. Station 346.

We have already recorded this (*loc. cit.*, p. 149), but it is worthy of record that nearly all the subsequent specimens from the same locality that have since come into our hands were found living inside the valves of defunct Brachiopoda, and are therefore in first-class condition. *Saxicavæ* occurred with them.

Kellyia magellanica, Sm.

Kellyia magellanica, E. A. Smith, *Proc. Zool. Soc. Lond.*, p. 41, pl. v. figs. 6, 6 *a*, *b* (1881).

Hab.—Burdwood Bank, with *K. cycladiformis* (Desh.). Station 346.

Only one perfect valve, agreeing exactly with the figure 6*a* above quoted.

Davisia cobbi, Coop. and Prest.

Davisia cobbi, J. E. Cooper and H. B. Preston, *Ann. and Mag. N. Hist.*, ser. viii., vol. v. pp. 113, 114, pl. iv. figs. 9, 10 (1910).

Hab.—Burdwood Bank, Station 346, at 56 fathoms.

A small species with peculiar hinge. It would be unfortunately impossible, from the very indistinct photogravure plates, to tell the generic characteristics, and we wish it had been possible to figure both this and the *Malvinasia*, described at the same opportunity, in a more satisfactory fashion.

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[*Rossia patagonica*, *Loligo patagonica*, *Onychoteuthis ingens*, *Pleurotoma* (*Bela*) *Cunninghami*, *Pl.* (*Mangilia*) *Coppingeri*, *Lachesis meridionalis*, *Euthria atrata*, *E. meridionalis*, *Nassa* (*Tritia*) *Coppingeri*, *Lamellaria patagonica*, *Collonia Cunninghami*, *Trochus* (*Zizyphinus*) *consimilis*, *Tectura* (*Pilidium*) *Coppingeri*, *Chiton* (*Ischnochiton*) *imitator*, *Diplodonta lamellata*, *Mactra* (*Mulinia*) *levicardo*, *Loripes pertenuis*, *Kellia magellanica*, *Astarte magellanica*, *Cardita* (*Actinobolus*) *velutina*, *Carditella* (n. g.) *pallida*, spp. nov. marinæ.]

1907. Joubin, L., *Expédition Antarctique Française* (1903–5) *commandée par Dr Jean Charcot: Sciences Naturelles*, "Documents Scientifiques: Céphalopodes," Paris, 1 pl.

1907. Melvill, James Cosmo, and Standen, Robert, "The Marine Mollusca of the Scottish National Antarctic Expedition," *Trans. Roy. Soc. Edin.*, xlvi., part i., pp. 119–157, 1 pl.

[*Tugalia antarctica*, *Littorina* (*Lævilitorina*) *coriacea*, *Lacuna notorcadensis*, *Rissoa Edgariana*, *R. scotiana*, *Cerithiopsis malvinarum*, *Trophon minutus*, *Nassa* (*Ilyanassa*) *Vallentini*, *Chrysodomus* (*Sipho*) *archibenthalis*, *C.* (*Sipho*) *crassicostatus*, *Columbarium benthocallis*, *Dentalium eupatrides*, *Arca* (*Bathyarca*) *Strebeli*, *Lissarca notorcadensis*, *Modiolarca mesembrina*, *Pecten pteriola*, *Amussium* 18-*liratum*, *Lima gouyhensis*, *Kellia Lamyi* (nom. nov.), *Cuspidaria Brucei*, *Scacchia plenilunium*, *Pecten multicolor*, spp. n.]

1907. Strebel, Hermann, "Beiträge zu Kenntnis der Mollusken-Faunen der Magalhaen. Provinz," Part v., *Zool. Jahrb. Syst. Jena*, pp. 79–196, Taf. viii.

[A continuation of the enumeration of the Molluscan fauna of the Falkland Islands, with new species of *Megatebennus*, *Tugalia*, *Patinella*, and several non-marine forms.]

1907. Eliot, Sir Charles N. E., K.C.M.G., "Nudibranchs from New Zealand and the Falkland Isles," *Proc. Malac. Soc.*, vii. pp. 327–361, pl. xxviii. (London).

[*Cratena Vallentini*, *Galvina falklandica*, *Coryphella falklandica*, *Staurodoris falklandica*, *Acanthodoris falklandica*, spp. n.]

1908. Strebel, Hermann, *Wissenschafte Ergebnisse der Schwedischen Südpolar Expedition*, 1901–3, *unter Leitung von Dr Otto Nordenskjöld*, Band vi., Lieferung i., "Die Gastropoden," mit 6 Tafeln (Stockholm).

[New species of genera *Actæonina*, *Retusa*, *Cylichnina*, *Anderssonia*, *Philine*, *Bela* 6 spp., *Sarcula*, *Mangilia*, *Pleurotomella*, *Admete*, *Paradmete* n. g. 3 spp., *Ancillaria*, *Glypteuthria*, *Sipho* 2 spp., *Neobuccinum*, *Pfefferia* n. g. 4 spp., *Trophon* 4 spp., *Bittium* 3 spp., *Cerithiopsis*, *Rissoia* 5 spp., *Eatoniella*, *Natica* 3 spp., *Scalaria*, *Volutaxiella* n. g. 2 spp., *Eulima*, *Odostomia*, *Calliostoma* 5 spp., *Photinula*, *Promargarita* n. subgen., *Submargarita* n. subgen., *Margarita* 2 spp., *Cyclostrema*, *Scissurella*, *Thilea*.]

1908. Dall, William Healey, Report on the Dredging Operations off the West Coast of Central America to the Galapagos, etc., carried on by the U.S. Fish Commission Steamer "Albatross" during 1891, in charge of Alexander Agassiz.

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[A few Magellanic species recorded, *e.g.* on p. 315, *Antistreptus magellanicus*, Dall = *Glypteuthria contraria*, Strebel.]

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[*Cadulus Thielei*, *Siphonodentalium minimum*, *Dentalium majorinum*, var. n. *yaussianum*.]

1908. Plate, L., Expédition Antarctique Belge. Résultats du Voyage du S.Y. "Belgica" en 1897–98–99 sous le commandement de A. de Gerlache de Gomery. Rapports Scientifiques: Zoologie, "Scaphopoden" (Anvers, Buschmann).

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[*Philobrya multistriata*, sp. n.]

1909. Thiele, Johann, "Revision des Systems des Chitonen," Tl. 1–2, *Zoologica* (Stuttgart), H. 56. 10 Taf.

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[*Notaeolidia*, *Tritonia*, *Tritoniopsis*, spp. n.]

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[*Photinula solidula*, *Modiolarca gemma*, *M. picturata*, *Cyamium iridescens*, *Malvinasia* (n. gen.) *Arthuri*, *Darisia* (n. gen.) *Cobbi*, *Psephis foveolata*, spp. n. marinæ.]

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Pélécypodes, *id.*, pp. 388–394.

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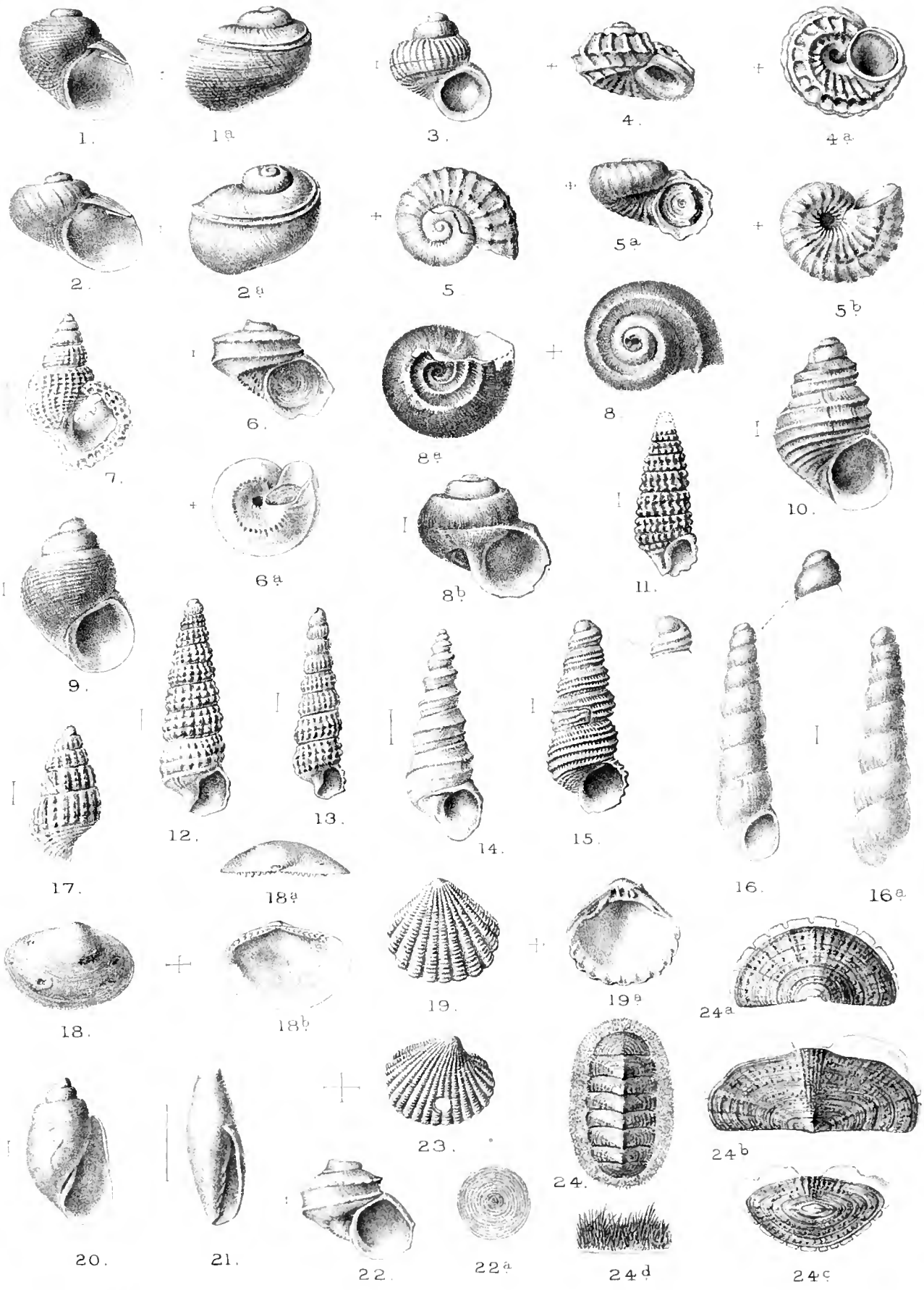
EXPLANATION OF PLATE.

1. *Scissurella eucharista.*
2. ,, *timora.*
3. *Cyclostrema calypso.*
4. ,, *coatsianum.*
5. ,, *gaudens.*
6. ,, *meridionale.*
7. *Trichotropis antarctica.*
8. *Lacuna abyssicola.*
9. *Rissoa (Onoba) filostria.*
10. ,, ,, *paucilirata.*
11. *Bittium brucei.*
12. ,, *burdwoodianum.*
13. *Cerithiopsis macroura.*
14. *Turritella algida.*
15. *Mathilda rhigomaches.*
16. *Turbonilla xenophyes.*
17. *Savatieria concinna.*
18. *Yoldia profundorum.*
19. *Cardiella pallida*, Sm., var. 12-*costata* nov.
20. *Retusa antarctica.*
21. *Mitra (Volutomitra) porcellana.*
22. *Cyclostrema meridionale* (cum operculo).
23. *Cardita congelascens.*
24. *Chætopleura brucei*, Iredale.

MELVILL & STANDEN: "SCOTIA" MARINE MOLLUSCA.



PART VI.

BRACHIOPODA.

VI.—THE BRACHIOPODA OF THE SCOTTISH NATIONAL ANTARCTIC EXPEDITION.

By J. WILFRID JACKSON, F.G.S.,
Assistant Keeper, Manchester Museum.

(*WITH TWO PLATES.*)

The Brachiopoda of the Scottish National Antarctic Expedition (1902 to 1904).

By J. Wilfrid Jackson, F.G.S., Assistant Keeper, Manchester Museum. *Communicated by* Dr W. S. Bruce. (With Two Plates.)

(MS. received May 6, 1912. Read June 17, 1912. Issued separately August 28, 1912.)

The Brachiopoda of the Scottish National Antarctic Expedition of the S.Y. *Scotia* (1902–1904), though in some cases somewhat scanty in number of individuals, are of particular interest, mainly on account of increasing very materially our knowledge in regard to the geographical range of certain forms, as well as of adding other species to those already known from the Antarctic coast-line.

Representatives of this class were dredged at three stations, viz.: Station 325 (Scotia Bay, South Orkneys), 9–10 fathoms; Station 346 (Burdwood Bank, south of the Falkland Islands), 56 fathoms; and Station 417 (off Coats Land, Antarctica), 1410 fathoms.

The Scotia Bay dredgings resulted only in the acquisition of one species, which, though possessing certain characteristics of *Liothyrina uva*, differs in many other respects from that widely distributed form, and may possibly be ultimately regarded as a distinct species. As sufficient material for a complete study is not available, the specimens are referred, in this report, to a new variety of *L. uva*, viz. *notoreadensis*.

At Burdwood Bank were obtained some interesting forms of *Terebratella dorsata* and *Liothyrina uva*, both being well-known Magellanic species, as well as some young forms which may possibly represent a new species of *Terebratella*.

At this station some interesting examples of a new *Cephalodiscus* were also dredged, which have provided welcome material in the form of very young stages of *Liothyrina uva*, as well as of others referable to *Terebratella dorsata* and *Magellania venosa*.

The dredging at Station 417 yielded four forms, all of them being of extreme interest, coming as they do from so southerly a latitude, and from the neighbourhood of the newly discovered Coats Land.

The species met with here comprise an interesting form of *Macandrevia* (*M. diamantina*), hitherto only recorded from the Gulf of Panama and Northern Peru; *Pelagodiscus atlanticus*, a typical abyssal form and a species of almost cosmopolitan distribution; *Liothyrina blochmanni*, n. sp.; and some fragmentary remains of an undoubtedly new Rhynchonelloid, unfortunately too imperfect for accurate specific description. These, being deep-water forms, are all thin-shelled animals, and do not attain a very large size.

It is particularly fortunate that amongst the specimens of *Macandrevia dia-*

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mantina are examples which have afforded the much-desired opportunity for studying the developmental stages of the loop.

With regard to *Pelagodiscus atlanticus*, although of almost world-wide distribution, its probable existence in Antarctic waters has only recently been demonstrated by EICHLER (1911),* who, with some hesitation, refers to this species two larval forms of a *Discinisca* obtained in March 1903 by the "Gauss" Expedition, at a depth of about 1640 fathoms in the neighbourhood of their winter station, Kaiser Wilhelmland II.

Although it is, to some extent, a matter for regret that this report is so late in its publication, owing to the material having only recently come into my hands for study, the long delay has not been without its compensations, as I have been able to derive some benefit from, and make comparisons with, collections made by other Antarctic expeditions whose reports are already published.

Before proceeding with the detailed description of the species I must here express my great indebtedness to the numerous friends who have assisted in one way or another during the preparation of this report.

To Dr F. BLOCHMANN, of Tübingen University, I am especially indebted for his very material help in the discrimination of critical forms, and for his kind interest and valuable assistance. To Dr W. H. DALL I am also grateful for his great kindness and confidence in submitting to me a type specimen of his *Macandrevia diamantina* for comparison with the *Macandrevia* obtained in 1410 fathoms off Coats Land. Amongst the various friends who have assisted in sorting out the smaller Brachiopoda from the Burdwood Bank material, I wish to particularly mention my colleague Mr R. STANDEN, the Rev. L. J. SHACKLEFORD, and Messrs B. R. LUCAS, F.G.S., and F. G. PEARCEY. And in conclusion I must tender my sincere thanks to Dr W. S. BRUCE, F.R.S.E., for entrusting his Brachiopod collections to me, and for placing maps and much general information at my disposal.

List of species contained in the *Scotia* collections :—

Class BRACHIOPODA.

Pelagodiscus atlanticus (King), off Coats Land, 1410 fathoms.
Hemithyris, n. sp., off Coats Land, 1410 fathoms.
Liothyrina uva (Brod.), Burdwood Bank, 56 fathoms.
,, var. *notorcadensis*, nov., Scotia Bay, South Orkneys, 9–10 fathoms.
L. blochmanni, n. sp., off Coats Land, 1410 fathoms.
Macandrevia diamantina, Dall., off Coats Land, 1410 fathoms.
Terebratella dorsata (Gm.), Burdwood Bank, 56 fathoms.
,, n. sp.?, Burdwood Bank, 56 fathoms.
Magellania venosa (Sol.), Burdwood Bank, 56 fathoms.

* See bibliography at end of report.

Description of Species.

The literature in the main is restricted to the more important papers. Further synonymy will be found in Davidson's *Recent Brachiopoda* (1886–1888); Fischer and Oehlert (1892); and Blochmann (1912).

Pelagodiscus atlanticus (King).

Discina atlantica, King, 1868, *Proc. Nat. Hist. Soc. Dublin*, vol. v. pp. 170–173.
" " ., 1880, Davidson, "*Challenger*" *Report*, pp. 62 and 65, pl. iv. figs. 17–18.
Discinisca atlantica (King), 1888, Davidson, *Mon. Recent Brach.*, pt. iii. p. 200, pl. xxvi. figs. 18–22.
" " " 1891, Fischer and Oehlert, *Exped. Scient. du "Travailleur" et du "Talisman,"* Brachiopodes, p. 120.
" " " Section *Pelagodiscus*, 1908, Dall, *Bull. Mus. Comp. Zool.*, vol. xliii. p. 440.
Discinisca , 1911, Eichler, *Deutschen S.-P. Exped.*, xii., Zool., iv. p. 87, pl. xliv. fig. 22.

Hab.—Station 417; lat. 71° 22′ S., long. 16° 34′ W. (off Coats Land, Antarctica). Depth, 1410 fathoms. March 18, 1904. Sea bottom, blue mud and stones. Temperature 29°·9 F.

Obs.—Four upper valves of this interesting species were trawled at this station. The largest specimen measures 6·75 by 6 mm.; the others, 5 by 5, 4·75 by 4, and 3·5 by 3·5 mm. respectively.

All are in a good state of preservation. The shell is thin, semi-transparent, yellowish-brown in colour, and marked by numerous close-set concentric growth lines. The protegulum in each example is well defined, and situated somewhat posteriorly.

Pelagodiscus (formerly *Discinisca*) *atlanticus* is a typical cold-water species with a bathymetric range from 200 to 2425 fathoms. Its geographic range is almost world-wide, as it is known from the North and Mid-Atlantic Ocean, the Pacific, and off Australia. Some seven or eight different localities were established for it by the *Challenger* Expedition.

Off Valparaiso it was obtained by this Expedition in 2160 fathoms, on a mud bottom; temperature 34° F.

It has also been taken south-west of the Galapagos Islands, in 2035 fathoms; temperature 35°·3 F. (*Albatross*).

As mentioned in the prefatory remarks, its probable existence in Antarctic waters has recently been alluded to by Eichler (1911), who describes two larval forms of a Discinoid from a depth of about 1640 fathoms, Kaiser Wilhelmland II. These appear to have strong affinities with *P. atlanticus*, and in all probability are referable to this widely dispersed form.

The present discovery of the species well within the Antarctic Circle is highly interesting, as it increases the known range to a considerable extent geographically, though not bathymetrically.

The very wide range of this species is, in all probability, due to larval transportation, as the larvæ are known to live in a free and floating condition for nearly a month, and have been taken in a drag-net not far from land (SCHUCHERT, 1911).

Hemithyris sp. (Pl. II. fig. 14.)

Hab.—Station 417 ; lat. 71° 22′ S., long. 16° 34′ W. (off Coats Land, Antarctica). Depth, 1410 fathoms. March 18, 1904. Sea bottom, blue mud and stones. Temperature 29°·9 F.

Obs.—Some fragmentary remains of a probable new Rhynchonelloid were met with at the above station. These consist of hinge portions only of one ventral and two dorsal valves, but are, unfortunately, too small and imperfect for accurate specific description.

The material at my disposal appears to belong to a small trigonal form possessing a thin, translucent test. The colour is a yellowish-brown, and the outer surface smooth with very faint growth lines.

The ventral valve possesses dental plates, as in the type species *Hemithyris psittacea*, and from the evidence of the fragment the beak appears to be somewhat produced, and to possess a moderately large foramen.

The dorsal valve exhibits a short, feeble, median septum separating well-marked muscular impressions. There is no cardinal process. Hinge plate divided and consisting of two short, flattened, curved lamellæ, which are widely divergent.

Shell-mosaic similar in character to but larger in size than that of *R. cornea* figured by BLOCHMANN (1908 ; pl. xxxvii. fig. 16).

Fig. 14 (Pl. II.) in the present report is taken from a fairly well-preserved fragment.

The above description, of course, applies only to the posterior portion ; the anterior end of the shell is quite unknown, hence one cannot say if the species is plicated or not.

Two new species of *Rhynchonella* (*R. racovitzæ* and *R. gerlachei*), and several indefinite forms too imperfect for identification, have been described from the Western Antarctic by JOUBIN (1901), but these all come from a less depth than the Coats Land form. This latter may, however, be intimately related with one or other of these forms, but owing to the paucity of material in both cases a decision on this point is for the present out of the question.

It is most unfortunate that the fragments of the Coats Land example are so small and indefinite, as this prevents a comparison being made, not only with the above-mentioned recent forms, but also with the fossil examples of *Hemithyris* recently described by BUCKMAN (1910) from Antarctica (Swedish Expedition), especially *H. antarctica*, Buck., from the Pleistocene beds of Cockburn Island, off Graham Land, to which species the Coats Land form presents some points of resemblance.

There is also the possibility of relationship with two other fossil species, viz. *Hemithyris plicigera* (Jhering) and *H. australis*, Buckman, from the Miocene-Oligocene beds of the same island.

Liothyrina uva (Broderip). (Pl. I. fig. 9.)

Terebratula uva, Broderip, 1833, *Proc. Zool. Soc. London*, pt. i., p. 124.
,, ,, 1835, *Trans. Zool. Soc. London*, vol. i. p. 142, pl. xxiii. fig. 2.
,, ,, 1880, Davidson, "*Challenger*" *Report*, p. 31, pl. ii. figs. 4–4*a* (figs. 3–3*b* are *Liothyrina fulva*, Bl.).
Liothyris uva (Brod.), 1886, Davidson, *Mon. Recent Brach.*, pl. ii. figs. 5–7.
Terebratula (*Liothyrina*) *moseleyi*, Dav., 1892, Fischer and Oehlert, *Bull. Soc. d'hist. nat Autun*, vol. v. p. 264, pl. viii. figs. 9–23.
Liothyrina uva (Brod.), 1906, Blochmann, *Zool. Anzeiger*, vol. xxx. p. 698.
,, ,, 1907, Oehlert, *Bull. Mus. d'hist. nat. Paris* (1906), vol. xii. p. 555, text-figs.
,, ,, 1908, Oehlert, *Expédition antarctique Française*, 1903–1905, *Sciences nat. Brachiopodes*, pl. i. and text-figs.
,, ,, 1908, Blochmann, *Zeitschr. f. wiss. Zool.*, Bd. xc. p. 615.
,, ,, 1908, Dall, *Bull. Mus. Comp. Zool. Harvard Coll.*, vol. xliii. p. 443.
,, ,, 1909, Dall, *Proc. U.S. Nat. Mus.*, vol. xxxvii. p. 279.
,, ,, 1911, Eichler, *Deutsche S.-P. Expedition* (Brachiopoden), Bd. xii. (Zoologie iv.), Berlin, p. 338.
,, ,, 1912, Blochmann, *Die Brach. der Schwed. S.-P. Expedition*, Bd. vi. (Zoologie ii.), No. 7, Stockholm, p. 1, pl. i. figs. 1–13; pl. ii. figs. 16–18; pl. iii. figs. 20–28.

Hab.—Station 346; lat. 54° 25′ S., long. 57° 32′ W. (Burdwood Bank), 56 fathoms. December 1, 1903. Sea bottom, Bryozoa. Temperature 41°·8 F.

Obs.—Several dead examples of a small species of *Liothyrina* were trawled at the above station at 56 fathoms.

The largest example (Pl. I. fig. 9) measures: length, 15·5 mm.; breadth, 13 mm., and agrees very closely with the specimen figured by Fischer and Oehlert (*op. cit.*, pl. viii. fig. 23) under the name of *Terebratula* (*Liothyrina*) *moseleyi*, Dav. The two vascular sinuses show very clearly in the interior of the ventral valve, as in their figured example. The dorsal valve of this specimen is also interesting as showing a very distinct trace of a median septum, as well as a strongly developed hinge apophysis, which occupies a considerable portion of the posterior end of the valve.

Other noteworthy features are the remarkable thickness of both valves, and the abundance of coarse growth lines, which would lead one to infer that the shell had attained an adult, or even a gerontic, condition.

Most of the other examples, though smaller in size, also show a considerable thickness in their shells, which renders the test quite opaque.

All are similar in form, being somewhat pyriform, and attaining their maximum diameter a little anterior to the middle of the valves.

The colour of the specimens is milk-white.

The examples of *Liothyrina* obtained from the colony of a new *Cephalodiscus*,

dredged at this station, range in size from 1 mm. to 7 mm., and furnish ample material for a study of the gradual development of the shell and brachial support.

Though the development of the latter organ is well known in the genus *Liothyrina*, through the careful studies by Deslongchamps (1884) of young forms of *L. vitrea*, it may be of interest to give here a detailed description of the various stages in the development of this appendage, based upon a study of the young examples in my possession.

In the smallest example (L., 1 mm.) the brachial support has only just commenced to make its appearance, and is represented by two small sharp points* descending from the rudimentary crural bases, which consist of two short raised diverging bosses bordering the dental sockets. The apical portion of the ventral valve of this specimen shows a somewhat triangular peduncular opening, which is slightly notched on each side. No deltidial plates are apparent, but the teeth are fairly well-developed. The shell-mosaic of both valves is quite clear, but irregular in its development. The shell-perforations are large and well rounded, and show on an average 256 punctæ per square millimetre.

The shell at this stage is very linguloid in appearance, and recalls to mind the early stage of *Terebratulina septentrionalis* figured by Morse (*Mem. Bost. Soc. Nat. Hist.*, vol. v., 1902, pl. li. fig. 16).

At 1·5 mm. in length the shell has assumed a more pear-shaped outline; the descending branches of the loop have increased slightly in length and diverge strongly from each other. The peduncular opening is more normal in shape, and traces of deltidial plates are slightly visible.

At 1·75 mm. the deltidial plates are still further developed and the descending branches of the loop exhibit slight traces, near their bases, of the crural points.

At 2·5 mm. the branches of the loop are curved slightly backwards and inwards towards the bottom of the valve; they are here more ribbon-like in form than in previous stages. The deltidial plates show increased development; the shell-mosaic is very irregular and wavy or flow-like in arrangement.

At 3 and 3·5 mm. the crural points exhibit greater development and the loop branches show a stronger convergence towards each other.

At 4 mm. the converging branches are almost in contact at their extremities, but no angle, as yet, is present on their surface.

At 5 mm. the deltidial plates are larger and seen to be highly punctate, and the cardinal process of the dorsal valve has appeared. The loop is still unjoined, and there is no sign of angulation. In the umbonal cavity of both valves a thin dark line is apparent (visible through the shell) which probably represents the median septum. The mosaic of the muscular impressions in the dorsal valve is clear and scale-like, but in remainder of the shell is very irregular. The punctæ in this specimen range from 224 to 280 per square millimetre.

At 6·5 mm. the characteristic angulation, at the junction of the descending branches

* Visible only under a high-power microscopic objective.

with the transverse band, has appeared, but the loop is still unconnected. The cardinal process is well developed and very rugose. The deltidial plates are joined at their posterior extremities, thus defining the pedunculer opening, which is round. At this stage the shell has increased considerably in thickness, being quite opaque in the older portions. Its shape is essentially the same as in the adult examples.

Some difference of opinion appears to exist amongst scientific observers as to the specific identification of this southern form.

Fischer and Oehlert (1893), in their report on the brachiopods of Cape Horn, figure a number of specimens under the name of *Liothyrina moseleyi*, Dav., a species originally met with at Kerguelen by the *Challenger* Expedition. Blochmann (1906), however, having received one of Fischer and Oehlert's specimens from the Paris Museum, refers the Cape Horn shells to *L. uva*, an identification upon which Dall (1908) throws some doubt, basing his argument chiefly upon differences in temperature. He points out that the type specimen of *L. uva*, from the Gulf of Tehuantepec, came from water of a high temperature, probably about 65° F., whereas the examples from Cape Horn came from much colder water, viz. between 42°·8–44°·4 F.

Blochmann, in his later paper (1912), satisfactorily dismisses this argument by calling attention to the range of temperature in other well-known species of brachiopods.

In this excellent memoir Blochmann also clearly proves, from a careful examination of original examples from Kerguelen and from the Magellanic region, that Fischer and Oehlert's specimens cannot be referred to *L. moseleyi* on account of important differences in the brachial support and in the composition and arrangement of the spiculæ. He considers their specimens to be undoubtedly referable to *L. uva*, to which species he also unhesitatingly refers the Burdwood Bank examples obtained by the *Scotia* and Swedish South-Polar Expeditions.

The geographical distribution of *L. uva* has recently been worked out by the same authority (Blochmann, 1908 and 1912) with the greatest care.

The original example, upon which Broderip founded the species, was obtained in the Gulf of Tehuantepec attached to a dead valve of *Meleagrina margaritifera*, at a depth of 10–12 fathoms.

The type specimen formerly in the Cuming collection is now in the British Museum. This specimen is somewhat abnormally developed, as will be seen by Davidson's figure (*Recent Brach.*, pl. ii. figs. 5–5*b*). In the same work (pl. ii. figs. 6–6*b*) Davidson also figures another more normal example from the same place.

In his report on the Brachiopoda of the *Challenger* Expedition, Davidson refers to further discoveries of this species as follows:—One dead example ("*Chall.*" *Rept.*, pl. ii. figs. 3–3*b*) trawled in 120 fathoms off Twofold Bay, South-East Australia. A second example ("*Chall.*" *Rept.*, pl. ii. figs. 4–4*a*), obtained off Buenos Ayres, at a depth of 600 fathoms; bottom temperature, 2°·7 C. A third specimen, or rather two fragments of a dead shell, dredged off Heard Island, near Kerguelen,* in 150 fathoms; bottom

* Not Heard Island, east of Magellan Straits, as given by Oehlert (1907, 1908).

temperature 1°·8 C. Davidson further states that "in the British Museum there are likewise some white specimens stated to have been dredged near the Falkland Islands."

With regard to the Twofold Bay example, Blochmann (1906, 1908), from a study of the original specimen, states that it is clearly distinct from *L. uva*, and on the grounds of differences in the brachial support and the number of pores in the shells of both forms, considers it an entirely new species, to which he has given the name of *L. fulva*.

Regarding the Buenos Ayres example, I am of the opinion that this also is a different species from *L. uva*. According to Davidson's figure ("*Chall.*" *Rept.*, pl. ii. fig. 4) it differs widely in outline from that of the type specimen and the additional example figured by him from the Gulf of Tehuantepee (*R. B.*, pl. ii. figs. 5–6). The beak is less produced and less compressed laterally, and the foramen is smaller. Moreover, the depth (600 fathoms) from which the specimen came is greater than that at which *L. uva* is known with certainty to live.

In the above respects the Buenos Ayres example also differs from any of the specimens illustrated by Fischer and Oehlert (1892) and Blochmann (1912) from the Magellanic region, in which the outline of the shell is more pyriform.

Oehlert (1907 and 1908), in his report on the Brachiopoda of the French Antarctic Expedition, figures and describes under the name of *L. uva* some extraordinarily large examples obtained presumably from the West Antarctic. For some unexplained reason, no particulars are given in either of these papers as to the exact place of discovery or the depth from which the specimens came.

The largest example measures: length, 45; breadth, 30; thickness, 25 mm.

The species is further recorded for the coast of Guatemala, South Peru, and Galapagos by Dall (1909), but no further particulars are given.

Recently Blochmann (1912) has described and figured some interesting forms from a depth of 122 fathoms at South Georgia (Swedish Expedition), which up to the present appears to be the limit of its eastern range.

It would appear, therefore, that the species is widely distributed from Tehuantepec to Cape Horn, Falkland Islands, South Georgia, West Antarctic, and has crept north along the eastern coast of South America as far as Buenos Ayres, if the identification of this example is correct.

In addition to the Twofold Bay record referred to above, the species has been further recorded from Australian waters.

Hedley (*Mem. Aust. Mus.*, iv., 1902, p. 289) cites it from Coogee (49–50 fathoms) and Botany Bay (79–80 fathoms), both in the neighbourhood of Sydney.

Blochmann (1912), however, from a study of one of Hedley's specimens, has been able to satisfactorily demonstrate that the reference in question is due to an error in identification, the specimen being referable to *Terebratulina cancellata*, Koch.

It is possible also that the later record by Hedley (*Records Aust. Mus.*, vi., 1905,

p. 43)* of specimens of *L. uva* from 111 fathoms, East Cape Byron, Australia, may be founded on a similar error in determination.

Liothyrina uva (Brod.), var. *notorcadensis*, nov.† (Pl. 1. figs 1–3.)

Hab.—Station 325; lat. 60° 43′ 42″ S., long. 44° 38′ 33″ W. (Scotia Bay, South Orkneys). 6 fathoms. February 1, 1904. Sea bottom, sand. Temperature 32°·5 F.

Obs.—At this station some remarkably large oval forms of a *Liothyrina* were obtained in very shallow water. These, for reasons given below, and in order to call greater attention to them, I have ventured to describe under the above heading.

Four specimens in all were obtained here, two large, one of medium size, and one very young.

The measurements of these examples are as follows:—

	Length.	Breadth.	Thickness.
No. 1 (dead)	39	28·5	25 mm.
„ 2 (live)	29	22	18 „
„ 3 (dead)	21·5	16	11 „
„ 4 (dead)	2·75	2·5	

Examples Nos. 1, 2, and 3 are all very thick-shelled; No. 4, being a juvenile, is almost transparent.

Example No. 2, which was attached by means of its peduncle to the larger specimen (No. 1), is almost covered on its exterior with small coiled Serpulæ and Polyzoa. The marginal portion exhibits curious radiating descending grooves.

The largest specimen is very similar in general appearance to those obtained by the French Antarctic Expedition, figured by Oehlert (*op. cit.*, pl. i.). The shell is remarkably robust, and, judging from the crowding together of the growth-lines at the margins, it is evidently a very old (gerontic) individual (Pl. I. fig. 1).

The interior of the dorsal valve exhibits a very distinct median septum extending a third the length of the valve, as well as strongly marked muscular impressions. The brachial support is, unfortunately, somewhat broken (see Pl. I. fig. 3), but sufficient remains for comparisons to be made with other forms.

Outwardly this example presents the appearance of having been bored by an agency similar to *Cliona* or one of the perforating Polyzoa, as the surface of the shell is covered with branching vermiform groovings, some of which penetrate to the interior.

The living example (No. 2), which was attached to the above, has provided material for the study of the general characters of the spiculæ, etc., and I am much indebted to Dr F. Blochmann, to whom I submitted this and other examples, for his kindness in comparing these with the specimens obtained by the Swedish Expedition at South Georgia.

* Not referred to by Blochmann (1912).

† From the locality.

I have also to thank him for very generously sending me several preparations made from this specimen.

Dr Blochmann considers the specimens from South Georgia and from South Orkneys to be referable to *L. uva*, but points out certain peculiarities whereby they differ from typical examples from Burdwood Bank and elsewhere.

From the microscope preparations it is seen that the spiculæ are somewhat weaker in their development than is usual; the spicules penetrating into the bases of the cirri, too, are in most places not ordinarily developed.

In the visceral membrane (dorsal and ventral) and in the spiral arms the spiculæ are completely absent. They are also somewhat less developed than usual in the side arms, being confined to the anterior portion of the ventral side.

The Scotia Bay examples, therefore, present a considerable difference in the form of the spiculæ when compared with the characters exhibited by the examples of *L. uva* figured by Blochmann (1912, pl. ii. figs. 16–18).

In these latter, which come from the Falkland Islands, Magellan Straits, and Cape Horn, the spiculæ are normally developed in the visceral membrane, but in other particulars they conduct themselves as in the above-mentioned examples.

Unfortunately my specimens arrived too late for Dr Blochmann to study them before the publication of his recent report on the examples from South Georgia (Swedish Expedition). He has since, however, made a careful comparison of the forms from both localities, and reports that, as in the Scotia Bay examples, the spicules are also absent from the visceral membrane in those from South Georgia. Consequently, his remark that "the spiculæ exhibit no differences" (1912, p. 3), now requires modification.

It would appear from this fact that we are possibly dealing here with an interesting geographic variant, if not with an entirely new species. The study of a larger number of examples, however, would be necessary before one could arrive at a definite conclusion as to whether the absence of spiculæ from the visceral membrane is a constant character or not. Hence it remains purely a matter of opinion whether this eastern form is to be regarded as a variety or as a distinct species.

The brachial support presents the characteristics of *L. uva* (see fig. 3, and Blochmann, 1912, pl. i. fig. 12); the outer appearance, too, agrees fairly well with this species, with the exception that the specimens are larger than usual and the characteristic fine radiating striæ of *L. uva* are scarcely perceptible.

The difference in size in the Scotia Bay examples might, of course, be due to the very shallow depth (6 fathoms) from which these specimens came. The same argument does not apply, however, to the South Georgia examples, which were obtained in about 122 fathoms.

Owing to the unfortunate omission of particulars relating to depth, etc., in Oehlert's reports (1907 and 1908) on the specimens obtained by the French Antarctic Expedition, whose area of research was off the western Antarctic continent,

south-west of the South Shetlands, the possibility of the large size being influenced by shallowness in depth cannot be determined.

The specimens obtained by this Expedition are very oval in shape, like the Scotia Bay examples, and, as in the latter, they also possess a curious labiate prolongation of the foramen over the dorsal umbo (see fig. 1, and OEHLERT, 1908, pl. i.), which does not appear to be present in the South Georgia examples or in normal specimens of *L. ura* from Burdwood Bank and neighbouring stations.

The shells, too, possess a greater vertical diameter owing to the rotundity of their valves, and the angular appearance of the lateral margins, present in *L. ura*, is absent (compare BLOCHMANN, 1912, pl. i.).

To the above-mentioned differences must also be added an important variation in the composition of the shell-mosaic and the perforations of the test, based upon a study of the Scotia Bay examples.

Here the number of pores per square millimetre in specimens Nos. 2 and 3 is 96 to 128. These examples are, unfortunately, too opaque for a detailed study of the mosaic.

An examination of different portions of both valves of the young example No. 4, shows a range from 88 to 128 pores per square millimetre. The shell-mosaic is here clearly visible and consists almost throughout of a well-developed imbricating structure, with scarcely any trace of the irregular character exhibited in young examples of *L. ura* (2·75 and 5 mm. in length) from the Burdwood Bank material. The number of pores in the latter specimens ranges from 200 to 256 per square millimetre.

It may be of some interest here to call attention to a number of fossil forms of Terebratulidæ which have recently been described from the immediate neighbourhood of Graham Land, to the south-west of the South Orkneys.

In the report on the Antarctic fossil Brachiopoda collected by the Swedish South Polar Expedition, BUCKMAN (1910) describes, under the generic name of *Terebratula*, several very interesting forms, which appear to me to have some bearing on the recent species now inhabiting the neighbouring seas.

Amongst the coarsely punctate series three forms are described, two of which are referred to previously described fossil species; the other, owing to its fragmentary character, is not specifically determined.

One of these forms is referred by BUCKMAN to *Terebratula bulbosa*, Tate (a species met with in Australian Tertiary strata), with certain slight modifications in the description to suit the Antarctic specimens.

Without a comparative study of the Australian and Antarctic forms it is impossible to say if this identification is correct or not, but it appears to me possible that the two forms are in no way related to each other.

BUCKMAN'S figure* (pl. iii. fig. 7), which is a restoration, and his revised description present, in my opinion, striking resemblances, so far as external appear-

* The labiation of the foramen has been overlooked by the artist.

ances are concerned, with the recent examples described above from South Orkneys. The shell-punctæ and internal characters (the latter unfortunately unknown so far in the fossil form), may, however, prove them to be quite distinct.

The fossil examples were obtained at Cockburn Island, off Graham Land, in strata referred by BUCKMAN to Miocene-Oligocene age.

Liothyrina blochmanni, n. sp. (Pl. I. figs. 4–8.)

Shell somewhat pear-shaped, longer than wide, reaching its greatest diameter towards the anterior margin. Sides of beak elongate, subrectilinear; lateral margins convex, merging insensibly into the frontal border, which is rounded. Line of joining of valves somewhat flexuous. Valves swollen, without plication or sinus; the ventral slightly deeper than the dorsal.

Surface smooth, with numerous very fine growth lines and traces of extremely fine radiating striæ which appear to arise from the radial arrangement of the punctæ.*

Test very thin, glassy, and almost transparent; visibly punctate. Colour whitish.

Shell-mosaic very clear and distinct; regularly developed. Pores per square millimetre = 60 to 80.

Ventral valve with a short beak, incurved, truncated by a moderately large, circular, collared foramen, bounded below by two joined deltidial plates. Sides of the beak well rounded. In the interior, teeth small and placed in immediate contact with the basal angles of the deltidial plates. No dental plates. Umbonal cavity very deep. Internal surface completely smooth. Muscular impressions very weak.

Dorsal valve very convex, with a linguloid nucleus. Interior smooth. Slight median septum extending from adductor muscular impressions almost to the apex of umbonal cavity, its total length being about a quarter the length of the valve. Muscular impressions clear but not deeply marked. Cardinal process small but quite distinct; flattened and transverse. Cardinal apophysis weak, composed of two divergent and flattened triangular plates, the external borders of which limit the dental sockets; the inner borders form the base of the crura. The brachial apparatus commences with short crura, which bear wide, triangular crural processes with their points directed somewhat ventrally. The descending limbs are remarkably parallel.† The transverse band is short but fairly broad, and is slightly indented in the middle portion; point of junction with descending branches well rounded.

Dim.—Size of the largest example (type): length, 23 mm.; breadth, 19 mm.; thickness, 12·5 mm.

Hab.—Station 417; lat. 71° 22′ S., long. 16° 34′ W. (off Coats Land). Depth, 1410 fathoms. March 18, 1904. Sea bottom, blue mud and stones. Temperature 29°·9 F.

Obs.—Two almost perfect examples, together with a single dorsal valve and the hinge portion of another, were brought up by the trawl at this station.

* This radiating striation can only be seen in a good light and when the shell is held at a certain angle.

† Recalling DAVIDSON's figure of *L. sphenoidea* in *Recent Brachiopoda*, pl. ii. fig. 18.

The well-preserved examples fortunately possessed the dried-up remains of the brachiæ and other parts of the animal, by means of which a study of the spiculæ has been made possible.

These latter bodies are entirely absent in the cirri as well as in the visceral membrane. In the arms the spiculæ are very feebly developed and restricted to the hinder portion of the dorsal side.

This species has some resemblance externally to some forms of the Magellanic Liothyrinæ referred to *L. uva*, but differs entirely from these in the extreme thinness of the adult shell, the smaller number of pores per square millimetre, and the difference in the form of the brachial support and the spiculæ of the arms.

Owing to the many differences existing between this form and other known Liothyrinæ, I venture to describe it as an entirely new species, to which I have very great pleasure in attaching the name of Professor F. BLOCHMANN, of Tübingen, to whom all students of recent Brachiopoda are so much indebted.

Macandrevia diamantina, Dall. (Pl. II. figs. 15–19.)

Dall, 1895, *Proc. U.S. Nat. Mus.*, vol. xvii. p. 723, pl. xxx. fig. 5; pl. xxxii. figs. 3 and 6.
„ 1908, *Bull. Mus. Comp. Zool. Harv. Coll.*, vol. xliii. p. 443.

Hab.—Station 417; lat. 71° 22′ S., long. 16° 34′ W. (off Coats Land), 1410 fathoms. March 18, 1904. Sea bottom, blue mud and stones. Temperature 29°·9 F.

Obs.—A fair number of living adult examples of this interesting species were brought up in the trawl at the above station. Along with these were a few dead examples, badly broken, and a quantity of small fragments which would point to the fact that a large number of specimens had been broken up by the numerous pebbles in the trawl net.

All the living examples were closely attached by their peduncles to pebbles of granitoid and other rocks, the pebbles varying in size from that of a hazel-nut to that of a walnut (see Pl. II. fig. 15). Some of the pebbles, especially the smaller ones, are worn almost round, while others are somewhat angular. However large the size of the pebbles, only one example of this species was observed on each. In several instances tubes of Serpulæ are present on both valves.

The specimens are very uniform in size and show no appreciable variation in shape.

Sizes of some of the specimens:—

Length.	Breadth.	Depth.
18·5	16	9·5 mm.
19	17	8·5
19·5	16	9·5
20	17·5	
20·5	15·5	10

I am quite unable to separate the Antarctic form from DALL'S species, as it agrees word for word with his description (*op. cit.*, p. 723).

Dall however, gives no particulars of the shell-mosaic and the number of pores per square millimetre. Through his generosity in lending me the pedicle valve of his type specimen I have been enabled to study these points and make comparisons with the Antarctic form.

Dall's type shows 104 to 112 punctæ per square millimetre. In the "Coats Land" adult examples these range from 92 to 110, with an average of 99.

Other known species: *M. cranium*, Müll., = 188 to 272 (adults 192 to 216); *M. vanhöffeni*, Bloch., = 120–132.

The shell-mosaic in both forms is practically identical, and consists of the usual overlapping scale-like structure.

Several of the specimens exhibit very clearly the vascular sinuses in the pallium.

In the dorsal valve there are two; these curve round the adductor muscular impressions and then diverge widely from each other, ceasing some little distance from the lateral margins of the valve. In the specimen examined these sinuses do not appear to bear any ramifications.

In the ventral valve there are four sinuses; the two median ones almost straight, slightly diverging near their anterior extremities, somewhat broad posteriorly and narrowing gradually towards the anterior, where they end abruptly without ramifications. These terminate some little distance from the anterior margin of the valve. The two lateral sinuses are slightly arched and send off four or five ramifications on their exterior sides, two or three of which again subdivide near the extreme lateral edge of the valve. These two sinuses are connected with the two median ones at a point about a quarter the length of the valve, whence they diverge.

Compared with the pallial sinuses of *Terebratella dorsata*, those of the ventral valve of *M. diamantina* present a striking resemblance to the illustrations given by Fischer and Oehlert (1892), more especially fig. 28 of plate x. They are quite distinct from those of *Magellania venosa* depicted by these authors (*loc. cit.*, pl. xii. figs. 5 and 15).

(*Note.*—The dorsal and ventral valves referred to above are not of the same individual.)

As previously mentioned, the examples brought up by the trawl at this station were in an adult condition; they all exhibit the final development of the brachial support, which is figured for the first time in this report (Pl. II. fig. 16).

In some samples, however, of deposit (No. 38) brought up later from the same depth and station, I was pleased to find two examples of this species which exhibit interesting stages in the development of this organ.

The smallest specimen measures (dorsal valve): length, 4 mm.; breadth, 4 mm., and shows the loop in its platidiform stage (Pl. II. fig. 17). It here consists of two descending branches, which converge towards the centre of the valve, where they become attached to a laterally compressed tube-like septal pillar possessing a few spinous processes on its anterior edge. This stage agrees almost exactly with the figure of the

same stages depicted by Friele in the ontogeny of the type species, *M. cranium* (Friele, 1877, pl. i. figs. 2–2*b*), the only point of difference being in the possession of a less number of spinules on the septal pillar.

The number of pores per square millimetre in this specimen ranges from 120 to 124. The scale-like structure of the shell-mosaic is very clear.

The second specimen from the same deposit, though slightly damaged, is interesting as showing a very advanced terebratelliform (or pre-adult) stage (Pl. II. fig. 18). The dorsal valve of this example measures: length, 8·75 mm.; breadth, 8·5 mm., and shows the final development of the loop almost achieved. The descending branches are broad, and possess two internal triangular apophyses indicating the position occupied by the transverse (jugal) band attached to the septum in the terebratelliform stage; also very prominent spinules at the recurvation. The stage of this specimen is almost equivalent to that of *M. cranium* figured by Friele (1877, pl. iii. fig. 10) and Beecher (1895, pl. ii. fig. 1: 1901, pl xxiv. fig. 1).

The descending lamellæ are supported at their origin by vertical, slightly converging, crural plates; no cardinal process is yet present.

The median septum is only very slightly visible and takes its rise immediately below the apex of the valve, whence it runs a distance of half the length of the valve and then ceases midway between the transverse band and the point of recurvation of the loop.

In none of the fully adult specimens of *M. diamantina* which I have examined is there any trace of the connecting bands on the descending branches, though the spinules at the recurvation are still apparent but much reduced. The median septum, which is only feebly developed, is also much reduced in length and confined to the umbonal region, where it supports the rather prominent cardinal process. On either side are two short parallel median septa supporting the convergent, but not united, crural plates.

The ventral valve of the above specimen (length, 10 mm.) shows a large foramen with rudimentary deltidial plates, beneath the anterior angles of which are the two rather prominent teeth.

On the exterior of both valves several conspicuous growth-halts are visible; the shell-punctæ = 112 per square millimetre (middle of the ventral valve).

Though the material at my disposal is so scanty, it does not seem improbable that, judging from the stages just described, the intermediate phases in the metamorphosis of the loop will show considerable similarity to those described by Friele in *M. cranium*.

The correct relationship of *M. diamantina* with the sub-family Dallininæ, a group so characteristic of the northern hemisphere, is thus clearly established by the transformations undergone by the brachial support.

This fact, which is, I believe, the first recorded instance of the "Dallinoid" type of development in austral waters, is of great importance, as it has hitherto been considered that the two phyla, of common origin, of the section *Terebratella*, *i.e.* the sub-families

Dallininæ and Magellaninæ, were geographically separated into two provinces, one (Dallininæ) being restricted to boreal, the other (Magellaninæ) to austral seas (Schuchert, in Zittel, 1900, p. 329).

It can now be shown that the sub-family Dallininæ is well represented in the austral region.

This discovery is of still further interest as being highly confirmatory of Dall's observations when first describing this and two other species of *Macandrevia* from the Gulf of Panama (Dall, 1895, p. 721).

He remarks: "As regards the partly austral species about to be described, since there is no means of deciding whether their development agrees with those forms referable to Magellaninæ or not, and as the adult shells exhibit no characters which could not be regarded as diagnostic of a genus different from *Eudesia*,* I feel obliged for the present to refer them to that group. It may be observed that there is nothing to prevent the free migration of northern forms into the South Pacific along the coast of the Americas. The writer has already the evidence to show that several species, in deep water, do extend from Bering Sea south to the vicinity of the Galapagos Islands and, in the case of one species, *Solemya johnsoni*, Dall, more than a thousand miles further south; with the known great range of many brachiopods, there would be no apparent reason why species of the Panamic region, for instance, belonging to the northern type of development, should not extend their range southward, if opportunity arose. I regard it then as quite likely that the species I refer to may be Macandrevian in their development as well as in their adult state, though, for the mass of characteristically austral species, the reverse might be the case."

The prescience of this eminent American author has thus been amply justified.

Macandrevia diamantina was originally described from two specimens obtained in deep water, 1175 fathoms, mud, Gulf of Panama; bottom temperature 36°·8 F., and was again met with later in 2222 fathoms, mud, off Sechura Point, Northern Peru; temperature 35°·2 F.

The discovery, therefore, of this species in deep and cold water off the coast of the Antarctic continent is highly interesting as showing a very considerable range southward.

Furthermore, it forms a connecting link in the distribution of the genus *Macandrevia*, which now ranges from the North Atlantic (*M. cranium*), Davis Strait (*M. tenera*), *via* the Gulf of Panama (three species, viz. *M. americana*, *M. craniella*, and *M. diamantina*), Peru (*M. diamantina*), West Patagonian coast (*M. americana*), Coats Land (*M. diamantina*), to Kaiser Wilhelmland II., Antarctica (*M. vanhöffeni*).

Though the distance between the recorded stations for *M. diamantina* appears to be so great, it is not at all improbable that it will ultimately be met with in other stations off the long South American coast as further dredgings are carried out in that area. *Macandrevia americana*, one of the Panamic species, has already been found

* Dall regarded *Macandrevia* as a sub-genus of *Eudesia*.

on the West Patagonian coast; while *Liothyrina uva* also extends from the Gulf of Panama to the Antarctic.

As a similar, and, in fact, parallel instance of wide distribution in another group of animals, I might mention the case of *Dentalium megathyris*, Dall (=*D. shoplandi*, M. and S., *non* Jouss.).

This interesting scaphopod was dredged along with another new species (*D. eupatrides*, M. and S.) at the same station and depth (Coats Land, 1410 fathoms). It has been met with in deep water at several stations on the western coast of Central and South America, viz. off Chiloe Island, and South-East Chili, in 1050 and 1342 fathoms; near Galapagos Island in 812 fathoms; off Ecuador in 1740 fathoms; Gulf of Panama, south-west of Tehuantepec, in 2282 fathoms; off Mazatlan in 995 fathoms.

Terebratella dorsata (Gmelin). (Pl. II. figs. 11–13.)

Anomia dorsata, Gmelin, 1788, *Syst. nat.*, ed. xiii., p. 3348.
Terebratella dorsata (Gmelin), 1887, Davidson, *Mon. Recent. Brach.*, p. 75, pl. xiv. figs. 9–11, 13–19 (fig. 12 looks like a young *Magellania venosa*).
,, ,, 1889, Dall, *Proc. U.S. Nat. Mus.*, vol. xii. p. 231.
,, ,, 1892, Fischer and Oehlert, *Bull. Soc. d'hist. nat. Autun*, vol. v. p. 272, pl. ix., x., xi., figs. 1–6.
,, ,, 1908, Dall, *Bull. Mus. Comp. Zool. Harvard Coll.*, xliii. p. 444.
,, ,, 1909, Dall, *Proc. U.S. Nat. Mus.*, vol. xxxvii. p. 279.
,, ,, 1912, Blochmann, *Die Brach. der Schwed. S.-P. Expedition*, Bd. vi. (Zoologie ii.), No. 7, Stockholm, p. 11.

Hab.—Station 346; lat. 54° 25′ S., long. 57° 32′ W. (Burdwood Bank), 56 fathoms. December 1, 1903. Sea bottom, Bryozoa. Temperature 41°·8 F.

Obs.—Dead examples only of this well-known Magellanic species were obtained at the above station. These consist, in most cases, of fairly perfect specimens; in others, of loose valves only. All are quite white in colour.

The examples, for the most part, are representative of adult individuals, and are interesting as exhibiting a considerable amount of variation, both in shape and size. The smallest fully-adult example measures: length, 22 mm; breadth, 23 mm.; the largest adult is: length, 38 mm.; breadth, 36 mm.

Several of the specimens differ from the typical transverse form in being almost round, and one example is curious in presenting quite an elongate appearance, calling to mind the well-known Australian species, *Magellania flavescens* (Pl. II. fig. 13).

The beak is largely produced, recurved, as is usual, and truncated by a relatively large foramen. One side of the specimen is somewhat distorted in growth, giving the shell an asymmetrical appearance. The size of this specimen is: length, 25 mm.; breadth, 18·5 mm.; thickness, 12·5 mm.

In all the examples obtained the test is remarkably thick and, consequently, quite opaque. The radiating ribs on the surface, which in most examples are also visible in a reversed order in the interior, differ very largely in the various individuals, some

possessing fine, and others coarse, ribbing. In some cases the ribbing is almost entirely obsolete, even in adult examples, a feature already noted by FISCHER and OEHLERT, and described and figured by them as var. *submutica* (1892, p. 279, pl. xi. figs. 5–6).

Internally the specimens present many interesting features. In some examples indications of senile conditions are very apparent. The teeth of the ventral valve show considerable enlargement, the muscular impressions are remarkably deep, and the peduncular passage is considerably narrowed by thick deposits of calcareous matter on either side, forming a deep and narrow channel. The foramen is reduced to a very small size (Pl. II. fig. 11).

In no case, however, are the deltidial plates absorbed, as is often the case during senile decay.

In the dorsal valve similar conditions are to be seen. Here the cardinal process is of notable size and the brachial support of extreme tenuity. (See FISCHER and OEHLERT, 1892, pl. ix. fig. 6).

Similar evidences of senility are present externally in the thickening of the lateral and frontal margins and the crowding together of the growth lines (Pl. II. fig. 12). (See also FISCHER and OEHLERT, 1892, pl. ix. figs. 3–4.)

The various young examples of this species, obtained mostly from the tests of *Cephalodiscus*, range in size from 1 to 6 mm. and show an interesting series of growth-stages in the brachial support. This feature has already been very ably described by FISCHER and OEHLERT (1892), and as the above specimens exhibit no important points of difference, it will not be necessary to deal with them again here.

Terebratella dorsata appears to be restricted to the immediate neighbourhood of South America. It is an abundant species in the Magellan Straits, the littoral of Tierra del Fuego, and Falkland Islands. On the east coast of Patagonia it does not appear to range further north than latitude 52° S. (near Cape Virgins) and the Falkland Islands. On the West Patagonian coast it seems to possess a more considerable extension, having been recorded from Valparaiso and Coquimbo, Chili.

A more distant locality has been recorded for this species by DAVIDSON ("*Chall.*" *Report*, p. 44), viz. Royal Sound, Kerguelen, but BLOCHMANN (1906), from a study of the original examples, has shown this record to be erroneous, the specimens in question being an entirely new species, *Terebratella enzenspergeri*, Blochmann.

The bathymetric range of *T. dorsata*, according to recent authorities, is from about 5 to 120 fathoms.

In the report on the fossil Brachiopoda of the Swedish S.-P. Expedition, BUCKMAN (1910) has described a new species of *Magasella* (*M. antarctica*) which appears to me to present certain definite resemblances to *Terebratella dorsata* (Gmelin).

The fossil species, which comes from the Glauconitic Bank formation (Pleistocene) at Cockburn Island, off Graham Land, West Antarctic, is described and figured by BUCKMAN (1910, p. 18, pl. i. figs. 17–17*d*), with the remark that *Terebratella*

rubicunda * is possibly its nearest ally, but, owing to the strongly developed septum, its place in the genus *Terebratella* is precluded, and therefore it might possibly be described as the magaselliform ancestor of *T. rubicunda*.

In my opinion, judging from Buckman's figure, the original of which would appear to be partly a cast, this form is more closely allied to one or other of the numerous variations of the polymorphic *T. dorsata*.

If comparisons be made with *T. dorsata*, var. *submutica*, F. and O. (*op. cit.*, p. 279, pl. xi. figs. 1–6), a very striking resemblance is noticeable. In this variety the radiating sculpture is almost absent, and the appearance of the shell is less transverse than in the typical form.

It might be argued, however, that the deltidial plates in these specimens are fully developed, thus denoting an adult condition, but in examples of this form from Burdwood Bank there are specimens which show the deltidial plates only partially developed, and, as is usual in *T. dorsata*, the radiating ribs of the exterior are visible also on the interior of the valves and would thus be impressed upon a fossil cast of this species.

To my mind it would be much more reasonable to refer the Cockburn Island fossil to a magaselliform stage of *Terebratella dorsata*, and more especially to the var. *submutica*, F. and O., than to go so far away as New Zealand for a comparison.

According to Fischer and Oehlert (1892), *T. dorsata* is not cited among the fossils of Patagonia by d'Orbigny, Darwin, and Sowerby, but on the contrary is given by Hutton (1873) and Hector (1886) for the New Zealand Tertiaries (Lower Miocene-Ahuriri formation) from Cape Rodney, Auckland, N. Island, associated with the recent *Rhynchonella nigricans*, Sow.

This reference, if authentic, is of considerable importance as indicating significant climatic changes during the deposition of these beds.

One feels disposed, however, in the light of present knowledge, to question the correct identification of the New Zealand species, and to consider the possibilities of the form in question being referable to the well-known and variable *T. cruenta* or a probable ancestor of that species.

Terebratella sp. (Pl. II. fig. 10.)

Hab.—Station 346; lat. 54° 25′ S., long. 57° 32′ W. (Burdwood Bank), 56 fathoms. December 1, 1903. Sea bottom, Bryozoa. Temperature 41°·8 F.

Obs.—Amongst the smaller specimens of Brachiopoda from this station are one or two examples whose generic and specific positions are somewhat doubtful.

The two largest and most perfect of these questionable forms measure :—

	Length.	Breadth.	Thickness.
No. 1 . .	13·25	10·5	6·75 mm.
„ 2 . . .	16	14	8·5 „

* A New Zealand recent species.

Both specimens (Pl. II. fig. 10) exhibit a terebratelliform condition in the brachial support. The descending branches, which extend two-thirds the length of the valve, are very thin and are attached to the median septum by a slender jugal band nearly at right angles with the descending branches.

The ascending branches follow much the same course as those below, and are united by means of a short transverse band which is slightly inflected in its median portion.*

The crural points are very short and not turned inwards towards each other, as in *Magellania venosa* and *Terebratella dorsata*, but are directed upwards in the direction of the ventral valve. The jugal band is situated about the middle of the length of the loop, and is fixed to the terminal part of the septum; it is quite as slender as the other portions of the apparatus.

It would appear from certain indications on the descending branches that the metamorphosis of the loop is still uncompleted, as the inside edges of these, at their junction with the jugal band, exhibit traces of an oblique suture, a feature hitherto not observed in adult *Terebratella dorsata*.

The umbonal cavity of this valve is occupied by a well-developed cardinal plateau fixed to the bottom of the valve, and depressed longitudinally in its median part in the form of a trough, from the anterior end of which extends a thin-edged median septum. The posterior extremity of the plateau carries a well-developed transverse cardinal process; the lateral parts form two somewhat triangular plates bordering the dental sockets.

Externally the shell is of an oval form, longer than broad, attaining its maximum diameter about the middle of the valves (Pl. II. fig. 10). Line of joining slightly flexuous at the frontal and lateral margins. Valves swollen, the ventral being deeper than the dorsal. Surface roughened by numerous well-pronounced growth-lines, which are close set. Specimen No. 2 exhibits very numerous close-set growth-lines at the margins similar to those seen in specimens which have attained a senile condition.

The test is very solid and opaque. Beak of ventral valve moderately produced, incurved, and truncated by a large foramen, with rudimentary deltidial plates. Sides of the beak carinated, forming a flattened area below the foramen. The test is covered with very numerous perforations, but owing to the difficulty in lighting I have been unable to count them satisfactorily under the microscope.

Owing to the want of further material the exact identification of this interesting form is extremely difficult. It can scarcely be regarded as a terebratelliform stage of *Magellania venosa*, as at this stage in its ontogeny the latter species is much more transverse and the branches of the loop broader (see especially Fischer and Oehlert, 1892, pl. xi. fig. 8).

Neither can it be looked upon as a small adult *Terebratella dorsata*, on account of the entire absence of the characteristic surface sculpture of that species, as well as the distinct difference in shape and the discordance in the composition of the brachial support.

* These are broken off in photograph.

Blochmann (1912) has referred to one of these specimens in dealing with a probably new species of *Magellania* obtained by the Swedish South-Polar Expedition at the same locality (Burdwood Bank), and remarks on its correspondence with his described example, with the exception that whereas the *Scotia* specimen possesses a distinctly pronounced angulation of the beak, his *Magellania* specimen exhibits no such character, the sides of the beak being well-rounded, without any indication of an angle.

From the thickness of the test he is inclined to regard the form as a possibly new *Terebratella*.

Magellania venosa (Solander).

Anomia venosa, Solander, 1788, *Dixon's Voy.*, p. 355, pl. xi.
Waldheimia venosa (Sol.), 1886, Davidson, *Mon. Recent Brach.*, p. 49, pl. viii. figs. 1–5; pl. ix. fig. 1.
Eudesia venosa (Sol.) 1889, Dall, *Proc. U.S. Nat. Mus.* vol. xii. p. 231.
Magellania venosa (Sol.), 1892, Fischer and Oehlert, *Bull. Soc. d'hist. nat. Autun*, vol. v. p. 312, pl. xi. figs. 7–16; pl. xii. figs. 1–17.
,, ,, 1909, Dall, *Proc. U.S. Nat. Mus.*, vol. xxxvii. p. 279.
,, ,, 1912, Blochmann, *Die Brach. der Schwed. S.-P. Exped.*, Bd. vi. (Zoologie ii.), No. 7, Stockholm, p. 9.

Hab.—Station 346; lat. 54° 25′ S., long. 57° 32′ W. (Burdwood Bank), 56 fathoms. December 1, 1903. Sea bottom, Bryozoa. Temperature 41°·8 F.

Obs.—Amongst the young examples obtained from *Cephalodiscus* dredged at this station are several which appear to be referable to the above species. One or two of these examples are less than 3 mm. in length.

One specimen, which measures 4 mm., shows 256 punctæ per square millimetre; another, 6 mm. long, shows a range from 240 to 256 punctæ, both examinations being made about the middle of the ventral valve.

In *M. venosa*, according to Blochmann (1912), the perforations per square millimetre range from 240 to 280.

The various specimens are interesting as showing some of the very early stages in the development of the brachial support of this species, which were first made known through the admirable work of Fischer and Oehlert (1892).

The geographical range of *M. venosa* is very much the same as that of *Terebratella dorsata*, with which it is often accompanied.

It has been met with abundantly by many expeditions in the neighbourhood of Tierra del Fuego (35 to 80 fathoms); Magellan Straits (7 to 20 fathoms), and Falkland Islands, where the largest specimens, so far known, were obtained by Rear-Admiral Sulivan in 1843, near Fort William, in 6 to 7 fathoms (see pl. viii. figs. 2 to 2*c*, Davidson, *Rec. Brach.*).

The species is recorded also from the west coast of Patagonia (from 1 to 30 fathoms) and from Coquimbo, Chili.

Full particulars, up to 1892, of the various recorded stations, will be found in Fischer and Oehlert's memoir on the *Brachiopodes du Cap Horn* (1892), where also is given the most complete description of the species.

One citation, however, calls for special remark.

Like *Terebratella dorsata*, this species has also been recorded from Kerguelen.

E. A. Smith (1879) mentions *Waldheimia dilatata*, Lam. (a synonym of *M. venosa*, Sol.), as having been obtained at Observatory Bay, Kerguelen, on rocks at 4 fathoms.

Davidson (*R. B.*, p. 52), however, remarks that the *Challenger* did not bring back a single specimen of Solander's species.

Without an examination of the original specimens it is impossible to say whether these are rightly referred to *M. venosa*, but I am disposed to doubt the correct determination, in the light of recent research on the Brachiopoda of both regions. As Blochmann (1906) has shown, the specimens formerly recorded from Kerguelen as *Terebratella dorsata* have proved to belong to a new species, viz. *T. enzensperyeri*, Bl. It does not seem unlikely, therefore, that the Magellaniæ in question may likewise have been erroneously referred to the characteristic Magellanic species.

With regard to the fossil distribution of this species, little appears to be known.

Pilsbry (1898, p. 329), in a reference to a collection of Tertiary fossils from Cape Fairweather, Patagonia, remarks that *M. venosa* (Sol.) is abundant.

According to Ortmann (1902), however, this identification is incorrect, the species in question being named by this author *Terebratella gigantea*.

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EXPLANATION OF PLATES

Plate I.

Figs. 1–3. *Liothyrina ura* (Brod.), var. *notorcadensis* nov.—Scotia Bay, South Orkneys; 9–10 fathoms.

Fig. 1. Dorsal view showing labiate prolongation of foramen over dorsal umbo; also vermiform groovings caused by *Cliona* or perforating Polyzoa. Slightly above natural size.

Fig. 2. Side view of same example.

Fig. 3. Interior views of both valves of same example as fig. 1, showing brachial support (broken) and position of teeth.

Figs. 4–8. *Liothyrina blochmanni*, n. sp.—Station 417, off Coats Land; 1410 fathoms.

Fig. 4. Dorsal view of type-specimen. $\times 1\frac{1}{3}$.

Fig. 5. Side view of same example. $\times 1\frac{1}{3}$.

Fig. 6. Interior views of both valves of same example, showing the weak character of the brachial support, also position of teeth. $\times 1\frac{1}{3}$.

* According to Buckman (1910), 1896 is date of off-print, 1900 date of volume.

Fig. 7. Front view of same example. $\times 1\frac{1}{3}$.

Fig. 8. Shell-mosaic, etc., of another example. $\times 175$.

Fig. 9. *Liothyrina uva* (Brod.).—Burdwood Bank, south of Falkland Islands; 56 fathoms. Interior views of both valves, showing brachial support and median septum in dorsal and pallial sinuses in ventral valve. $\times 1\frac{1}{3}$.

Plate II.

Fig. 10. *Terebratella* sp.—Burdwood Bank, south of Falkland Islands; 56 fathoms. Interior views showing terebratelliform stage of loop, etc. $\times 1\frac{2}{3}$. (The ascending branches, unfortunately, broke away before photograph was taken.)

Fig. 11. *Terebratella dorsata* (Gmelin).—Burdwood Bank, 56 fathoms. Interior view of fragment of ventral valve showing small size of the foramen, muscular impressions, etc. $\times 1\frac{1}{2}$.

Fig. 12. *Terebratella dorsata* (Gmelin).—Burdwood Bank, 56 fathoms. Typical example showing shape and surface sculpture. Natural size.

Fig. 13. *Terebratella dorsata* (Gmelin).—Burdwood Bank, 56 fathoms. Elongate variety showing produced beak, etc. $\times 1\frac{1}{2}$.

Fig. 14. *Hemithyris* sp.—Station 417, off Coats Land, 1410 fathoms. Shell-mosaic, ventral valve. $\times 166$ about.

Figs. 15–19. *Macandrevia diamantina*, Dall.—Station 417, off Coats Land, 1410 fathoms.

Fig. 15. Specimens attached to pebbles of granite rocks; slightly larger than natural size.

Fig. 16. Interior views of dorsal and ventral valves, showing adult loop, etc. $\times 1\frac{2}{3}$.

Fig. 17. Platidiform stage of loop in example 4 mm. in length. $\times 12$.

Fig. 18. Pre-adult stage of loop in example 9 mm. in length. $\times 4\frac{1}{2}$.

Fig. 19. Shell-mosaic, etc., from middle of ventral valve of an adult individual. $\times 175$.

Jackson: "Scotia" Brachiopoda—Plate I.

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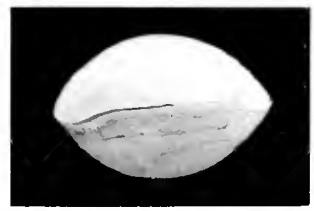

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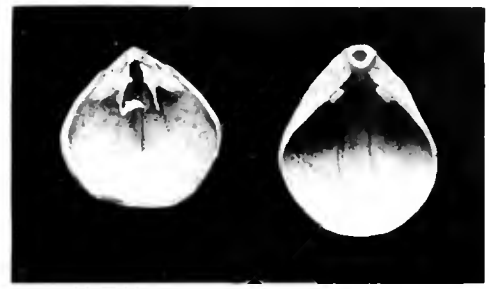

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Photo. J. W. Jackson

McFarlane & Erskine Lith. Edin.

Jackson: "Scotia" Brachiopoda—Plate II.

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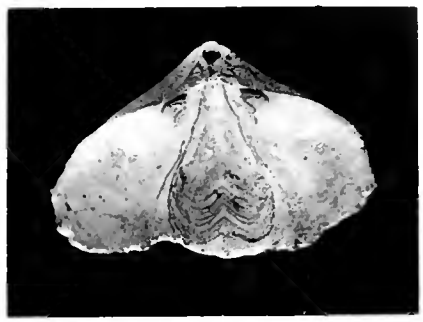

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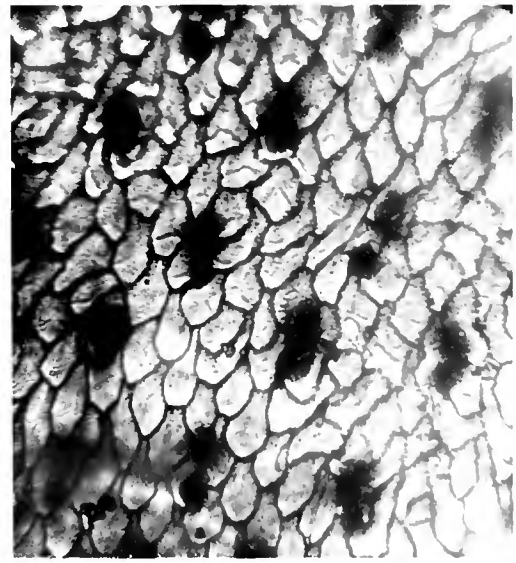

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Photo. J. W. Jackson

McFarlane & Erskine, 7th Edn.

PART VII.

AMPHIPODA.

VII.—THE AMPHIPODA OF THE SCOTTISH NATIONAL ANTARCTIC EXPEDITION.

By CHAS. CHILTON, M.A., D.Sc. (N.Z.), M.B., C.M. (Edin.),
Hon. LL.D. (Aberd.), F.L.S.,
Professor of Biology, Canterbury College, New Zealand.

The Amphipoda of the Scottish National Antarctic Expedition.

By **Chas. Chilton**, M.A., D.Sc. (N.Z.), M.B., C.M. (Edin.), Hon. LL.D. (Aberd.), F.L.S.; Professor of Biology, Canterbury College, New Zealand. *Communicated by* Dr W. S. Bruce. (With Two Plates.)

(MS. received March 30, 1912. Read June 17, 1912. Issued separately September 21, 1912.)

CONTENTS.

I. Introduction.

Shortly after my arrival in Britain in December 1911 I was honoured by a request from Dr W. S. Bruce, leader of the Scottish National Antarctic Expedition, that I would prepare a report on the Amphipoda collected during the voyage of the *Scotia*. Dr E. J. Allen, Director of the Marine Laboratory, Plymouth, very kindly offered me accommodation in the laboratory for the work, and free access to the library of the laboratory, which, fortunately, is very well supplied with works on the Crustacea. I was assured also of assistance from Mr T. V. Hodgson, the Curator of the Museum and Art Gallery, Plymouth, from Mrs E. W. Sexton, and from other friends; and accordingly I undertook the work. I received the main portion of the collection, contained in sixty-three bottles, on the 8th January 1912, and a few days later I received from Dr W. M. Tattersall of the Manchester Museum eighteen tubes containing additional Amphipoda found among the Schizopoda of the Scottish National Expedition which had been submitted to him for determination; these additional specimens contained three or four species not represented in the collection first received.

Twelve tubes of additional specimens from Dr Tattersall and many further specimens from the *Scotia* collection reached me in May. These consisted chiefly of duplicates of species previously sent, but contained also two species not previously seen. Some additions to the report, which had been sent in at the end of March, were therefore necessary.

With very few exceptions, the Amphipoda proved to have been particularly well preserved, and the localities, depth, and other particulars had been in all cases carefully recorded. I have given full details of these, even at the risk of some slight repetition, as they may prove to be of use in helping to decide questions now unforeseen that may afterwards arise. In several cases, especially among the Lysianassidæ, large numbers of specimens of various sizes had been collected from each locality, and these complete sets have been of very great use in helping me to ascertain the changes that take place in some species during the growth of the animal, and in determining the differences

(REPRINTED FROM THE TRANSACTIONS OF THE ROYAL SOCIETY OF EDINBURGH, VOL. XLVIII., PP. 455–520.)

between the sexes. I regret that the time at my disposal has been too short to allow of the complete examination of these series of specimens.

By far the greater part of the collection was made at the South Orkney Islands, mainly at Scotia Bay, Station 325, lat. 60° 43′ S., long. 44° 38′ W., the winter quarters of the *Scotia*. This appears to be a good collecting-ground for Amphipoda, particularly, of course, for the Lysianassidæ, and the forms obtained from this locality are extremely useful for comparison on the one hand with those obtained in 1882–83 by the German Transit of Venus Expedition from South Georgia, and on the other hand with the specimens collected by the French Antarctic Expedition from Port Charcot, Wandel Island, and other neighbouring localities. A few specimens were obtained from stations further south, at localities intermediate between Kerguelen Island and those already mentioned. Besides these, a small number of species was gathered at Gough Island, a locality from which very few Amphipoda had hitherto been described; others at the Falkland Islands; and some were obtained at Cape Town and Saldanha Bay in South Africa, and help to show the relation of the Amphipoda of South Africa to those of the various sub-Antarctic lands.

A few species were collected in the northern and tropical parts of the Atlantic on the voyage out and on the homeward voyage. As the greater part of the collection is from Antarctic and sub-Antarctic regions, I have kept these Atlantic species in a list by themselves, distinct from those gathered in the sub-Antarctic localities, under which I include Gough Island and South Africa.

As I was able to consult the reports on the Amphipoda of some of the Antarctic Expeditions, and already had some acquaintance with several of the sub-Antarctic species, it seemed a favourable opportunity for endeavouring to compare the results as far as possible, and to determine cases where the same species had been described under different names by different authors. In this effort I have been greatly assisted by the kindness of many friends. Dr G. Pfeffer and Dr O. Steinhaus of the Hamburg Museum very kindly placed at my disposal everything that I needed from the collections made at South Georgia by the German Expedition in 1882–83, and described by Dr Pfeffer in 1888; Monsieur Edouard Chevreux has sent me co-types of several of his species; from Mr A. O. Walker and from the British Museum I have had co-types of many of the species obtained by the *Southern Cross* and *Discovery* Expeditions, and described by Mr Walker; while the Rev. T. R. R. Stebbing and the authorities of the Vienna Museum have supplied still other specimens that have been extremely useful for comparison. Later on, when most of the work was completed, I was able, through the kindness of Dr W. T. Calman, to check my results by comparison with types and other specimens in the British Museum. At the same time, I have been able to see the Amphipoda collected by Sir E. Shackleton's British Antarctic Expedition in 1908-09, which had been placed in Mr Hodgson's hands; and in several cases I have been able to compare the *Scotia* specimens with New Zealand specimens that I had brought with me to England. To all those who have assisted me in these various ways I desire here to record my most grateful thanks.

It is a pleasure also to mention here my indebtedness to those who have assisted in other ways. I wish particularly to thank Dr E. J. Allen of the Marine Laboratory, Plymouth, for allowing me to make such free use of the facilities offered by the institution under his charge; without his assistance it would have been impossible to do the work in the time. Dr W. T. Calman of the British Museum, besides sending me co-types of species I required, has assisted me in the examination of others at the Museum itself and by his advice on many difficult points. Professor Woltereck of Leipzig and Dr A. Behning of the Zoological Station at Saratov have most obligingly communicated to me some of the results of their examination of the Amphipoda of the German South Polar and other Expeditions, which are as yet unpublished, though in the printer's hands. To Mrs E. W. Sexton I am indebted for the loan of many papers and books that I required, for the keen interest which she has shown in the work during its progress, and for the great care and skill with which she has prepared the drawings of most of the figures for this paper

In order to make clear the various references that will be given below, it may be well to state very briefly the growth of our knowledge of the Antarctic and sub-Antarctic Amphipoda. That knowledge dates back to the years 1839–40, when three expeditions—the British, French, and American—visited Antarctic seas. The British leader, Sir James Clarke Ross, penetrated very far south in his memorable voyage, and during the expedition several Crustacea were collected, including some Amphipoda. No special report on these Amphipoda was published, but they appear to have been deposited in the British Museum, and several of them were afterwards described by Spence Bate and other writers. The Crustacea collected by the American Expedition were described by J. D. Dana in his well-known work, which forms one of the fundamental treatises for the study of the Crustacea. In it many Amphipoda are included. For many years after 1840 no further advance was made, and there is nothing noteworthy to be recorded until 1874, when several expeditions were sent out to southern seas for the observation of the Transit of Venus, and during these expeditions various collections were made. The Amphipoda of the British Expedition from Kerguelen Island were described by E. J. Miers, and others collected by the American Expedition by S. I. Smith. The French Expedition spent some time at the Campbell Island, and the Crustacea collected were afterwards described by Henri Filhol in the *Mission de l'Ile Campbell*, in which he also included a general list of the Crustacea of New Zealand. This report was not published till the year 1885, and in the meantime a beginning had been made with the study of the Crustacea of Australia and New Zealand by Professor W. A. Haswell and Mr G. M. Thomson respectively. During the years 1873 to 1876 the *Challenger* Expedition had made numerous collections in sub-Antarctic and a few in Antarctic seas, and these were most fully described and figured by the Rev. T. R. R. Stebbing in his elaborate report published in 1888. In the same year, but at a slightly earlier date, there was published a report by Dr G. Pfeffer on the Amphipoda collected at South Georgia by the German Transit of Venus Expedition of

1882–83. For some time after this no further contribution of any importance was made specially dealing with Antarctic Amphipoda, though those of some of the sub-Antarctic regions were gradually becoming better known. The next contribution to our knowledge of the Antarctic forms was made by the *Southern Cross* Expedition, which visited South Victoria Land in 1898–1900; the Amphipoda collected by this expedition were described by Mr A. O. Walker in 1903.

Meanwhile, the Antarctic Expeditions of Britain, Germany, Sweden, and France had been wintering in the Antarctic and making numerous collections. The Amphipoda of the French Antarctic Expedition were described by Monsieur Edouard Chevreux in 1906, and those of the British by Mr A. O. Walker in 1907. The reports on the German and Swedish Expeditions have not yet been published.

In 1907 a small scientific party from New Zealand visited the sub-Antarctic Islands lying to the south of that land, and the Crustacea collected were described by myself in 1909 in *The Sub-Antarctic Islands of New Zealand*, published by the Philosophical Institute of Canterbury.

A preliminary report on the Amphipoda of the recent French Expedition in the *Pourquoi Pas?* was published by M. Chevreux in 1911.*

From the lists given below it will be seen that the *Scotia* collection contained fifty-six species from Antarctic or sub-Antarctic seas and six Atlantic species. The great majority of these were already known, and I have made only nine new species and no new genus. This appears to show that the Amphipoda of the southern seas are becoming fairly well known so far as the mere identification of species is concerned, though there is much to be done in tracing out more completely the distribution of the species and any local varieties that they may present.

On the other hand, it may be noted from his preliminary report on the Amphipoda of the *Pourquoi Pas?* Expedition that M. Chevreux has established six new genera and numerous new species.

It will be seen that I have reduced a number of species to the rank of synonyms. I have done this only where there appeared to be good grounds for so doing, and in all cases where there is likelihood of a difference of opinion I have endeavoured to give my reasons in full. In thus reducing the number of described species, I have only continued a necessary work that has been commenced in recent years by other writers. In the earlier days of the study of the Amphipoda, when workers were few and collections scanty, it frequently happened that a collection from a new locality contained many new species. In numerous instances these were described on very meagre material, often from a single specimen; and even when there was an abundant supply of specimens time did not allow of the dissection of more than one or two, hence there

* M. Chevreux's second paper (*Bull. Muséum Nat. Hist.*, 1912, No. 4), containing the diagnoses of the new species collected by this expedition, reached me when the final proofs of my paper had been corrected, and therefore too late for the results to be noticed here, though it is probable that one or two of the new species described below are identical with those established by M. Chevreux.

was little opportunity of distinguishing between characters subject to individual variation and those really common to the species. Consequently, when other specimens were obtained it was frequently found that they did not agree in all particulars with any of the species already described, and they were naturally considered to be new and were given a distinctive name. This practice was perhaps the safest at the time, and it was the more desirable when the specimens came from a new locality; but it unfortunately led to the idea that forms from fresh localities were almost necessarily new, and that the distribution of nearly all the species of Amphipoda was very limited. It also led to the introduction of long specific diagnoses, often containing characters of individual importance only. Naturally enough, specimens afterwards examined did not agree in all respects with these detailed descriptions, and thus a vicious circle was set up, leading to the continued establishment of new species, some of them being admittedly described in self-defence, and the fact that many species were widely distributed was long obscured.

As knowledge gradually increased it was found that in many cases the same species had been described under various names, and the preparation of a general survey of the whole group, such as that for *Das Tierreich*, necessarily led to a considerable reduction of species. From the example of a few species which were readily recognised, and hence known to occur at places widely remote from one another, it was found that some species at any rate were more widely distributed than had been originally supposed. Much assistance in clearing up difficulties was obtained from the detailed study by various authors of individual species and the consequent elucidation of the various forms that occur in some species and especially of the differences between the sexes and of the changes that take place during growth; and it is to further work of this kind that we must look for assistance in defining the limits of the different species.

Several of the species—or groups that I refer to under one specific name—are widely distributed in sub-Antarctic seas, and, as might be expected, the specimens from different localities now separate from one another are not always precisely the same, but show what may be considered local varieties. Some authors would doubtless prefer to call these local varieties species and give each a distinctive name; but this must necessarily lead to an indefinite multiplication of species, with ever-increasing difficulty of determining those already established, and as a matter of practical convenience it seems to me to be better at present to endeavour to recognise these widely distributed species and to leave the determination of their varieties until a larger number of forms from many localities have been studied.

In the list below I have indicated briefly the distribution of each species. From this it will be seen that an increasing number are now known to extend around the globe in sub-Antarctic seas, and that there is a greater resemblance between the Amphipodan faunas of South America, New Zealand, Australia, Kerguelen Island, and even South Africa, than appeared to be the case a few years ago. The importance of the facts on the question of the cause of this distribution cannot be discussed here. Another point made clear is that the number of species in northern seas represented by the same

or by a closely allied form in the southern is also shown to be increased. Leaving out of account the species known to be cosmopolitan, it has been long known that there were some species identical in Arctic and Antarctic seas, though practically unknown in the tropics; nearly every writer on Antarctic Amphipoda has identified one or more with northern species. It appears from examples like *Orchomenopsis chilensis* (Heller), and others that might be quoted, that in these examples of "bi-polar" species the species is not always entirely absent from the tropics, but exists there in deeper waters, while it can live near the surface in the colder regions; or that the tropical or temperate form is so much smaller than the polar one that it has usually been considered a separate species, and the existence of the species at intermediate localities has been overlooked. It appears that, for some reasons not altogether understood, many Amphipoda find their optimum environment near the Arctic and Antarctic regions, and exist there in greatest abundance, attaining a size far greater than that usual for similar forms in warmer seas. The difficulty of deciding whether these smaller forms are to be considered separate species or not is very great, and it must not be expected in the present state of our knowledge that logically uniform results can be arrived at. In some cases where the animal is abundant and specimens from many localities have been examined, we may be able to group them into one large species, while in other cases where only a few have been studied we are forced to leave them as separate small species. Unfortunately, this leaves the groups distinguished by specific names of very unequal value in the discussion of questions of distribution.

II. List of Species.

ANTARCTIC AND SUB-ANTARCTIC.

Name of Species.	Distribution and Remarks.
1. *Acontiostoma marionis* Stebbing.	Gough Island, Marion Island, Straits of Magellan, New Zealand.
2. *Amaryllis macrophthalma* Haswell.	Australia, South Africa, South America, New Zealand, Indian Ocean.
3. *Cyphocaris anonyx* Boeck	Widely distributed in both northern and southern seas.
4. *Lysianassa cubensis* (Stebbing).	South Africa and Gulf of Mexico.
5. *Alicella scotiæ*, sp. nov.	South Atlantic; an allied species found in the North Atlantic.
6. *Cheirimedon femoratus* (Pfeffer).	South Orkneys, South Georgia, and Graham Land (Port Charcot).
7. *Tryphosa murrayi* Walker.	Off Coats Land and South Victoria Land.
8. *Tryphosites stebbingi* (Walker).	Off Coats Land and South Victoria Land.
9. *Orchomenella pinguides* Walker.	South Orkneys and South Victoria Land.
10. *Orchomenella macronyx* Chevreux.	South Orkneys and Graham Land (Port Charcot).
11. *Waldeckia zschaui* (Pfeffer).	Off Coats Land, Graham Land, and South Victoria Land.
12. *Orchomenopsis nodimanus* Walker.	South Orkneys and South Victoria Land.
13. *Orchomenopsis chilensis* (Heller).	In all seas, northern and southern.
14. *Orchomenopsis* (?) *coatsi*, sp. nov.	Off Coats Land.
15. *Harpinia obtusifrons* Stebbing.	Widely distributed in Antarctic and sub-Antarctic seas.
16. *Leucothoe spinicarpa* (Abildgaard).	In all seas.
17. *Amphilochus squamosus* G. M. Thomson.	South Orkneys, Marion Island, and New Zealand. Perhaps identical with *A. neapolitanus* of northern seas.

Name of Species.	Distribution and Remarks.
18. *Metopoides sarsii* (Pfeffer).	South Orkneys, South Georgia, and Graham Land (Port Charcot).
19. *Metopella orata* (Stebbing).	South Orkneys, Straits of Magellan.
20. *Thaumatelson walkeri*, sp. nov.	South Orkneys. } An allied species at South Victoria Land.
21. *Thaumatelson inermis*, sp. nov.	South Orkneys. }
22. *Thaumatelson herdmani* Walker.	South Orkneys and South Victoria Land.
23. *Bircenna crassipes* (Chevreux).	South Orkneys and Graham Land (Port Charcot). A closely allied species occurs in New Zealand.
24. *Colomastix brazieri* Haswell.	South Orkneys and Australia.
25. *Liljeborgia dubia* (Haswell).	Widely distributed in southern seas.
26. *Epimeria macrodonta* Walker.	Off Coats Land and South Victoria Land.
27. *Pariphimedia integricauda* Chevreux.	South Orkneys and Graham Land (Wandel Island).
28. *Acanthonotozoma australis*, sp. nov.	Only one specimen known, from lat. 71° 22′ S., long. 16° 31′ W.; a deep-sea species (1410 fathoms).
29. *Leptamphopus nova-zealandiæ* (G. M. Thomson).	Widely distributed in southern seas.
30. *Haliragoides australis*, sp. nov.	South Orkneys. A closely allied species in northern seas.
31. *Eusirus antarcticus* G. M. Thomson.	In all Antarctic seas. Perhaps identical with the northern *E. propinquus*.
32. *Eusirus splendidus*, sp. nov.	South Orkneys. Perhaps only a form of the preceding species.
33. *Eurymera monticulosa* Pfeffer.	South Orkneys, South Georgia, and Graham Land (Wandel Island).
34. *Bovallia monoculoides* (Haswell).	In all southern seas.
35. *Pontogeneia dunai* (G. M. Thomson).	Falkland Islands, Australia, New Zealand.
36. *Pontogeneia antarctica* Chevreux.	South Orkneys, Graham Land, and the sub-Antarctic Islands of New Zealand.
37. *Atyloides magellanica* (Stebbing).	In all sub-Antarctic seas.
38. *Atyloides serraticauda* Stebbing.	In all sub-Antarctic seas.
39. *Atyloides calceolata*, sp. nov.	South Orkneys. Closely related to the preceding species.
40. *Paramæra australina* (Bate).	A very abundant and variable species in sub-Antarctic and Antarctic seas.
41. *Djerboa furcipes* Chevreux.	South Orkneys and Graham Land.
42. *Paraceradocus miersii* (Pfeffer).	South Orkneys, South Georgia, and Graham Land.
43. *Mæra mastersii* (Haswell).	Widely distributed in the warmer southern seas.
44. *Paradexamine pacifica* (G. M. Thomson).	South Orkneys, Graham Land, and New Zealand.
45. *Polycheria antarctica* (Stebbing).	In all southern seas, and extending far to the north in the Indian and Pacific Oceans.
46. *Notolropis homochir* (Haswell).	Australia and South Africa. Closely allied to northern species.
47. *Talorchestia scutigerula* (Dana).	Falkland Islands and Tierra del Fuego.
48. *Hyale grandicornis* (Kroyer).	Gough Island and Chili. A closely allied species in New Zealand.
49. *Hyale sabbanha*, sp. nov.	South Africa.
50. *Haplocheira barbimana* (G. M. Thomson).	In all southern seas.
51. (?) *Eurysthens afer* (Stebbing).	Gough Island, South Africa.
52. *Jassa falcata* (Montagu).	Widely distributed in northern and southern seas.
53. *Caprella æquilibra* Say.	South Africa. Very widely distributed.
54. *Hyperia gaudichaudii* Milne Edwards.	Falkland Islands, South Victoria Land.
55. *Vibilia antarctica* Stebbing	In all southern seas.
56. *Euthemisto thomsoni* Stebbing.	In all southern seas.*

* The following additional species has been identified by the Rev. T. R. R. Stebbing from material sent to him:—
Lanceola astiva Stebbing, 1888, p. 1309, pl. cliii.; from Station 121.

NORTHERN AND TROPICAL ATLANTIC.

Name of Species.	Distribution and Remarks.
1. *Synopia schéeleana* Bovallius.	Pacific and Atlantic Oceans.
2. *Hyale grimaldii* Chevreux.	North Atlantic.
3. *Allorchestes plumicornis* (Heller).	Mediterranean and North Atlantic.
4. *Sunamphitoe pelagica* (Milne Edwards).	North Atlantic.
5. *Anchylomera blossevillii* Milne Edwards.	Tropical Atlantic.
6. *Oxycephalus clausi* Bovallius.	Tropical Atlantic and (?) Pacific.

III. Antarctic and sub-Antarctic Species.

Genus Acontiostoma Stebbing, 1888.

Acontiostoma marionis Stebbing.

1. *Acontiostoma marionis* Stebbing, 1888, p. 709, pl. xxx.*
   ,, ,, ,, 1906, p. 15, fig. 4.
   ,, *magellanicum* Stebbing, 1888, p. 714, pl. xxxi.
   ,, ,, ,, 1906, p. 15.

Station 461, Gough Island: 100 fathoms. 23rd April 1904. One specimen, 7 mm. long, 5 mm. high.

This specimen agrees well with the description and figures given by Stebbing. As I have only the single specimen, I have not dissected it, but the maxillipeds can be seen to agree with his description, while the shape of the third uropod and of the telson with its fringe of stout spines leaves no doubt as to the identity of the species.

A. magellanicum Stebbing is, as Mr Stebbing has pointed out, almost certainly the young of this species, which is now therefore known from Marion Island, Gough Island, and Straits of Magellan.

Among the Amphipoda that I brought with me from New Zealand for examination I have a slide from Mr G. M. Thomson's collection that undoubtedly belongs to this genus, and is, I think, not specifically distinct from *A. marionis*. It has the upper antennæ and the first gnathopod rather stouter than is shown in Mr Stebbing's figure; but the peculiar second gnathopod, with the finger sunk in a little cavity at the end of the propod, and the uropoda and telson, agree very closely with the *Challenger* specimen. In some points it approaches rather nearer to *A. magellanicum*, and tends to confirm the view that that species is only the young of *A. marionis*.

This slide was mounted by Mr Thomson from one of a very small number of specimens collected in Lyttelton Harbour by myself about the year 1884, and handed to him in 1895 when I left New Zealand for a lengthy period. When living, the animals, which were all of very small size, were bright red in colour. I had dissected and mounted a slide of one of the other specimens about that date, and I have a drawing

* The references are made by the year of publication to the works given in the Bibliography on pp. 235–237. I have given only those references that appeared to be necessary for the purpose of the present paper.

made at the time of the second gnathopod which closely corresponds with that given by Stebbing of the *Challenger* specimen.

Since this was written I have been able to compare Mr Thomson's slide with those of the *Challenger* specimens in the British Museum. The *Challenger* specimen of *A. marionis* is considerably larger than the New Zealand specimen, and, as stated above, has the first gnathopod more slender; but the differences are not, I think, of specific importance. The dissected parts of the small specimen of *A. magellanicum* are now so transparent that they are difficult to examine, but so far as they can be made out they seem to agree generally with *A. marionis*.

A. pepinii Stebbing, obtained by the *Challenger* at Kerguelen Island, was placed by Mr Stebbing in a new genus, *Stomacontion*, in 1899, and *A. kergueleni* Stebbing made a synonym of *A. pepinii*.

It seems, however, to be too near to *A. marionis* to be separated generically. Unfortunately, the very minute mouth parts do not show very clearly in Mr Thomson's prepared slide, and I cannot make out whether the first maxilla in it has the palp one- or two-jointed: but the palp of the maxillipeds certainly seems to have the fourth joint quite vestigial or absent, as described for *Stomacontion*: in *Acontiostoma* it is "very small." There seems to me to be no essential difference between the two genera in the third uropods.

Genus Amaryllis Haswell, 1880.

Amaryllis macrophthalma Haswell.

Amaryllis macrophthalmus and *A. brevicornis* Haswell, 1880A, p. 253, pl. viii. fig. 3, and p. 254.
" *macrophthalma* Stebbing, 1888, p. 707, pl. xxix.
" " " 1906, p. 24.
" " " 1908, p. 67.
" " " 1910A, pp. 569 and 633.
" " " 1910B, p. 448.
" " Walker, 1909, p. 327.

Station 483, South Africa, entrance to Saldanha Bay; trawl, 25 fathoms. 21st May 1904. Five specimens, the largest 9 mm. long.

These specimens agree well with the short description given in *Das Tierreich*, and illustrate several of the points in Stebbing's further description given in the reference quoted above, 1908, p. 67.

Another species, *A. bathycephala* Stebbing, has been described from Port Philip, Australia, and is evidently very closely allied, differing mainly in the side plate and basal joint of the third peræopod. In my specimens the hind lobe of the side plate is more produced downwards than in Stebbing's figure of *A. macrophthalma*, and thus is a little more like *A. bathycephala*, but on the other hand the basal joint of the limb is expanded above instead of being narrowed as in the latter species.

The species is now known from Australia, South Africa, Straits of Magellan, and New Zealand, and Mr Walker has recorded it from Wasin, British East Africa. In

1904 Mr Walker added another species, *A. tenuipes*, from Ceylon, for which he established a new genus, *Vijaya*; but Mr Stebbing (1910A, p. 570) has pointed out that the difference in the male and female antennæ on which the genus was founded occurs also in *Amaryllis*, and that the new genus is therefore not required.

Genus Cyphocaris Lütken and Boeck, 1870.

Cyphocaris anonyx Boeck. (Pl. I. figs. 1–4.)

Cyphocaris anonyx Boeck, *Forh. Selsk. Christian.*, 1870, p. 104.
" " Stebbing, 1906, p. 29.
" " Walker, 1903A, p. 39, and 1903B, pp. 227 and 232.
" *micronyx* Stebbing, 1888, p. 656, pl. xii.
" " Chevreux, 1900, p. 164.

Station 414, lat. 71° 50′ S., long. 23° 30′ W.; 8 ft. vertical net, from the surface to 1000 fathoms. 15th March 1904. One specimen, total length 20 mm.

This specimen in all probability belongs to this species, although it differs from the description given in *Das Tierreich* in several minor points. The first segment of the peræon is more produced in front and much more acute than is shown in Stebbing's figure of the *Challenger* specimen; the antennæ have more numerous joints in the flagella; there is no accessory flagellum to be seen in either of the upper antennæ—possibly it has been broken off, though I can detect no trace of this. The first and second peræopods (fig. 3) are simple or almost so, the propod being only very slightly widened and the finger apparently not folding back upon it. The basal joints of the third to the fifth peræopods have the margins less serrated.

The gnathopods (figs. 1 and 2), the uropod, and the telson agree fairly well with *C. anonyx*, which has been already recorded from Tristan da Cunha in the South Atlantic, and I think the *Scotia* specimen is only a larger and more fully developed specimen of that species. The whole integument is soft, there is no sign of eyes, and the animal was probably taken at a considerable depth. It is interesting to note that in 1903 Mr Walker stated that this species would probably be found to occur in Antarctic seas. It is also found in the seas of the northern hemisphere.

Genus Lysianassa Milne Edwards, 1830.

Lysianassa cubensis (Stebbing). (Pl. I. fig. 5.)

Lysianax cubensis Stebbing, 1897, p. 29, pl. vii.B.
Lysianassa cubensis Stebbing, 1906, p. 38.

Station 478, South Africa, Cape Town, Coaling Jetty No. 1. 14th May 1904. Two specimens, the larger a female 13 mm. long.

Station 483, South Africa, entrance to Saldanha Bay; trawl, 25 fathoms. 21st May 1904. Two specimens, one a male 8 mm.

These agree well with the descriptions and figures given by Stebbing, except that the larger ones contain rather more joints in the flagella of the two antennæ. In the second antenna of the male the flagellum is long, about two-thirds the length of the animal, and the last joint of the peduncle is longer than the preceding joint, which is rather short. In the second maxilla the inner lobe is specially broad and has the inner margin pretty strongly convex. The second gnathopod has the palm a little projecting so as to approach towards the chelate character. The uropods agree well with the description; the character of the peduncle of third uropod seems fairly characteristic, and is shown in fig. 5. Its outer margin is produced upwards into a vertical flange above the general body of the joint; it curves upwards at the end into a subacute point, and bears three short spinules on the distal half of the upper margin. The two branches are similar in shape, both tapering to the extremity; the outer is slightly longer than the inner, and bears a few long hairs at a little distance from the end.

The species was originally described from specimens in the Copenhagen Museum, coming from the Gulf of Mexico.

Genus Alicella Chevreux, 1899.

Alicella scotiæ, sp. nov. (Pl. I. figs. 6 and 7.)

Station 468, South Atlantic, lat. 39° 48′ S., long. 2° 33′ E.; 2645 fathoms. 29th April 1904. One specimen, 20 mm. long.

Integument soft, the body greatly swollen about the middle, tapering considerably posteriorly. The hinder half of the body somewhat compressed, with a slight dorsal ridge, but hardly carinate. Side plates 1–4 increasing in depth, the fourth with its posterior lobe extending about one-third along the fifth, which is shallower than the fourth and broader than deep. Lateral plate of the first pleon segment angular in front but rounded behind, its lower border fringed with long setæ; that of the second segment with both angles rounded; the third with the anterior rounded, posterior angle quadrate, both bearing plumose setæ on the lower margin. Sides of the third segment of the urus upraised alongside the telson. Eyes indistinct, apparently forming a narrow crescentic band along the lateral sides of the head.

Antennæ slender, first shorter than the second, about as long as the head and the first segment of the peræon, the first joint short and thick, as long as the second and third together, the third very short; flagellum of about twenty joints, the first as long as the next five and supplied on the inner side with dense tufts of long setæ, similar setæ being present also on a few of the succeeding joints. Accessory flagellum nearly half as long as primary; of six joints the first as long as the next two.

Second antenna with third joint well exposed; the fourth with long, rather stout setules on the lower margin; fifth slightly longer than the fourth, with long slender setæ on lower margin; flagellum many-jointed, of about thirty-five joints, all except the more distal ones bearing a small tuft of long setæ at the lower distal angle.

First gnathopod (fig. 6) moderately stout; basal joint stout, of equal width throughout; a few tufts of long setæ near the distal end of its posterior margin; ischium, merus, and carpus all short, subequal, and all bearing long setæ on the posterior margin; carpus also with tuft at the antero-distal angle; propod at base as wide as the distal end of the carpus, narrowing slightly distally; anterior margin straight or slightly curved, and with tufts of long setæ; posterior margin slightly concave distally, and bearing numerous long setæ in tufts; the palm transverse, straight, defined by two long spinules; finger long, extending beyond the palm.

Second gnathopod (fig. 7) slender; basal joint curved; ischium much longer than the merus; carpus longer than the propod, which is narrowed at base, slightly curved; palm rather short and slightly oblique; the posterior margin of the merus is furred and bears three tufts of long setæ towards the distal end; carpus furred on both margins, with tufts of long setæ on the lateral surface and anterior margin at distal end, and several tufts, or short transverse rows, on the distal half of the posterior margin; propod with both margins furred, and tufts of long setæ on their distal portions, those on the anterior border towards the base of the finger forming a dense group of very long setæ. The first and second peræopoda rather slender; the merus slightly broadened and produced at the antero-distal angle; propod somewhat curved; finger about half as long as the propod, slender, curved, smooth. The third, fourth, and fifth peræopoda are of increasing lengths, all having the merus much broadened and produced, the propod curved, and the finger long, as in the first and second peræopoda; basal joint of all expanded, that of the third rounded posteriorly, those of the fourth and fifth somewhat angled below, and with the posterior margin convex in its upper part and straight or slightly concave below, the hind margins feebly crenulate.

First uropods with the branches slender, subequal, longer than the peduncle, marginal spines on the peduncle and on the outer branch. Third uropod with peduncle large, shorter than the branches, which are subequal in length, lanceolate, margins fringed with short spinules and long plumose hairs, the inner branch with small second joint. Telson reaching nearly to the end of the third uropod, apparently without spines on its dorsal surface.

This species differs from the typical species *A. gigantea* Chevreux in having both gnathopoda subchelate and the first not slender but moderately stout. As there are only the two species known, it will be well to slightly widen the characters of the genus to include the species now being described. The typical species was of enormous size, one of the specimens being as much as 140 mm. long; probably when specimens of both species of an intermediate size are known, it will be found that the two are more nearly alike than appears from the detailed description above, which is based on the single specimen obtained by the *Scotia*.

Genus Cheirimedon Stebbing, 1888.

Cheirimedon femoratus (Pfeffer).

Anonyx femoratus Pfeffer, 1888, p. 93, pl. ii. fig. 2.
Cheirimedon dentimanus Chevreux, 1905, p. 159, and 1906b, p. 2, figs. 1–4.

South Orkneys, Brown's Bay, Station 326a. November 1903. Many specimens of about 10 mm. in length.

South Orkneys, Scotia Bay, Station 325; dredge, 9–10 fathoms. May 1903. One small specimen.

South Orkneys, Scotia Bay, Station 325; dredge, 4 fathoms, gravel bottom, clumps of weeds; temperature 29°·1. 3rd December 1903. Two specimens.

These specimens agree minutely with the figures and description given by Chevreux, and I have been able to compare them with co-types of his species which he has been good enough to send me. I have also compared them with a specimen of *Anonyx femoratus* Pfeffer from South Georgia, kindly placed at my disposal by the authorities of the Hamburg Museum, and I find it is quite the same as the South Orkneys specimens and those from Port Charcot sent to me by Monsieur E. Chevreux. Pfeffer's description agrees well with *C. dentimanus*, but his figure shows the telson too broadly rounded posteriorly and the cleft too shallow. The figure was, however, made without dissecting the specimen. His name has priority by many years. M. Chevreux states that this species appears to closely resemble *C. fougneri* Walker from South Victoria Land. I have been able to examine co-types of this species from the British Museum, and also specimens obtained by the *Nimrod* Expedition, and find that, though there is considerable resemblance in general structure, *C. fougneri* differs considerably from *C. dentimanus* in the greater length of the antennæ, and also in having the body much less compact, and the first gnathopod more slender.

Genus Tryphosa Boeck, 1871.

Tryphosa murrayi Walker.

Tryphosa murrayi Walker 1903a, p. 50, pl. ix. figs. 45–51.
„ „ „ 1907, p. 16 (part).

Station 411, Coats Land, lat. 74° 1′ S., long. 22° W.; 161 fathoms. Many specimens, the largest 22 mm. long.

After much consideration, I have decided to record these specimens under the name given above. I have been able to compare them with the type of Mr Walker's species obtained by the *Southern Cross* Expedition, and the two agree so closely that they must be considered specifically identical. The eyes are obsolete, the lateral lobes of the head produced and acute or subacute, the hind margin of the third pleon segment straight,

and the first segment of the urus bears a well-marked triangular carina. The appendages are in close agreement with those of the type, and in both the inner lobe of the first maxilla bears four setæ instead of two as given in the diagnosis of the genus in *Das Tierreich Amphipoda*, two of the setæ being shorter than the others.

While it is easy to identify the *Scotia* specimens with Mr WALKER's type, the position is not so clear if we try to go a little further. In the *Southern Cross* Amphipoda Mr WALKER described another species, *Tryphosa adarei*, differing from *T. murrayi* in certain minor characters which appeared at the time to be of specific importance. In 1907, however, on the receipt of numerous other specimens from the *Discovery* Expedition, he united the two species under the name *T. murrayi*, as the examination of the specimens showed that the characters at first relied upon were subject to variation. In this he was perhaps right, but a comparison of his specimens of *T. adarei* with my specimens shows that they differ from them as they do from *T. murrayi* in having the first gnathopod rather stouter towards the distal end, and particularly in having the carpus stouter and rather shorter than the propod, while in *T. murrayi* it is as long as or longer than the propod ; though the differences are not great, they appear to be constant in the specimens I have examined. Moreover, Mr WALKER states that *T. adarei* closely resembles *T. barbatipes* Stebbing, but differs in the proportions of the joints of the upper antennæ and of the gnathopoda. Before comparing the *Scotia* specimens with *T. murrayi* Walker I had also noted their great similarity to *T. barbatipes*, except in the shape of the first gnathopods, and comparison of the three shows that *T. adarei* is largely intermediate in this character between *T. murrayi* and *T. barbatipes*, so that, if the first two are united, it will be necessary to unite them both with *T. barbatipes*. This species is, however, now placed by STEBBING in another genus, *Tryphosella*, and the shape of the first gnathopod in the type specimen of *T. barbatipes* which I have also examined is considerably different from that of *T. murrayi*, the carpus being shorter and the propod longer and stouter and slightly different in outline, as may be seen from an examination of the figure in the *Challenger* Report, and there are differences in some other characters. It is quite likely that an examination of specimens from other localities will show complete transitional forms, but at present I cannot go fully into this question, and in the meantime prefer to identify my specimens with *T. murrayi* and to leave that species distinct from *T. adarei* and from *T. barbatipes*. In all three species the side plates of the first and second gnathopoda have a small tooth at the posterior angle. It is to be hoped that a complete revision of this group will be made before long ; such a revision must, however, include the similar forms from northern seas, some of which appear to be very closely allied.

Tryphosa murrayi is known from South Victoria Land and from near Coats Land, though not yet recorded from intermediate localities.

Genus Tryphosites G. O. Sars, 1891.

Tryphosites stebbingi (Walker).

Hoplonyx stebbingi Walker, 1903A, p. 52, pl. ix. figs. 52 to 57.
Tmetonyx stebbingi Stebbing, 1906, p. 720.
" " Chilton, 1909A, p. 618.

Station 411, Coats Land, lat. 74° 1′ S., long. 22° W.; 161 fathoms. Many specimens, about 17 mm. long.

I have compared these specimens with those from the *Southern Cross* Expedition on which Mr Walker established the species, and find that they agree closely in all points, except that the lateral process of the head might almost be called acute instead of "point rounded"—in some of the *Southern Cross* specimens it is almost or quite as acute as in the *Scotia* specimens. The first segment of the urus is slightly compressed, but hardly sufficiently so to be called carinate. The eyes are very indistinct or absent completely. The first gnathopod has the propod slightly narrowed towards the distal end, with the palm short and not well defined; in one specimen the palm was found to be rather oblique on one side of the body, while on the other it was almost transverse; the dactyl has a prominent secondary nail. In this specimen the second uropod had the inner branch somewhat constricted towards the distal end, as shown by Stebbing for *Tryphosa cicadoides* (1888, pl. iv. fig. ur_2); the telson is long and narrow, without marginal spinules, but with two small spinules in the emargination at the end of each lobe.

The species appears to be close to *T. cicadoides* Stebbing, one of the chief differences being apparently in the shape of the telson; but it is to be noted that the drawings of the telson of the two specimens represented on plates iv. and v. of the *Challenger* Report differ to some extent.

The species was described by Walker under the genus *Hoplonyx*, and compared with *H. kergueleni* (Miers), which is now placed under *Tryphosa*, the genus to which *T. cicadoides* was first assigned. *Tryphosa kergueleni* is certainly not unlike *Tmetonyx stebbingi*, but differs in the points mentioned by Walker, and particularly in having the propod of the first gnathopod stouter and with the palm regularly rather oblique. The first gnathopod of *Tryphosa trigonica*, as figured in the *Challenger* Report, is more like that of *T. stebbingi*, and in describing that species Mr Stebbing suggested that it was perhaps the young of *T. kergueleni* (Miers).

In the *Scotia* specimens, and also in those collected by the *Southern Cross*, the epistome is produced anteriorly into an acute process as in *Tryphosites longipes* (Bate and Westwood), and the species must be placed in the same genus, though the differences between *Tryphosa*, *Tmetonyx*, and *Tryphosites* are very trifling. *Tryphosites stebbingi* appears to be very close to *T. longipes* of northern seas, differing chiefly in having the peræopoda shorter and stouter and the eyes indistinct.

Tmetonyx stebbingi is now known from South Victoria Land and from Coats Land, and I have recorded a form from the sub-Antarctic islands of New Zealand which appears to belong to this species, but is much smaller, has well-developed eyes, and is darkly pigmented (1909A, p. 618).

Genus Orchomenella.

Orchomenella pinguides Walker.

Orchomenella pinguides Walker 1903A, p. 46, pl. viii. figs. 24–30.
,, ,, ,, 1907, p. 13.

South Orkneys, Scotia Bay, Station 325. 2nd January 1904. Several specimens.

These specimens undoubtedly belong to this species, as on comparison I find that they agree closely with co-types of Walker's species kindly sent me by Dr Calman of the British Museum. They show also a pretty close resemblance to *Cheirimedon dentimanus* Chevreux, but differ in having the eyes not black (in spirit specimens), and in having the first gnathopod less strongly developed and the palm not concave; the third segment of the pleon has the posterior angle rather more rounded, and the telson appears slightly more elongated than in Chevreux's species. I have also been able to examine specimens of *O. pinguides* from South Victoria Land collected by the *Nimrod* in 1908, and can detect no difference between them and the South Orkneys specimens. In most of the *Nimrod* specimens the eye is colourless in spirit and appears to have been red in the living animal; some of the specimens were labelled "Red Amphipods," and the specimens preserved in formalin still show the red colour of the eyes and a slight pinkish tinge of the whole body. On the other hand, Walker in describing his species says: "Eyes moderately large, dark, oval, expanded below." There thus appears to be some variation in the eyes of *Orchomenella pinguides*, for in the co-types from the British Museum one specimen has an eye still fairly darkly coloured, but in the others it is pale, as in the South Orkneys specimens, and I have noticed also some variation in the *Nimrod* specimens.

Orchomenella macronyx Chevreux.

Orchomenella macronyx Chevreux 1905, p. 161, fig. 2.
,, ,, ,, 1906B, p. 8, figs. 5–7.

South Orkneys, Scotia Bay, Station 325. May 1903. Two specimens, 4·5 mm. long.

These two small specimens on the whole agree well with Chevreux's description, especially in the shape of the last segment of the pleon and the first of the uropods. The eye is rather narrower and less oval, and the first gnathopod appears to have a slightly more transverse palm, against which the finger fits closely without projecting beyond it. The telson is concave above.

Genus Waldeckia Chevreux, 1906
(= Charcotia Chevreux, 1905, name preoccupied).

Waldeckia zschauii (Pfeffer).

Anonyx zschauii Pfeffer, 1888, p. 87, fig. 1.
Orchomenopsis zschauii Stebbing, 1906, p. 85 (part).
Charcotia obesa Chevreux, 1905, p. 163, fig. 3.
Waldeckia obesa Chevreux, 1906B, p. 15, figs. 8–10.
„ „ Walker, 1907, p. 10, pl. ii. fig. 4.

Station 411, Coats Land, lat. 74° 1′ S., long. 22° W.; 161 fathoms. 12th March 1904. Many specimens, the largest 16 mm. long.

Although I have been unable to examine specimens of *Anonyx zschauii* Pfeffer, as those described by him did not belong to the official collection of the German Expedition of 1882–83, and consequently were not deposited in the Hamburg Museum, I feel confident that my specimens must be referred to his species. His description of the great obesity of the body, and particularly of the dorsal process on the first segment of the urus, which is so distinct from that of other species with which it might otherwise be confused, leaves no doubt upon the subject. In this species, in place of the more or less rounded prominence on the first segment of the urus, the process rises abruptly behind the usual depression into a sharp tooth, from which it slopes downwards towards the next segment; this is shown clearly also in Pfeffer's figure, although the figure is rather small. Mr Stebbing in 1906 referred his species *Orchomene carimanus* to Pfeffer's species, but an examination of the mounted slides of the *Challenger* collection in the British Museum shows that the first gnathopod of *O. carimanus* has the propod broad and not narrowing distally as in *W. zschauii*, and, judging from the description, the process on the urus does not appear the same as in that species, and it appears to me that *O. carimanus* Stebbing is more properly referred to the widespread and variable species *O. chilensis* (Heller); see p. 474, where the question is further discussed.

I did not at first compare my specimens with the descriptions of *Waldeckia obesa* Chevreux, but the shape of the basal joint of the third peræopod in one of the slides I had mounted proved to be so similar to the figures given by both Chevreux and Walker that a full comparison was made, with the result that my specimens proved to be identical with that species also. The figures given by Chevreux and Walker show the great obesity of the body and the great prolongation backwards of the fourth side plates better than Pfeffer's; but, on the other hand, they hardly show so well the character of the process on the urus, though from their descriptions it seems evident that they were dealing with the same structure.

I have compared the *Scotia* specimens with those collected by the *Discovery* and referred to this species by Mr Walker, and find no essential difference; in the *Discovery* specimens the third segment of the pleon is slightly more compressed and elevated into a blunt dorsal tooth, while the tooth on the first segment of the urus is a little shorter than in the *Scotia* specimens.

Walker's figure is taken from a male specimen, and shows the long second antennæ found in that sex; these are longer than in the males of *Orchomenopsis chilensis* (Heller) and some other allied species. The occurrence of some specimens with long lower antennæ was pointed out by Pfeffer in his original description.

Whether it was necessary to establish the new genus *Waldeckia* for this species appears to me to be doubtful, but as that has been done I am referring the species to it. As mentioned above, Stebbing in his *Tierreich Amphipoda* placed the species under *Orchomenopsis*, and the affinities of the species seem to me to be distinctly with species of that genus such as *O. chilensis* (Heller) and *O. nodimanus* Walker. It is true that Chevreux has described the propod of the first gnathopod of *W. obesa* as being simple and not subchelate; but in my specimens, although the propod narrows very considerably distally, there is a distinct though short palm, and this is shown also in the figures given by Pfeffer and Walker. Moreover, there are considerable differences in the breadth of the propod in other species of *Orchomenopsis*, as will be seen from my discussion of *O. chilensis* (Heller); and in the South African specimens which I refer to that species the propod narrows distally in the same way, though not to the same extent, as in *W. zschauii*.

The other important point in which *Waldeckia* differs from *Orchomenopsis*, as first pointed out by Chevreux, is in the possession of finger-like accessory branchiæ. Chevreux describes one of these as being present on all the legs, and two on the fourth. In the specimens I examined I found them on the fourth, fifth, and sixth legs only, and only one on the fourth. They appear to arise either from or near the base of the branchia. They are long and finger-like in shape, but seem to differ in internal structure from the branchia, being filled with granules or globules of some kind, and whether they are really branchial in function is perhaps doubtful. This, however, is neither the time nor the place for a discussion of their physiological importance; the question that concerns us now is their presence or absence, and their value when present as a generic character.

Secondary or accessory branchiæ have been described in several genera of the Amphipoda belonging to quite different families, and it seems probable that they may be independently developed in cases where there is special need for them, and that their presence is not of great taxonomic importance. For example, they occur in some species of *Hyalella* and not in others, and the species in which they occur are nevertheless retained under the genus *Hyalella*. It was not till after I had written down the general considerations given above that I had an opportunity of specially looking for accessory branchiæ in other allied species; but afterwards, on examining large specimens of *Orchomenopsis chilensis* Heller (= *O. rossii* Walker), from Station 411, whence the *Waldeckia zschauii* had been obtained, I found them in that species also, though they appear to be present only on the fifth and sixth legs. Unfortunately, my attention was not specially directed to this question till it was too late to make an examination of other specimens, but the facts detailed above show, I think, that *Waldeckia* is nearer to *Orchomenopsis* than might appear at first sight.

The small amount of difference between some of these genera, and the difficulty of referring a species to its proper genus, is shown by the fact that while CHEVREUX established for the species in question the new genus *Waldeckia*, and compared it with *Menigrates* and *Lepidepecreum*, Mr WALKER, who was independently working at the same species, had at first classified it under *Socarnes*, and Mr STEBBING has since stated that he would have been inclined to concur in this view. Mr STEBBING has, however, now accepted the genus *Waldeckia*, and has described a new species, *W. chevreuxi*, from Australia (1910A, p. 572, pl. xlvii.B). This species, which, though undescribed, has been long known to me from New Zealand, differs from *W. zschauii* (Pfeffer) in having the first gnathopod quite simple, and thus offers an additional reason for retaining the genus *Waldeckia*, unless indeed *W. chevreuxi* could not have been as appropriately placed under one of the existing genera.

Genus ORCHOMENOPSIS Sars, 1893.

Orchomenopsis nodimanus Walker.

Orchomenopsis nodimanus Walker, 1903A, p. 44, pl. vii. figs. 13–17.
„ „ Stebbing, 1906, p. 721.

South Orkneys, Scotia Bay, Station 325; trap. Many specimens, averaging about 15 mm.

South Orkneys, Scotia Bay; 10 fathoms. March 1903. Three specimens, the largest 13 mm.

South Orkneys, Scotia Bay; 9–10 fathoms. April 1903. One specimen.

Also taken at other times along with *O. chilensis* (Heller).

These specimens agree well with the description given by WALKER, and I have been able to compare them with co-types of his species from the British Museum, and find no essential difference between the specimens from the South Orkneys and those from South Victoria Land. The species in most respects is very similar to *O. chilensis* (Heller), but can be distinguished by the slight carination of the hinder part of the body and by the peculiar structure of the propod of the first gnathopod; in most of my specimens this is a little stouter than is shown in WALKER'S figure, and it bears a tubercle on the posterior surface as described by him.

This species occurred along with *O. chilensis* (Heller) in many captures.

Orchomenopsis chilensis (Heller).

Anonyx chilensis Heller, 1865, p. 129, pl. xi. fig. 5.
Orchomenopsis obtusa Sars, 1891 and 1895, p. 74, pl. xxvi. fig. 2, and p. 684.
Orchomene musculosus Stebbing, 1888, p. 673, pl. xx.
(?) „ *abyssorum* Stebbing, 1888, p. 676, pl. xxi.
(?) „ *cavimanus* Stebbing, 1888, p. 679, pl. xxii.
Orchomenopsis musculosa and (?) *abyssorum* Stebbing, 1906, p. 84.
(?) „ *zschauii* Stebbing (part), 1906, p. 85.

Orchomenopsis proxima Chevreux, 1903, p. 93, fig. 6*a–c*, and 1906B, p. 13.
„ *rossii* Walker, 1903A, p. 45, figs. 18–23, and 1907, p. 14.
(?) „ *abyssorum* Walker, 1903B, pp. 224 and 227.
(?) „ „ Chevreux, 1903, p. 92.

South Orkneys, Scotia Bay, Station 325 ; trap, 15 fathoms. May 1903. Several hundred specimens up to 15 mm. in length, all "taken from trap in one day ; bait—penguin." Taken along with *O. nodimanus*.

Station 411, Coats Land, lat. 74° 1′ S., long. 22° W. ; 161 fathoms. 12th March 1904. Many specimens, most of them of large size, about 20 mm.

South Orkneys, Station 325 ; 21 fathoms. September 1903. "Through hole in ice made for seal skeleton." Many hundreds of specimens of varying size up to 15 mm. Taken along with *O. nodimanus*.

South Orkneys, Station 325 ; 13–25 fathoms. August 1903. Many specimens ; *O. nodimanus* being taken at the same time.

South Orkneys, Scotia Bay ; 9–10 fathoms. May 1903. Many specimens ; also taken along with *O. nodimanus*.

South Orkneys, Station 325 ; 27 fathoms ; temperature 29°. June 1903. Many specimens ; *O. nodimanus* being taken at the same time.

In order to make clear the discussion of this species it will be well to give the following historic account. The genus *Orchomenopsis* was established by Sars in 1893 for the species *O. obtusa*. In 1888 Mr Stebbing had described three species under the genus *Orchomene*, namely :—*Orchomene musculosus*, described from one specimen about 12 mm. long, taken near the south of Japan ; *Orchomene abyssorum*, from the Atlantic, east of Buenos Aires, 1100 fathoms, one specimen, male ; and *O. cavimanus*, from Kerguelen Island, two or three specimens, the one described being 12 mm. long. Of these species Sars included the first two, and with some doubt also the third, in his genus *Orchomenopsis*. Many years before this, however, in 1865, Heller had described the species *Anonyx chilensis* from Chili, and in his revision of the Amphipoda for *Das Tierreich* Stebbing puts the whole of his three species under *Orchomenopsis*, giving *Anonyx chilensis* Heller as a doubtful synonym of *O. abyssorum*, and identifying his species *O. cavimanus* with *Anonyx zschauii* Pfeffer, which had been described from South Georgia in 1888. In 1903 Chevreux described *Orchomenopsis proxima* from specimens obtained from deep waters in the tropical Atlantic Ocean, at the same time identifying other specimens from the Northern Atlantic with *O. abyssorum*, and describing a new species, *O. excavata*, which he stated comes close to *O. cavimanus* (Stebbing). In 1906 he identified specimens obtained by the French Antarctic Expedition from Graham Land with *O. proxima*, pointing out a few small differences between the specimens from the two localities, and stating that the species was very close to *O. obtusa* Sars. Meanwhile, in 1903, Walker had described *O. rossii* from Cape Adare, also referring to its close resemblance to *O. obtusa* ; in 1907 he examined many specimens obtained from South Victoria Land by the *Discovery* Expedition, and

modified his original description in one or two points in which he found that the additional specimens showed some slight variation from those at first described. In 1903 he also had identified as *O. abyssorum* specimens obtained from the Atlantic by the *Oceana*.

The *Scotia* collections contain an enormous number of specimens from the various localities given above, and a comparison of these with co-types of WALKER's species showed that they were the same as the forms described by him under the name *O. rossii*. A comparison of the different specimens from the South Orkneys and other *Scotia* localities with co-types of WALKER's species supplied by the British Museum, and with specimens collected by the *Nimrod* Expedition, showed that the species varied greatly not only in size but also in several points which had been relied upon by previous authors for the description of different species—for example, in the second gnathopod, some of the specimens having the palm strictly transverse, while in others it was slightly produced so as to give the gnathopod almost a chelate character; in the postero-lateral angle to the third pleon, which in some is quadrate and in others more or less broadly rounded; and in the proportions of the two branches of the third uropods. There are, of course, also differences between the sexes, the males having the lower antenna considerably longer than the females, and having the branches of the third uropod supplied with more numerous long plumose setæ, though some similar setæ are present in the female. An examination of young forms appears to show that these setæ are only developed to the full extent in older specimens, there being fewer in younger forms.

I was able also to compare these specimens with a specimen of *O. proxima* Chevreux from Port Charcot, kindly sent to me by Monsieur CHEVREUX, and I have come to the conclusion that this species is the same as *O. rossii*, the differences which M. CHEVREUX points out being accounted for by the variations mentioned above. In the character of the eyes and in other points it is quite the same as a specimen of *O. rossii* of moderate size; on the other hand, as M. CHEVREUX points out, it is considerably larger than the forms from the North Atlantic on which he originally described the species *O. proxima*. From the Vienna Museum I obtained specimens of *Anonyx chilensis* Heller, taken by the *Novara* at Chili. This proved to be about half the size of *O. proxima*; it differs a little in the shape of the eye and in the somewhat smaller size of the rounded prominence on the first segment of the urus, but in all other points I can find nothing to distinguish it from *O. rossii* Walker. In *Anonyx chilensis* the eye is almost oval, widening slightly below, and it is colourless in the spirit specimens and probably was red in the living animal, as described by SARS in *O. obtusa*. In large specimens of *O. rossii* from Antarctic regions, the eye usually differs somewhat in shape, being much narrower above and wider below, and in most of them it is dark in colour in spirit specimens, though in many, and especially in forms preserved originally in formalin, there is still a reddish tinge to be seen. Moreover, even in the Antarctic specimens there is some variation in the size, shape, and colour of the eyes, and consequently I do not think this slight difference sufficient to distinguish *Anonyx chilensis*

Heller from *O. rossii* Walker. Monsieur CHEVREUX had also kindly sent me a specimen of *O. obtusa* Sars from Norway, and an examination of this showed that in size and in all essential characters it was identical with the specimens of *Anonyx chilensis* Heller, though the eye was less oval and more widened below, and hence more like the specimens of *O. rossii*. Consequently I am forced to the conclusion that *O. obtusa* Sars also belongs to this widely distributed species. *O. musculosa* Stebbing was described from a single specimen obtained from the south of Japan, and from the description given I think there can be no doubt that it is the same as the other forms already described. *O. abyssorum* Stebbing is supposed to be distinguished from the other species mainly by the more strictly chelate character of the second gnathopod, and the figure of the *Challenger* specimen shows the palm much more produced than it is in any of the forms I have already referred to, though, as I have pointed out, there is considerable difference among them in this character. In all other points there seems little to distinguish *O. abyssorum* from the others, and, as mentioned above, STEBBING has already given *Anonyx chilensis* Heller as a possible synonym of this species, although the second gnathopod in that form can hardly be described as truly chelate.

For some considerable time I was inclined to think that perhaps it would be wise to keep *O. abyssorum* as a separate species; however, after having finished my examination of the forms already mentioned, I found in the *Scotia* collection a number of specimens from Saldanha Bay in South Africa which in most points are quite similar to *O. rossii*, but in which the second gnathopod has the palm so much produced that it could quite strictly be called chelate, as in *O. abyssorum* Stebbing.

If this form had agreed in other points with STEBBING's *O. abyssorum* it would confirm the opinion that this is a distinct species; but this is not the case, for the first gnathopod, instead of having the basos slender and the propod rather broad, as in the type specimen, is somewhat stouter than usual, and differs also in having the propod considerably narrowed distally, so that its palm is much shorter.* In it the eyes are black, usually oval, though slightly widening below, and they vary in size and in the amount of widening at the lower part. After careful consideration I think it best to include this form also in the same species as the others, although they might perhaps be looked upon as different variety, though not corresponding in all points with the form described as *O. abyssorum* by STEBBING.

If all these forms are combined they must be known under the name of *Orchomenopsis chilensis* Heller, as that name has priority by many years. With regard to *O. cavimanus* Stebbing, from the Kerguelen Islands, STEBBING himself has identified it with *O. zschauii* (Pfeffer); but, as I have shown elsewhere, PFEFFER's species is quite distinct in the shape of the dorsal process on the urus and in the greater stoutness of the body and the character of the first gnathopod, and has been since redescribed by CHEVREUX under the name *Waldeckia obesa*.

* In the stout basos and in the character of the propod the first gnathopod in these specimens shows considerable approach to *O. nodimanus* Walker, but it lacks the tubercle present in that species.

I have examined a mounted slide of *O. cavimanus* Stebbing in the British Museum. The palm of the second gnathopod is hardly so oblique as shown in the figure of the whole appendage in the *Challenger* Report, but is distinctly concave, the finger impinging against a rather narrow projection of the propod and being thus separated from the rest of the palm. This structure seems rather more marked in the one gnathopod than in the other of the same specimen, and the difference from typical specimens of *O. chilensis* is not greater than, or indeed so great as, that of the specimens from South Africa mentioned above, and the other parts of the specimen seem to agree well with that species. In the same way, *O. excavata* Chevreux, from the Atlantic, might perhaps also be looked upon as only a form of the widespread *O. chilensis* Heller, but I have not been able to examine specimens of *O. excavata*.

Orchomenopsis (?) coatsi, sp. nov. (Pl. I. figs. 8–9.)

Station 411, Coats Land, lat. 71° 1′ S., long. 22° W.; 161 fathoms. 12th March 1904. Many specimens, about 13 mm. long.

In general possessing the characters of an *Orchomenopsis*, but differing markedly in the first gnathopoda (fig. 8), which are long and very slender. The basos is long, slender, but expanding at the middle so as to be elongate fusiform; the ischium is fully half as long as the basos; merus shorter; carpus about as long as the ischium, slender; propod longer than the carpus but not broader, narrow, oblong, about four times as long as broad; palm a little oblique; small tufts of setæ on the propod toward the distal end.

The second gnathopod (fig. 9) is of the form normally found in the genus; the carpus is expanded so that the posterior margin is strongly convex, both margins being furred; the propod is much shorter than the carpus, narrowed at the base; palm short, transverse or a little projecting; the margins of the propod are furred, and supplied with long setæ in the usual manner.

Remarks.—The first gnathopoda of this species differ so much from those of other species of *Orchomenopsis* that it should perhaps be classed in some other genus, but I cannot find any genus that seems more appropriate, for in all the other characters it is closely similar to a typical species such as *O. chilensis*, and I therefore prefer to place it provisionally under *Orchomenopsis* rather than to add another genus to the Lysianassidæ.

Genus Harpinia Boeck, 1871.

Harpinia obtusifrons Stebbing.

Harpinia obtusifrons Stebbing, 1888, p. 820, pl. lvi., and 1906, p. 143.
„ „ Walker, 1907, p. 17.
„ „ Chilton, 1909A, p. 619.

South Orkneys, Scotia Bay, Station 325; dredge, 9–10 fathoms. May 1903. One female, 4 mm. long; another female (from Scotia Bay), 7 mm.

These specimens resemble those examined by me from Campbell Island, and differ from the description of the genus as given by STEBBING in *Das Tierreich Amphipoda* in having the eye present and formed of many facets, though it is pale in colour in the smaller specimen.

The species is widely distributed in Antarctic and sub-Antarctic seas.

Genus LEUCOTHOE Leach, 1813–14.

Leucothoe spinicarpa (Abildgaard).

Gammarus spinicarpus Abildgaard, 1789, in O. F. Muller, *Zool. Dan.*, 3rd ed., vol. iii. p. 66, pl. cxix. figs. 1–4.
Leucothoe antarctica Pfeffer, 1888, p. 13, pl. ii. fig. 4.
„ *spinicarpa* Stebbing, 1906, p. 165.
„ „ Walker, 1907, p. 18.
„ *commensalis* Haswell, 1880, p. 261, pl. x. fig. 3.
„ „ Stebbing, 1906, p. 166.
„ „ „ 1910A, p. 580 and p. 630.

South Orkneys, Scotia Bay, Station 325; 9–10 fathoms. April 1903. One specimen, 8 mm. long.

I have been able to compare this specimen with some obtained at South Victoria Land by the *Nimrod*, and with specimens from Plymouth, England, and I agree with Mr WALKER that there is no appreciable difference between them and the European species. The South Orkneys specimen has the conical process on the propod at the base of the finger a little more obtuse than in the others, but in all other points they agree.

With regard to *L. commensalis* Haswell, Mr STEBBING says: "It is perhaps only a matter of taste or convenience whether this should be taken as a distinct species or as a variety of *L. spinicarpa* Abildg." In my South Orkneys specimen the propod of the second gnathopod contracts a little more towards the finger hinge than is shown in SARS' figure of the European form, as it does in the Australian specimens examined by Mr STEBBING; on the other hand, the tuberculation of the palm is practically intermediate between that shown by SARS and by HASWELL, and the resemblance throughout is so very close that I see no good object in retaining a different name for the Australian specimens.

Three other species are at present included in the list of Australian Crustacea, viz. *L. brevidigitata* Miers, *L. diemenensis* Haswell, and *L. gracilis* Haswell; but, as STEBBING points out, it is probable that they should all be included in *L. spinicarpa*, though, as yet, I have not been able to examine specimens. I have, however, examined the type of *L. antarctica* Pfeffer from the Hamburg Museum, and find that it also belongs to this cosmopolitan species.

I may take this opportunity of stating that I have recently (1912, p. 129) united *L. tridens* Stebbing, obtained in New Zealand waters by the *Challenger*, with the

earlier described *L. traillii* G. M. Thomson, as the small differences given in the descriptions were found not to hold for all specimens or to be based on misconceptions. It is not unlikely that this species will also prove to be only a form of *L. spinicarpa* Abildg.

Genus Amphilochus Bate, 1862.

Amphilochus squamosus G. M. Thomson.

Amphilochus squamosus G. M. Thomson, 1880, p. 4, pl. i. fig. 4.
,, *marionis* Stebbing, 1888, p. 743, pl. xxxviii.
,, ,, ,, 1906, p. 151 and p. 723.
,, ,, Walker, 1901, p. 300.

South Orkneys, Scotia Bay, Station 325. Several specimens, all of small size, about 3 mm. long.

These specimens certainly agree with Stebbing's species described from Marion Island, but they are also the same as the species previously described by Thomson under the name *Amphilochus squamosus*, from New Zealand. This latter species, which has been accidentally omitted from the list in *Das Tierreich Amphipoda*, is fairly common in New Zealand, and I have long noted that it is very closely allied to the *Challenger* species, and the present opportunity of examining specimens from another locality that undoubtedly belong to Stebbing's species confirms this. The New Zealand specimens are usually covered with dark, reddish-black spots, and some of the South Orkneys specimens still show signs of similar coloration. Mr Thomson described a small accessory flagellum on the first antenna, and, though this does not appear to have been noted by others in this genus, which is described in *Das Tierreich* as being "without accessory flagellum," it is undoubtedly present also in the South Orkneys specimens. Walker has pointed out that *A. neapolitanus* Della Valle, 1893, is perhaps the same as *A. marionis*; in describing his species Stebbing originally compared it to *A. tenuimanus* Boeck. It will probably be found to be either the same as or very closely allied to one of the northern species. Mr Thomson's name has priority over all except *A. manudens* Bate and *A. tenuimanus* Boeck.

Genus Metopoides Della Valle, 1893.

Metopoides sarsii (Pfeffer). (Pl. I. fig. 10.)

Metopa sarsii Pfeffer, 1888, p. 84, pl. ii. figs. 3, 8, and pl. iii. fig. 2.
Metopoides walkeri Chevreux, 1906A, p. 37, fig. 1; 1906B, p. 28, figs. 15–17.

South Orkneys, Scotia Bay, Station 325; shore pools; temperature 30°–32°. 6th December 1903. Eight specimens, the largest measuring 7 mm. in length in the usual position with the pleon folded under the peræon.

In the collection of Amphipoda in the Hamburg Museum there is a single specimen

of *Metopa sarsii* Pfeffer. This specimen I have been allowed to dissect and mount permanently as a micro-slide, and I find it agrees precisely with *M. walkeri* Chevreux, a name which must therefore be dropped in favour of the older *M. sarsii*.

My specimens agree minutely with Chevreux's description; the accessory flagellum is, I think, present in all the specimens, but it is exceedingly small, so small that it would hardly be inaccurate to say that it is absent. Chevreux describes the palp of the mandible as two-jointed; I think there is a minute third joint present in the specimen from which I dissected the mouth parts, but if so it is almost as small as the accessory flagellum; yet the presence or absence of these minute joints is one of the distinguishing marks for some of the genera into which the family Metopidæ is now divided.

Chevreux was unable to identify his species with any of those described by Stebbing in the *Challenger* Report, but says it seems to be nearest to *Metopa ovata*; but this species has the basal joints of peræopods four and five narrow, and is now placed in the genus *Metopella*. I would rather be inclined to compare it to *M. magellanica* or *M. compacta*, species now placed in the genus *Metopoides*, while the small acute teeth which are present on the palm of the second gnathopod, as described by Chevreux, show an approach to the more irregular palm found in *M. crenatipalma*, a species now known as *Proboloides crenatipalma*.

From the *Challenger* collections Stebbing described six species of *Metopa*—one from Kerguelen Island, the other five from Cape Virgins, off Patagonia; each of which, with one exception, was represented by one specimen only, though of one species another specimen was found at Nightingale Island in the Tristan da Cunha group. Of these six species three are placed in *Das Tierreich Amphipoda* under *Metopoides*, two under *Metopella*, and the other under *Proboloides*. As these genera are separated from one another and from *Metopa* by small points such as those I have mentioned above, and as there are altogether twenty-one species of *Metopa*, six of *Metopella*, three of *Metopoides*, and seven of *Proboloides*, it is not to be wondered at that the classification of the family is admittedly in an unsatisfactory condition, and I think it wisest not to attempt to identify the species under consideration with any of the *Challenger* species, although it is probably the same as one of the species described from Cape Virgins.

The sides of the last segment of the urus are raised into a vertical plate on each side of the telson, and this is continued by a similar vertical plate on the outer edge of the peduncle of the third uropod, so that a groove is formed, protected on each side by these vertical plates or flanges, in which the telson may rest when the animal swims by backward strokes of the hinder part of the body (see Plate I. fig. 10).

Genus Metopella G. O. Sars, 1892.

Metopella ovata (Stebbing).

Metopa ovata Stebbing, 1888, p. 764, pl. xlii.
" " " 1906, p. 183.

South Orkneys, Scotia Bay, Station 325A; dredge, 2–8 fathoms; temperature 29°-30°. 6th December 1903. Several specimens, none exceeding 3 mm. in length.

South Orkneys, Scotia Bay, Station 325; 9–10 fathoms. April 1903. Three small specimens.

Several of these are females bearing eggs, and none can be said to be certainly males. These specimens agree closely with the description given by Stebbing, and have the basal joints of the fourth and fifth pereopods narrowed as given in the diagnosis of the genus. The gnathopods, uropods, and telson are all in close agreement with the figures given in the *Challenger* Report; the accessory flagellum on the upper antenna is present, though extremely small, being about the same size as in *Metopoides sarsii* Pfeffer. The palp of the mandible is short, and consists of a very short first joint, an expanded second joint bearing three setæ along one margin, and a very short third joint tipped by a setum.

Genus Thaumatelson Walker, 1906.

This genus was established by Walker in 1907 for his species *T. herdmani* obtained by the *Discovery* Expedition. The *Scotia* obtained several specimens from the South Orkneys of what appear to be two additional species of the same genus. The genus is mainly characterised by the very peculiar telson, which was described by Walker as "large, entire, oval, and set in a vertical plane on its longer edge." The telson in the two species I have now to describe agrees well with this description. The shape of the telson is probably associated with the extremely large side plates which cover all the appendages when these are withdrawn, and enclose the animal so that it looks like a small bivalve shell; when this is done the pleon is folded in under the side plates which appear to overlap the telson all except a small thicker ridge along its dorsal margin, which fills the small slit between the right and left side plates.

In the mouth parts the genus agrees well with the characters of the family Metopidæ; one species, however, is peculiar in having the second gnathopod chelate.

Thaumatelson walkeri, sp. nov. (Pl. I. figs. 11–15.)

South Orkneys, Scotia Bay, Station 325. April and May 1903. Several specimens, the largest 3 mm. in length.

Specific Description.—In general characters (see fig. 11) similar to *T. herdmani*, but with the side plates even larger, the fourth segment being longer than any of the others

and having an extremely large side plate. The second and third pleon segments not produced into a postero-dorsal tooth, but the third bearing a stout conical tooth projecting at right angles to the dorsal surface of the segment. The first antenna has the first joint much larger than the second or third, and produced at the upper margin into a broad, hood-like process; a minute accessory flagellum is present.

Further Description.—The antennæ (fig. 12) are quite short, the upper one being slightly longer than the lower. It has its basal joint very stout, and is produced above at the distal end into a broad process overlapping the second and nearly as long. The second joint is slightly broader than the third, which is about the same length. The flagellum tapers gradually, and consists of about thirteen joints, all with very few setæ. There is a small accessory appendage.

In the second antenna the last joint of the peduncle is slightly longer and more slender than the preceding; the flagellum is of about the same length as the peduncle, and contains about ten joints.

The mandibles have the same general shape as in *Metopa*; the palp, though small, is less vestigial than in some of the other genera of the family; the first joint is short, the second moderately long and broad, and the third is about as long as the first. There is no molar process. The first maxilla has the palp two-jointed. In the second maxilla the outer lobe is rather longer and broader than the inner. Both these maxillæ, and also the maxillipeds, have the same general character as in the next species, *T. inermis*.

The first gnathopod (fig. 13) has the basos long, widening a little distally; the merus is rather longer than the ischium, and ends in a rounded lobe bearing three long setæ, the posterior margin being furred; the carpus is about half as long as the propod, and is produced posteriorly into a short lobe fringed with setæ; the propod sub-oblong, about twice as long as broad, with anterior margin rather strongly convex; the palm oblique, straight, and defined by stout spinules.

The second gnathopod (fig. 14) is similar in general structure, but is longer; the ischium is not produced into a lobe; the carpus is shorter, but has the lobe longer; and the propod is longer, being considerably more than twice as long as broad.

The peræopoda are slender, and bear only a few short setæ.

The segments of the urus (fig. 15) cannot be made out distinctly, and appear more or less completely fused; the uropoda are long and slender, and bear few setæ; the first uropod reaches beyond the others, and has the peduncle longer than the subequal branches; in the second uropod the peduncle is about the same length as the equal branches; the third has the peduncle slightly longer than the basal joint of the single branch. The telson is flattened so as to form a vertical plate, and has a slight thickening along the dorsal margin.

When the side plates are folded together the strong tooth on the third pleon segment projects backwards, and the whole animal looks very like an Ostracod, some of which were found along with it, having been at first sorted out along with specimens of this species.

Thaumatelson inermis, sp. nov. (Pl. I. figs. 16 and 17.) *

South Orkneys, Scotia Bay, Station 325; 9–10 fathoms. April and May 1903. Several specimens, the largest 3 mm. long.

Specific Description.—Very similar to *T. herdmani* Walker, but differing in having the second gnathopod long and chelate, the propod being produced into a long acute process as long as half the whole propod, the fixed finger finely pectinate and fitting closely against the dactyl, which has its inner margin furnished with small, widely separated serrations.

Further Description.—The form described above is the female, several of the specimens examined bearing eggs. The lateral angle of the head is rather acute; and in the shape of the body, the proportions of the segments and of the side plates, the species closely resembles *T. herdmani*. The eye is fairly large, round, and colourless in spirit, having been probably red in the living animal. In the first antenna the first joint is large and produced at its upper distal angle, though to a slightly less extent than in *T. walkeri*, and I can find no accessory flagellum. In other respects the antenna is similar to that of *T. herdmani*, and the joints of the flagellum bear long sensory setæ. In the lower antenna the last joint of the peduncle is about as long as the preceding, and the flagellum is of the same length. The mandible has the palp small, the first joint is short, the second moderately long, the third small and slender, the cutting edge and other parts having the character common to the family. The first maxilla has the palp two-jointed, its extremity furnished with four or five small spinules and one or two longer setæ; the inner lobe is rounded at the end, and bears three or four setæ; the outer lobe bears several stout spinules and one or two longer setæ, and has its inner margin furred. The second maxilla is of the ordinary form.

The maxillipeds have the inner lobes separate, rounded at the end, and bearing two rather large setæ. The outer lobe is small, being merely a slight extension of the joint as in *Metapoides sarsii*. The palp is similar to that in *T. herdmani*.

The first gnathopod (fig. 16) has the side plate undeveloped; in general shape it is similar to that of *T. herdmani*, but has both the merus and the carpus produced posteriorly into a lobe tipped with long setæ, the process of the merus reaching to the end of that of the carpus. The propod is rather large, and is slightly distended at the palm, which is nearly transverse and is defined by three or four stout spinules.

The second gnathopod (fig. 17) has the basal joints similar to those of *T. herdmani*, but is chelate, as already described. The peræopoda are long, very slender, and bear few setæ or spinules. The side plates of the fourth pair are particularly large, and cover up the fifth, sixth, and seventh pairs, the side plates of which are not developed and the basal joints slender. The first uropod extends considerably beyond the second; the branches are subequal, shorter than the peduncle. The second uropod is short, but extends beyond the third and a little beyond the telson; its branches are subequal.

* This species is perhaps the same as *Thaumatelson nasutum* Chevreux (*Bull. Muséum Hist. Nat.*, 1912, No. 4, p. 5), though the descriptions of the mandibular palp do not agree.

The third uropod reaches a little beyond the peduncle of the second; its single branch is about as long as the peduncle, but rather more slender, and bears a minute second joint. The telson reaches slightly beyond the third uropod, is greatly flattened vertically, and has the dorsal border somewhat thickened, as described in *T. walkeri*.

In many respects this species shows close approximation to *T. herdmani*, described by Mr Walker, from South Victoria Land, but is clearly distinguished by the large chelate second gnathopod. This may, however, ultimately prove to be a sexual character.

Thaumatelson herdmani Walker.

Thaumatelson herdmani Walker, 1906, p. 15, and 1907, p. 21, pl. vii. fig. 11.

South Orkneys, Scotia Bay, Station 325. 1903. A few specimens.

After I had drawn up the description of the preceding species, with the remarks thereon, I found in the "residues" of some collections made during 1903 both additional specimens of that species and also others with subchelate second gnathopoda agreeing in all respects with *T. herdmani* Walker, so that that species also does occur at Scotia Bay. I can find very little difference between the two except in the second gnathopoda, and, as stated above, strongly suspect that both forms belong to the same species; but the additional specimens came into my hands too late to allow of the question being fully investigated.

Genus Bircenna Chilton, 1884.

Bircenna crassipes (Chevreux).

Wandelia crassipes Chevreux, 1906A, p. 87, figs. 1 and 2.
" " " 1906B, p. 45, figs. 24–26.
Bircenna crassipes Chilton, 1909B, p. 62.

South Orkneys, Scotia Bay, Station 325; dredge, 9–10 fathoms. May 1903. One specimen, 2 mm. long.

This small specimen agrees very closely with Chevreux's description and figures.

The species is very close to *B. fulva* Chilton from New Zealand, and differs from it only in the longer and more slender gnathopods, and in having the branches of the first and second uropods equal and shorter in proportion to the peduncles.

Kuria longimana Walker and Scott (1903, p. 228), from the Indian Ocean, appears to be nearest ally of the genus *Bircenna*.

Genus Colomastix E. Grube, 1861.

Colomastix brazieri Haswell.

Colomastix brazieri Haswell, 1880, p. 341, pl. xxii. fig. 4.
" " Stebbing, 1906, p. 206.

South Orkneys, Scotia Bay, Station 325. 1903. Two small females, the larger 3·5 mm. long.

These specimens certainly belong to this genus, and probably to Haswell's species;

but as they are both females of small size, and perhaps not fully mature, the identification is not free from doubt. They agree generally with the description of the species in *Das Tierreich Amphipoda*, but appear to differ in the following points:—

The upper antenna is rather longer and stouter than the lower; the flagellum is very small, and consists of one short joint and two, or perhaps three, very minute ones.

The lower antenna has the fifth joint of the peduncle a little longer than the fourth, and both considerably longer than the third; the flagellum consists of one small joint, followed by one or more very minute ones. There are no serrations to be seen on the lower antenna, the animal in this point agreeing with the description.

The mouth parts were not examined.

The first gnathopod is long and slender, agreeing well with the description.

The second gnathopod has the carpus as long, and at distal end as broad, as the propod. The inner branch of the third uropod scarcely reaches beyond the extremity of the preceding uropods; its upper margin is minutely serrulate; the outer branch is more slender, and is about two-thirds as long. Very minute serrulations are present on the inner branches of the first and second uropods also.

The telson apparently agrees with the description, but could not be fully examined.

It is perhaps doubtful if this species is really distinct from *C. pusilla* (Grube), from the North Atlantic and the Mediterranean, but the *Scotia* specimens appear to differ from it in the proportions of the joints of the lower antenna, and in the absence of serrations on the peduncle. On the other hand, the second gnathopods and the uropods agree quite as well, or perhaps better, with *C. pusilla* than with *C. brazieri*. Another species, *C. hamifera* Kossmann, has been recorded from the Red Sea, but is thought to be probably an immature male of *C. pusilla*. All the three species were combined under the name *C. pusilla* by Della Valle in 1893.

C. brazieri was described from the east coast of Australia. I have taken a specimen in Otago Harbour, New Zealand, that probably belongs to the same species; in the living animal the eye was red as in *C. pusilla*.

Genus Liljeborgia Bate, 1862.

Liljeborgia dubia (Haswell).

Eusirus dubius Haswell, 1880, p. 331, pl. xx. fig. 3.
Liljeborgia dubia Stebbing, 1906, p. 233, 1910A, p. 638, and 1910B, p. 454.
,, ,, Walker, 1907, p. 35.
,, ,, Chilton, 1909A, p. 619.

South Orkneys, Scotia Bay, Station 325; dredge, 9–10 fathoms. June 1903. One imperfect specimen, anterior half of body only; the length of the whole animal would be fully 15 mm.

This fragment seems to belong, without doubt, to this species; it agrees in the peduncles of the antennæ and in the narrower basal joints of the third to fifth

peræopods. In these characters it differs from *L. consanguinea*, which has been taken off South Africa and at Kerguelen and Heard Islands.

Another species, *L. æquabilis*, described by STEBBING, 1910A, pp. 588 and 638, from Australian seas, seems to be closely allied, and all three species present many points of resemblance to *L. fissicornis* (Sars), found in the Arctic and North Atlantic Oceans.

L. dubia is now known from Australia, New Zealand, South Victoria Land, the South Orkneys, and South Africa.

From Mangareva Island, Gambier Archipelago, M. CHEVREUX has described a species, *L. proxima*, 3 mm. long, which is, he says, very near to *L. pallida* (Sp. Bate) and *L. brevicornis* (Bruzelius). It seems also to be very close to *L. dubia* or to *L. æquabilis*, the latter of which is, according to STEBBING, in close agreement with *L. brevicornis*.

Genus EPIMERIA.

Epimeria macrodonta Walker.

Epimeria macrodonta Walker, 1906, p. 16, and 1907, p. 24, pl. viii. fig. 14.

Coats Land, Station 411; trap, 161 fathoms; lat. 74° 1′ S., long. 22° W. 10th March 1904. One specimen, 25 mm. long.

This specimen must, I think, undoubtedly belong to WALKER'S species, but it differs a little in the arrangement of some of the numerous teeth. The first segment of the peræon has a short dorsal tooth and a small lateral tooth; there are no teeth on the short second segment; the other segments of the peræon and those of the pleon bear dorsal and lateral teeth as described by WALKER. The first segment of the urus bears a strong dorsal tooth as described, but on the second segment there is a tooth placed a little laterally on each side on the posterior margin, and there is a lateral carina ending in sharp teeth on the third segment. The first joint of the peduncle of the first antenna bears a long tooth on the under side at the extremity, in addition to the two lateral teeth; the inner tooth on the second joint is much longer than the outer one. The eye is large, round, and projects as a hemisphere from the side of the head; in the spirit specimen it is yellowish in colour.

This species seems to come near to *E. loricata* Sars, which is widely distributed in northern seas, and appears to differ only in the arrangement of the teeth on the pleon and urus, and in the acuteness of the dorsal teeth—points which are probably subject to variation.

Mr WALKER'S specimens were from the Winter Quarters of the *Discovery* in M'Murdo Strait, South Victoria Land.

Genus Pariphimedia Chevreux, 1906.

Pariphimedia integricauda Chevreux.

Pariphimedia integricauda Chevreux, 1906A, p. 39, fig. 25, and 1906B, p. 39, figs. 21–23.

South Orkneys, Scotia Bay, Station 325; shore pools. 4th February 1904. Temperature 32°–35°. One specimen, 13 mm. long.

South Orkneys, Scotia Bay, Station 325; dredge, 4 fathoms, gravel bottom and clumps of weed. 3rd December 1903. Temperature 29°·1. One specimen, 11 mm. long.

These specimens agree well with M. Chevreux's description and figures so far as the external characters are concerned. I have not examined the mouth parts in detail.

His specimens were obtained at Wandel Island.

Genus Acanthonotozoma Boeck, 1876.

Acanthonotozoma australis, sp. nov. (Pl. II. fig. 19.)

Scotia, 18th March 1904. Lat. 71° 22′ S., long. 16° 34′ W.; 1410 fathoms. Station 417. One female specimen; length of body (head to base of telson), 35 mm.

Head and anterior six segments of peræon dorsally rounded; last segment of peræon, the three segments of pleon, and first of urus dorsally carinate. On the first four of these the carina forms a large tooth produced acutely backwards; on the first segment of the urus it is confined to the posterior half of the segment, and is preceded by a slight notch, the whole of the portion in front of which is folded under the preceding segment when the body is fully extended. The carina itself is convex anteriorly, and produced backwards into a very acute point (fig. 19).

Head broad, dorsally convex, curving slightly downwards in front, and ending in a short acute rostrum reaching about half way to end of first segment of upper antenna; lateral margin with a short subacute process below the upper antenna, and with the lower margin produced anteriorly into a rounded process and separated from the rest of the head by a slight furrow.

First side plate produced anteriorly, with anterior angle rounded and posterior angle quadrate; second, anterior angle rounded, posterior subacute; third, much deeper than first and second, posterior angle produced, almost acute; fourth, posterior angle produced acutely inferiorly, the posterior process between the two emarginations subacute; fifth, anterior lobe regularly round, posterior lobe a little deeper, acute, and with a groove below for basal joint of peræopod; sixth, similar, but with anterior lobe smaller and concealed by the fifth side plate; seventh, small and rounded. Lower border of first pleon segment rounded below, the second with lower margin straight and posterior angle produced acutely; both with an oblique ridge running towards the posterior angle. Third segment similar to the second segment, but without ridge.

Eyes completely absent. Upper antennæ reaching considerably beyond peduncle of lower. First joint of peduncle very stout, produced at inner upper angle into a long acute spine reaching beyond the end of second joint, and with a blunter and shorter spine on under outer side; second joint produced into subacute spine on the outer side; third joint with small spines on the outer and inner sides, the outer one tipped with setæ, flagellum longer than peduncle, rather stout, especially towards base, and having some of the basal joints slightly produced below and bearing the sensory setæ.

Lower antennæ as long as head and first five segments of peræon; last joint of peduncle somewhat compressed laterally, longer than preceding, which is slightly keeled above and produced at the extremity.

First gnathopod simple, fairly stout; carpus much broader and longer than propod; the lower margin of merus, carpus, and propod spinose. Second gnathopod similar to first in size and form.

First and second peræopods longer than gnathopods and somewhat slender. Third peræopod much longer than second, its basal joint narrow, with ridge running down the middle of outer side; propod much longer than carpus. Fourth peræopod similar to third, but considerably longer; lower posterior angle of basal joint quadrate and not produced. Fifth peræopod much longer than the fourth; basal joint broader, produced posteriorly at upper part into a rounded lobe below which the margin is deeply concave; postero-inferior angle produced into an acute point reaching almost as far as the end of the ischium.

First uropod with base much longer than the subequal branches and grooved above; branches narrow-lanceolate, ending acutely, the outer one folded in under the inner.

Second uropod similar, but with peduncle as long as inner branch; the outer branch not much more than half the length of inner. Third uropod with peduncle very short, produced above on outer margin into an acute spine which reaches as far as the end of the telson; the two branches subequal, narrow-lanceolate, flat, the outer one folded under the inner. Telson flat, laminar, scarcely narrowed, emarginate posteriorly.

On the whole, this species seems to come fairly well under *Acanthonotozoma*, though it would not be difficult to find points in which it does not quite fit the generic description. Both gnathopoda are simple, but the first is neither slender nor feeble. The mouth parts have not been examined in detail, but do not appear especially drawn out for piercing; the palp of the mandible is slender, that of the maxilliped is small and slender, and shorter than the very large outer plate, which is much larger than the inner plate.

Genus Leptamphopus G. O. Sars, 1893.

Leptamphopus novæ-zealandiæ (G. M. Thomson).

Pherusa novæ-zealandiæ G. M. Thomson, 1879, p. 239, pl. x.c, figs. 2, 2*a–c*.
Panoplæa debilis G. M. Thomson, 1880, p. 3, pl. i. fig. 3.
Oradarea longimana Walker, 1903A, pp. 40 and 56, pl. x. figs. 77–89.

Oradarea longimana Walker, 1907, p. 32.
„ „ Chevreux, 1906B, p. 54.
Leptamphopus noræ-zealandiæ Stebbing, 1906, pp. 294 and 727.
„ „ Chilton, 1909A, p. 621.

South Orkneys, Scotia Bay, Station 325. 1903. A few specimens.

This species is widely distributed in Antarctic and sub-Antarctic seas. It very closely resembles *Djerboa furcipes*, except in the telson, which is undivided. Fuller details concerning it will be found under the last reference given above.

Genus Haliragoides O. Sars, 1893.

Haliragoides australis, sp. nov.

South Orkneys, Scotia Bay, Station 325; 9–10 fathoms. May 1903. A few small specimens, about 3 mm. long; all very delicate and fragile.

The specimens are almost too delicate and fragile to allow of a full description, but there is no doubt that they belong to this genus, and that they come pretty close to *H. inermis* (O. Sars) from the northern seas. They appear to differ in having the first and second segments of the pleon slightly produced backwards into a small dorsal tooth; the postero-lateral angle of the third pleon segment is produced to a small acute tooth. The head has a more distinct rostrum curving considerably downwards; the eye is large, well-developed, oval, but colourless in spirit specimens. The first gnathopod differs in having the propod somewhat narrowed at the base and the palm slightly shorter than the hind margin. In all other points that can be observed the specimens seem to be very close to *H. inermis*.

The occurrence of this species at the South Orkneys adds another to the list of cases where a northern species of a genus is represented in the south by the same species or by one closely allied.

Genus Eusirus Kröyer, 1845.

In order to make clear what is now known about the species of *Eusirus* from sub-Antarctic seas it seems desirable to give the following historical account:—

In 1880 G. M. Thomson identified specimens from New Zealand with the northern species *E. cuspidatus* Kröyer, but distinguished them as a new variety, *antarctica*.

In 1888 Stebbing examined two specimens collected by the *Challenger*, one from Kerguelen and the other from Heard Island, and referred them to *E. longipes* Boeck, another northern species, saying that they were distinguished from *E. cuspidatus* by the absence of the spine-teeth from the apex of the second joint of the maxilliped palp.

In 1893 Sars in identifying specimens from the Lofoten Isles with *E. longipes* gave the points which he considered distinguish it from the other species, and said that the form recorded under this name from the *Challenger* Expedition is scarcely identical with Boeck's species.

In the same year Della Valle included all the forms mentioned above under *E. cuspidatus*.

In 1903 Walker described a new species, *E. lævis*, from the *Southern Cross* Expedition, and said: "It may be easily distinguished from the other known species by the absence of dorsal teeth on the segments and by the entire margins of the third metasome segment and the first joints of the peræopoda. From *E. cuspidatus*, var. *antarctica*, Thomson, it is separated by the conspicuous dactylus of the maxillipeds."

In 1906 Stebbing combined the *Challenger* specimens with those described by Thomson, and gave them under the name *E. antarctica*, thus raising Thomson's variety to the rank of a species. In describing it he says it is "exceedingly like *E. propinquus*" —another northern species.

In 1907, from the National Antarctic Expedition, Walker examined many specimens of *Eusirus*, some of them of large size. These he referred to *E. propinquus* G. O. Sars, giving a few points in which they differ, but stating that these are due to age. At the same time he described another new species, *E. microps*, "recognisable by the relatively small eyes and slender hirsute legs. From its nearest ally, *E. holmi* H. J. Hansen, it differs in the structure of the gnathopoda." He makes no further comparison of these specimens with either *E. antarctica* or *E. lævis*.

In the same year Chevreux described two specimens obtained by the French Antarctic Expedition as the male and female of a new species, *E. laticarpus*.

It will thus be seen that the question is already pretty complicated, and that the path of anyone endeavouring to identify species of *Eusirus* from Antarctic seas is by no means free from difficulty.

Eusirus antarcticus G. M. Thomson.

Eusirus cuspidatus, var. *antarctica*, G. M. Thomson, 1880, p. 4, and 1881, p. 26.
„ *longipes* Stebbing, 1888, p. 965, pl. lxxxvii.
„ *antarcticus* Stebbing, 1906, p. 340.
„ *propinquus* Walker, 1907, p. 30.
„ *laticarpus* Chevreux, 1906b, p. 149, figs. 27–30.
(?) „ *lævis* Walker, 1903a, p. 55, pl. x. figs. 70–76.

South Orkneys, Scotia Bay, Station 325; 9–10 fathoms. June 1903. One male, not well preserved.

Station 201, lat. 59° 43′ S., long. 30° 44′ W.; in clear water among floe, surface. 13th February 1903. Temperature 30°·1. One female.

Off Coats Land, lat. 72° 31′ S., long. 19° 00′ W.; vertical net, 1–1000 fathoms. 5th March 1904. Temperature 30°. One female.

Station 411, Coats Land, lat. 74° 1′ S., long. 22° W.; 161 fathoms. One specimen.

These specimens agree in nearly all respects with the description given by Chevreux of *E. laticarpus*. The females agree with his, and differ from the male in

the much longer and more slender antennæ and in the greater depth of the cleft in the telson; the eye is rather small, oval, or very slight reniform. These specimens are therefore somewhat different from the specimens from Kerguelen Island described by Stebbing in the *Challenger* Reports. I think, however, that Chevreux is right in considering the two specimens examined by him as male and female of the same species, for, in addition to the female specimens of which I have spoken above, I have one specimen from Station 325 which by the character of the antennæ is almost certainly a male, and it agrees very closely with the form described by Chevreux as the male. It has the teeth at the end of the antennal joints a little longer than is shown in his figures, but they are arranged in the same way, and the difference in degree is probably due to age. This specimen, like his, has the eyes large, oval, and, in the spirit specimen, of a reddish-brown colour. I have carefully compared it with the full description given by Stebbing of the *Challenger* specimens, and it agrees minutely in everything except that the telson is less deeply cut. My specimen is, however, about 12 mm. long, while his is only 7·5 and was probably immature. This seems to be confirmed by the fact that the antennæ in it are not modified in the special way described by Chevreux. In the young male we would naturally expect to find the telson more like that of the female. Walker also has stated that the cleft in the telson becomes shallower in older forms.

From the resemblance of my specimens to those described by Chevreux, and of the male to Stebbing's, I cannot help coming to the conclusion that *E. laticarpus* must be specifically identical with *E. antarcticus*.

To this species must, I think, be added the forms referred by Walker to *E. propinquus*. I have been fortunately able to examine two specimens obtained by the *Nimrod* in the same locality as Walker's specimens, and I cannot find sufficient differences to separate them from the *Scotia* specimens. They are 7·5 mm. long, and appear to be males, having the antennæ short and provided with calceoli; the eyes are nearly round, of moderate size, and the telson has the cleft deeper—nearly as deep as in the form figured by Chevreux as the female. The other characters agree very closely, and the points of difference noted are probably due to age. The back of the pleon and of the posterior portion of the peræon is somewhat scabrous.

Stebbing has given the apparent absence of calceoli as one of the characters of *E. antarcticus*, but I expect they will, as in so many other species, be found to be normally present in fully mature males. They are certainly present in my *Nimrod* specimens, though, as stated above, these specimens may be more or less immature; the calceoli are, however, extremely delicate, and appear much more elongated than is usually the case, and a character that is much more easily observed is the downward projection of every second joint of the flagellum as described and figured by Chevreux. The male specimen from Station 325 is not in a sufficiently good state of preservation (having apparently been partially dried) to show the calceoli, but the antennæ show the other modifications of the male. Walker makes no mention of calceoli in his speci-

mens, nor of the sexual differences, but states generally that the length of the flagellum of the antennæ and of the cleft in the telson varies with age.

It will be seen that, as STEBBING points out, this Antarctic species is very close to *E. propinquus* of northern seas, and probably WALKER is correct in definitely identifying it with that species; the resemblance, however, to other northern species, *e.g. E. longipes*, is also very close, and I think it will be better in the meantime to leave the southern form under a distinctive name. The differences between all the described species of the genus are very slight, and probably further research will lead to a reduction of the number.

E. lævis Walker was described from a single specimen, the size of which is not given; from the shortness of the flagella of the antennæ and of the projections of the carpus, and from the absence of dorsal teeth, it seems likely that it was an immature specimen, perhaps belonging to this species.

With regard to *E. microps* Walker I do not feel able to express any definite opinion; some of the specimens were of large size, and the long antennæ would indicate that they were females, but, on the other hand, the telson is only very slightly cleft.

M. CHEVREUX has recently (1911B, p. 405, fig. 3), described another species, *E. bouvieri*, from the South Sandwich Islands, but in view of the variations in this species described above, it seems doubtful if the differences noted in the dorsal margin of the first segment of the urus, and in the smaller depth of the cleft of the telson, are of very much importance. His single specimen was an ovigerous female, but has the short antennæ which appear to be the mark of the male as pointed out by CHEVREUX himself in *E. laticarpus*.

Eusirus splendidus, sp. nov. (Pl. II. fig. 20.) *

South Orkneys, Scotia Bay, Station 325. 15th August 1903. 54 fathoms. Two specimens, both males: No. 1, 30 mm., No. 2, 35 mm. in length of body.

First four segments of peræon slightly compressed; hinder portion of body much compressed, carinate, with pronounced dorsal teeth projecting backwards on the three last segments of peræon and on the three segments of pleon; first segment of urus with dorsal depression followed by slight carina on the posterior portion; second and third rounded. Side plates 1–4 slightly deeper than their respective segments; first produced anteriorly into a rounded lobe reaching nearly to anterior margin of head, its posterior angle with two or three teeth; second and third rounded below, with two or three small teeth at the posterior angle; fourth broader, its posterior margin produced into a subacute lobe below the fifth, lower margin rounded, posterior margin below production serrate; fifth with the posterior lobe deeper than the anterior; sixth with the posterior lobe produced downwards, much deeper and broader than the anterior; seventh, small, rounded below, not divided into lobes. Epimeral plate of the first pleon segment narrowly rounded below; second, much broader, rounded anteriorly, posterior

* Probably the same as *Eusirus perdentatus* Chevreux (*Bull. Muséum Hist. Nat.*, 1912, No. 4, p. 10).

angle quadrate and very slightly produced; third, rounded anteriorly, inferior margin slightly convex, posterior more strongly convex, posterior angle quadrate (fig. 20).

Eyes large, prominent, oval, less darkly pigmented in the larger specimen. Upper antennæ more than half the length of the body, first segment stout, with sharp tooth below and smaller lateral teeth at its extremity; second as long as the first, but much more slender, ending in numerous sharp teeth which are almost as long as the third joint; third joint very short, also ending in sharp teeth; flagellum much longer than the peduncle, many-jointed, each second joint produced below and bearing calceoli in addition to other setæ, proximal joints very short; accessory flagellum slender.

Gnathopoda similar to those of *E. antarcticus*, but with the propod broader; second gnathopod slightly larger than the first; first and second peræopoda very slender, longer than the gnathopoda; third, fourth, and fifth pairs increasing in length, the fifth being about as long as the peræon and pleon combined. First uropod with outer branch about two-thirds the length of the inner, which is as long as the peduncle; second with outer branch half the length of the inner and as long as the peduncle; third with peduncle short, branches subequal and slender; telson more than twice as long as the peduncle of third uropod, very narrow, with two slight lateral ridges on the upper surface and a shallow central groove between them; cleft not more than one-sixth the length, the two posterior lobes very acute and widely divergent.

Length of body: up to 35 mm.

It is only with great reluctance that I establish this new species, but the compression of the hinder part of the body and its production into carinal teeth is carried to a much greater degree than in any of the species of *Eusirus* known to me. In all the specimens of *E. antarcticus* only the pleon segments are produced into teeth, with occasionally a small tooth on the last segment of the peræon; and until transitional forms are known it will, I think, be safer to rank the present specimens as a separate species. There are also some differences in the uropoda, but whether these are merely associated with age or not I cannot say.

The general resemblance to *E. antarcticus* in the appendages is, however, so great that I should not be surprised if it proves ultimately to be a special form of that species. Walker has, however, had larger specimens before him which apparently showed only the normal amount of carination.

Genus Eurymera Pfeffer, 1888.

Eurymera monticulosa Pfeffer.

Eurymera monticulosa Pfeffer, 1888, p. 103, pl. i. fig. 3.
„ „ Stebbing, 1906, p. 357.
„ „ Chevreux, 1906b, p. 59, figs. 34–36.

South Orkneys, Scotia Bay, Station 325; dredge, 4 fathoms, gravel bottom, clumps of weed. 3rd December 1903. Temperature 29°·1. One specimen, imperfect, 15 mm.

This agrees well with the descriptions given by PFEFFER and CHEVREUX, except that the third uropod does not extend much beyond the others. In the upper antennæ every second joint of the flagellum is slightly expanded below and bears sensory setæ, thus having somewhat the appearance of the flagellum in *Paramœra austrina*; in this character the antennæ agree exactly with the original description given by PFEFFER.

I have been able to compare my specimen with those in the Hamburg Museum originally described from South Georgia by Dr PFEFFER, and thus to confirm the identification.

M. CHEVREUX records the species from Booth Wandel Island.

Genus BOVALLIA Pfeffer, 1888.

Bovallia monoculoides (Haswell).

Atylus monoculoides Haswell, 1880, p. 327, pl. xviii. fig. 4.
Bovallia gigantea Pfeffer, 1888, p. 96, pl. i. fig. 5.
„ „ Chevreux, 1906B, p. 54, figs. 31–33.
„ „ Stebbing, 1906, p. 357.
Eusiroides monoculoides Stebbing, 1906, p. 345, and 1910A, p. 595.
„ „ Chevreux, 1908, p. 475.
„ *crassi* Stebbing, 1906, p. 346, and 1910A, p. 594.
„ *cæsaris* Stebbing, var. Walker, 1904, p. 264, pl. iv. fig. 22
Bovallia monoculoides Chilton, 1909A, p. 622.

Several specimens from shore pools and moderate depths at South Orkneys, Scotia Bay, Station 325. Largest specimen 37 mm. long.

These specimens agree well with the descriptions of *Bovallia gigantea* given by PFEFFER and CHEVREUX. They have the last segment of the peræon and the first two segments of the pleon carinate and produced into an acute dorsal tooth; the third segment of the pleon bearing a blunt tooth. In smaller specimens these teeth are less marked. They thus agree also with the description originally given by STEBBING for *Eusiroides cæsaris*, but they differ from it in having the posterior margin of the third segment of the pleon slightly convex and without serrations. The accessory flagellum of the first antenna is present, but is small, and appears to be united with the third joint of the peduncle much in the same way as I have described for the specimens of *Atylus megalophthalmus* Haswell, which are now considered to be a form of the widely spread *Paramœra austrina* (Bate).

Through the kindness of the authorities of the Hamburg Natural History Museum, I have been able to examine co-types of *Bovallia gigantea* Pfeffer from South Georgia. These are larger than the largest *Scotia* specimens, and the dorsal teeth are slightly less acute, but there is no difference of any importance. That the dorsal teeth are subject to considerable variation was already known from their varying development in the three species of *Eusiroides* originally described by STEBBING. Two of these, *E. cæsaris* and *E. pompeii*, were united by STEBBING in the *Das Tierreich Amphipoda*, and

identified with *Atylus monoculoides* Haswell. In 1909 I urged reasons for uniting with it the third species also, *i.e.* *E. crassi*, and pointed out the identity of the whole with *Borallia gigantea*.

About the same time STEBBING independently examined additional specimens from Australia, and, speaking of *E. crassi*, said: "Whether this can be retained as a species distinct from *E. monoculoides* seems doubtful."

The amount of serration on the posterior margin of the third pleon segment may be considerable, as in the form described under the name *E. cæsaris*, or may be altogether absent, as in the specimens now before me. This variation has already been referred to by STEBBING, WALKER, CHEVREUX, and myself, and need not be further discussed.

Along with some of the specimens which he described under the name "*E. cæsaris* Stebbing, *var.*" WALKER found an ovigerous female, 5 mm. long, which with some hesitation he described as a new species, *E. orchomenopsis*, the main difference being that in the third uropoda the outer branch is much the longer and has a terminal joint. Mr WALKER is disposed to think that, though sexually mature, this specimen has not attained the full mature characters.

Genus PONTOGENEIA Boeck, 1871.

Pontogeneia danai (G. M. Thomson).

Atylus danai G. M. Thomson, 1879, p. 238, pl. x.c, fig. 1.
„ *lippus* Haswell, 1880, p. 328, pl. xx. fig. 1.
Eusiroides lippus Stebbing, 1906, p. 346.
Pontogeneia danai Stebbing, 1906, p. 360.
„ „ Chilton, 1912, p. 130.

Falkland Islands, Cape Pembroke, Station 118; among calcareous algæ. January 1903. Several specimens, some poorly preserved, the largest 6 mm. long.

Some specimens appear to have been partially dried, and it is not easy to make out the necessary points in the antennæ with certainty, but others better preserved show that they differ from the next species in having every fourth or fifth joint of the flagellum of the upper antennæ produced below and crowned with a tuft of sensory setæ; in *P. antarctica* every *third* joint is dilated to a less extent. In both species the dilatations are closer together on the six or seven basal joints of the flagellum. In the present species, too, the antennæ are more nearly equal in length, the gnathopoda are more slender, and the telson is perhaps rather more deeply cleft. The differences—particularly the one last mentioned—are all rather slight.

I have been able, since the above paragraph was written, to compare the Falkland Island specimens with specimens of *P. danai* G. M. Thomson from New Zealand, and think they must be considered the same. In the Falkland Island specimens the peduncle of the upper antenna bears rather longer setæ on the under surface, but it also bears on that surface a number of calceoli on slight projections, giving a scabrous appearance which is well marked in the New Zealand specimens.

Mr Stebbing has put *Atylus lippus* Haswell down as a doubtful species of *Eusiroides*, but I have specimens from Sydney Harbour that I think certainly belong to Haswell's species, and these I cannot distinguish from the species common on New Zealand coasts which was described as *Atylus danai* by Mr Thomson. The species is therefore now known from Australia, New Zealand, and the Falkland Islands, and probably extends round the globe in sub-Antarctic seas.

Pontogeneia antarctica Chevreux.

Pontogeneia antarctica Chevreux, 1906A, p. 72, fig. 2, and 1906B, p. 69, figs. 40 and 41.
„ „ Chilton, 1909A, p. 624.

South Orkneys, Scotia Bay, Station 325 ; in shore pools and at moderate depths. Several specimens, the largest 6 mm. long.

These specimens agree well with Chevreux's description, and can be distinguished from the preceding most easily by the character of the upper antennæ, as described above.

Though this species seems to be a true *Pontogeneia*, yet in the somewhat slender antennæ it makes some approach towards the genus *Paramœra*, and at the end of the third joint of the upper antenna there is a short process tipped with one or two long hairs that appears to represent a vestigial accessory flagellum, but it is fused with the third joint of the peduncle somewhat as appears to be the case in *Atylus megalophthalmus* Haswell, which is looked upon as a variety of *Paramœra australina* (Bate). *Pontogeneia antarctica* is, however, clearly distinguished from *Paramœra* by having every *third* joint of the primary flagellum expanded below, instead of every second, and also by the lobes of the telson being rounded posteriorly.

The species is known from Auckland and Campbell Islands, from Flanders Bay and Booth Wandel Islands, as well as from the South Orkneys, and thus appears to represent *P. danai* in colder and more southerly seas.

Genus Atyloides Stebbing, 1888.

Atyloides magellanica (Stebbing). (Plate I. fig. 18.)

Atylopsis magellanica Stebbing, 1888, p. 925, pl. lxxix.
Pontogeneia magellanica Stebbing, 1906, p. 360.
„ „ Walker, 1907, p. 33, pl. xii. fig. 20.
„ „ Chevreux, 1906B, p. 64, figs. 37–39.
Atyloides magellanica Chilton, 1909A, p. 627.

South Orkneys, Scotia Bay, Station 325 ; shore pools. 2nd February 1904. Temperature 32°–35°. Numerous specimens, the largest about 10 mm. long.

These agree well with the description of this species given by Chevreux. It is evident that the telson varies to some extent. Chevreux figures it with a seta arising from a slight notch on each half. Walker says "the divisions of the telson are smooth and rounded at the tips," and shows it with the sides converging and convex, without

terminal setæ or noteh. In one specimen I find one half with a noteh and the other without (Plate I. fig. 18); in others it closely resembles the figure given by Chevreux.

The species is found in all sub-Antarctic seas.

Atyloides serraticauda Stebbing.

Atyloides serraticauda Stebbing, 1888, p. 920, pl. lxxviii., and 1906, p. 36.
" " Walker, 1907, p. 33.
" " Chevreux, 1906B, p. 87.
" " Chilton, 1909A, p. 627.
(?) *Schraderia gracilis* Pfeffer, 1888, p. 141, pl. ii. fig. 5 (no description, only one figure).

South Orkneys, Scotia Bay, Station 325; shore pools. 2nd February 1904. A few specimens, the largest 12 mm. long.

In fully grown specimens this species may be recognised by the long antennæ, gnathopoda, and peræopoda, and particularly by the serrations on the side plates and on the hinder margin of the third pleon segment. These serrations may, however, be almost completely absent in smaller specimens, and the species is by no means so easy to recognise, and the identification then depends mainly on the telson.

Schraderia gracilis was named in 1888 by Pfeffer, but not described, only a general figure of the whole animal being given. This figure without drawings of the separate appendages is quite insufficient for identification in this group, which contains so many species very nearly alike in general appearance; and as it is not now possible to ascertain from which individual specimen the drawing was made, Pfeffer's species must remain doubtful. There are several specimens in the collection of the Hamburg Museum labelled "*Schraderia gracilis*," and these prove to belong to the species now under consideration, *Atyloides serraticauda* Stebbing.

The species is widely distributed in Antarctic and sub-Antarctic seas.

Atyloides calceolata, sp. nov. (Plate II. figs. 21–23.)

South Orkneys, Scotia Bay, Station 325; 10 fathoms. A few specimens, mostly imperfect, about 5 mm. long.

Specific Description.—Similar to *Atyloides serraticauda* in general shape of body, in the serrations on the anterior side plates, the posterior margins of the basal joints of the peræopoda, the posterior margin of the third segment of the pleon, and in the telson; differing mainly in the antennæ. The first antenna (fig. 21) with the first joint longer and considerably stouter than the second, its lower margin bearing distally an acute spine with another shorter spine placed laterally, a few long setæ near the end joint; second joint bearing on its under surface two well-marked calceoli of characteristic shape, one on a little prominence at a short distance from the proximal end and the other near the distal end, some fine setæ at the end of the joint; third joint short; the whole antenna about as long as the body.

Second antenna (fig. 21) with the gland cone very acute; the third joint short, pro-

duced inferiorly into one or two distal teeth, and with a spinule on the upper side; fourth joint twice as long as the third, bearing on its upper surface two calceoli, each on a slight projection similar to those on the second joint of the upper antenna, a few fine setæ scattered on both margins of the joint and at the distal end (rest of antenna missing).

Gnathopods (figs. 22 and 23) similar in general shape to those of *A. serraticauda*, but not quite so slender, the second gnathopod having the propod much longer than the carpus, sub-oblong, but expanding somewhat towards the palm, which is slightly oblique and defined by one or two small spinules, the whole of the long hind margin bearing short tufts or transverse rows of spinules.

The peræopoda similar to those of *A. serraticauda*; the third uropod rather short, branches not very much longer than the base, lanceolate, and bearing spinules and fine serrations on the margin; telson cleft for about two-thirds its length, each half oblong, posterior margin of each truncate and divided into about eight or nine fine teeth.

I have only a few specimens of this species, and in most of them portions of the antennæ and some of the other appendages are broken off; but the arrangement of the calceoli on the peduncles of the antennæ seems characteristic, and differs from that in any of the allied species known to me.

Genus Paramœra Miers, 1875.

Paramœra austrina (Bate).

Atylus austrinus Spence Bate, 1862, p. 137, pl. xxvi. fig. 4.
Paramœra australis Miers, 1875, p. 75.
Atyloides australis and *A. assimilis* Stebbing, 1888, p. 914, pl. lxxv., and p. 918, pl. lxxvii.
Megamœra fasciculata G. M. Thomson, 1880, p. 5, pl. i. fig. 5.
Stebbingia gregaria Pfeffer, 1888, p. 110, pl. ii. fig. 7.
" " Stebbing, 1906, p. 358.
Paramœra austrina Stebbing, 1906, p. 363, 1910A, p. 640, and 1910B, p. 450.
" " Chilton, 1909A, p. 625.

Specimens of this species were obtained from the following stations:—

South Orkneys, Scotia Bay, Station 325; 10 fathoms.
" " Scotia Bay, Station 325A; dredge, 2–8 fathoms, gravel and clumps of weed; temperature 29°–30°. 6th December 1903.
" " Scotia Bay, Station 325; dredge, 9–10 fathoms. April 1903.
" " Scotia Bay, Station 325; dredge, 4 fathoms, gravel bottom and clumps of weed; temperature 29°·1′. 3rd December 1903.
" " Scotia Bay, Station 325; 5–10 fathoms; temperature 31°·5′. 2nd January 1904.
Falkland Islands, Station 118; shore. 7th January 1903.
" " Cape Pembroke, Station 118; shore pools. January 1903.
Gough Island, Station 461; trap, 75 fathoms. 21st April 1904.
" " Station 461; off floating kelp. 21st April 1904.

A special variety of the species was obtained as follows:—

South Africa, entrance to Saldanha Bay; 25 fathoms. 21st March 1904.

This species is one that is very widely distributed in sub-Antarctic seas, and is usually found in shore pools or in shallow waters around the coast. It has been pointed out by several authors that specimens of it vary considerably; probably when the different forms are carefully compared it may be possible to distinguish several local varieties, but I think, in the present state of our knowledge, that Mr Stebbing is right in uniting the various forms under this one name.

Through the kindness of the authorities of the Hamburg Museum I have been able to examine the type and other specimens of *Stebbingia gregaria* Pfeffer, and I find that they undoubtedly belong to this species. Several of them are of comparatively large size, but they show no distinction of importance from the ordinary form, and the small accessory flagellum of the upper antenna is present. Various authors have described this accessory flagellum as being absent in the specimens examined by them, and, though I have usually been able to find it, there are a few specimens that I have seen in which I have been unable to do so, although in all other points they seem to belong to the species; and there seems little doubt, as pointed out by Walker and others, that in this as in some other species the small accessory flagellum may sometimes be actually absent; probably this is more commonly the case in older forms.

Of the local varieties I can at present indicate two:—

(1) The form described under the name *Atylus megalophthalmus* Haswell. In this form the head has a rostrum nearly half as long as the first joint of the upper antenna; the accessory flagellum, though apparently present, is small, short, and fused to the third joint of the peduncle; and the telson has the posterior portion of each lobe somewhat rounded and without setæ.

(2) The forms mentioned above from South Africa, Saldanha Bay. In general appearance, and in the antennæ and gnathopods, etc., these agree closely with forms from other localities, but they differ somewhat markedly in the telson, the posterior portion of each lobe of which is cut into three or four acute teeth and is without setæ. In some forms from other localities there may be two such teeth, but, so far as I know, not more, and the telson usually bears two or more long setæ on each lobe. The telson in the Saldanha Bay variety closely resembles that described by Chevreux for *Atyloides longicornis* from Port Charcot, etc., a species which appears to me to be little more than a variety of *Paramæra austrina* in which the accessory flagellum is absent and the gnathopods are rather small.

Even in the more typical forms there seems to be considerable variation in the size and shape of the gnathopods. In some the propod is oblong, with the palm almost transverse, as shown by Mr Stebbing in his drawings of *Atyloides australis* Miers; in others the propod is more oval, with the palm somewhat oblique; the length of the carpus is also subject to variation, and the setæ seem to be more abundant on the antennæ and gnathopods in some specimens than in others.

This species had been recorded from South Africa by Mr Stebbing under the name of *Atyloides assimilis*, from a specimen found on the screw of the *Challenger* off Cape Agulhas. Mr Stebbing's figure of the telson shows some approach to that of the Saldanha Bay specimens, but each lobe bears only two acute teeth.

Genus Djerboa Chevreux, 1906.

Djerboa furcipes Chevreux.

Djerboa furcipes Chevreux, 1906b, p. 74, figs. 42–44.

South Orkneys, Scotia Bay, Station 325; 10 fathoms. (No date.) A few specimens, the largest 15 mm.

South Orkneys, Scotia Bay, Station 325; 15 fathoms. April 1903. Six specimens, the largest 18 mm. long.

These specimens agree well with the description and figures given by Chevreux. They bear a very close and striking resemblance to *Leptamphopus novæ-zealandiæ*, and it is very difficult to distinguish the two species without dissecting off the telson, which is deeply cleft in *Djerboa furcipes* but undivided in *Leptamphopus novæ-zealandiæ*; in the first species, however, the integument is marked by a number of short marks arranged more or less in parallel lines, and in doubtful cases this helps as a guide to their identification.

Genus Paraceradocus Stebbing, 1899.

Paraceradocus miersii (Pfeffer).

Megamœra miersii Pfeffer, 1888, p. 121, pl., fig. 3.
Paraceradocus miersii Stebbing, 1906, p. 429.
„ „ Chevreux, 1906b, p. 93.

South Orkneys, Station 325; from stomach of Weddell seal. 4th January 1904. One male, 45 mm. long.

South Orkneys, Station 325; dredge, 9–10 fathoms. 17th August 1903. One female, 22 mm. long; June 1903, one female, 20 mm.

In the large specimen all the segments of the peræon and pleon are rounded dorsally; the pleon is slightly compressed but not carinate; teeth are present on the first and second segments of the urus as described; the third uropods are missing. The female specimens also show no carination on the peræon or pleon, and have the third uropods of moderate size only. The upper antennæ are considerably longer than half the body; the second joint of peduncle is as long as the first, and the flagellum is considerably longer than the peduncle. In the lower antennæ the flagellum is longer than the last joint of the peduncle. Except for the absence of carination, the specimens agree closely with Pfeffer's description.

This fine species is now known from South Georgia, South Orkneys, Port Charcot, Booth Wandel and Hovgaard Islands.

Genus Mæra Leach, 1813.

Mæra mastersii (Haswell).

Megamæra mastersii Haswell, 1880A, p. 265, pl. xi. fig. 1.
„ *thomsoni* Miers, 1884, p. 318, pl. xxxiv. fig. B.
Mæra mastersii Stebbing, 1906, p. 439.
„ „ Chilton, 1911, p. 594.

South Africa, entrance to Saldanha Bay, Station 483; 25 fathoms. Five specimens, the largest 10 mm. long.

Although they show some differences, I think these specimens may be referred to this species. On the whole they agree fairly well with Haswell's description; and if the form described as *Megamæra thomsoni* by Miers really belongs here, the species is evidently a variable one. My specimens differ from the description given by Stebbing in *Das Tierreich* in the following points:—The third segment of the pleon has the posterior angle produced so as to be acute, but the hind margin is hardly denticulate; the eyes are small, almost round; in the upper antenna the first joint has a stout spinule at its lower distal margin, the accessory flagellum contains seven joints; the flagellum of the second antenna is considerably longer than the last joint of the peduncle. In the first gnathopod the carpus and propod are hardly slender, each having the posterior margin convex and agreeing fairly well with Haswell's description; this appendage shows considerable resemblance to that of *Elasmopoides chevreuxi* Stebbing, but the carpus and propod have the hind margins less strongly convex than in that species. The second gnathopod agrees well with the description. The third, fourth, and fifth peræopoda are fairly stout, the basal joint has the hind margin only finely serrated. The uropoda and the telson agree well with Haswell's description. The specimens are colourless (in spirit) and do not show the light yellowish-brown colour mentioned by Stebbing, which was present in the Kermadec Island specimens I examined in 1911. In the rather stout peræopoda and in some other points they have rather the appearance of an *Elasmopus*.

This species is widely distributed in the warmer southern seas.

Genus Paradexamine Stebbing, 1899.

Paradexamine pacifica (G. M. Thomson).

Dexamine pacifica G. M. Thomson, 1879, p. 238, pl. x.B, fig. 4.
Paradexamina pacifica Stebbing, 1906, p. 518.
„ „ Chilton, 1909A, p. 632.
Paradexamina fissicauda Chevreux, 1906B, p. 88, figs. 51–53.

South Orkneys, Station 325; 9–10 fathoms. April and May 1903. Four specimens, the largest 17 mm. long.

South Orkneys, Scotia Bay, Station 325; 2–8 fathoms, gravel and clumps of weed. Temperature 29°–30°. 6th December 1903. Several specimens, the largest 14 mm. in length.

These specimens are in most respects intermediate between *P. pacifica* and *P. fissicauda*. They agree with the latter species, except that the last segments of the peræon are without dorsal teeth, or, in the largest, with a small tooth on the last segment only. In this species, as in so many others, the dorsal teeth evidently vary, for Stebbing notes the same thing in his description of *P. pacifica*. The *Scotia* specimens have the lateral angle of the head rounded, as in *P. fissicauda*, and they resemble that species also in the greater stoutness and the proportions of the joints of the antennæ and peræopoda; the telson, however, is not split right to the base, but only very deeply, as in *P. pacifica*.

Through the kindness of Mr Stebbing I have been able to examine specimens of *P. pacifica* from New Zealand sent to him years ago by Mr Thomson. The comparison of these with the *Scotia* specimens shows that it is not possible to maintain the two as separate species. In the carination of the body, in the uropoda and telson, the New Zealand specimens resemble those from the South Orkneys. They differ, however, in having the appendages slightly more slender; thus the upper antennæ may have the second joint of the pedunele considerably longer than the first, and in the peræopoda the propod may be nearly as long as the carpus, instead of being shorter, as described by Chevreux. In them, too, the lateral angle of the head is produced into a small, sharp, acute point.

If we had to deal only with the New Zealand specimens and those from Wandel Island, it might be possible to look upon the latter as a separate but closely allied species; but, if that were done, a new species would have to be made for the South Orkneys specimens, with characters almost precisely intermediate between those of the other two, while future examination of specimens from some fresh locality would probably necessitate the establishment of another intermediate species on very trivial points of difference. I therefore think it much the best course to consider all the specimens as belonging to one widely spread sub-Antarctic and Antarctic species which, through isolation, has become slightly modified into two or three local varieties.

Genus Polycheria Haswell, 1879.

Polycheria antarctica (Stebbing).

Dexamine antarctica Stebbing, 1875, p. 184, pl. xv.A, fig. 1.
Polycheria tenuipes Haswell, 1880B, p. 345, pl. xxii. fig. 8.
,, ,, Stebbing, 1906, p. 520.
,, *brevicornis* Haswell, 1880B, p. 346.
,, *obtusa* G. M. Thomson, 1882, p. 233, pl. xvii. fig. 3.
Tritata kergueleni Stebbing, 1888, p. 941, pl. lxxxiii.
,, *antarctica* Walker, 1904, p. 266, pl. iv. fig. 25.

Polycheria antarctica Stebbing, 1906, p. 520.
,, ,, Walker, 1907, p. 34.
Tritæta osborni Calman, 1898, p. 268, pl. xxxii. fig. 2, and p. 288.
Polycheria atolli Walker, 1905, p. 926, pl. lxxxviii. figs. 1–5.

Entrance to Saldanha Bay, Station 483. One specimen, 6 mm. long.
South Orkneys, Scotia Bay, Station 325. Many specimens, all of small size, averaging 2 mm. in length.

The specimen from Saldanha Bay is, I think, specifically identical with the *Challenger* form described under the name *Tritæta kergueleni*. The eye is very large, occupying the greater part of the side of the head; the posterior angle of the third pleon segment is quadrate, with a very short tooth, and the pleon and urus have the carination described, though to a less degree; the antennæ agree with the description as regards the proportions of the joints, the lower being a little longer than the upper; the branches of the third uropods are slightly unequal.

In the large eye and in other essential points it also agrees with *P. tenuipes* Haswell, and with *P. obtusa* G. M. Thomson, whose description of the terminal joints of the peræopoda applies exactly to the specimen under consideration. In describing his specimen Mr Thomson pointed out that it was probably the same as *P. tenuipes* Haswell. On the other hand, the Saldanha Bay specimen differs from the Kerguelen Island one in the side plates, which are not so acutely produced anteriorly.

The specimens from South Orkneys are all small. The eye is of much smaller size, and the carination of the pleon is absent altogether or only slightly marked; the joints in the flagella of the antennæ are fewer in number, and the two antennæ are about equal in length; the outer branch of the third uropod is only about half the length of the inner; both the third and the fourth side plates are produced anteriorly into an acute lobe exactly like that figured by Stebbing for *P. antarctica* (1906, p. 520, fig. 91). In this respect, therefore, they differ from his description of *P. tenuipes*, with which they agree in some of the other points mentioned, for that species is described in *Das Tierreich Amphipoda* as having the fourth side plate reduced to a short, blunt lobe, this character being apparently taken from Calman's description of *P. osborni*, which Stebbing gives as a synonym of *P. tenuipes*.

These South Orkneys specimens are apparently immature, although the characteristic form of the terminal joints of the peræopoda and of the third and fourth side plates is already present, and I think there can be no doubt they belong to the same species as the Saldanha Bay specimen. In the smaller eye they resemble *P. brevicornis* Haswell, which does not seem to be separated from *P. tenuipes* by any other character of importance. Mr Walker (1907, p. 34) has pointed out that Haswell's description of the second gnathopod of *P. tenuipes* and of *P. brevicornis*, and his figure of that of the first species, are quite unlike those of *P. antarctica*. The figure is undoubtedly very rough and insufficient, but the descriptions, so far as they go, are not inconsistent with

either the Saldanha Bay or the South Orkneys specimens before me, and these, as I have said, must, I think, be referred to *P. antarctica*.

STEBBING, in 1906, made *P. osborni* Calman a synonym of *P. tenuipes* Haswell, to which he also assigned *P. obtusa* G. M. Thomson and, with a "?", *P. brevicornis* Haswell.

In describing *P. osborni*, CALMAN referred to the southern species described, and said they "are probably all referable to one." If this is done, however, it will then certainly be impossible to retain his species as distinct. This will be seen if we take the points of difference in order :—

1. Dorsal processes of urus much less prominent. This applies also to the South Orkneys specimens, and, to a less degree, to the Saldanha Bay specimen.

2. Maxillipeds with outer plates nearly equalling the palp in length and bearing only about eleven spines. In the South Orkneys specimens the plates bear only eleven spines, though they are rather shorter than the palp. In *P. atolli*, too, WALKER describes the spines on the outer plate as few in number and present on the distal portion of the margin only.

3. Propod of first gnathopod with palmar edge short and not more than one-third the length of the dactyl. In the Saldanha Bay specimen the gnathopod agrees well with CALMAN's description, except that the palm is perhaps a little longer. From the appearance of this specimen, however, I think the palm is really longer than is shown in CALMAN's figure, and that the lobe against which the dactyl is represented as impinging is overlapped by the dactyl folding in on one side of it. If this is so, there is no essential difference between the palm of *P. osborni* and that of *P. antarctica* as figured by STEBBING under the name *P. kergueleni*.

CALMAN's description of the second gnathopod agrees quite well with that of the Saldanha Bay specimen.

4. Fourth side plate having the anterior process reduced to a short, blunt lobe. This applies also to the Saldanha Bay specimen and to *P. atolli* Walker.

5. Propod of third peræopod not widening distally. Both the Saldanha Bay and the South Orkneys specimens agree in this point with CALMAN's figure rather than with STEBBING's; the difference is one of degree only, and the widening is probably more marked in older specimens.

In view of all the considerations mentioned above, I feel compelled to unite also *P. atolli* Walker, from the Male Atoll, Maldive Archipelago, with *P. antarctica*. His description of the gnathopoda and of the first and second peræopoda, and of the side plates corresponding to these appendages, applies very well indeed to the Saldanha Bay specimen and also fairly well to *P. osborni*; but in the fewer spines and teeth on the outer plate of the maxillipeds and on the uropoda, *P. atolli* agrees rather with the South Orkneys specimens. Its chief peculiarity seems to be the fact that the palp of the first maxilla has "the top squarely truncate and crowned with short teeth," but in view of the other characters this is hardly sufficient to maintain it as a separate species.

The very large eye (red in colour, at least sometimes) found in some of the forms is certainly a very striking characteristic, and if it were constantly associated with other characters or with certain localities it would be entitled to great weight; but some specimens have the large eye associated with side plates which are not acutely produced anteriorly, while in the Kerguelen specimen the eye is large (black in this case) and the side plates are acutely produced; again, both the large-eyed and the small-eyed forms are found together in Port Jackson. It is just possible that the large eye is a sexual character, or it may be developed in older specimens which live at moderate depths, as appears to be the case in *Eusirus antarcticus*.

I have thus failed to find the characters relied upon for specific distinction in this genus constantly associated in any definite way, and am forced to conclude that all the forms belong to one species widely spread in southern seas and found also in the North Atlantic and in the Indian Ocean.

In addition to the localities mentioned above, the species *P. antarctica* has more recently been recorded from Ceylon by Mr Walker, so that the conclusion that we are dealing with one species only, first arrived at on morphological grounds, is now confirmed by the geographical distribution of the species.

After the discussion as given above had been written, I was able to visit the British Museum and examine there the types of the different species; Mr Walker also kindly sent me a specimen of *P. atolli*, and in doing so said that he now considered it probably not distinct from *P. antarctica*. I was able at the Museum to examine the type slides of *Tritæta kergueleni* Stebbing and of *P. atolli* Walker, and also to examine named specimens of *P. osborni* Calman, *P. antarctica* from the *Discovery* Expedition, and of *P. antarctica* recorded from Ceylon by Mr Walker. The slide of the dissected parts of the *Challenger* specimen of *Tritæta kergueleni* is not in very good condition, but it is evidently the one from which Mr Stebbing's excellent figures were made, and these are sufficient for our present purpose.

The type specimen of *P. atolli* has the first maxilla with short spinules on the palp as described, and the maxillipeds also correspond closely to the figure given, but in all other essentials it agrees with my Saldanha Bay specimen, both gnathopods closely agreeing, except that in the first the flange on the propod has the margin minutely serrate; the first and second peræopoda, again, have side plates similar to those in the Saldanha Bay specimen. An examination of *P. osborni* showed that this species also was the same as the Saldanha Bay specimen, and therefore the same as *P. atolli*. The side plate of the first gnathopod is produced in front a little more acutely than in the type of *P. atolli*, and is tipped with two small setæ; the side plate of the second gnathopod is also produced in front, but not so acutely as the first, and might be described as being narrowly rounded anteriorly; that of the first peræopod is acutely produced, while the second is rounded as described by Calman. The eye is large.

The *Discovery* specimens labelled *P. antarctica* undoubtedly agree specifically with Stebbing's type of *Tritæta kergueleni* in having the side plates all more or less

acute, those of both the first and second peræopoda being acutely produced in front; the eye is large, showing a little colour in the spirit specimens and probably having been red in the living animal, but it is not so large as in the Saldanha Bay specimen. The terminal joints of the peræopoda are rather wide distally, as shown in STEBBING's figure.

It seemed possible, therefore, that after all we might perhaps be dealing with two species: one *P. antarctica*, with side plates more or less acutely produced in front, the other *P. tenuipes* (including *P. osborni* and *P. atolli*), in which some of the side plates were rounded in front, although, as already shown, the differences did not appear to be constant. Considerable interest was therefore attached to the examination of the specimens from Ceylon referred by WALKER to *Tritæta antarctica*, to see if they were really distinct from *P. atolli*. It was found that in some points they are a little nearer to *P. antarctica* than the type specimen of *P. atolli* is; thus, for example, the side plates of the first gnathopod are acutely produced in front as in *P. antarctica*; the side plates of the second gnathopod, however, are rounded below. The side plates of the first and second peræopoda cannot be very clearly made out, but they appear to be fairly acute in front, though projecting rather more posteriorly than shown in STEBBING's figure. In other points, however, these Ceylon specimens were clearly the same as *P. atolli*, and the eye is large and shows little colour in the spirit specimens. Consequently, after considerable hesitation, I was forced to remain at the conclusion at which I had previously arrived, that it is impossible to separate the various forms into two species. The species has more recently been recorded from the east coast of Africa by Mr WALKER under the name of *P. atolli*, and it was some confirmation of the conclusion I arrived at to find that specimens in the Museum from this locality, though recorded under the name *P. atolli*, were in the separate tube labelled by him *P. antarctica*.

It seems clear that here, as in other cases, we have one widely distributed species, most abundant in Antarctic and sub-Antarctic seas, but extending far to the north both in the Indian seas and in the Pacific, and that, although it is impossible to find constant characters for the separation of it into two distinct species, there are slight local differences, some showing one combination of characters, others another combination.

A small specimen of this species was among some undetermined Amphipoda, collected at South Georgia in 1882–83, that were submitted to me by the authorities of the Hamburg Museum.

[After the whole discussion of this species as given above had been written, I found further specimens from South Orkneys in a bottle of "residues" received in May 1912 from various collections made at Scotia Bay in 1903. Some of these specimens were larger than those from the South Orkneys mentioned above, the largest being about 5 mm. long. In the largest specimens the eye was very large, and red in colour, as in the Saldanha Bay and other specimens already referred to; in smaller specimens the

eye showed intermediate sizes, though in none of those examined was it quite so small as in the small South Orkneys specimens first examined. The side plates seem to be acutely produced as described for *Tritæta kergueleni*; but in at least one specimen the anterior lobe of the second peræopod was only subacute, and was shorter than that in the first peræopod. In the third uropods the outer branch is about half as long as the inner; in both branches the extremity is narrowed, almost free from setæ, and curves upwards.

In these respects, therefore, these additional specimens tend to confirm the conclusion arrived at that all the forms of *Polycheria* are referable to one species. They present a peculiarity, however, in having the telson particularly long, reaching to the end of the third uropod; in side view it appears thick, scarcely narrowing distally, and the margin is fringed with stout spinules. In the smaller South Orkneys specimens it is much shorter, reaching hardly half way along the branches of the uropod, and the spinules on it are few and much less prominent. In the specimen figured in the *Challenger* Report the telson is intermediate, reaching more than half way to the end of the third uropod, and bearing numerous spinules. In the smallest of the additional specimens now being described it is hardly so long as in the largest, but still longer than in some *Discovery* specimens from M'Murdo Sound that are themselves larger in size. It seems probable that the especially long and strong telson is a character developed beyond the average, like the large eye, and that it attains its full size only in specimens of a definite age—possibly it lengthens rapidly at a particular moult.]

Genus Nototropis A. Costa, 1853.

Nototropis homochir (Haswell).

Atylus homochir Haswell, 1885, p. 101, pl. xiii. figs. 5–7.
Nototropis homochir Stebbing, 1906, p. 333, figs. 77 and 78.
,, ,, ,, 1910A, p. 639.
,, ,, ,, 1910B, p. 455.

South Africa, entrance to Saldanha Bay, Station 483; 25 fathoms. 21st May 1904. Several specimens, largest 10 mm. long.

These agree with Stebbing's description, except in a few small points: *e.g.* the third joint of the palp of the mandible is not longer than the second, but barely equal to it in length; the lower hind corner of the basal joint of the third peræopod (in the female) is slightly produced into a small subacute lobe; that of the fourth is not produced, but in the fifth peræopod it is produced as a subacute lobe reaching about to the end of the ischium.

The points which distinguish this species from some of those found in northern seas, *e.g.* from *N. vedlomensis* (Bate and Westwood), do not seem to be very great; it appears to differ from that species, however, in the amount of production of the basal joints of the peræopoda three to five, and in the size and arrangement of the

carinate teeth on the pleon and urus. Della Valle in 1893 united both these two species and several others under the name *Atylus swammerdamii* (Milne Edwards).

The southern species is known from Australia and South Africa.

Another species which appears to belong to this genus was described in 1862 by Spence Bate under the name *Atylus villosus*, from specimens obtained at Hermit Island in the South Atlantic by the Antarctic Expedition under Sir James Clarke Ross.

Genus Talorchestia.

Talorchestia scutigerula (Dana).

Orchestia scutigerula Dana, 1853 and 1855, p. 863, pl. lviii. fig. 2.
,, ,, Spence Bate, 1862, p. 26, pl. iv. fig. 7.
Talorchestia scutigerula Stebbing, 1906, p. 545.

Falkland Islands, near Port Stanley, Station 118; from banks of a fresh-water, peaty stream. 7th January 1903. Two males and three females, the largest male 15 mm. in length.

These specimens agree very well with the description as given in *Das Tierreich Amphipoda*. The large expansion on the second joint of the fifth peræopod is very striking, and is very similar to the expansion on the fifth joint in *Talorchestia telluris* (Bate).

The species is known from Tierra del Fuego as well as from the Falkland Islands, and it was taken at Hermit Island in the South Atlantic, during the Antarctic Expedition under Sir J. C. Ross in 1840.

Genus Hyale.

Hyale grandicornis (Kröyer).

Orchestia grandicornis Kröyer, 1845, p. 292, pl. i. fig. 2 *a–n*.
Allorchestes verticillata and *A. peruviana* Dana, 1855, p. 886, pl. lx. figs. 2 and 3.
Hyale grandicornis Stebbing, 1906, p. 566.

Gough Island, Station 461; shore. One male, 12 mm. long.

I refer this specimen to Kröyer's species without much doubt. It agrees minutely with the description of all its characters given by Stebbing in *Das Tierreich*, particularly in the pectination of the finger of the peræopoda; the setule on the finger is rather long and fairly distinct, but not strong. The hind margin of the basal joint of the fourth peræopod is furnished with small spinules as described, but they are very small, and they are also present, though not in quite such numbers, in the third and fifth peræopoda. Both the first and the second gnathopoda agree very closely with the description.

This species was described originally from Valparaiso, and *H. novæ-zealandiæ* (G. M. Thomson), which is found in New Zealand itself and in the sub-Antarctic islands lying to the south of it, appears to be almost the same.

Hyale saldanha, sp. nov. (Pl. II. figs. 24–29.)

South Africa, entrance to Saldanha Bay, Station 483; 25 fathoms. 21st May 1905. Several specimens, males and females, the largest about 9 mm. long.

Specific Description.—*Male.*—Back rounded, not carinate, and without dorsal teeth. Pleon segment three, with postero-lateral corner quadrate with slightly produced point. Eyes of moderate size, round. The first antenna (fig. 24) reaches to the middle of the flagellum of the second; peduncle with first joint much longer and broader than the second, and produced below at its distal end into a rather broad expansion, which appears to have a vertical flange, and at the lower part of this a thicker conical portion tipped with two setæ; second joint with a smaller similar expansion; flagellum of sixteen joints all bearing a fairly distinct tuft of long setæ at the lower distal angle. Second antenna (fig. 24) about one-third the length of the body; last two joints of the peduncle subequal; flagellum of about thirty-five joints. First gnathopod (fig. 27) with the basos rather broad except at the base; the carpus short, triangular, its posterior margin produced into a rounded fringed lobe; propod oblong, widening slightly distally, front margin convex and smooth, hind margin straight or very slightly concave, with a group of spinules at the centre; palm oblique, slightly convex, shorter than hind margin, defined by two stout spinules, the finger fitting closely up against the palm.

Second gnathopod (fig. 28) with basos expanded distally into a flange on the outer margin, ending in a rounded lobe at the extremity; ischium with a similar rounded process; merus short, its apex subacute; carpus very short, fitting closely into the emargination on the base of propod; propod large, oval, slightly narrowing distally, its anterior border regularly convex and smooth; palm oblique, longer than the hind margin, straight except for a rounded process near the base of the finger, fringed with a double row of short spinules and defined by two stout spines; finger stout, fitting into a small pocket at the end of the palm. Peræopoda one to five robust; propod slightly curved, especially in the last three pairs, its concave margin bearing at regular intervals three stout spinules of about equal size, all minutely serrated towards the end, but without a specially large serrated spine; posterior border of propod unarmed; finger strong, about half the length of the propod, much curved, inner setule very small; in the third peræopod (fig. 29) the basos is rounded, projecting inferiorly as far as the end of the ischium, in the fourth and fifth similar, but in the fourth the basos is slightly narrower than in the third and fifth; hind margins of basos in all either smooth or only faintly crenulate. Uropoda short, the first with peduncle about as long as the branches, and with two or three spinules along its lateral margins and a stout curved spine at the distal end; branches subequal, with lateral and terminal spinules. Second uropod similar, but with peduncle shorter than the branches. Third uropods with the branch rather shorter than the base, both with stout terminal spinules. Telson with a stout spinule on each half.

Female.—Similar to the male, except in the gnathopoda, which are shown in figs. 25 and 26.

I have been forced to make a new species for these specimens from South Africa, from which locality no species of *Hyale* appears to have been hitherto recorded. The species appears to come very close to *H. camptonyx* (Heller), from the Mediterranean and North Atlantic, but it differs in a few points mentioned in the description above, and particularly in the peculiar and apparently characteristic expansion of the first joint of the peduncle of the upper antenna. *H. schmidtii* (Heller), also from the North Atlantic, seems to be pretty closely allied also, but has the second antenna much longer.

In many respects the present species is similar to *H. media* (Dana), which is known from several localities on the borders of the Atlantic Ocean, but it seems to be clearly distinguished from that species by the absence of the "very large submedian serrate spine" on the propod of peræopoda 3 to 5.

Genus Haplocheira Haswell, 1879.

Haplocheira barbimana (G. M. Thomson).

Gammarus barbimanus G. M. Thomson, 1879, p. 241, pl. x.d, fig. 1.
Haplocheira barbimana Stebbing, 1906, p. 609.
" " Walker, 1907, p. 35.

South Orkneys, Scotia Bay, Station 325; 9–10 fathoms. May 1903. Five specimens.

The largest of these specimens is 7 mm. long. They agree closely with New Zealand specimens.

The species is widely distributed in southern seas.

Genus Eurystheus.

(?) *Eurystheus afer* (Stebbing). (Pl. II. figs. 30-34.)

Gammaropsis afra Stebbing, 1888, p. 1097, pl. cxiii.
Eurystheus afer Stebbing, 1906, p. 612.
" " " 1910B, p. 461.

Gough Island, Station 461; trawl, 100 fathoms. 23rd April 1904. Two small specimens: the one a male, 4 mm., probably immature; the other a female, 5 mm.

I refer these specimens to this species with considerable doubt; but if, as Mr Stebbing suggests, *E. atlanticus* is only a variety of this species, it appears to be a variable one, and it may perhaps be extended sufficiently to include forms now being considered. The male specimen probably has not acquired the fully adult characters.

The female specimen differs from Stebbing's description in having the eyes oval and of normal shape; the first gnathopod (fig. 30) has the carpus longer than the propod, and the whole limb is more slender; the second gnathopod (fig. 31) is also longer, the carpus is not cup-shaped but sub-triangular, widening distally, and is about

two-thirds as long as the propod. The third uropods have the branches equal in length and rather longer than the peduncle. In other respects the specimen agrees fairly well with STEBBING's description, and the lateral lobe of the head is acutely pointed as in that species.

The form that I consider the immature male differs from the female in the second gnathopods (fig. 33), which are of the same general shape, with a moderately long carpus but with the propod larger and stouter, its palm more oblique and bearing three short conical acute teeth, one near the base of the finger, one beyond the point on which the end of the finger impinges, and one midway between these two. The third and fifth peræopoda are peculiar in having the merus widely dilated so as to be fully half as broad as long (see fig. 34); in the fourth peræopod the merus is of the usual shape. Whether this expansion of the merus is a sexual character, or an individual variation in the particular specimen examined, I cannot say.

Genus JASSA.

Jassa falcata (Montagu).

Cancer (*Gammarus*) *falcatus* Montagu, 1808, *Trans. Linn. Soc.*, vol. ix. p. 100, pl. v. fig. 2.
Podocerus falcatus and *P. validus* Stebbing, 1888, p. 1132, pl. cxix., and p. 1135, pl. cxxxviii.B.
„ *ingens* Pfeffer, 1888, p. 131.
„ *australis* Haswell, 1880, p. 338, pl. xxi. fig. 8.
Jassa pulchella Stebbing, 1906, p. 654.
„ „ Chilton, 1909A, p. 647.
„ *goniamera* Walker, 1903A, p. 61, pl. xi. figs. 98–106A.
„ *wandeli* Chevreux, 1906B, p. 94, figs. 54–56.
„ *falcata* E. W. Sexton, 1911, p. 212.

[I have given only the chief references relating to the occurrence of this species in southern seas. The very numerous references to its occurrence in the northern hemisphere can be readily traced from those here given.]

South Orkneys, Scotia Bay, Station 325, and Macdougal Bay, Station 326B. Several specimens of both sexes and of various ages.

Station 414, lat. 71° 50′ S., long. 23° 30′ W.; vertical net, from surface to 1000 fathoms. 15th March 1904. One specimen.

Mrs SEXTON, who has specially studied this species, believes that there are at least two different forms of the adult male.

When I came to examine the South Orkneys specimens it became quite clear that some of them were almost, if not quite, the same as the northern species, and that the males belonged to what Mrs SEXTON has described as the "second form." The males agree almost exactly in the characters given of the second antenna and of the gnathopods for this form; and females of this form were also present. As there are two forms known of this species in European seas, it was to be expected that, if the South Orkneys species was really the same species, the "first form" would also be found there. This actually proved to be the case, for two specimens from Macdougal

Bay agree almost exactly with Plymouth males of the first form. I have been able to compare my specimens with specimens of both forms determined by Mrs SEXTON, and she has been good enough to examine them along with me, and agrees that the South Orkneys specimens are not sufficiently distinct to be looked upon as a separate species.

I have also been able to compare my specimens with numerous forms labelled *Podocerus ingens* Pfeffer, from South Georgia, kindly sent to me by the authorities of the Hamburg Museum. Most of these appear to belong to the "first form," and agree closely with Plymouth specimens; they differ a little in the shape of the side plate of the second gnathopod, but the difference is slight, and there is a gap between this and the preceding side plate as described by Mrs SEXTON. The second gnathopod itself agrees almost precisely with Plymouth specimens, both in the fully mature form and in the immature stages. In the flagellum of the lower antenna the joints are usually a little more distinct than in typical Plymouth specimens, but in the South Georgia specimens there is some variation in this point; apparently the joints are more distinct in younger forms and become more fully coalesced in the older ones; they bear the characteristic plumose hairs as described by Mrs SEXTON. PFEFFER's type of *Podocerus ingens*, which I have also been able to examine, is a very large specimen, 26 mm. in length. Though apparently belonging to the first form, it differs a little in the shape of the second gnathopod; the thumb is comparatively small, and at its base on the outer side there is a small secondary notch or tooth that does not seem to be represented in the smaller specimens labelled *Podocerus ingens*. It is possible that this large form may be a separate species, but I am inclined to think that it is only a very large form of *Jassa falcata*, and that the differences are merely those that we might expect to meet in such a very large form. *Jassa goniamera* Walker seems certainly to belong to *J. falcata*; the specimen he described and figured under this name is an immature male of the first form. He states that the third uropod bears no secondary teeth on the outer branch. In all the specimens that I have been able to examine I have found teeth present, as in the Plymouth specimens, though small; occasionally these may become lost in preserved specimens, and I presume that is what has happened in the specimens examined by Mr WALKER. *Jassa wandeli* Chevreux, again, appears undoubtedly to be another specimen of the same species; his figure 54 is taken from a male not quite fully mature, and shows the characteristic gap between the first and second side plates, while the lower antenna exactly corresponds, both in his figure and description, to that of the first form of the male. In the specimen he figures, the various joints of the flagellum appear to be slightly more completely coalesced than they are in some of the South Georgia and South Orkneys specimens, and thus more like Plymouth specimens of this form.

I have long been familiar with this species under the name of *Podocerus validus* Dana in New Zealand, and it has been described from Australia by Professor HASWELL under the name *Podocerus australis*. In his report on the *Challenger* Amphipoda Mr STEBBING recorded it from Kerguelen Island under the name *Podocerus falcata*,

and suggested that it had possibly been carried out from northern seas by attaching itself to the hull of the vessel. Though marine crustacea doubtless are occasionally dispersed in this way by ships, we now know that *Jassa falcata* is a cosmopolitan species, and its occurrence in Kerguelen Island can therefore be otherwise accounted for. It has been pointed out by Mr G. M. Thomson and myself that the animal often temporarily attaches itself to the carapace of large crustacea, such as *Jasus edwardsii* Hutton, and probably its dispersal is assisted in this way.

The brief notice I have given above gives only a faint idea of the complex forms of this species and of the changes it passes through. These forms and its full life history are being worked out by Mrs Sexton and others at the Marine Laboratory, Plymouth, and I have been greatly assisted in the identification of my specimens by the communication of some of the results already obtained but not yet fully published.

Genus Caprella Lamark, 1801.

Caprella æquilibra Say.

Caprella æquilibra Say, 1818, p. 391.
„ „ Mayer, 1903, pp. 75, 89, pl. iii. figs. 29–34, pl. vii. figs. 66–69.
„ „ Stebbing, 1910b, p. 466.

South Africa, entrance to Saldanha Bay, Station 483; trawl, 25 fathoms. 21st May 1904. One immature male.

The specimen is not fully mature, but I think undoubtedly belongs to this widely distributed species.

It is worthy of note that this is the only Caprellid taken during the expedition, and that the family seems to be quite absent from the Antarctic fauna, and only very poorly represented in the sub-Antarctic.

Genus Hyperia Latreille and Desmarest, 1823.

Hyperia gaudichaudii Milne Edwards.

Hyperia gaudichaudii Milne Edwards, 1840, vol. iii. p. 77.
„ „ Stebbing, 1888, p. 1394, p. 169.
„ „ Walker, 1907, p. 7.

Falkland Islands, Stanley Harbour, Station 118; "ectoparasitic on jelly-fish." 7th January 1903. Several males, females, and young; the largest female being 15 mm. long.

Station 541; 37° 41′ N., 29° 25′ W., surface; hand-net. 3rd July 1904. "Associated with Aurelia caught at the same time." Two males.

Station 112; surface, lat. 46° 3′ S., long. 56° 30′ W. 3rd January 1903. Many specimens, all of small size, the largest 6 mm.

These specimens all seem undoubtedly to belong to this widely distributed species, which has already been recorded from Antarctic regions by Mr Walker.

Genus Vibilia.

Vibilia antarctica Stebbing.

Vibilia antarctica Stebbing, 1888, pp. 1290, pl. cl.
,, *propinqua* Walker, 1907, p. 6.

Station 422, lat. 68° 32′ S., long. 12° 49′ W.; 8 ft. vertical net, surface to 800 fathoms. 23rd March 1904. Two specimens, 10 mm. long.

These specimens appear to be the adults of this species, which was described from an immature form by Mr Stebbing. Dr A. Behning, who has worked out the Vibilidæ of the German South Polar and other Expeditions, informs me that this species appears to be the typical Antarctic species, though extending also some distance north, and that it is very close to *V. propinqua*, but is distinguished by the long carpal process and the poor development of the eyes. I presume this is the same species as that recorded by Walker under the name of *V. propinqua* from the *Discovery* Expedition.

Genus Euthemisto.

Euthemisto thomsoni Stebbing.

Themisto antarctica G. M. Thomson, 1879, p. 243, pl. x.d, figs. 2 and 3.
Euthemisto thomsoni Stebbing, 1888, p. 1414, pls. cxxiv. and cxxv.
,, ,, ,, 1910b, p. 655.

Station 468, lat. 39° 48′ S., long. 2° 33′ E.; "trawl, 2645 fathoms." 29th April 1904. One specimen, doubtless obtained from the surface.

This specimen agrees closely with the description given by Stebbing in the *Challenger* Report, and I give it under the name that is used both there and in his recent report on the collections of the *Thetis* from Australia, without entering into discussion of the validity of the actual name.

IV. Tropical and North Atlantic Species.

Genus Synopia Dana, 1852.

Synopia schéeleana Bovallius.

Synopia schéeleana Bovallius, 1886, *N. Acta. Soc. Upsal.*, ser. 3, vol. xiii., No. 9, p. 16, pl. ii. figs. 22–29.
,, ,, Stebbing, 1888, p. 799, pl. cii.
,, ,, ,, 1906, p. 272.
,, ,, Chevreux, 1900, p. 64.

Station 62, Tropical Atlantic, lat. 4° 15′ S., long 33° 38′ W. 13th December 1901. Three or four small, delicate specimens, the largest 3 mm. long.

These specimens agree closely with the description and figures given by STEBBING in his *Challenger* Report.

The species is known from the warm waters of the Pacific and the Atlantic Oceans. It is perhaps not distinct from *Synopia ultramarina* Dana, with which it is united by DELLA VALLE.

Genus HYALE H. Rathke, 1837.

Hyale grimaldii Chevreux.

Hyale grimaldii Chevreux, 1891, p. 257, figs. 1–5, and 1900, p. 10, pl. ii. fig. 2.
" " Stebbing, 1906, p. 567.

St Vincent, Station 24; among seaweed on shore. 1st December 1902. One male and one female; the male 3 mm. long.

Although these specimens are too small for certain identification, I think they must belong to this species. The gnathopoda of the male agree well with CHEVREUX's description, having the flange on the side of the basal joint, as described, and the propod is of the same shape, though the rounded lobe on the palm near the base of the finger is not so well marked. The lower antennæ are hardly so stout as shown in CHEVREUX's figure.

The species was previously known from the North Atlantic.

Genus ALLORCHESTES Dana, 1849.

Allorchestes plumicornis (Heller).

Nicea plumicornis Heller, 1866, p. 5, pl. i. figs. 8 and 9.
Allorchestes plumicornis Stebbing, 1906, p. 583.
" " Walker, 1901, p. 299, pl. xxvii. figs. 20 and 21.
" " Chevreux, 1911, p. 241, pl. xvii. figs. 1–3.

St Vincent, Station 24; north-east beach. 1st December 1902. Four small specimens.

There is no fully developed male among these specimens, but from the characters of the females I think they must belong to this species. The largest is probably immature, as the upper antennæ have only eleven joints in the flagellum and the lower fourteen; about half the joints in the latter bear tufts of long sensory setæ, the tufts decreasing in size distally; there is also a tuft on the distal end of the last joint of the peduncle, but none on the other parts of the peduncle. The second gnathopod agrees well with WALKER's figure; the dactyl of all the peræopoda bears the prominent setule on the inner margin, and in the remaining characters the specimens agree well with the descriptions given by STEBBING and CHEVREUX.

The species is well known from various parts of the Mediterranean, but does not appear to have been recorded from St Vincent.

Genus Sunamphitoe Bate, 1857.

Sunamphitoe pelagica (Milne Edwards).

Amphithoe pelagica Milne Edwards, 1830, *Ann. Sci. Nat.*, vol. xx. p. 378.
Sunamphitoe pelagica Chevreux, 1900, p. 102, pl. xi. fig. 4.
" " Stebbing, 1906, p. 645.

St Vincent, Station 24; north-east beach. 1st December 1802. One female, 5 mm. long.

Gulf Weed, Station 538, lat. 32° 11′ N., long. 34° 10′ W.; surface. 30th June 1904. Several of both sexes, largest about 6 mm. long.

These specimens agree in all essential respects with the descriptions given by Stebbing and Chevreux.

The species is widely distributed in the North Atlantic, but I know of no previous record from St Vincent.

Genus Anchylomera.

Anchylomera blossevillii Milne Edwards.

Anchylomera blossevillii Milne Edwards, 1830, *Ann. Sci. Nat.*, vol. xx. p. 394.
" " Stebbing, 1888, p. 1433, pl. xvii.
" " Chevreux, 1900, p. 147.

Station 62, Tropical Atlantic, lat. 4° 15′ S., long. 33° 38′ W.; tow-net. 13th December 1902. One specimen.

Station 57, Tropical Atlantic, 2° 1′ S., 32° 18′ W.; tow-net. 12th December 1902. Four specimens, 4 mm. long.

This is a common species in the warmer parts of the Atlantic Ocean.

Genus Oxycephalus Milne Edwards, 1830.

Oxycephalus clausi Bovallius.

Oxycephalus clausi Bovallius, 1887, p. 35.
" " Stebbing, 1888, p. 1578, pl. cci.
" " Chilton, 1911, p. 567.

Station 40, Tropical Atlantic, lat. 5° 57′ N., long. 25° 56′ W. 7th December 1902. One specimen.

This specimen agrees very closely with those described and figured by Stebbing from the *Challenger* Expedition, and it is also the same as specimens from the Kermadec Islands examined by me in 1911.

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VI. EXPLANATION OF PLATES.

VI. EXPLANATION OF PLATES.

Plate I.

Fig. 1. *Cyphocaris anonyx* Boeck. First gnathopod.
,, 1*a*. ,, ,, ,, ,, extremity more highly magnified.
,, 2. ,, ,, ,, Second gnathopod.
,, 3. ,, ,, ,, Second peræopod.
,, 4. ,, ,, ,, Third peræopod.
,, 5. *Lysianassa cubensis* Stebbing. Third uropod.
,, 6. *Alicella scotia*, sp. nov. First gnathopod.
,, 7. ,, ,, ,, Second gnathopod.
,, 8. *Orchomenopsis* (?) *rostsi*, sp. nov. First gnathopod.
,, 8*a*. ,, ,, ,, ,, extremity more highly magnified.
,, 9. ,, ,, ,, Second gnathopod.
,, 10. *Metopoides sarsii* (Pfeffer). Last segment of urus, with third uropod and telson.
,, 11. *Thaumatelson walkeri*, sp. nov. Side view.
,, 12. ,, ,, ,, Antennæ.
,, 13. ,, ,, ,, First gnathopod.
,, 14. ,, ,, ,, Second gnathopod.
,, 15. ,, ,, ,, Urus, with uropoda and telson.
,, 16. ,, *inermis*, sp. nov. First gnathopod.
,, 17. ,, ,, ,, Second gnathopod.
,, 18. *Atyloides magellanica* (Stebbing). Telson of specimen, showing unsymmetrical lobes.

Plate II.

Fig. 19. *Acanthonotozoma australis*, sp. nov. Side view of whole animal.
,, 20. *Eusirus splendidus*, sp. nov. Side view of whole animal.
,, 21. *Atyloides calceolata*, sp. nov. Basal joints of antennæ.
,, 22. ,, ,, ,, First gnathopod.
,, 23. ,, ,, ,, Second gnathopod.
,, 24. *Hyale saldanha*, sp. nov. Anterior portion of head of female, with antennæ.
,, 25. ,, ,, ,, First gnathopod of female.
,, 26. ,, ,, ,, Second gnathopod of female.
,, 27. ,, ,, ,, First gnathopod of male.
,, 28. ,, ,, ,, Second gnathopod of male.
,, 29. ,, ,, ,, Third peræopod of male.
,, 30. (?) *Eurystheus afer* (Stebbing). First gnathopod of female.
,, 31. ,, ,, ,, Second gnathopod of female.
,, 32. ,, ,, ,, First gnathopod of male.
,, 33. ,, ,, ,, Second gnathopod of male.
,, 34. ,, ,, ,, Third peræopod of male, with widened merus.

Chilton: "Scotia" Amphipoda.—Plate I.

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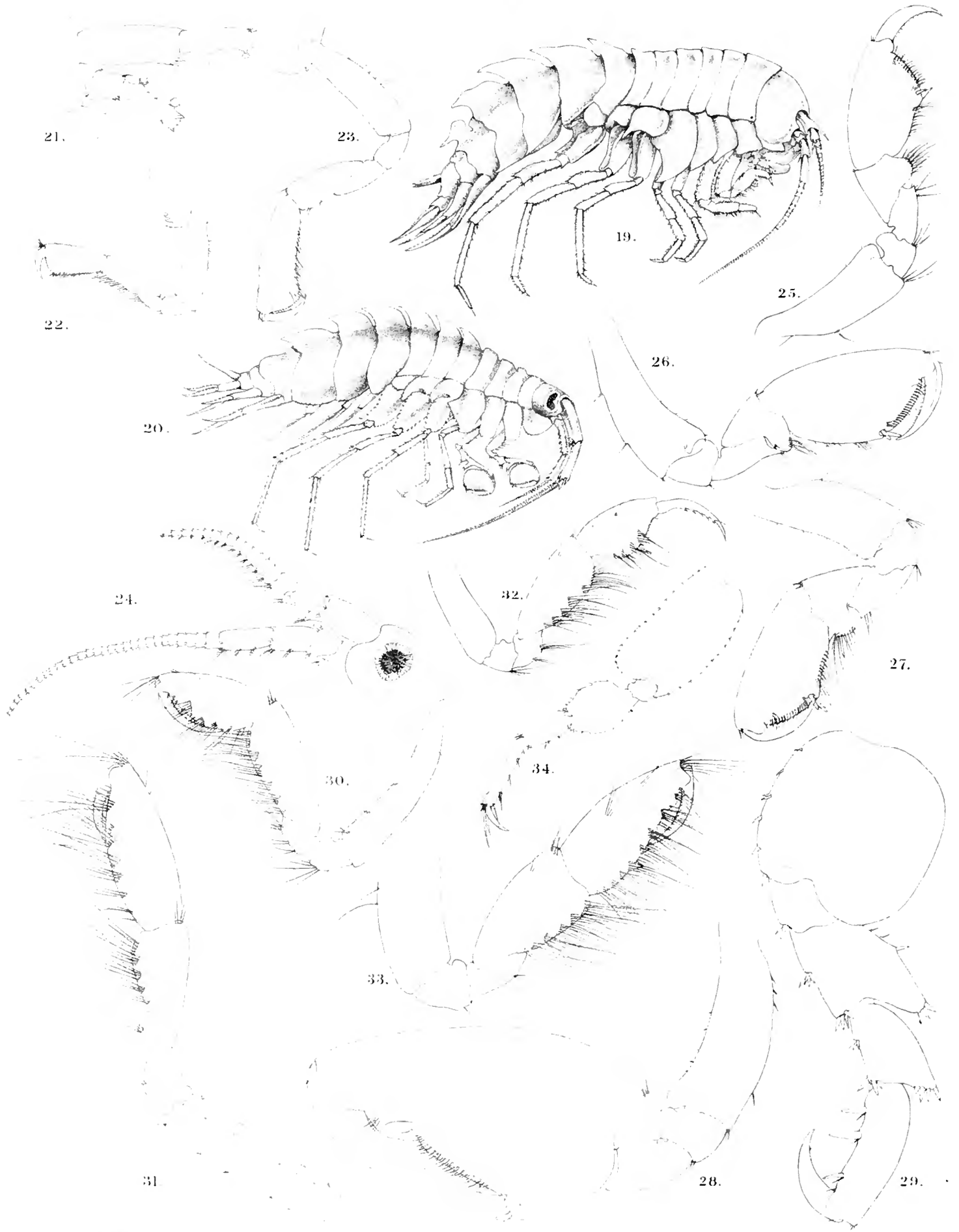
M.c Farlane & Erskine Lith. Edin.ª

Chilton: "Scotia" Amphipoda.—Plate II.



E. W. Sexton & Chas. Chilton, del.

PART VIII.

CESTODA.

The Cestoda of the Scottish National Antarctic Expedition. By John Rennie, D.Sc., and Alexander Reid, M.A., University of Aberdeen. (With Two Plates.)

(MS. received May 6, 1912. Read June 17, 1912. Issued separately September 6, 1912.)

The Cestode material obtained by the *Scotia* Expedition consisted of eight adult and three larvæ or immature forms. Of these, one (*Anchistrocephalus microcephalus*, Rud.) is not Antarctic, having been obtained from the Sunfish (*Orthagoriscus mola*), at Station 107, in 39° 12′ S., 53° 44′ W., on January 1, 1903.

Of the others, only two appear to have been previously described, viz. *Dibothriocephalus antarcticus*, Baird, and *Dibothriocephalus wilsoni*, Shipley. The hosts from which the Cestoda of the Antarctic and sub-Antarctic regions were obtained are, with the exception of the Bonito,* from which a larval *Tetrarhynchus* was obtained, Seals and Penguins. In view of this fact, the number of forms obtained may be regarded as relatively large. A study of the species on record from Arctic Pinnipedia suggests the interesting fact that the two Cestode faunas are quite distinct. Eight species of *Dibothriocephalus* are on record from Pinnipedia of the Arctic regions, none of which have so far been obtained in the Antarctic. The adult forms found, however, with one exception all belong to this genus.

A noteworthy feature is the relatively large proportion of very small and delicate species of Cestoda occurring in the Pinnipedia of the Antarctic. Indeed, none of the forms obtained can be described as large; the maximum size is that of *D. pygoscelis*, viz. 29 cm.

Shipley has suggested with regard to the Cestoda of Ross's Seal that, in view of the feebleness and variability of its dentition, it probably feeds on soft substances, and expresses the opinion that the plerocercoid stage probably occurs in the tissues of Cephalopods. Jellyfish are also mentioned, and these form part of the food of this Seal.

With regard to Seal Cestodes in general, we note that although the parasites are small the infection is generally heavy, and from this it may be argued as probable that the intermediate hosts become infected without much difficulty. The embryos are extraordinarily minute, and if dissipated in the waters would probably infect drifting organisms, *e.g.* Jellyfish or Ctenophora, more readily than others, *e.g.* Fishes. On the other hand, Crustacea and similar organisms of scavenging habits, feeding on the fæces of the Seals, have an even better chance of being infected, and these may provide the intermediate host. Beyond this it is scarcely profitable to speculate further.

* This fish (*Thynnus pelamys* Linn.) it appears was found at Station 31—some distance south of the Cape Verde Islands—on 4th December 1902, and its parasite therefore cannot be described as Antarctic or sub-Antarctic.

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Description of Species.

Ariola (1) divides the family Bothriocephalidæ as under :—

Sub-families :

Diplogoninæ. Two sets of gonads to each segment.

Mesogoninæ. A single set of gonads; genital apertures on surface. All the Bothriocephalidæ found, with one exception, belong to this group.

Pleurogoninæ. Marginal genital apertures.

One of the species found, *Anchistrocephalus microcephalus*, Rud., belongs to this group.

Order PSEUDOPHYLLIDEA, Carus.

Family Dibothriocephalidæ, Lühe.

Sub-family mesogoninæ (Ariola).

Genus *Dibothriocephalus* (Lühe).

Dibothriocephalus scoticus, n. sp. (Pl. I. figs. 1 and 2.)

This form occurred in the intestine of a Sea-leopard (*Stenorhynchus leptonyx*).

The maximum dimensions are : strobila, length 13·3 cm., breadth 6·8 mm. ; scolex, 2·5 mm. by 1·5 mm. The scolex when fully extended shows a pair of dorso-ventral suckers widely gaping posteriorly and tapering towards the tip, which is rather sharply conical. The sucker lips are rather thin, almost weak.

No distinct neck is present. The proglottides are fairly broad, with well-marked backwardly directed flanged margins. Anteriorly they are roughly rectangular, much shorter than broad ; in the mature parts of the strobila they become relatively longer.

The cuticle is rather thin, and beneath it an extremely fine circular layer of muscle can be made out with difficulty. Next this is a longitudinal layer, also slightly developed. This longitudinal layer lies between the narrowed ends of the cellular subcuticula, whose elements form a clearly defined band. Following on this is the layer of the yolk follicles, which, in the mature segments, except at the level of the uterus and cirrus sac, forms a practically continuous band. Within this occur two muscle layers, a well-defined longitudinal layer outermost ; while, within, a thin circular band separates the peripheral area from the central.

The longitudinal nerve cords are placed about one-fourth of the transverse diameter from the margin.

In the mature segments there are about nine testes follicles external and about six internal to the nerve cord on each side.

Central longitudinal excretory canals were not observed, but there are numerous small peripheral canals in the subcuticula just external to the yolk follicles.

The yolk cells are extremely variable in form and size, and may be described as

amœboid in appearance. The largest measure ·017 mm.; the smallest noted, ·012 mm. There is a well-marked yolk reservoir of pear shape between the two lobes of the ovary.

The ovary in transverse section appears as an elongated band, becoming shorter and thicker in its more anterior parts. The larger cells measure ·014 mm. in diameter.

The uterus consists of a winding tube of about four loops, the limbs of which in transverse section are seen to wind both dorsally and ventrally. There is a large dilated space just at the opening. On external view, the uterus in mature segments appears clustered in a rounded mass posteriorly, the winding portion being distinct only in its more anterior region. The shelled ova vary in size; the smallest measure ·070 × ·043 mm., and the largest ·082 × ·048 mm. They are operculate.

The testis is very large, consisting of numerous follicles occupying the greater part of the medullary region. The follicles are more or less spherical in form, and lie in close-set rows extending across the whole width of the proglottis, being separated from each other by the dorso-ventral muscles, which are correspondingly numerous. A common size of a follicle in a mature proglottis is ·069 to ·087 mm. in maximum diameter.

The cirrus sac is thick-walled, and oval in transverse section, presenting no distinctive peculiarities.

From the foregoing description, it appears that this species has not been previously observed. From the same host, von Linstow (3) has described *D. quadratus*, and with his account a careful comparison has been made. The scolex in the two species is very similar in general form. In *D. quadratus* it measures 1·3 mm. by ·71 mm., or about half the dimensions of the present species. The strobila is 22·5 cm. long, and 3·5 mm. broad at its widest part; the proportions of the present species are, it will be observed, altogether different. The longitudinal dimension of the ova given by von Linstow is ·055 mm., which is considerably less than the smallest measurement observed in *D. scoticus*. The shelled ova are in *D. quadratus* described as non-operculate; in the present species they are clearly operculate. Further, the appearance of the yolk follicles is quite different in the two species.

A comparison has also been made with other *Dibothriocephalus* species recorded in Pinnipedia, with like negative results.

In honour of the Scottish Expedition, we have named this new species *Dibothriocephalus scoticus*.

Dibothriocephalus coatsi, n. sp. (Pl. I. figs. 5 and 6.)

In *Stenorhynchus leptonyx* there occurred along with *Bothriocephalus scoticus* a number of specimens of a small, hitherto unrecorded Cestode.

The total length of strobila of the examples found is from 42 to 80 mm. In a specimen of 42 mm. the width at the broadest part, which is 23 mm. from the anterior end, is 1·8 mm.

The scolex is of distinctive appearance, being long, blunt, and of almost uniform width, measuring 2 mm. by ·75 mm. in extent. There is a pair of shallow, widely gaping suckers, dorso-ventrally placed, extending the whole length, and open at both ends (fig. 5).

The mature segments are rectangular in form, with slightly undulating margin. In the specimen 42 mm. long, the largest, which were terminal, measured ·61 mm. long by 1·04 mm. broad. They are also relatively thick, measuring in section ·61 mm. dorso-ventrally.

The cuticula and sub-cuticula are of typical appearance. Beneath the sub-cuticula are the yolk follicles. These are very numerous, and in many sections, *e.g.* those at the level of the ovary, they form a practically continuous band. The individual yolk cells, which vary in form, measure on an average about ·014 mm. by ·017 mm.

The shape of the ovary presents no unusual features. In a section at the level of its junction with the yolk ducts it has the form of a transverse band. Posteriorly to this it appears as a pair of detached, more or less rounded, and thicker masses. The ovarian cells measure ·017 mm. by ·01 mm.

The uterus consists of a few close coils which wind dorso-ventrally, so that in section it usually has the appearance of an almost complete circle. The shelled ova measure ·052 mm. by ·041 mm.

The testis follicles, which occupy the greater part of the central area of the proglottis, measure in their greatest dimensions ·034 mm. by ·052 mm.

There is a well-developed inner layer of longitudinal muscles; the dorso-ventral muscles are also well marked.

The longitudinal nerve cords are extremely ill-defined and weak, although relatively large. They are placed slightly less than one-fourth of the width of the proglottis from the margin, and are slightly nearer to the ventral than the dorsal surface.

The central longitudinal excretory canals can be made out only in places. They are placed at the extreme lateral margin of the central layer, next to the longitudinal muscles, but, as they frequently cannot be traced in serial sections, they probably anastomose a good deal. Peripheral canals are present just exterior to the yolk follicles. These are most clearly visible at the lateral margins, where two or three frequently occur close together.

This form differs in most particulars from all the hitherto described species of the group to which it belongs, and we have therefore classed it as new, naming it *Dibothriocephalus coatsi*. It is an interesting fact that two new species should have been obtained from *Stenorhynchus* by the Scottish Expedition, and that *D. quadratus*, the only form hitherto described from this host, should not have been found.

Dibothriocephalus antarcticus.

Bothriocephalus antarcticus, Baird, 1853.

About a dozen or more examples of this species were obtained from the stomach of a Ross's Seal, *Ommatophoca rossi*. These were all smaller than Baird's specimens, which were about 9 inches long. The *Scotia* examples range from 132 to 29 mm., but most measure about 100 mm. Baird's (2) description is rather brief and confined to externals, but from this, together with his excellent figure, there is no mistaking the identity of the *Scotia* specimens with his type.

This species was also found by the *Discovery* Expedition, and the specimens are described by Shipley, to whose account reference is made below.

Dibothriocephalus antarcticus, Baird (2), is a slender-bodied worm, with a conical scolex and with fairly sharp tapering point. The two suckers are long and comparatively deep. According to Baird, there are "two small rounded projecting lobes" at their posterior margins, but these in the *Scotia* examples are only occasionally present, and appear to be dependent upon the state of contraction of the animal. There is no neck; the anterior part of the body for some distance behind the scolex is rounded, resembling an annelid in form; in the more posterior part the form is thick and flattened, being here elliptical in section. The colour is reddish yellow. The segments, even in the mature part of the animal, are very short; they are deeply constricted off from each other, and as the free margins are directed backward the segments appear to overlap more than they actually do. The only dimensions given by Baird are: "length, about nine inches; greatest breadth of body, about three lines," and although the *Scotia* examples are very much smaller, the proportions agree well. The *Discovery* specimens come much nearer in length to the *Scotia* examples, although there is a very distinct discrepancy as regards width. Shipley reports that most of the *Discovery* examples "were just under 10 cm.," and that "the greatest breadth is 7 mm. in the largest specimen." The longest *Scotia* worm is 13·2 cm., and its greatest breadth is 4·5 mm.; most of the specimens are about 4 mm. in width. Again, as regards scolex dimensions, Shipley gives "3 mm. in length and 3 mm. in breadth posteriorly." In none of the *Scotia* specimens is the greatest breadth equal to the length of the head; they measure from 3 to 3·5 mm. long by 2 mm. wide. The actual differences here, however, are slight.

A general account of the anatomy is given by Shipley (4). He mentions that, besides the two longitudinal canals of the excretory system, "there are also small canals which lie close under the surface at the edges of the proglottides, usually two at each side, but they also break up from time to time into twisting branchlets." These canals appear to be very numerous; from 42 to 45 may be present in a section, while at each lateral margin a group of four can usually be made out.

The testes which occupy the central layer lie mostly towards the dorsal surface. There are from 18 to 20 follicles in a transverse section.

Dibothriocephalus wilsoni, Shipley. (Pl. I. fig. 4.)

This small tapeworm, which SHIPLEY (4) has already referred to as "very attractive" in appearance, was also found by the *Scotia* investigators, although not in the same host. These were obtained in the intestine of Weddell's Seal along with numbers of *Bothriocephalus mobilis*, n. sp. The *Discovery* specimens occurred in Ross's Seal (*Ommatophoca rossi*).

It is a small, semi-translucent, delicate-looking Cestode, not undeserving of SHIPLEY's epithet. The scolex is short and conical in the contracted state, as appears in SHIPLEY's figure. In more extended specimens, however, it is more rounded at the free end, as well as longer. An interesting point is the early appearance of mature segments; the first of these may be but the fifth behind the head. SHIPLEY's dimensions for this species are: length, 4 to 5·5 mm.; greatest breadth, 1 mm.; 9 to 13 proglottides; scolex, ·5 mm. Some of the *Scotia* specimens are quite 10 mm. in length, and have 18 segments; one which measured less than 4 mm. contained 8 segments, none of which were mature, but in 5 of which the outline of the developing uterus and other sex ducts could be traced in a surface view.

The only other point made out with regard to which SHIPLEY's account may be supplemented refers to the dimensions of the ova. His figures are ·042 by ·035 mm., and these he gives as about the average. We find the ova do vary in size, and while we have not struck an average figure, we think that on the whole the dimensions we have to quote are fairly common and typical. These are ·069 by ·037 mm.

The general appearance of this Cestode is given in fig. 4.

Dibothriocephalus mobilis, n. sp. (Pl. II. figs. 7 to 10.)

This is an extremely pretty little Cestode, highly translucent, which was found in the intestine of Weddell's Seal, where it occurred in considerable numbers. It measures from 12 to 20 mm. in length, and is about 2 mm. at its widest part. The scolex is broad at its free end, narrowing towards its junction with the strobila. It measures ·5 mm. in diameter. The suckers are lateral in position, deep and widely gaping the whole length of the scolex, and having extremely mobile lips. They are capable of extension backward, showing in such a case large posteriorly directed flaps. Owing to the extreme mobility of the scolex, it is rather variable in form, although its general appearance remains characteristic (figs. 7 and 8).

No neck is present. The segments are rectangular, at first narrow, being about twice as broad as long, lastly becoming practically square at the posterior end. The number varies from about 16 to 25; they are mature about the 7th or 8th segment. On a surface view the genital pores are seen to lie together close to the anterior border of the proglottis.

The uterine pores are placed for the most part alternately right and left of the middle line in successive segments. The uterus in the immature segments shows three

loops to each side; in the mature parts it appears as a rounded mass filled with the shelled ova. The yolk follicles are exceedingly numerous in the mature segments, lying closely over the whole of the inner part of the peripheral layer and visible externally. They form morula-like masses, more or less irregular in shape. In section they are mainly circular, and measure ·052 mm. in diameter. The individual yolk cells are large, measuring when fully grown about ·016 mm.

The ovary consists of a pair of flattened circular masses, which in their maximum development measure ·174 mm. in diameter, connected by a narrow band in the middle. The shelled ova measure ·051 mm. × ·034 mm. They are not operculate.

The testes follicles, which occupy the central area, occur in the planes between those occupied by the yolk follicles. Where the yolk follicles occur the central area is narrowed, and only the extreme ends of the individual testes appear here. The individual cells of the testes are extremely small. The cirrus sac is highly muscular, circular in form; the short protrusible penis is relatively thick.

The cuticle is remarkably thick, measuring ·014 mm.; the sub-cuticle consists of fairly large cells of irregular shape, amongst which the small excretory canals occur. These are fairly numerous, viz. between 30 and 40. The rest of the body consists largely of a thin and loosely packed parenchyma.

This form is clearly differentiated from all the other small Bothriocephalids in the laterally placed suckers and distinctive form of the scolex, size and general shape of the proglottides, nature of the yolk follicles, and characteristics of the ova.

We propose for it the name of *Dibothriocephalus mobilis*.

Dibothriocephalus pygoscelis, n. sp. (Pl. II. figs. 11 and 12.)

A small quantity of Cestode material, undated, and labelled, "Adult tapeworms from some species of *Pygoscelis*, probably *P. antarctica* or *P. adelia*; possibly, though not likely, *P. papua*," was found to consist of a number of extremely brittle fragments of a *Dibothriocephalus*.* Only one or two head pieces could be found, the larger of which measured 29 cm. Fragments up to 21 cm. in length occur in the collection.

The scolex measures 1·8 mm. in length, is of almost uniform breadth, slightly broader at the posterior border, where it measures ·7 mm. in diameter. The suckers are long and shallow, forming a pair of dorso-ventral grooves, extending nearly the whole length of the scolex.

There is a short neck; the anterior proglottides are markedly flanged, and at least four times as broad as long. In the broadest part of the worm they reach 9 mm. in breadth and about 1·5 mm. in width. The common genital pore can be seen upon the ventral surface as a rather broad crescentic slit, a little way behind the anterior border, while the uterine pore is placed slightly behind in the middle line.

* This was found by Dr Pirie lying on the snow near the beach at Scotia Bay, South Orkneys, where a number of penguins had been congregated—chiefly *P. antarctica* and *P. adelia*,—January 11, 1904. See *Zoological Log*, p. 95, including footnote.

The following additional points have been made out.

The cuticula and sub-cuticula are well developed. Peripheral excretory canals are numerous. The yolk follicles are very numerous and large. In longitudinal section they appear as closely arranged, long, narrow bands, sometimes spindle-shaped, extending from the sub-cuticula to the longitudinal muscle layer, which is well marked.

The uterus has four or more turns, winding dorsally and ventrally in a spiral manner (fig. 12). The shelled ova vary in size. A common dimension is: length ·073 mm., breadth ·051 mm. But there is a small proportion of long and narrow eggs measuring ·100 mm. by ·041 mm. The eggs are operculate.

The species appears to be unrecorded previously. No *Dibothriocephalus* species have hitherto been described from either Arctic or Antarctic birds. It resembles generally the scolex of *D. quadratus* in form and dimensions, but the proglottides are smaller and the ova dimensions are dissimilar; it resembles *D. cordatus* in the dimensions of the eggs, but disagrees in other features. *D. lanceolatus* is a much smaller form. In general features *D. pygoscelis* resembles *D. romeri*, but is on the whole larger, and again the egg dimensions are greater. In particular, the specially large size of the shelled ova and form of the scolex differentiate it from all other described Arctic or Antarctic species occurring in either birds or Pinnipedia.

We propose to name it *Dibothriocephalus pygoscelis*.

Sub-family PLEUROGONINÆ (Ariola).

Genus *Anchistrocephalus*, Monticelli, 1890.

Synonyms.

Tænia, Auctorum.
Bothriocephalus, Rudolphi, 1808.
Dibothrium, Diesing, 1850.
Polyonchobothrium, Diesing, 1850.
Anchistrocephalus, Monticelli, 1890.

Anchistrocephalus microcephalus (Rud.), 1819. (Pl. I. fig. 3.)

This tapeworm was found in very large numbers in the intestine of the Sunfish, *Orthagoriscus mola*, in a mass weighing several pounds, and almost completely blocking the intestine. *O. mola* was captured at Station 107.

It was first described by Rudolphi, in 1810, and its occurrence has since been noted and its anatomy described by other investigators. It is a readily recognisable species, and does not appear to have been recorded in any host other than the Sunfish. The scolex has a pair of rather deep, open, thick-margined, square-looking suckers topped by a hemispherical rostellum, the base of which is encircled by several close-set rows of small hooks (fig. 3 (*a*)).

The genital pores are marginal in position (fig. 3 (*b*)).

The appearance of the scolex varies with the state of contraction, and the rostellum may be retracted so as to be concealed below the anterior margins of the suckers, and thus appear to be absent. Similarly, the anterior proglottides, which in the extended condition are rather long, with thick, overlapping posterior margins (described by ARIOLA as "campanulate"), in the contracted condition become rectangular, short, and relatively very broad. The maximum size occurring in the *Scotia* specimens is 40 cm. by 5·5 mm., which is considerably less than that given by ARIOLA, viz. 66 cm. by 7·5 mm. This, which appears surprising in view of the large number of examples in the collections, is probably due to breakages. The specimens occurred very closely matted together, and there are numerous fragments without scolices. ARIOLA (1) has given a summary of the chief features of this species.

The following additional points have been made out in transverse sections.

The longitudinal nerve cords, which are large and well defined, are situated about one-fifth of the transverse diameter from the margin, external to the longitudinal excretory canals.

The central excretory canals are six in number, three each, right and left of the middle line.

Order CYCLOPHYLLIDEA, van Ben.

Family TÆNIIDÆ, Ludw.

Hymenolepis, sp. (?).

The Cestode here described was found in the intestine of the Ringed Penguin, *Pygoscelis antarctica*—locality, South Orkneys. It occurred in groups of from four to twelve, having their heads within a small swelling upon the intestine of about the size of a pea. The swelling, which had brownish granular contents, projected upon the outer side of the intestine. The heads appeared, as far as could be made out, to lie freely in the cavity formed by the swelling or cyst. This opened to the intestinal cavity by a very narrow aperture through which the closely grouped necks of the worms passed.

The "heads" are of very irregular and variable form. This anterior region is best described as a "pseudo-scolex." The "neck" is very long, and in most cases is at one part enlarged in a long oval form. The segmented portion is nearly cylindrical—not flattened—and, apart from colour, has quite an annelid appearance. The following measurements were made :—

Length of "neck," 6–12 mm.
Width of "neck" at broadest part, ·93 mm. to 1·13 mm.
Length of segmented region, about 1 cm.
Number of segments, about 40.
Diameter of broadest segment, 1·21 mm.

As already stated, the "heads" are very irregular in form. In the neck region calcareous corpuscles are very numerous.

The oldest proglottides are sexually immature. Only the testes are developed; they lie in the middle layer, occupying the area between the excretory vessels. There are from 16 to 19 follicles in a cross-section through their region of greatest development. The follicles are oval in section and measure from ·019 mm. to ·038 mm. along their longer axis.

Calcareous corpuscles are extremely abundant, especially in the cortical area; they are oval or circular in form, and measure from ·0063 mm. to ·0095 mm.

There is a pair of longitudinal excretory vessels on each side, placed dorsal and ventral, but quite near to each other; only the larger pair appears to be connected by transverse vessels. Both pairs have thick walls.

The longitudinal nerve cords, which lie outside but near to the excretory canals, are very ill-defined.

The question whether this type is normal is somewhat difficult to determine. The ill-defined nature of the scolex region is rather against such a view. MEGNIN (quoted by BRAUN) considers that the pseudo-scolex condition is characteristic of the very old stages of worms, but in the present case the worms are immature. Again, this condition may be a case of retarded development. This is not altogether impossible, in view of the marked pathological condition set up in the intestine at the point of attachment, and the occurrence of the parasites in groups within a single cyst, both of which conditions are unusual in other cases of Cestode fixation. On the other hand, their occurrence in this way in several different specimens suggests that the features described are usual with this species.

What positive structural data are available are not sufficient to permit of exact classification, but the type may provisionally be placed near the genus *Hymenolepis* on account of the shape of the segments, the character of the neck, and the limited number of the testes.

Order TETRAPHYLLIDEA, Carus.

Family PHYLLOBOTHRIIDÆ, Braun.

Phyllobothrium, sp. (Pl. II. figs. 3 and 4.)

From the areolar tissue under the blubber of Weddell's Seal there were found on two occasions examples of a bladder-worm whose features, especially those of the scolex, are characteristic of the genus *Phyllobothrium*. One of the specimens is incomplete.

The complete specimen consists of a scolex having four much-plaited or folded bothria. Accessory suckers are absent. Behind the scolex is a neck piece slightly flattened, 17 mm. long and about 2 mm. broad. Behind the neck is a long oval bladder, creased or wrinkled upon the surface, thick-walled and hollow, with terminal pore

or slightly inverted posterior end. The bladder measures 32 mm. in length, and at its widest part is 10 mm. in diameter.

The incomplete specimen is of interest in so far as it shows a portion of the neck invaginated within the bladder. Since this is the condition in which cysticerci usually occur in the tissues of their host, the existence of another specimen in the fully extended condition in such a situation is worthy of special note.

The presence of these larval Cestodes in the subcutaneous tissue of an animal such as Weddell's Seal is of particular interest. The hosts of adult *Phyllobothria* are, as far as known, mostly Selachians.

With regard to the question as to the probable host of the adult worm, Dr Bruce has made the interesting suggestion that this may be the Grampus. He informs me that *Stenorhynchus leptonyx* and *Lobodon carcinophaga* are frequently seen with large gashes upon their sides, which he is of opinion may be due to the attacks of a Grampus (*Orca*, sp. ?). He considers it likely that Weddell's Seal is liable to similar attacks, and in fact that the whole seal may at times be eaten. The following birds are fond of blubber, and devour the carcases of seals, viz. the Giant Petrel (*Ossifraga gigantea*), Sheathbill (*Chionis alba*), and Skuas (*Megalestris MacCormicki* and *M. antarctica*). Such habits render them liable to infection with the bladder-worm in question, and it is possible that the normal host of the adult occurs amongst these.

Order TETRARHYNCHA, v. Ben.

Family Tetrarhynchidæ.

Tetrarhynchus, sp. (Pl. II. figs. 15 to 18.)

From the muscles of the Bonito (*Thynnus pelamys* Linn.) caught at Station 31, a small number of cysticercoids of a *Tetrarhynchus*-like organism were found. These were not enclosed in a bladder, but lay quite free in the muscles, the proboscides being in a number of instances partially extruded. They were not in any instance fully extended.

The specimens measure about 6 mm. in length and $1\frac{1}{2}$ to $1\frac{3}{4}$ mm. in width. There is a thick, firm, slightly wrinkled, glistening cuticle upon the exterior. A distinctive feature is the entire absence of suckers at the anterior end. There are four slender retractile proboscides bearing about sixteen longitudinal rows of closely set, recurved hooks. The proboscides are connected with four well-developed muscular bulbs, such as are characteristic of this group.

At the posterior end there is a small spherical bulb which is retractile within a cavity. In most examples the bulb is within, but in one or two instances it occurred exserted, the body of the cysticercoid being constricted closely around its base (fig. 15).

Transverse sections of the bulb show it to contain a deeply staining connective

tissue in which there is a transverse row of ten or twelve excretory canals (fig. 18). These merge in each other, converging to a terminal pore. Longitudinal sections show the branches of the canals to be very numerous.

The body of the cysticercoid consists of a peripheral and a central portion. The former is limited by a well-defined, thick cuticle, contains numerous excretory vessels (about 60 in transverse section) and a loose parenchyma. The central region contains the muscular bulbs of the proboscides, and around these a well-developed mass of longitudinal muscles (fig. 16). The central area at its posterior end merges into the protrusible bulb (fig. 17).

The question of the more exact identification of the species to which the form belongs must be left undecided.

G. R. Wagener (5) has described a similar form from *Phycis mediterranea*.

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REFERENCES TO FIGURES.

c. = cuticula.
c.s. = cirrus sac.
exc.c. = excretory canals.
exc.b. = excretory bulb.
l.m. = longitudinal musculature.
n.c. = nerve cord.
o. = ovary.
per.a. = peripheral area.
r.m. = retractor muscles of proboscides.
s.c. = sub-cuticula.
sh.ov. = shelled ova.
t.f. = testes follicles.
ut. = uterus.
v. = vagina.
y.c. = yolk cells.

EXPLANATION OF PLATES.

Plate I.

Fig. 1. Transverse section of *Dibothriocephalus scoticus*, n. sp., at the level of the ovary.

Fig. 2. (*a*) Entire specimen of *D. scoticus*; (*b*) scolex of *D. scoticus*.

Fig. 3. (*a*) Anterior end of *Anchistrocephalus microcephalus*; (*b*) immature proglottis of *Anchistrocephalus microcephalus*.

Fig. 4. Four specimens of *Dibothriocephalus wilsoni*, Shipley.

Fig. 5. Scolex of *Dibothriocephalus coatsi*, n. sp.

Fig. 6. Transverse section of *D. coatsi*.

PLATE II.

Fig. 7. Entire specimen of *Dibothriocephalus mobilis*, n. sp.

Fig. 8. Scolices of *D. mobilis*, n. sp.

Fig. 9. Transverse section of proglottis of *D. mobilis*.

Fig. 10. ,, ,, through uterus and cirrus sac of *D. mobilis*.

Fig. 11. Proglottis of *Dibothriocephalus pygoscelis*, n. sp.

Fig. 12. Diagrammatic longitudinal section of proglottides of *D. pygoscelis*, showing position of sex openings and uterine coils.

Fig. 13. Metacestode of *Phyllobothrium* sp., from blubber of Weddell's Seal.

Fig. 14. Scolex of *Phyllobothrium* sp.

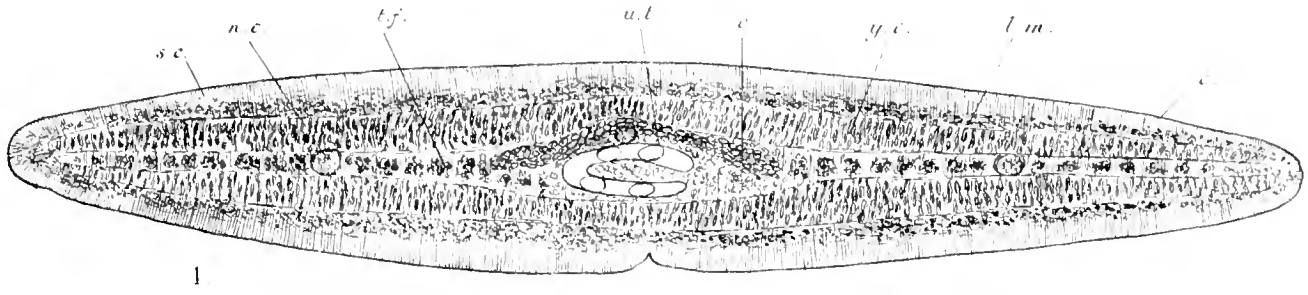
Fig. 15. Larval *Tetrarhynchus* from the muscles of the Bonito.

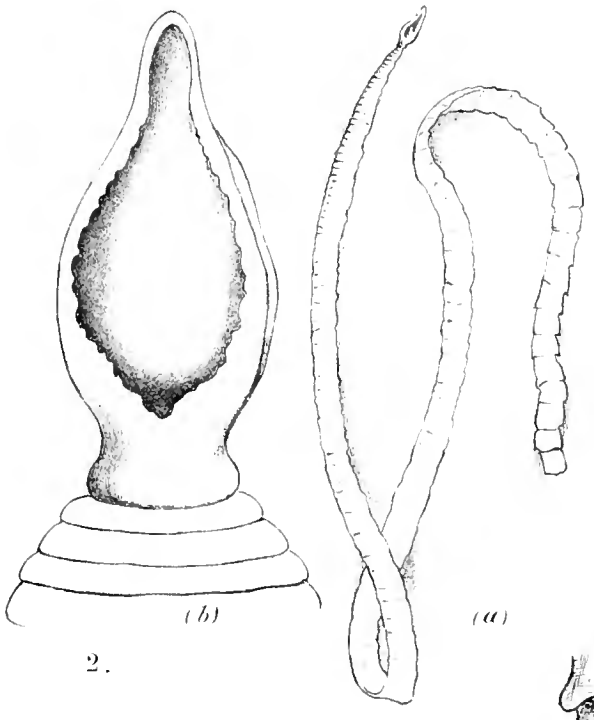
Fig. 16. Transverse section of larval *Tetrarhynchus* through retractor muscles of proboscides.

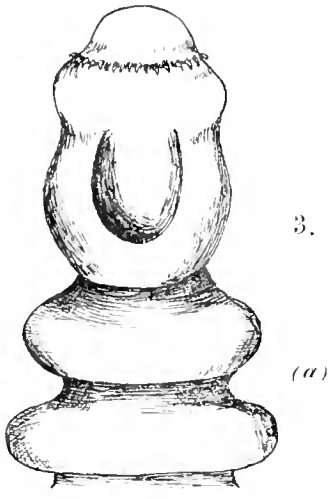
Fig. 17. Diagram of posterior end of larval *Tetrarhynchus* showing excretory bulb retracted.

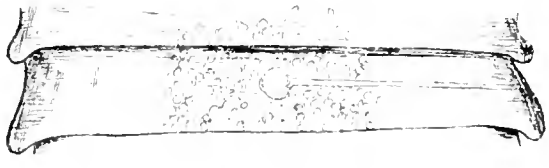
Fig. 18. Transverse section of larval *Tetrarhynchus* through retracted bulb, showing row of excretory vessels.

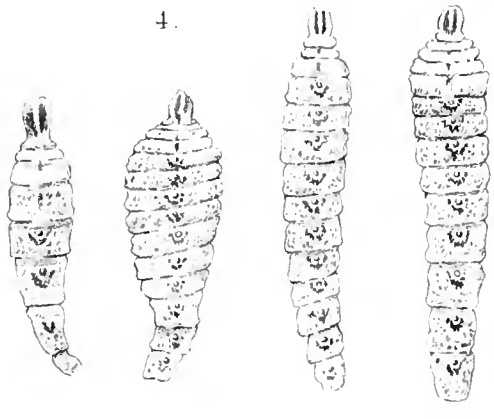
Rennie and Reid: "Scotia" Cestoda—Plate I.

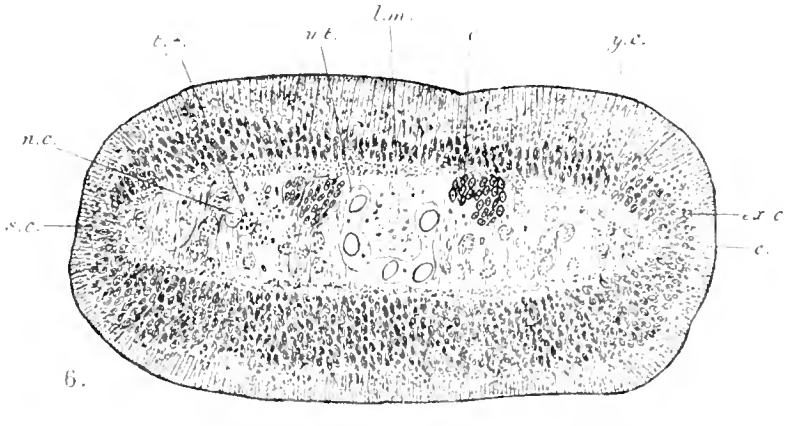




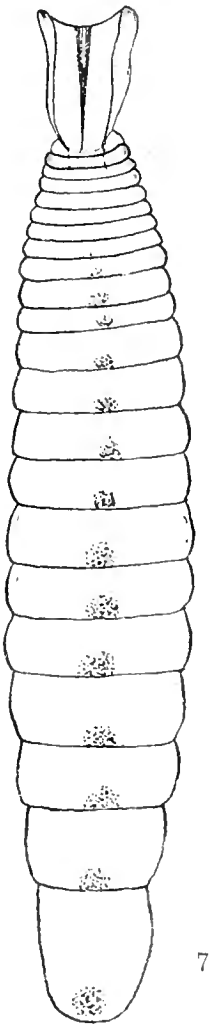








Rennie and Reid: "Scotia" Cestoda—Plate II.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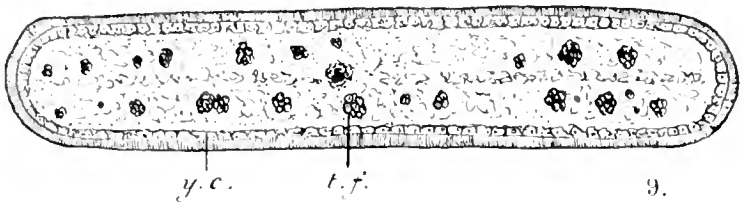

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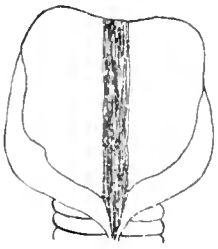
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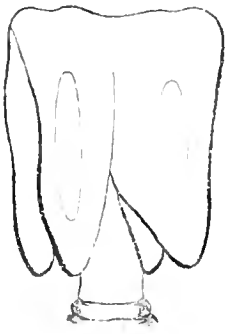

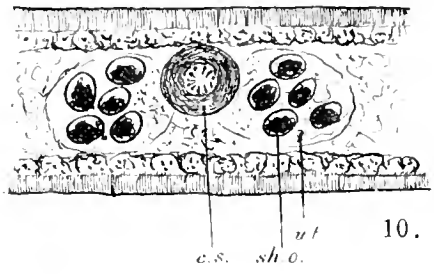

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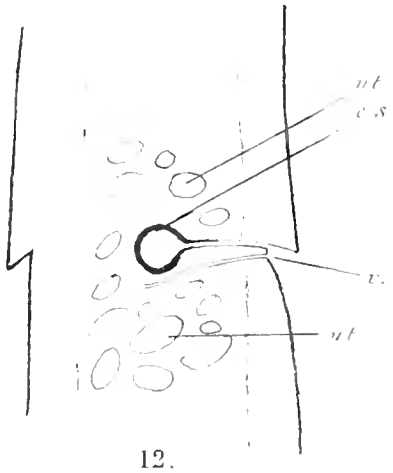

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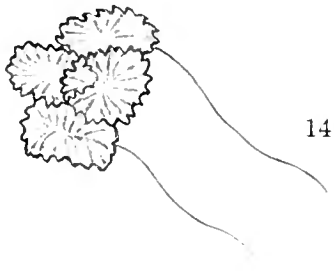
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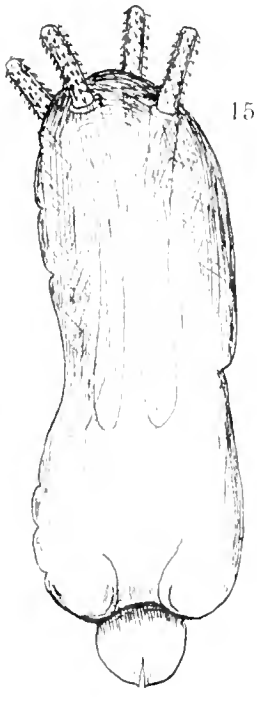
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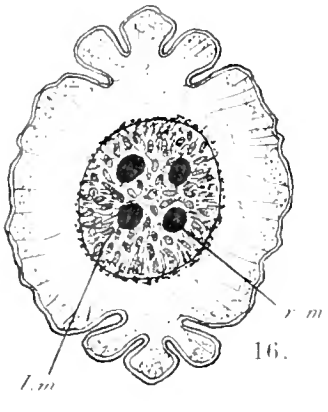

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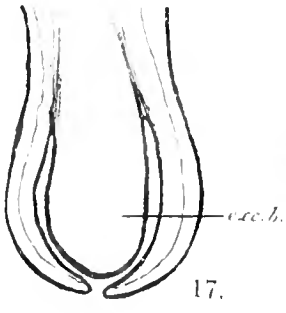

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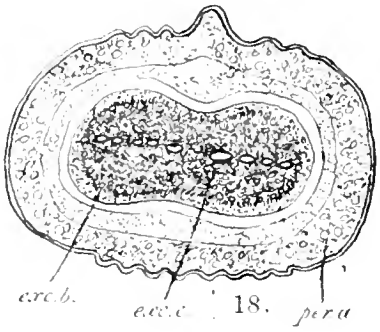

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PART IX.

MICROSCOPIC LIFE ON GOUGH ISLAND.

SCOTTISH NATIONAL ANTARCTIC EXPEDITION.

IX.—NOTE ON MICROSCOPIC LIFE ON GOUGH ISLAND, SOUTH ATLANTIC OCEAN.

By JAMES MURRAY.

"Scotia" Collections.—Note on Microscopic Life on Gough Island, South Atlantic Ocean.

By James Murray. *Communicated by* William Evans, F.R.S.E.

(Read November 25, 1907.)

By favour of Dr William S. Bruce and Mr R. N. Rudmose Brown, I was allowed to examine a small tuft of moss from Gough Island, or Diego Alvarez. The material was collected by the Scottish National Antarctic Expedition when the *Scotia* visited the island in April 1904.

Mr Brown (1) speaks of the luxuriant vegetation of the island, which is "clothed in green from the water's edge almost to the summit," of the "moss-clothed cliffs and luxuriantly growing ferns and flowers" (2), suggesting a paradise for the microscopist. It may be confidently affirmed that Gough Island will be found to have a rich microscopic fauna, as every land yet investigated, having a climate favourable to the growth of moss, maintains abundant microscopic life of many classes.

It was therefore with disappointment that I found the one little tuft of moss available to be an unfavourable specimen. It may have been already washed, in preparing it as a botanical specimen, but the sediment I obtained by washing was very small in quantity, and contained few recognisable organisms.

As Dr Bruce assures me that everything found will be new for the island, I am induced to publish a note on the very meagre result obtained.

Rotifera.

Philodina flaviceps, Bryce (3).—A species only recently discovered in Scotland, and easily recognisable by the spurs, which are very short.

Callidina angusticollis, Murray (4).—One of the most widely distributed of all Rotifers. The case only was found on Gough Island, and measured $\frac{1}{132}$ inch (190 μ) in length.

Bdelloid egg.—Similar to that of *Philodina citrina*, which has a prominence at one pole of the egg. Several species, of different genera, have this type of egg, so that no certain identification can be made from it.

Rhizopoda.

Heliopera petricola, Leidy, var. *amethystea*, Penard.

Difflugia sp.—Of hemispherical form, like an *Arcella*.

Euglypha ciliata (Ehr.).

Euglypha sp.—No spines, section circular. A Rhizopod, with the form of a *Euglypha*, and similar surface plates, but without spines, has been found in Scotland also.

(reprinted from the proceedings of the royal physical society of edinburgh, vol. xvii., no. 4.)

In addition to the four species named, there were two worms, a *Nematode* and an *Oligochæte*, and a blue-green tabular *Alga*, with the cells grouped in multiples of four.

In studying the micro-biology of lands previously unexplored, one does not anticipate much peculiarity, even in the most remote islands. The reason for this is that the majority of microscopic fresh-water or land species are what JENNINGS calls "potentially cosmopolitan"—that is to say, they can be conveyed through the air to all parts of the world, in the form of eggs or spores, or even in some classes in the adult condition, and may settle down in any part offering favourable conditions.

Some classes are not so easily conveyed as others, and there is always the anticipation that there may be peculiar insular forms in any unexplored island to stimulate the interest of naturalists.

On account of the high seas and the dangerous coast, it was only with great difficulty that we effected a landing, and it was only possible to remain ashore for a few hours. Hence the small collections! Gough Island undoubtedly holds out a splendid and interesting field for the investigation of its invertebrate fauna.—W. S. B.

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PART X.

MICROSCOPIC LIFE ON GOUGH ISLAND.

SCOTTISH NATIONAL ANTARCTIC EXPEDITION.

X.—FURTHER NOTE ON MICROSCOPIC LIFE ON GOUGH ISLAND, SOUTH ATLANTIC OCEAN.

By Dr. EUGÈNE PENARD,
Geneva.

(*WITH TEXT ILLUSTRATIONS.*)

"Scotia" Collections.—Further Note on Microscopic Life on Gough Island, South Atlantic Ocean—Rhizopoda. By Dr Eugène Penard, Geneva. *Communicated by* William Evans, F.R.S.E.

(Read December 18, 1911. Received January 24, 1912. Issued separately March 23, 1912.)

[Explanatory Note by W. Evans.—In the summer of 1907, shortly before his departure for the Antarctic, Mr James Murray examined, for micro-organisms, a small tuft of moss brought from Gough Island, in the South Atlantic Ocean, by the Scottish National Antarctic Expedition of 1902–4. Not having time to examine the material exhaustively, Mr Murray passed on the residue (contained in one small bottle) to Dr E. Penard for more thorough examination. Mr Murray's report was communicated to this Society in November 1907, and published in the *Proceedings* early in the following year (vol. xvii. p. 127). In April 1908, Dr Penard sent to Dr Bruce the following account of the species he had found in the material received from Mr Murray.]

List of Rhizopoda, etc., found in Moss-residue from Gough Island.

The following is a list of the Rhizopods [1] found in the material received from Mr Murray:—

Arcella discoides, Ehrbg.—One specimen, very small.

Parmulina brucei, spec. nova (see p. 245).—About ten specimens.

Difflugia constricta, Ehrbg.—One specimen.

Euglypha ciliata, Ehrbg.—Rare.

,, *compressa*, Carter.—Rare.

,, *laevis*, Perty.—I refer to this species, though doubtfully; moderately numerous, very small and very broad specimens with fine and distinct alveoli.

,, *strigosa*, Leidy.—Rare.

Heliopera petricola, Leidy.—Large, clear, very light pink colour; very likely this is the species found by Murray, but it differs from var. *amethystea*, Penard, which is still larger.

Nebela caudata, Leidy.—One specimen only.

,, *collaris*, Leidy.—Rather abundant;[1] in several forms (as a rule small).

Phryganella hemisphærica, Penard.—Rare.

Sphenoderia fissirostris, Penard.—Not very rare.

[1] When I say "abundant," it is only "relatively" to other species, for in fact the specimens were few compared with the average "richesse" of mosses or Sphagnum.

Trinema enchelys (Ehrbg.).—Not rare; always very small form, as generally found in mosses.

,, *lineare*, Penard.

Such are the Rhizopods I found in the Gough Island material. They are few in species, and each species is poorly represented in numbers, yet this note may be of some interest, and for several reasons:—

1. All are species found in Europe (except one, *Parmulina brucei*), and did not differ in appearance, except that they were perhaps on the average a little smaller.
2. They represent, most of them, the typical fauna of mosses, but the scarcity (one specimen only) of *Difflugia constricta*, a species always so abundant in mosses, is remarkable.
3. With the exception of the above, no Difflugias were observed. Murray found one. "*Difflugia* spec.," but it was very likely *Phryganella hemisphærica*. In Europe, and indeed everywhere, Difflugias (except *constricta*) are rare in mosses.
4. One species has never been found before, namely *Parmulina brucei*, nov.; but it will probably be found somewhere else one day or other.[1] I append a description of this species, or rather of its envelope, which was the only part of the organism available. I have taken the liberty of naming it *brucei*, after the leader of the *Scotia* expedition.

For other organisms besides Rhizopods I did not look specially, but I found the following:—A small rotifer (*Brachionus*?), about twenty specimens of *Callidina angusticollis*, Murray, a small diatom which was abundant (*Meridion* sp.), and a good many samples of *Merismopedia*—very likely that "blue-green tabular Alga, with the cells grouped in multiples of four," which Murray mentions.

Parmulina brucei, spec. nova.

Enveloppe chitineuse, jaunâtre, en forme de pyramide ou de cône tronqué, à base deux fois environ aussi large que le sommet. De ce sommet, ou plateau dorsal, partent un certain nombre d'arêtes (14 à 16 en moyenne), qui descendent vers la face ventrale, et divisent la surface de l'enveloppe en partitions ou facettes à peu près égales.[2]

La surface de cette enveloppe est couverte de ponctuations très-nettes, serrées les unes contre les autres, disposées régulièrement.

[1] I have this year (1911) found this same species, though very likely a special variety of it, in mosses collected by Dr Fuhrmann at an altitude of 3000 metres, on the Andes of America (Colombia).

[2] Il est possible cependant que ces arêtes ou facettes n'existent pas toujours; elles manquaient dans les exemplaires trouvés plus tard dans les Andes. Dans cette dernière station (Paramo, Cruz Verde; Colombie), d'ailleurs, on pouvait constater d'autres différences, surtout dans les ponctuations caractéristiques du plateau dorsal, et peut-être y a-t-il là une variété spéciale.

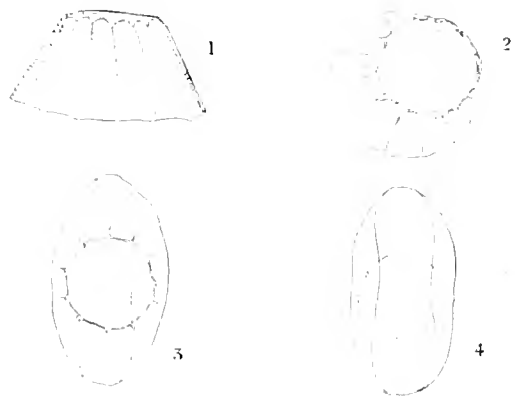
A partir de l'arête dorsale, la membrane devient toujours plus claire et plus mince, et elle finit par ne plus être qu'une pellicule très-fine, qui se replie brusquement en dedans sur la face ventrale pour border le plasma.

Cette enveloppe est peu déformable, mais peut cependant se refermer sur elle-même, en rapprochant ses bords comme deux lèvres ; mais le plateau dorsal, plus rigide, ne prend pas part à la déformation.

Noyau ?

Vesicule contractile ?

Diamètre à la face ventrale . .	125–150 μ.
Diamètre du plateau dorsal . .	65– 80 μ.
Hauteur dorso-ventrale . . .	70– 80 μ.



PARMULINA BRUCEI.

FIG. 1. Enveloppe, vue de côté.
,, 2. Enveloppe, vue de trois quarts, par le plateau dorsal.
,, 3. Enveloppe fermée sur elle-même, vue par le plateau dorsal.
,, 4. La même, vue par la face ventrale.

Localité.—Gough Island, Mer du Sud, dans les mousses.

Obs.—Le genre *Parmulina* est très-proche voisin du genre *Corycia*, au quel j'avais cru tout d'abord devoir rapporter l'organisme de Gough Island ; mais tandis que dans les *Corycia* nous avons une sorte de sac, très-souple, très-déformable, ici la membrane est plus forte, presque rigide sur la face dorsale, susceptible de se fermer sur elle-même à la manière d'un chapeau dont on rapprocherait les deux bords, mais pas de se déformer complétement. Probablement aussi le plasma est-il différent, recouvert peut-être d'une pellicule membraneuse. Ce genre, du reste, est encore très-mal connu ; on a quelques renseignements sur la *Parmulina cyathus*,[1] mais la *P. brucei*, qui n'a pas été étudiée à l'état vivant, demande à être revue de plus près.

[1] PENARD, "Sur quelques Rhizopodes des mousses," *Arch. für Protistenk.*, vol. xvii. fasc. 2, 1909, p. 286.

PART XI.

ENTOMOSTRACA.

XI.—THE ENTOMOSTRACA OF THE SCOTTISH NATIONAL ANTARCTIC EXPEDITION.

By THOMAS SCOTT, LL.D., F.L.S.,
Scottish Fishery Board, Aberdeen.

The Entomostraca of the Scottish National Antarctic Expedition, 1902–1904.

By Thomas Scott, LL.D., F.L.S. *Communicated by* Dr J. H. Ashworth.

(With Fourteen Plates.)

(MS. received January 24, 1912. Read February 19, 1912. Issued separately November 15, 1912.)

CONTENTS.

Introductory Statement.

The Entomostraca recorded here were collected by the s.y. *Scotia* on its way to and from the Antarctic, and also while carrying on investigations there during the years 1902 to 1904. The Entomostraca in these collections belong chiefly to the Copepoda, but the Cladocera and Ostracoda are also represented, the last by a considerable number of species. These three groups are described below in the order mentioned.

The Copepoda.

The Copepoda recorded in the following pages number considerably over one hundred species. A fairly large proportion of them belong to the Calanoida and to one or two other groups of pelagic forms; these were, for the most part, obtained in samples of plankton—chiefly surface gatherings collected by tow net at various stations on the outward voyage between Cape Verde and the Falkland Islands. On the other hand, most of the Harpacticoida, of which there are a good number, are from the neighbourhood of the South Orkney Islands, but some of them were also obtained in siftings from material brought up in the dredge or trawl net, and amongst organisms washed from floating Gulf-weed.

Most of the pelagic or free-swimming species from the tow-net collections are more or less widely distributed, and have been described in various published works, but some of them are tolerably rare. The Harpacticoida and other demersal forms are, however, not so well known, and a considerable number of those recorded here appear to be undescribed; a few of them are closely related to British or other northern species, and seem to lend some support to the idea of a bipolar distribution

The occurrence at places so far distant as the Falklands and South Orkneys of demersal forms identical with, or closely allied to, those of Britain and Norway has a bearing on the question of distribution different from that concerning organisms living

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freely in the open sea. Such free-swimming species are subject to dispersal over wide areas by tidal and other currents, and numerous examples of such dispersal are indicated or described by various authors; but the wide distribution of an Harpactid such, for example, as *Orthopsyllus linearis*, Claus, may not be so easily explained. This Copepod is one of a group which have an elongated and moderately slender body, provided with short appendages that are scarcely, if at all, fitted for swimming, but are rather adapted for living among branching zoophytes or on the roots and stems of seaweeds. The transporting action of currents can have much less effective influence on the distribution of such species than on species living a free life in the open sea. Nevertheless, *Orthopsyllus linearis* has been recorded from the British Islands, from Norway, the Mediterranean, the Suez Canal, the Gulf of Manaar, and the Gulf of Guinea. More recently it has been obtained in material collected in the Malay Archipelago during the *Siboga* Expedition of 1899–1902,* and now this non-swimming species is here recorded from gatherings collected by the *Scotia* among the South Orkney Islands.

Another species—*Asterocheres suberites*, Giesbrecht—belonging to a different group of Copepods, is usually found living as a commensal in the water passages of certain sponges.†

The wide dispersal of this *Asterocheres* cannot, from its peculiar habitat, be to any large extent attributed to oceanic currents, yet it has been recorded from the British Islands and the Mediterranean; and one or two specimens from a gathering collected among the South Orkneys by the *Scotia* can scarcely be distinguished from those living on British sponges. Other species equally interesting and showing the near relationship of the non-pelagic Copepoda of the far South with those of our Northern Seas will be noticed in the sequel, but two may be briefly referred to here. One of them —an Harpactid, obtained in a small gathering of minute Molluscan shells collected on the shore at Port Stanley, Falkland Islands—has a remarkable likeness to a species that was dredged in the Firth of Forth off St Monance in 1891,‡ and which has been described more recently by G. O. Sars from Norwegian specimens.§ The female of this species is distinguished by having the last pair of thoracic legs large and leaf-like,—hence the generic name *Phyllopodopsyllus*. The other form is also interesting because it may be regarded as supplying a "missing link" in the little group of nearly related species representing four genera, viz.—*Cervinia*, Norman, *Cerviniopsis*, G. O. Sars, *Zosime*, Boeck, and *Pseudozosime*, Scott. In the first genus the inner ramus of the first pair of thoracic legs is three-jointed and that of the next three pairs two-jointed; in the second all the four pairs of thoracic legs have the inner ramus three-jointed. In the third the inner ramus of the first pair is two-jointed, and that of the next three pairs three-jointed; while in *Pseudozosime* the inner ramus of all the four pairs is composed of

* *The Copepoda of the "Siboga" Expedition*, by Andrew Scott, A.L.S., p. 225 (1909).
† *Fauna u. Flora des Golfes von Neapel*, 25. Monogr., "Asterocheriden," by Dr W. Giesbrecht, p. 70.
‡ *Tenth Annual Report of the Fishery Board for Scotland*, part iii. p. 253, pl. ix. figs. 19–32.
§ *An Account of the Crustacea of Norway*, vol. v. part xix. (1907), p. 231, pl. clv.

two joints. These differences become more apparent when arranged in tabular form, thus :—

Name of the Genus.	Inner Ramus of			
	1st pair.	2nd pair.	3rd pair.	4th pair.
Cervinia	3-jointed	2-jointed	2-jointed	2-jointed
Cerviniopsis . . .	3- ,,	3- ,,	3- ,,	3- ,,
Zosime	2- ,,	3- ,,	3- ,,	3- ,,
Pseudozosime . . .	2- ,,	2- ,,	2- ,,	2- ,,

The small Harpactid, for which it has been necessary to institute the new generic name, *Pseudozosime*, was obtained by washing some material dredged in Scotia Bay, South Orkneys, in June 1903. Only one specimen—a female—was observed; it so closely resembled *Zosime*, Boeck, that only after careful dissection could the differences referred to be detected.

In this account of the Copepoda from the *Scotia* collections, the general arrangement followed is that outlined by G. O. Sars in his *Crustacea of Norway*, vol. iv. p. 2. He divides the Copepoda into seven sub-orders or tribes, viz. the Calanoida, Harpacticoida, Cyclopoida, Notodelphyoida, Monstrilloida, Caligoida, and the Lernæoida. The first three contain all the Copepoda recorded here except *Dysgamus atlanticus*, which belongs to the Caligoida. Dr G. S. Brady's Report on the *Challenger* Ostracoda and other papers on these organisms have been of much assistance in dealing with this group.

As several of the species recorded here, particularly among the Harpacticoida, appear to be undescribed, drawings of these have been prepared to show their distinguishing features, and to illustrate the descriptive notes relating to them. A few other more or less rare and interesting forms are also figured to show peculiarities of structure and some of the characteristics by which they may be determined from others closely allied to them. My son, Andrew Scott, A.L.S., has prepared a number of these drawings, and I desire to express my indebtedness to him for these, as well as for assistance in determining some of the more critical and troublesome species.

I have also to express my thanks to the Executive Committee of the Carnegie Trust for the Universities of Scotland for defraying the expenses of the plates.

I have not considered it necessary to give a list of the authors whose works have been consulted, but reference to the more important of them will be found throughout the systematic part of the Report.

Systematic List of Species Recorded or Described in this Report.

COPEPODA.

CALANOIDA.

CALANIDÆ.

Calanus, Leach.
- *minor* (Claus).
- *tenuicornis*, Dana.
- *acutus*, Giesbrecht.
- *propinquus*, G. S. Brady.

Calanoides, G. S. Brady.
- *brevicornis* (Lubbock).

Megacalanus, Wolfenden.
- *robustior* (Giesbrecht).
- *gracilis* (Dana).

Undinula, A. Scott.
- *vulgaris* (Dana).
- *darwinii* (Lubbock).

EUCALANIDÆ.

Eucalanus, Dana.
- *attenuatus*, Dana.
- *crassus*, Giesbrecht.
- *subtenuis*, Giesbrecht.

Rhincalanus, Dana.
- *gigas*, G. S. Brady.
- *cornutus*, Dana.

Mecynocera, I. C. Thompson.
- *clausi*, I. C. Thompson.

PARACALANIDÆ.

Paracalanus, Boeck.
- *aculeatus*, Giesbrecht.

Acrocalanus, Giesbrecht.
- *longicornis*, Giesbrecht.

Calocalanus, Giesbrecht.
- *pavo* (Dana).
- *plumulosus* (Claus).

Clausocalanus, Giesbrecht.
- *arcuicornis* (Dana).
- *furcatus* (G. S. Brady).

EUCHÆTIDÆ.

Euchæta, Philippi.
- *marina* (Prestandrea).

SCOLECITHRICIDÆ.

Scolecithrix, G. S. Brady.
- *danæ* (Lubbock).
- *glacialis*, Giesbrecht.

Racovitzanus, Giesbrecht.
- *antarcticus*, Giesbrecht.

CENTROPAGIDÆ.

Centropages, Kröyer.
- *furcatus* (Dana).
- *violaceus* (Claus).
- *brachiatus* (Dana).
- *calaninus* (Dana).
- *typicus*, Kröyer.

TEMORIDÆ.

Temora, Baird.
- *stylifera* (Dana).
- *turbinata* (Dana).

METRIDIIDÆ.

Metridia, Boeck.
- *lucens*, Boeck.
- *gerlachei*, Giesbrecht.

Pleuromamma, Giesbrecht.
- *abdominalis* (Lubbock).
- *gracilis* (Claus).
- *gracilis* var. *esterlyi*, nov.

LUCICUTIDÆ.

Lucicutia, Giesbrecht.
- *flavicornis* (Claus).

HETERORHABDIDÆ.

Heterorhabdus, Giesbrecht.
- *papilliger* (Claus).
- *austrinus*, Giesbrecht.

HALOPTILIDÆ.

Haloptilus, Giesbrecht.
- *acutifrons*, Giesbrecht.

CANDACIIDÆ.

Candacia, Dana.
- *pachydactyla*, Dana.
- *curta*, Dana.
- *bipinnata*, Giesbrecht.
- *æthiopica*, Dana.
- *bispinosa*, Claus.
- *simplex*, Giesbrecht.
- *longimana*, Claus.

PONTELLIDÆ.

Calanopia, Dana.
americana, Dahl.
Labidocera, Lubbock.
nerii (Kröyer).
acutifrons (Dana).
Pontella, Dana.
atlantica (M.-Edw.).
securifer, G. S. Brady.
spinipes, Giesbrecht.
Pontellina, Dana.
plumata, Dana.

PONTELLIDÆ—continued.

Pontellopsis, G. S. Brady.
regalis (Dana).
perspicax (Dana).
brevis (Giesbrecht).
villosa, G. S. Brady.

ACARTHIDÆ.

Acartia, Dana.
negligens, Dana.
danæ, Giesbrecht.

HARPACTICOIDA.

CERVINIIDÆ.

Pseudozosime, n. g.
browni, n. sp.

ECTINOSOMIDÆ.

Ectinosoma, Boeck.
antarcticum, Giesbrecht.
Bradya, Boeck.
proxima, n. sp.
Microsetella, Brady & Robertson.
norvegica (Boeck).
rosea (Dana).

MACROSETELLIDÆ.

Macrosetella, A. Scott.
gracilis (Dana).
Miracia, Dana.
efferata, Dana.

EUTERPINIDÆ.

Euterpina, Norman.
acutifrons (Dana).

CLYTEMNESTRIDÆ.

Clytemnestra, Dana.
scutellata, Dana.

HARPACTICIDÆ.

Harpacticus, M.-Edw.
fucicolus, n. sp.
pirici, n. sp.

PELTIDIIDÆ.

Alteutha, Baird.
austrina, n. sp.
dubia, n. sp.
Paralteutha, n. g.
typica, n. sp.

PORCELLIDIIDÆ.

Porcellidium, Claus.
affine, Quidor.

TISBEIDÆ.

Tisbe, Liljeborg.
australina, n. sp.
gracilipes, n. sp.
Psamathe, Philippi.
longicauda, Philippi.
fucicola, n. sp.
Machairopus, G. S. Brady.
australis, n. sp.
major, n. sp.

THALESTRIDÆ.

Parathalestris, G. O. Sars.
clausi (Norman).
coatsi, n. sp.
affinis, n. sp.
Idomene, Philippi.
forficata, Philippi.
Dactylopusia, Norman.
frigida, n. sp.
ferrieri, n. sp.
perplexa, n. sp.
Pseudothalestris, G. S. Brady.
intermedia, n. sp.
assimilis, G. O. Sars, var. *antarctica*.

DIOSACCIDÆ.

Diosaccus, Boeck.
tenuicornis, Boeck.
Amphiascus, G. O. Sars.
fucicolus, n. sp.

CANTHOCAMPTIDÆ.

Ameira, Boeck.
simulans, n. sp.
Parastenhelia, I. C. Thompson & A. Scott.
antarctica, n. sp.
Phyllopodopsyllus, T. Scott.
mossmani, n. sp.

LAOPHONTIDÆ.

Laophonte, Philippi.
rottenburgi, n. sp.
australis, n. sp.
wiltoni, n. sp.
exigua, n. sp.
Laophontodes, T. Scott
whitsoni, n. sp.

CLETODIDÆ.

Orthopsyllus, Brady & Robertson.
linearis (Claus).

CYCLOPOIDA.

OITHONIDÆ.

Oithona, Baird.
plumifera, Baird.
minuta, T. Scott.
similis, Claus.

CYCLOPIDÆ.

Cyclopina, Claus.
belgica, Giesbrecht.
Euryte, Philippi.
similis, n. sp.

LICHOMOLGIDÆ.

Lichomolgus, Thorell.
fucicola, G. S. Brady.
Pseudanthessius, Claus.
fucicolus, n. sp.

ASTEROCHERIDÆ.

Asterocheres, Boeck.
suberites, var. *antarctica*, n. var.

ARTOTROGIDÆ.

Artotrogus, Boeck.
proximus, n. sp.

SAPPHIRINIDÆ.

Sapphirina, J. V. Thompson.
ovatolanceolata, Dana.
gemma, Dana.
iris, Dana.
angusta, Dana.
lactens, Giesbrecht.

SAPPHIRINIDÆ—continued.

Sapphirina vorax, Giesbrecht.
auronitens, Claus.
nigromacutata, Claus.
intestinata, Giesbrecht.
opalina, Dana.
gastrica, Giesbrecht.
stellata, Giesbrecht.
darwini, Haeckel.
Saphirella, T. Scott.
abyssicola, T. Scott.
Copilia, Dana.
mirabilis, Dana.
denticulata, Claus.

ONCÆIDÆ.

Oncæa, Philippi.
venusta, Philippi.
mediterranea, Claus.
conifera, Giesbrecht.

CORYCÆIDÆ.

Corycæus, Dana.
venustus, Dana.
ovalis, Claus.
obtusus, Dana.
flaccus, Giesbrecht.
rostratus, Claus.
speciosus, Dana.
longistylis, Dana.
carinatus, Giesbrecht.
longicaudis, Dana.
elongatus, Claus.

CALIGOIDA.

CALIGIDÆ.

Dysgamus atlanticus, Stp. & Ltkn.

CLADOCERA.

Evadne, Loven.
tergestina, Claus.

Evadne spinifera, P. E. Müller.

OSTRACODA.

PODOCOPA.

CYPRIDÆ.

Macrocypris, G. S. Brady.
maculata, G. S. Brady.

CYTHERIDÆ.

Cythere, O. F. Müller.
inornata, n. sp.
quadridens, n. sp.
latibrosa, n. sp.
foveolata, G. S. Brady.
antarctica, n. sp.
peregrina, n. sp.

CYTHERIDÆ—continued.

Xestoleberis, G. O. Sars.
reniformis, G. S. Brady.
Cytherura, G. O. Sars.
ornata, n. sp.
porrecta, n. sp.
sculptilis, n. sp.
Paradoxostoma, Fischer.
retusum, G. S. Brady.
antarcticum, n. sp.
lævе, n. sp.

MYODOCOPA.

CYPRIDINIDÆ.

Philomedes, Liljeborg.
assimilis, G. S. Brady.
Asterope, Philippi.
australis, G. S. Brady.
oculata, G. S. Brady.

HALOCYPRIDÆ.

Halocypris, Dana.
globosa, Claus.
Conchœcia, Dana.
spinirostris, Claus.
procera, G. W. Müller.
elegans, G. O. Sars.
Euconchœcia, G. W. Müller.
chierchiæ, G. W. Müller.

COPEPODA.

Tribe *CALANOIDA*, G. O. Sars.*

Fam. CALANIDÆ.

Genus *Calanus*, Leach, 1816.

Calanus minor (Claus).

1863, *Celochilus minor*, Claus, *Die freilebenden Copepoden*, p. 172.
1893, *Calanus minor*, Giesb., *F. Fl. Neapel*, vol. xix. p. 90, pls. vi., vii., viii.

This species was observed in samples of plankton from twenty-one stations, ranging from Stations 7, 8, and 10 in the North Atlantic, 26° 23′ N., 20° 20′ W., to Stations 60, 62, and 64 in the South, 6° 30′ S., 34° 25′ W.

C. minor appears to be one of the more widely distributed species; its distribution, according to GIESBRECHT, extends from the Mediterranean to the Atlantic, Pacific, and Indian Oceans, between lat. 34° N. and 36° S.

Calanus tenuicornis, Dana.

1849, *Calanus tenuicornis*, Dana, *Proc. Amer. Acad.*, vol. ii. p. 15.

The only sample in which this species occurred was from Station 15 in 20° 34′ N., 23° 12′ W.

* The arrangement followed for the Calanoida is that of G. O. SARS' *Crustacea of Norway*, vol. iv.

Calanus acutus, Giesbrecht.

1902, *Calanus acutus*, Giesb., *Expéd. Antarct. Belge*, "Copepoden," p. 17, pl. i.

This species occurred in two of the *Scotia* gatherings, in one from 200 fathoms collected in 69° 22′ S., 26° 36′ W., Station 273, and in another from 500 fathoms collected in lat. 68° 40′ S., long. 30° 18 W., Station 280.

Calanus propinquus, G. S. Brady.

1883, *Calanus propinquus*, Brady, *Report Voy. "Challenger,"* vol. viii. p. 34, pl. ii.
1892, ,, ,, Giesb., *F. Fl. Neapel*, vol. xix. p. 91, pl. vii. figs. 31, 34 *et seq.*

C. propinquus was met with very sparingly in a surface sample collected 28th November 1903 in 59° 43′ S., 48° 10′ W., Station 337*b*. The distribution of this species extends to the Atlantic, Pacific, and Indian Oceans, between lat. 55° N. and 65° S. (Giesbrecht).

Genus *Calanoides*, G. S. Brady, 1883.

Calanoides brevicornis (Lubbock).

1856, *Calanus brevicornis*, Lubb., *Trans. Entom. Soc. Lond.* (N.S.), vol. iv. p. 11, pl. 3.
1892, ,, ,, Giesb., *F. Fl. Neapel*, vol. xix. p. 90, pl. vi. figs 7, 9, 18 *et seq.*
1894, ,, *frontalus*, F. Dahl, *Verh. d. zool. Gesellschaft*, p. 76.
1907, ,, *brevicornis*, G. O. Sars, *Bull. de l'Institut Océanographique*, No. 101, p. 4.
1909, *Calanoides* ,, A. Scott, "*Siboga*" *Expedl.*, Monogr. xxixa, "Copepoda," p. 10.
1910, *Calanus* ,, Stebbing, *Annals of the S. African Museum*, vol. iv. pt. iv. p. 520.

A few specimens were obtained in a surface tow-net gathering collected 5th May 1904 off Cape Peninsula, 34° 21′ S., 18° 29′ E., Station 477. This species is easily recognised by the slightly crested forehead; it appears to be widely distributed in the South Atlantic and Indian Oceans. The fifth pair of thoracic legs of the male of the species recorded here and of *Calanoides patagoniensis*, Brady, differ distinctly from those of the typical *Calanus*.

Genus *Megacalanus*, Wolfenden, 1904.*

Megacalanus gracilis (Dana).

1849, *Calanus gracilis*, Dana, *Proc. Amer. Acad.*, vol. ii. p. 18.

This species occurred very sparingly at Stations 11, 15, 18, and 29, 23° 50′ N., 21° 34′ W., to 12° 31′ N., 25° 09′ W., in the North Atlantic, and at Station 56 in the South Atlantic, 0° 42′ S., 31° 20′ W.

Megacalanus robustior (Giesbrecht).

1888, *Calanus robustior*, Giesb., *Atti Acc. Lincei Rend.*, ser. iv., vol. iv., sem. 2, p. 332.
1892, ,, ,, *idem*, *F. Fl. Neapel*, vol. xix. p. 91, pl. vii. figs. 15, 19 *et seq.*

Only a few specimens were obtained; they occurred in a gathering from Station 11, 23° 50′ N., 21° 34′ W., in the North Atlantic, and in two others, from Station 59, 2° 30′ S., 32° 42′ W., and Station 62, 4° 15′ S., 33° 38′ W., in the South Atlantic.

* See note on this genus in the *Copepoda of the "Siboga" Expedition*, by Andrew Scott (1909), p. 10 *et seq.*

Genus *Undinula*, A. Scott, 1909.

Syn. *Undina Dana* (name preoccupied).

Undinula vulgaris (Dana).

1849, *Undina vulgaris*, Dana, *op. cit.*, vol. ii. p. 18.
1892, *Calanus* ,, Giesb., *F. Fl. Neapel*, vol. xix. p. 92, pl. vi. fig. 11 ; pl. vii. fig. 2 *et seq.*

This species was observed in surface tow-net gatherings from a considerable number of stations, extending from Station 8, in 26° 12′ N., 20° 25′ W., to Station 82, in 20° 40′ S., 38° 20′ W. Both males and females were obtained. The structure of the fifth pair of thoracic legs in the male of this and the following species is so remarkable and so entirely different from those of the typical *Calanus*, that, as indicated by G. O. Sars, the position of these two species in the genus *Calanus* can scarcely be maintained. Dana ascribed the species named above to the genus *Undina*, but unfortunately that name was already occupied by Gould and also by Munster, and a modified form of the name was therefore adopted for the genus by my son in his Report on the Copepoda of the *Siboga* Expedition.

Undinula darwinii (Lubbock).

1860, *Undina darwinii*, Lubbock, *Trans. Linn. Soc. Lond.*, vol. xxiii. p. 7, pl. xxix.
1892, *Calanus* ,, Giesb., *F. Fl. Neapel*, vol. xix. p. 91, pl. vi. fig. 5 *et seq.*
1909, *Undinula* ,, A. Scott, "*Siboga*" *Expeditie*, "Copepoda," p. 17.

Several specimens, chiefly females, were obtained in a surface tow-net gathering collected 4th May 1904 in 34° 43′ S., 17° 15′ E., Station 476. This species is a true *Undinula*.

Fam. Eucalanidæ.

Genus *Eucalanus*, Dana, 1852.

Eucalanus attenuatus, Dana.

1849, *Calanus attenuatus*, Dana, *op. cit.*, vol. ii. p. 18.

This species occurred in samples from only five stations, all in the North Atlantic, viz., Stations 11, 12, 14, 20 and 26, 23° 50′ N., 21° 34′ W., to 14° 33′ N., 25° 9′ W.

Eucalanus crassus, Giesbrecht.

1888, *Eucalanus crassus*, Giesb., *Atti Acc. Lincei Rend.*, ser. 4, vol. iv. p. 333.
1892, ,, ,, *idem*, *F. Fl. Neapel*, vol. xix. p. 132, pl. iv. fig. 9 *et seq.*

This *Eucalanus* was obtained sparingly in two surface gatherings—one collected at Station 19, in the North Atlantic, 19° 12′ N., 24° 08′ W., the other at Station 68, in the South Atlantic—Pernambuco Lighthouse, bearing 7° 42′ S., 34° 32′ W.

Eucalanus subtenuis, Giesbrecht.

1888, *Eucalanus subtenuis*, Giesb., *op. cit.*, p. 33.
1892, „ „ *idem*, *F. Fl. Neapel*, vol. xix. p. 132, pls. xi. and xxxv.

A few specimens were obtained in samples from Stations 26, 27, and 59, 14° 33′ N., 25° 09′ W., to 2° 30′ S., 32° 42′ W.

Genus *Rhincalanus*, Dana, 1852.

Rhincalanus gigas, G. S. Brady.

1883, *Rhincalanus gigas*, Brady, *Report Voy.* "*Challenger*," vol. viii. p. 42, pl. viii. figs. 1–11.
1888, „ *nasutus*, Giesb., *op. cit.*, p. 334.
1902, „ *grandis*, Giesb., *Expéd. Antarct. Belge*, "Copepoden," p. 18, pl. i.
1909, „ *gigas*, A. Scott, "*Siboga*" *Expeditie*, Monogr. xxixa, "Copepoda," p. 24.

This species was obtained in two gatherings—one from 200 fathoms, collected 28th February 1903 in 69° 22′ S., 26° 36′ W., Station 273; the other from 500 fathoms, collected 2nd March, also 1903, in 68° 40′ S., 30° 18′ W., Station 280. Several specimens were obtained, large and small; the larger measured fully 8 mm. in length, while the smaller were similar to *R. nasutus*.

A careful examination of these *Scotia* specimens leaves scarcely any doubt in my mind that they all belong to the one species—*Rhincalanus gigas* of Brady, the only apparent difference between the largest and the smallest specimens being the difference in their size. Brady's specimens ranged from 8·5 to 10 mm., while the largest of the *Scotia* specimens measured fully 8 mm., and ranged from that to specimens no bigger than those found in the North Sea. I am therefore unable to regard *Rhincalanus nasutus* as anything more than a small variety of *R. gigas*, while *R. grandis* is a finer and somewhat larger form of the same species.

Rhincalanus cornutus, Dana.

1849, *Calanus cornutus*, Dana, *Proc. Amer. Acad.*, vol. ii. p. 19.
1852, *Rhincalanus cornutus*, Dana, *U.S. Explor. Exped.*, vol. xiii., 11., p. 1083, pl. lxxvi.

Tolerably frequent in two surface gatherings collected 5th May 1904, Station 477, off Cape Peninsula (34° 21′ S., 18° 29′ E.), South Africa.

Genus *Mecynocera*, I. C. Thompson, 1888.

Mecynocera clausi, I. C. Thompson.

1888, *Mecynocera clausi*, I. C. Thompson, *Journ. Linn. Soc.*, "Zool.," vol. xx. p. 150, pl. xi.

Mecynocera was observed in gatherings from Stations 7, 10, 12, 13, 15, and 28, all in the North Atlantic, between 26° 23′ N., 20° 20′ W., and 13° 7′ N., 25° 9′ W. I. C. Thompson collected his specimens at the Canary Islands, nearly in the same latitude as Station 7, 26° 23′ N., 20° 20′ W.

Fam. PARACALANIDÆ.

Genus *Paracalanus*, Boeck, 1864.

Paracalanus aculeatus, Giesbrecht.

1888, *Paracalanus aculeatus*, Giesb., *op. cit.*, p. 333.

This *Paracalanus* was met with at eight stations in the North, and four in the South Atlantic, ranging from Stations 26 to 66, 14° 33′ N., 25° 9′ W., to 7° 9′ S., 34° 30′ W.

Genus *Acrocalanus*, Giesbrecht, 1888.

Acrocalanus longicornis, Giesbrecht.

1888, *Acrocalanus longicornis*, Giesb., *op. cit.*, p. 332.

A. longicornis occurred sparingly in the twenty-one samples collected between Stations 17 in the North and 95 in the South Atlantic, 20° 18′ N., 23° 22′ W., to 32° 15′ S., 47° 30′ W.

Genus *Calocalanus*, Giesbrecht, 1888.

Calocalanus pavo (Dana).

1849, *Calanus pavo*, Dana, *Proc. Amer. Acad.*, vol. ii. p. 13.

This *Calanoid* was observed in gatherings from twenty-two stations, ranging from 7 to 94, 26° 23′ N., 20° 20′ W., to 30° 25′ S., 45° 45′ W., but was not very common in any of them.

Calocalanus plumulosus (Claus).

1863, *Calanus plumulosus*, Claus, *Die freilebenden Copepoden*, p. 174, pl. xxvi. figs. 15, 16.

The only gathering in which *C. plumulosus* was observed was collected at Station 25 in 15° 15′ N., 25° 9′ W.

Genus *Clausocalanus*, Giesbrecht, 1888.

Clausocalanus arcuicornis (Dana).

1849, *Calanus arcuicornis*, Dana, *op. cit.*, p. 52.

This was one of the more common species in the *Scotia* collections. It was observed in gatherings of plankton from thirty-one stations, extending from Station 7 in the North, to Station 112 in the South Atlantic, 26° 23′ N., 20° 20′ W., to 46° 03′ S., 56° 30′ W.

Clausocalanus furcatus (G. S. Brady).

1883, *Drepanopus furcatus*, Brady, *Report* "*Chall.*," "Copep.," p. 77, pl. iv. figs. 1 and 2, pl. xxiv. figs. 12–15.

In the *Scotia* collections this species appeared to be much rarer than the last. It was observed in gatherings from only four stations, viz., 12, 13, 59, and 90, 22° 19′ N., 22° 07′ W., to 26° 50′ S., 42° 20′ W.

Fam. Euchætidæ.

Genus *Euchæta*, Philippi, 1843.

Euchæta marina (Prestandrea).

1833, *Cyclops marina*, Prestandrea, *Effemeridi Sci. lett. Sicilia*, Palermo, vol. vi. p. 12.

The only species of *Euchæta* observed in the *Scotia* collections is the one named above—a species which appears to be widely distributed. It occurred more or less sparingly in gatherings from twenty-one stations, extending from Station 7 to Station 94, 26° 23′ N., 20° 20′ W., to 30° 25′ S., 45° 45′ W.

Fam. Scolecithricidæ.

Genus *Scolecithrix*, G. S. Brady, 1883.

Scolecithrix danæ (Lubbock).

1856, *Undina danæ*, Lubbock, *Trans. Entom. Soc. Lond.*, vol. iv. p. 15, pl. ix.

This, which is one of the only two representatives of the genus *Scolecithrix* observed, occurred in gatherings from eighteen stations, extending from Station 7 in the North Atlantic to Station 65 in the South, 26° 23′ N., 20° 20′ W., to 6° 52′ S., 34° 32′ W.

Scolecithrix glacialis, Giesbrecht.

1902, *Scolecithrix glacialis*, Giesb., *Expéd. Antarct. Belge*, "Copepoden," p. 25, pl. iv.

One or two specimens of this southern form occurred in two gatherings, one of which was collected at 200 fathoms on 28th February 1903 in lat. 69° 22° S., long. 26° 36′ W., Station 273; the other at 500 fathoms on 2nd March in 68° 40′ S., 30° 18′ W., Station 280.

Genus *Racovitzanus*, Giesbrecht, 1902.

Racovitzanus antarcticus, Giesbrecht.

1902, *Racovitzanus antarcticus*, Giesb., *Expéd. Antarct. Belge*, "Copepoden," p. 26, pl. iv. figs. 8–13, pl. v. figs. 1–5.

A single specimen was obtained in a sample from 200 fathoms, collected on 28th February 1903 in lat. 69° 22′ S., long. 26° 36′ W., Station 273.

The *Belgica* obtained this species at a depth of 500 metres in 70° 9′ S., 82° 35′ W. (*Belgica* Station 701). (*Vide* Dr Giesbrecht's *Copepoden of the "Belgica."*)

Fam. Centropagidæ.

Genus *Centropages*, Kröyer, 1848–1849.

Centropages furcatus (Dana).

1849, *Catopia furcata*, Dana, *Proc. Amer. Acad.*, vol. ii. p. 25.
1883, *Centropages furcatus*, Brady, *Report Voyage of the "Challenger,"* vol. viii. p. 83, pl. xxviii.
1892, " " Giesb., *F. Fl. Neapel*, vol. xix. p. 304, pls. xvii., xviii., and xxxviii.

The only gatherings in which this species was obtained were collected in the South Atlantic at Station 64, 6° 30′ S., 34° 25′ W., and Station 68A, 8° 00′ S., 34° 34′ W., Pernambuco, bearing 12 miles W.

Centropages violaceus (Claus).

1863, *Ichthyophorba violacea*, Claus, *Die freilebenden Copepoden*, p. 199, pl. xxxv.
1892, *Centropages violaceus*, Giesb., *F. Fl. Neapel*, vol. xix. p. 304, pl. iv. fig. 5 *et seq.*

This species occurred in gatherings from a number of stations both in the North and South Atlantic, from Station 7 in 26° 23′ N., 20° 20′ W., to Station 90 in 26° 50′ S., 42° 20′ W.

Centropages brachiatus (Dana).

1849, *Pontella brachiata*, Dana, *Proc. Amer. Acad.*, vol. ii. p. 27.
1852, *Calanopia brachiata*, Dana, *U.S. Explor. Exped.*, vol. xiii., II., p. 1133, pl. lxxix.
1892, *Centropages brachiatus*, Giesb., *F. Fl. Neapel*, vol. xix. p. 304, pl. xvii. figs. 26, 37 *et seq.*
1893, „ „ T. Scott, *Trans. Linn. Soc. Lond.*, ser. ii., "Zool.," vol. vi. p. 77.

Several specimens were obtained in surface tow-net gatherings collected on the 4th and 5th of May 1904 off Cape Peninsula, South Africa; Station 476, 34° 43′ S., 17° 15′ E., and Station 477, 34° 21′ S., 18° 29′ E.

Centropages calaninus (Dana).

1849, *Cyclopsina calanina*, Dana, *op. cit.*, vol. ii. p. 25.
1852, *Hemicalanus calaninus*, Dana, *U.S. Explor. Exped.*, vol. xiii., II., pp. 1105, 1106, pl. lxxviii.
1892, *Centropages* „ Giesb., *F. Fl. Neapel*, vol. xix. p. 305, pl. xvii. fig. 27 *et seq.*

The only sample in which this species was obtained was a surface gathering collected at Station 90 in 26° 50′ S., 42° 20′ W. Only one or two specimens were observed.

Centropages typicus, Kröyer.

1848, *Centropages typicus*, Kröyer, *Naturh. Tidsskr.* (N.S.), vol. ii. p. 588, pl. vi.
1863, *Ichthyophorba denticornis*, Claus, *Die freilebenden Copepoden*, p. 199, pl. xxxv.
1864, *Centropages typicus*, Boeck, *Forhandl. Videnskabs-Selsk. Christiania*, p. 19.
1892, „ „ Giesb., *F. Fl. Neapel*, vol. xix. p. 303, pls. ii., iv., xvii. fig. 48 *et seq.*

This species was observed in only one plankton sample—a gathering collected at Station 27 in 13° 38′ N., 25° 9′ W. The distribution of this species extends to the Mediterranean; and in the North Atlantic between 36° N. and 62° N. (Giesbrecht).

Fam. Temoridæ.

Genus *Temora*, W. Baird, 1850.

Temora stylifera (Dana).

1849. *Calanus stylifer*, Dana, *op. cit.*, vol. i. p. 12.
1856, *Diaptomus dubius*, Lubbock, *Trans. Entom. Soc. Lond.* (N.S.), vol. iv. p. 21.
1863, *Temora armata*, Claus, *op. cit.*, p. 195, pl. xxxiv.
1892, „ *stylifera*, Giesb., *F. Fl. Neapel*, vol. xix. p. 328, pl. v. fig. 2 *et seq.*

This species was of moderately frequent occurrence, and was observed in samples from Stations 18, 19, 26, 30, 36, 67, 68, 79, 83, 85, 86, 90, and 93, 19° 59′ N., 23° 34′ W., to 30° 05′ S., 45° 28′ W.

Temora turbinata (Dana).

1849, *Calanus turbinatus*, Dana, *op. cit.*, vol. i. p. 12.
1892, *Temora turbinata*, Giesb., *op. cit.*, p. 329, pl. xvii. fig. 14 *et seq.*

The only two samples in which this species was observed were collected at Station 12, 22° 19′ N., 22° 07′ W., and Station 14, 21° 28′ N., 22° 40′ W., both in the North Atlantic.

Fam. METRIDIIDÆ.

Genus *Metridia*, Boeck, 1864.

Metridia lucens, Boeck.

1865, *Metridia lucens*, Boeck, *Vid. Selsk. Forhandl.*, 1864, p. 14.
1892, ,, *hibernica*, Giesb., *op. cit.*, p. 340, pl. xxxii. fig. 11 *et seq.*
1904, ,, *lucens*, Cleve, *Invest. S. Africa*, vol. iii. p. 192.

A number of specimens were obtained in one or two samples collected on the 4th and 5th of May 1904 off Cape Peninsula, South Africa, Station 476, 34° 43′ S., 17° 15′ E., and Station 477, 34° 21′ S., 18° 29′ E. The Rev. T. R. R. STEBBING records the species as "abundant south and west of Cape Colony" (*Annals of the S. African Museum*, vol. vi. pt. iv. p. 535, 1910).

Metridia gerlachei, Giesbrecht.

1902, *Metridia gerlachei*, Giesb., *Expéd. Antarct. Belge*, "Copepoden," p. 27, pl. v.

This species was obtained in two gatherings, in one from 200 fathoms collected on 28th February 1903 in 69° 22′ S., 26° 36′ W., Station 273; and the other from 500 fathoms collected on 2nd March in 68° 40′ S., 30° 18′ W., Station 280. The distribution of *Metridia gerlachei* is apparently limited more or less to deep water, for although it was obtained at a number of stations by the Belgian Antarctic Expedition of 1897–1899, none of the samples in which it occurred were surface gatherings, but were from depths ranging from 100 to 500 metres.

Genus *Pleuromamma*, Giesbrecht, 1898.

Pleuromamma abdominalis (Lubbock).

1856, *Diaptomus abdominalis*, Lubbock, *Trans. Entom. Soc. Lond.* (N.S.), vol. iv. p. 22, pl. x.

The only gatherings in which this species occurred were collected at Stations 26 and 56, the one in 14° 33′ N., 25° 09′ W., Station 26, and the other in lat. 0° 42′ S., long. 31° 20′ W., Station 56; very few specimens were observed.

Pleuromamma gracilis (Claus). (Pl. XIII. fig. 7.)

1863, *Pleuromma gracilis*, Claus, *Die freilebenden Copepoden*, p. 197, Taf. 5.

This species was only observed in gatherings collected at Stations 14, 18, 39; all in the North Atlantic, 21° 28′ N., 22° 40′ W., to 6° 43′ N., 25° 48′ W.

Pleuromamma gracilis, var. *esterlyi*, nov. (Pl. XIII. figs. 8–10.)

1905, *Pleuromamma gracilis*, Esterly, "Copep. of the San Diego Region," *Univ. of California Publications*, vol. ii. p. 175, text-fig. C.

C. O. Esterly, in the work referred to above, describes and partly figures a form of this species which differs from what Giesbrecht appears to consider as the typical *Pleuromamma gracilis*—especially in the structure of the fifth pair of thoracic feet in the female. Dr Giesbrecht* shows the female fifth pair to consist each of a single ramus provided with three short and tolerably stout teeth, the inner one being slightly the larger; and this agrees fairly well with the specimens of *P. gracilis* in the *Scotia* collections, and with Dr Claus' original description, where, referring to the fifth pair, he says, "Der letzte Fuss des Weibchens bildet einen schmalen, undeutlich gegliederten Stab und endit mit drei kurzen Zinken."† In the form recorded by Esterly from the San Diego region—a form which is also represented in the *Scotia* collections—the rami of the fifth pair of thoracic legs in the female are distinctly two-jointed and armed at the apex with three tolerably long and spiniform teeth, the middle one being the longest (see fig. 9, Pl. XIII.). As there does not appear to be otherwise any marked difference between this form and *P. gracilis*, and in the absence of a male, I am inclined to regard this form as no more than a fairly distinct variety of *Pleuromamma gracilis*.

Fam. Lucicutidæ.

Genus *Lucicutia*, Giesbrecht, 1898.

Lucicutia flavicornis (Claus).

1863, *Leuckartia flavicornis*, Claus, *Die freilebenden Copepoden*, p. 183, pl. xxxii. figs. 1–7.
1892, ,, ,, Giesb., *F. Fl. Neapel*, vol. xix. p. 358, pls. v., xix., and xxxviii.
1898, *Lucicutia* ,, Giesbrecht & Schmeil, *Das Tierreich*, vol. vi. p. 3.
1904, ,, ,, Cleve, *Mar. Invest. S. Africa*, vol. iii. p. 192.

The only samples in which this species was observed were collected at Stations 11, 36, and 49, in the North Atlantic, 23° 50′ N., 21° 34′ W., to 1° 53′ N., 27° 26′ W.

Fam. Heterorhabdidæ.

Genus *Heterorhabdus*, Giesbrecht, 1898.

Heterorhabdus papilliger (Claus).

1863, *Heterochæta papilligera*, Claus, *op. cit.*, p. 182, pl. xxxii.
1892, ,, *papilliger*, Giesb., *op. cit.*, p. 372, pls. xx. and xxxix.
1898, *Heterorhabdus* ,, Giesbrecht & Schmeil, *Das Tierreich*, vol. vi. p. 114.
1901, *Heterochæta papilligera*, Cleve, "Plankton from the Indian Ocean and the Malay Archipelago," *Kongl. Sv. Vet.-Akad. Handl.*, Band xxxv., No. 5, p. 7.

This species, which appeared to be moderately rare, was only obtained in a single gathering collected at Station 15, 20° 34′ N., 23° 12′ W.

* Cf. *Fauna u. Flora des Golfes von Neapel.* † *Die freilebenden Copepoden*, p. 197 (1863).

Heterorhabdus austrinus, Giesbrecht.

1902, *Heterorhabdus austrinus*, Giesb., *Expéd. Antarct. Belge*, "Copepoden," p. 28, pl. vi.

H. austrinus occurred in gatherings from 200 and 500 fathoms. Only one or two specimens were obtained. These gatherings were collected on 2nd March 1903; Station 280, 68° 40′ S., 30° 18′ W.

Fam. HALOPTILIDÆ.

Genus *Haloptilus*, Giesbrecht, 1898.

Haloptilus acutifrons, Giesbrecht.

1892, *Hemicalanus acutifrons*, Giesb., *F. Fl. Neapel*, vol. xix. p. 384, pl. iii. fig. 11, pl. xxvii. fig. 12, pl. xlii. figs. 12 and 20.
1898, *Haloptilus acutifrons*, Giesb. & Schmeil, *Das Tierreich*, vol. vi. p. 117.

A single specimen of this *Haloptilus* was obtained in each of two gatherings, in one from 200 fathoms, the other from 500 fathoms, collected on 2nd March 1903 in 68° 40′ S., 30° 18′ W., Station 280. These specimens are more than twice the size of those recorded by Dr GIESBRECHT, and on that account were considered at first as belonging to a different species. A careful examination of them, however, did not reveal any difference sufficiently important to separate them from *H. acutifrons*.

Fam. CANDACIIDÆ.

Genus *Candacia*, Dana, 1846.

Candacia pachydactyla, Dana.

1849, *Candace pachydactyla*, Dana, *Proc. Amer. Acad. Sci.*, vol. ii. p. 23.
1883, ,, ,, Brady, *Report Voyage of the "Challenger,"* vol. viii. p. 68, pl. xxxi. figs. 2–9.
1898, *Candacia pachydactyla*, Giesb. & Schmeil, *op. cit.*, p. 128.
1904, ,, ,, Cleve, *Mar. Invest. South Africa*, vol. iii. p. 187.

This was a tolerably common form in the *Scotia* plankton collections, and appeared to be widely distributed. It was observed in samples collected at twenty-eight different stations, extending from Station 7 in 26° 23′ N., 20° 20′ W., to Station 95 in 32° 15′ S., 47° 30′ W.

Candacia curta, Dana.

1849, *Candace curta*, Dana, *op. cit.*, vol. ii. p. 33.
1892, ,, ,, Giesb., *F. Fl. Neapel*, vol. xix. p. 424, pls. xxi., xxii., and xxxix.
1893, ,, *intermedia*, T. Scott, *Trans. Linn. Soc. Lond.*, "Zool.," ser. 3, vol. vi. p. 61, pl. iv. figs. 30–37.
1898, *Candacia curta*, Giesb. & Schmeil, *Das Tierreich*, vol. vi. p. 128.

This *Candacia* was obtained sparingly in gatherings from the following five stations, viz. 31, 32, 35, and 49 in the North Atlantic, 11° 10′ N., 25° 20′ W., to 1° 53′ N., 27° 26′ W., and Station 59 in 2° 30′ S., 32° 42′ W. This species is found in the Red Sea, and its distribution extends both to the Atlantic and Pacific Oceans.

Candacia bipinnata, Giesbrecht.

1889, *Candace bipinnata*, Giesb., *Atti Acc. Lincei Rend.*, ser. 4, vol. v. p. 815.
1892, ,, ,, *idem*, *F. Fl. Neapel*, vol. xix. p. 424, pl. xxii. fig. 20 *et seq.*
1898, *Candacia* ,, Giesb. & Schmeil, *Das Tierreich*, vol. vi. p. 129.
1904, ,, ,, Cleve, *Mar. Invest. S. Africa*, vol. iii. p. 186.

A few specimens were obtained in a surface gathering collected 5th May 1904 off Cape Peninsula, South Africa, Station 477, 34° 21′ S., 18° 29′ E.

Candacia æthiopica, Dana.

1849, *Candace æthiopica*, Dana, *op. cit.*, vol. ii. p. 23.

The only gathering in which this species occurred was collected at Station 12 in 22° 19′ N., 22° 07′ W.

Candacia bispinosa, Claus.

1863, *Candace bispinosa*, Claus, *Die freilebenden Copepoden*, p. 191, Taf. 27, 28.

This species occurred sparingly in gatherings from the following seven Stations: 12, 14, 15, 72, 83, 85, and 86, 22° 19′ N., 22° 07′ W., to 24° 26′ S., 40° 25′ W.

Candacia simplex, Giesbrecht.

1889, *Candace simplex*, Giesb., *op. cit.*, ser. 5, vol. v. sem. 1, p. 815, and *Fauna u. Flora des Golfes von Neapel*, vol. xix ("Copep."), p. 424, pl. xxi. figs. 10, 30, 31 *et seq.*

This species was tolerably rare in gatherings from Stations 11, 59, and 83, 23° 50′ N., 21° 34′ W., to 22° 32′ S., 39° 22′ W.

Candacia longimana, Claus.

1863, *Candace longimana*, Claus, *op. cit.*, p. 190, Taf. 27 and 33.

A single specimen of this *Candacia* was obtained in a gathering from Station 49, 1° 53′ N., 27° 26′ W.

Fam. Pontellidæ.

Genus *Calanopia*, Dana, 1852.

Calanopia americana, Dahl. (Pl. XIII. figs. 1–6.)

1894, *Calanopia americana*, Dahl, *Berichte naturf. Gesells. Freiburg* (N.S.), vol. viii. p. 21, Taf. 1, figs. 23–26.

In this species the inner ramus of the first four pairs of thoracic legs in the female are two-jointed. The female fifth pair are simple, and consist each of a single two-jointed ramus; the proximal joint is moderately stout, but the end one is narrow and rather longer than the other, and terminates in a tolerably long spine, and there are also two short spines on the outer and one on the inner margin (fig. 4).

The male differs from the female by the peculiar structure of the right antennule, the fifth and sixth joints of which are produced exteriorly into angular and gibbous expansions. The seventh joint is elongated and slender, while the base of the next one extends inwards into a horn-like projection nearly at right angles to the joint, but curved slightly forward and having its inner edge finely serrated. The remaining joints are slender and moderately elongated, except the last one, which is short; the articulations between the fifth and sixth and the eighth and ninth joints are hinged (fig. 1).

The fifth pair of thoracic legs in the male are asymmetrical, that on the left side is long and slender and terminates in a claw-like spine, while the basal part of the proximal joint expands anteriorly into a short angular process. The other foot is also elongated, but the end joints are dilated and form a thumb-like arrangement, as shown in the drawing (fig. 5).

Habitat.—This species was obtained in gatherings from Stations 64, 65, 67, and 93, 6° 30′ S., 34° 25′ W., to 30° 05′ S., 45° 28′ W.

Calanopia americana was obtained by Dr DAHL in a collection of plankton from the mouth of the river Tocantins, on the north-west coast of South America, where the water was doubtless more or less brackish. Its occurrence in the *Scotia* collections, besides extending the distribution of the species considerably, is interesting, from its having been found in the open sea.

Genus *Labidocera*, Lubbock, 1853.

Labidocera nerii (Kröyer).

1848, *Pontia nerii*, Kröyer, *Naturh. Tidsskr.* (N.S.), vol. ii. p. 579, Taf. 6.

This was a tolerably common species in the *Scotia* collections. It occurred in no fewer than twenty-eight gatherings, extending from Station 7, 26° 23′ N., 20° 20′ W., in the North Atlantic, to 95, 32° 15′ S., 47° 30′ W., in the South Atlantic, occurring at nearly regular intervals.

Labidocera acutifrons (Dana).

1849, *Pontella acutifrons*, Dana, *op. cit.*, vol. ii. p. 30.

The only gatherings in which this species was obtained were collected at Station 14, 21° 28′ N., 22° 40′ W., and Station 18, 19° 59′ N., 23° 34′ W.

Genus *Pontella*, Dana, 1849.

Pontella atlantica (M.-Edw.).

1840, *Pontia atlantica*, M.-Edw., *Hist. Nat. Crust.*, vol. viii. p. 420, Taf. 39.

This species occurred in gatherings from Stations 7, 35, and 41, 26° 23′ N., 20° 20′ W., to 5° 40′ N., 26° 4′ W., but only a few specimens were observed.

Pontella securifer, G. S. Brady.

1883, *Pontella securifer*, Brady, *Report Voyage of the "Challenger,"* vol. viii. ("Copepoda"), p. 96, pl. xlv.

Gatherings collected at Stations 41, 82, and 83 yielded a few specimens of this *Pontella*, 5° 40′ N., 26° 4′ W., to 22° 32′ S., 39° 22′ W.

Pontella spinipes, Giesbrecht.

1889, *Pontella spinipes*, Giesb., *Atti. Acc. Lincei Rend.*, ser. 4, vol. v. sem. 2, p. 28.

This species was obtained in gatherings collected at Stations 14, 44, and 82, 21° 28′ N., 22° 40′ W., to 20° 40′ S., 38° 20′ W.

Genus *Pontellina*, Dana, 1852.

Pontellina plumata, Dana.

1849, *Pontella plumata*, Dana, *op. cit.*, vol. ii. p. 27.
1852, *Pontellina plumata*, Dana, *U.S. Explor. Exped.*, vol. xiii (ii.), p. 1135, pl. lxxix.

This moderately common species occurred in gatherings from eighteen stations, extending from Station 14 to 93, 21° 28′ N., 22° 40′ W., to 30° 05′ S., 45° 28′ W.

Genus *Pontellopsis*, G. S. Brady, 1883.

Pontellopsis regalis (Dana).

1849, *Pontella regalis*, Dana, *op. cit.*, vol. ii. p. 31.

This species occurred sparingly in gatherings from Stations 11, 35, 49, 54, 59, and 68, 23° 50′ N., 21° 34′ W., to Station 68A, 8° 0′ S., 34° 34′ W., Pernambuco bearing 12 miles W.

Pontellopsis perspicax (Dana).

1849, *Pontella perspicax*, Dana, *op. cit.*, vol. ii. p. 32.

The gatherings in which this species was observed were collected at Stations 27, 30, 35, 44, and 49, all in the North Atlantic, 13° 38′ N., 25° 9′ W., to 1° 53′ N., 27° 26′ W.

Pontellopsis brevis (Giesbrecht).

1889, *Monops brevis*, Giesb., *op. cit.*, ser. 4, vol. v. sem. 2, p. 28.

The only gathering in which this species occurred was collected at Station 67, in 7° 20′ S., 34° 38′ W.

Pontellopsis villosa, G. S. Brady.

1883, *Pontellopsis villosa*, Brady, *Report Voyage of the "Challenger,"* vol. viii. ("Copepoda"), p. 86, pls. xxxiv and xxxv.

This, which was a tolerably rare species in the *Scotia* collections, was only observed in a gathering from Station 8 in 26° 12′ N., 20° 25′ W.

Fam. Acartiidæ.

Genus *Acartia*, Dana, 1846.

Acartia negligens, Dana.

1849, *Acartia negligens*, Dana, *op. cit.*, vol. ii. p. 26.

This species was observed in gatherings collected at Stations 7, 11, 19, and 95, 26° 23′ N., 20° 20′ W., to 32° 15′ S., 47° 30′ W.

Acartia danæ, Giesbrecht.

1889, *Acartia danæ*, Giesb., *op. cit.*, ser. 4, vol. v. sem. 2, p. 26.

This occurred in gatherings from eleven stations, extending from Station 11 to Station 102, 23° 50′ N., 21° 34′ W., to 36° 31′ S., 51° 56′ W.

Tribe *HARPACTICOIDA*, G. O. Sars.*

Fam. Cervinidæ.

Genus *Pseudozosime*, new genus.

Generic characters: Female.—In the female the body is tolerably robust, and has a general resemblance to *Zosime*, Boeck, except that the abdomen is not so clearly defined from the cephalothorax; genital segment moderately large, with a distinct transverse suture. Anterior antennæ (antennules) short, stout, and composed of about five joints. Second antennæ and mouth organs nearly as in *Zosime*. The inner ramus of all the four pairs of swimming legs is composed of two joints, and the outer of three joints. The fifth pair are of moderate size; the inner portion of the basal joint is somewhat expanded, while the second joint is comparatively small.

Remarks.—*Pseudozosime* differs from the other genera nearly related to it by having the inner ramus of all the four pairs of thoracic legs biarticulated, and by the fifth pair being comparatively larger and more compact.

Pseudozosime browni, new species. (Pl. VIII. figs. 9–19.)

Female.—The body of the female tolerably stout, narrow, and elongated, bluntly rounded anteriorly, and tapering slightly towards the posterior end; rostrum prominent. Length of the specimen represented by the drawing 0·95 mm.

Antennules short, stout, composed of about five joints, and densely setiferous. Antennæ with the outer ramus triarticulated, and otherwise nearly as in *Zosime typica*, Boeck. Mouth organs also somewhat similar to those in that species.

The first four pairs of thoracic legs are moderately stout, and the inner ramus is composed of two and the outer of three joints. In the first pair the inner ramus reaches to the end of the three-jointed outer one, and the joints are nearly of equal length; the

* The arrangement followed for the Harpacticoida is that of G. O. Sars, *Crustacea of Norway*, vol. v.

outer margins of both rami are fringed with minute bristles, but in the outer ramus, the spinules at the outer distal angles of the first and second joints, and also those on the third joint, are tolerably stout and elongated. In the second and third pairs the inner ramus is rather shorter than the outer, and the end joint is about twice as long as the proximal one. In the fourth pair the inner ramus is considerably shorter than the outer one, and scarcely reaches to the end of its middle joint. The fifth pair are of moderate size; the inner portion of the basal joint is somewhat expanded, and provided with four setæ—two on the inner margin and two at the apex; the second joint is smaller, and furnished with three setæ at the distal end; all the setæ are elongated. Caudal rami short, and about equal in length to the last abdominal segment.

Habitat.—South Orkney Islands; collected in June 1903, 60° 43′ 42″ S., 44° 38′ 33″ W., Station 325. Only one specimen—a female—was observed in some siftings from dredged material. Named in compliment to Dr R. N. Rudmose Brown, the *Scotia* naturalist, who was in charge of tow-netting, and who in consequence was the collector of the whole material dealt with in this monograph.

Fam. Ectinosomidæ.

Genus *Ectinosoma*, Boeck, 1864.

Ectinosoma antarcticum Giesbrecht. (Pl. II. figs. 10–13.)

1902, *Ectinosoma antarcticum*, Giesb., *Expéd. Antarct. Belge*, "Copepoden," p. 31, Taf. 12.

One or two specimens (females) of an *Ectinosoma* apparently belonging to this species were obtained in one of the small gatherings of dredged material collected by the *Scotia* among the South Orkney Islands, Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W., and in these specimens the structure of the various appendages agrees very well with the description of the species given by Dr Giesbrecht. In the genus *Ectinosoma*, the form and armature of the fifth pair of thoracic legs are usually regarded as furnishing important specific characters, and in these *Scotia* specimens, the fifth pair of legs are identical with those of *Ectinosoma antarcticum*, as shown by Dr Giesbrecht's figures, and also by our drawings on Pl. II. fig. 14.

Genus *Bradya*, Boeck, 1872.

Bradya proxima, new species. (Pl. II. figs. 1–9.)

Female.—Body moderately robust. Antennules short and stout. Antennæ with the outer ramus well developed, and reaching to the end of the inner ramus. Mandibles, maxillæ, and maxillipeds similar to those in *Bradya typica*, Boeck.

In the first four pairs of thoracic legs both rami are of moderate length, and the joints are somewhat broad and flattened, and the marginal spines of the outer ramus are also elongated and slender. In the fifth pair there is a considerable space between

the one and the other, as in *Bradya typica*; the inner lobe of the basal joint is furnished with two long, slender setæ—the inner being rather the longer one; the second joint is small, and carries three setæ at its apex; the two inner setæ are elongated and subequal, but the other is short. The appendicular bristle is slender, and scarcely reaches to the end of the short apical seta. Caudal rami very short.

Habitat.—Scotia Bay, South Orkneys; collected in June 1903: Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W. Apparently rare.

Remarks.—The form described above is nearly allied to *Bradya typica*, Boeck, but differs in the armature of the last pair of thoracic legs, and in one or two other structural details.

Genus *Microsetella*, Brady & Robertson, 1873.

Microsetella norvegica (Boeck).

1864, *Setella norvegica*, Boeck, *Selskab. Forhandl. Christiania* (1864), p. 281.

This small *Harpactid* was observed in gatherings from only a few stations, viz. 37, 62, 93, 94, and 106, 7° 50′ N., 25° 31′ W., to 39° 01′ S., 53° 40′ W.

Microsetella rosea (Dana).

1847, *Harpacticus roseus*, Dana, *Proc. Amer. Acad.*, Boston, vol. i. p. 153.

This species appeared to be rather more common than the last, being present in gatherings from about fifteen stations, and with a distribution extending from Stations 7, 10, and 12 in the North Atlantic, 26° 23′ N., 20° 20′ W., to 22° 19′ N., 22° 07′ W., to Station 88 in 26° 25′ S., 42° 00′ W.

Fam. Macrosetellidæ.

Macrosetella, A. Scott, 1909.

Syn. *Setella*, Dana (but this name is preoccupied).

Macrosetella gracilis (Dana).

1846, *Setella gracilis*, Dana, *Amer. Journ. Sci.* (2), vol. i. p. 227.

This species occurred in gatherings from twenty-five stations, and appeared to be distributed over nearly the whole area traversed by the *Scotia*. The northerly Stations comprised 7, 10, 12, 14 in the North Atlantic, while Stations 93, 94, and 95 were the most southerly; 26° 23′ N., 20° 20′ W., to 32° 15′ S., 47° 30′ W.

Genus *Miracia*, Dana.

Miracia efferata, Dana, 1846.

1846, *Miracia efferata*, Dana, *Amer. Journ. Sci.* (2), vol. i. p. 230.

This was also observed in gatherings from twenty-five stations, and its distribution was somewhat similar to that of *Setella*.

Fam. EUTERPINIDÆ.

Genus *Euterpina*, Norman, 1903.

Syn. *Euterpe*, Claus, 1863 (name preoccupied).

Euterpina acutifrons (Dana).

1847, *Harpacticus acutifrons*, Dana, *Proc. Amer. Acad.*, Boston, vol. i. p. 153.

The only gathering in which this species occurred was from Station 65 in 6° 52′ S., 34° 32′ W.

Fam. CLYTEMNESTRIDÆ.

Genus *Clytemnestra*, Dana, 1847.

Clytemnestra scutellata, Dana. (Pl. XIII. figs. 11 and 12.)

1847, *Clytemnestra scutellata*, Dana, *Proc. Amer. Acad.*, Boston, vol. i. p. 154.

This species was observed rather sparingly at Stations 14, 32, 33, and 39, 21° 28′ N., 22° 40′ W., to 6° 43′ N., 25° 48′ W., all in the North Atlantic. This species may be distinguished from *Clytemnestra rostrata* (Brady) by the different structure of the antennules and caudal rami. Fig. 11, Pl. XIII., shows the end-joints of one of the antennules, and the caudal rami are represented by fig. 12.

Fam. HARPACTICIDÆ.

Genus *Harpacticus*, M.-Edw., 1838.

Harpacticus fucicolus, new species. (Pl. VIII. figs. 20–24.)

Female.—In its general appearance the female of this species is somewhat similar to *Harpacticus gracilis* (Claus).

The antennules are moderately slender and composed of nine joints; the first four are of moderate size and subequal, but the third is rather longer than any of the other three; the remaining five joints are small, and together are scarcely equal to one-fourth of the total length—the penultimate joint is the smallest. Antennæ small, the outer ramus short and composed of two joints. Mandibles and other mouth organs nearly as in *Harpacticus gracilis*.

First pair of thoracic legs slender; the outer ramus is considerably elongated, but the inner one reaches only to about the end of the first joint of the outer ramus; the armature of both rami is rather feeble. The next three pairs are somewhat similar to those in *Harpacticus gracilis*.

In the fifth pair, the inner portion of the basal joint is not much produced; it is provided with four setæ; one springs from the inner margin and three from the broadly

rounded apex; the outer margin of the second joint is nearly parallel with the inner, and near the extremity of the joint both margins converge to the angular apex; four setæ spring from the lower end of the outer margin and apex of this joint, and one from the lower end of the inner margin; all the setæ are moderately slender. Caudal rami very short.

Habitat.—Obtained on floating seaweed collected in the North Atlantic on 29th June 1904, between Cape Verde Islands and the Azores, Station 537, 29° 54′ N., 34° 10′ W.

Remarks.—The form described above has a close resemblance to *Harpacticus gracilis*, Claus, and it may ultimately have to be ascribed to that species. Meanwhile, as no male specimens have been observed, and as there are one or two slight differences between the two forms, as, for example, in the structure of the antennules and of the fifth pair of thoracic legs, it is perhaps better that the specimens from the *Scotia's* collections should be recorded under a distinct name.

Harpacticus piriei, new species. (Pl. V. fig. 15; Pl. XI. figs. 18–25.)

Female.—Body moderately stout, somewhat resembling *Harpacticus chelifer*, O. F. Müller, in its general form. Length about 0·85 mm.

Antennules composed of nine joints; the first four tolerably stout and elongated, the others small, so that, together, they are scarcely equal to a fourth of the entire length of the antennule (fig. 18, Pl. XI.). Antennæ and mouth appendages nearly as in *Harpacticus chelifer*.

The first pair of thoracic legs are tolerably slender, and somewhat similar to the species mentioned; the other three pairs are also somewhat similar to those in the same species, except that in the second pair the inner ramus is nearly as long as the outer one.

The fifth pair has the basal joint broad and its inner portion only slightly produced, and provided with four setæ of unequal lengths on its distal margin, the second seta from the outside being much longer than the others. The second joint is subtriangular in outline, the greatest width, which is near the proximal end, being about equal to half the length; the inner margin is nearly straight, but the outer is rounded and curves obliquely to the distal extremity: this joint is provided with six setæ of unequal lengths—two, having a considerable space between them, on the lower half of the outer margin, two close together at the apex, and two at the distal end of inner margin—the second seta from the inside being very small (fig. 15, Pl. V.).

The caudal rami in this species are very short.

Habitat.—Scotia Bay, South Orkneys, in siftings from some dredged material collected in 9 to 10 fathoms, in April 1903, Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W.

Remarks.—This species, though it resembles *Harpacticus chelifer* in some respects, differs distinctly in the form and armature of the fifth pair of thoracic legs, and also in the structure of the antennules. Named in compliment to Dr J. H. Harvey Pirie, one of the *Scotia* naturalists.

Fam. Peltidiidæ.

Genus *Alteutha*, Baird, 1845.

Alteutha austrina, new species. (Pl. X. figs. 9–15.)

Female.—Body depressed, expanded laterally, and having a general resemblance to *Alteutha depressa*, Baird. Length of the specimen represented by the drawing (fig. 9), 0·92 mm.

Antennules composed of nine joints; the second joint, which is the longest, is about equal to the third and fourth joints combined; the seventh and eighth, which are about equal in size, are smaller than any of the others (fig. 10). Second maxillipeds small, with the end joint short, and armed with a moderately stout terminal claw.

The outer ramus of the first pair of thoracic legs is considerably longer and stouter than the inner, and both rami are three-jointed—the joints of the outer ramus are subequal in length. The next three pairs are slender and similar to those in *Alteutha depressa*.

The fifth pair also resemble those of the same species: they consist of thin and moderately narrow and elongated plates with a subcentral and longitudinal hyaline band, as indicated in the drawing (fig. 14); each foot is two-jointed, but the articulation between the joints is sometimes not very clearly defined. The basal joint is short and carries a moderately stout spine on its outer distal angle; there is also a stout spine and a few small spinules at the extremity of the second joint, and the inner margin of this joint is obscurely crenulated, as shown in the figure (fig. 14).

Caudal rami short, moderately broad, and furnished each with one long and three (or four) short terminal bristles (fig. 15).

Habitat.—Scotia Bay, South Orkneys, obtained in siftings from some dredged material collected in June 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W.

Though this species resembles in some respects Dr Baird's *Alteutha depressa*, it differs from it in some important details, as indicated in the description given above.

Alteutha dubia, new species. (Pl. X. figs. 1–8.)

Female.—Body depressed, expanded laterally, as in *Alteutha depressa*, Baird; rostrum prominent. Length, 1·4 mm.

Antennules composed of nine joints; the second is considerably longer than any of the others; the seventh and eighth are small and subequal, and the end joint is about as long as the two preceding ones combined (fig. 2). Antennæ slender; outer ramus small and biarticulate.

Second maxillipeds elongated, end joint ovate, and armed with a moderately short and stout terminal claw (fig. 4).

The swimming legs are moderately slender, and both rami are three-jointed; the

inner ramus of the first pair is considerably shorter than the outer one, and the end joint is rather narrower than the first or second (fig. 5).

Fifth pair lamelliform, tolerably broad, and composed of two joints; the first joint is produced anteriorly into a narrow appendage bearing two apical and marginal setæ; the second joint is provided with five or six slender bristles on the distal half of the outer margin and apex (fig. 7).

Caudal rami short, ovate; a tolerably stout spine springs from a notch near the middle of the outer margin, and there are also one elongate and three short setæ round the distal end of each ramus (fig. 8).

Habitat.—Scotia Bay, South Orkneys, obtained in siftings from some dredged material collected in June 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W.

Remarks.—The species described above may be distinguished by the peculiar structure of the fifth pair of thoracic legs, as well as by the form and armature of the caudal rami.

Genus *Paralteutha*, new genus.

Definition.—Similar to *Alteutha*, Baird, in its general form and in its cephalothoracic appendages, except that the inner ramus of the first pair of swimming feet consists of two instead of three joints; and the lateral margins of the second joint of the fifth pair are parallel, or nearly so, while the distal extremity of the joint is obliquely truncated.

Paralteutha typica, new species. (Pl. X. figs. 16–25.)

Female.—Body depressed, expanded laterally, as in *Alteutha depressa*, Baird. Length of the specimen represented by the drawing (fig. 16), 1·6 mm.

Antennules nine-jointed, as in *Alteutha depressa*. Outer ramus of the antennæ small and biarticulate, but the end joint is very minute.

Mandibles with the masticatory end narrow and truncated, biting edge obscurely dentate. Second maxillipeds elongated, each provided with a tolerably large and powerfully clawed hand (fig. 20).

First pair of thoracic legs elongated and moderately stout, inner ramus not much shorter than the outer, and composed of two subequal joints (fig. 21). The next three pairs long and slender, and furnished with long slender marginal spines (fig. 22).

Fifth pair stout, two-jointed; the first joint is short, but the second is tolerably elongated, and about four times as long as broad; its margins are nearly parallel, and its distal extremity truncated and armed with three stout spines, the inner one being the largest. There are also two short spines on the inner margin, one near the middle of the joint, the other near its distal end. The first joint is also provided with a few long setæ, as shown in the drawing (fig. 24).

Caudal rami short and subquadrangular in outline. A short, stout spine springs from a notch on the outer margin of each ramus, and there are also a few small apical spines.

The male does not differ much from the female, except in the structure of the antennules and of the fifth pair of thoracic legs. The antennules are so modified that they form effective grasping organs. In the fifth pair of legs, the joints are nearly of equal length and their armature is also slightly different (fig. 25).

Habitat.—Scotia Bay, South Orkneys, obtained in siftings from dredged material collected in June 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W.

Remarks.—This species appears to hold an intermediate place between *Alteutha* and *Peltidium*. It resembles the first in its general appearance, and also to some extent in the structure of several of its appendages. On the other hand, the structure of the first pair of thoracic legs is somewhat similar to that of the same pair of legs in *Peltidium*.

Fam. Porcellidiidæ.

Genus *Porcellidium*, Claus, 1860.

Porcellidium affine, Quidor. (Pl. IV. figs. 5–13.)

1906, *Porcellidium affinis*, Quidor, *Expéd. Antarct. Française*, 1903–1905, "Copepodes," p. 4, pl. i. figs. 1–19.

Female.—The female of this species has a general resemblance to that of *Porcellidium ravanæ*, Thompson & Scott, described in Supplementary Report VII. of the Report on the Ceylon Pearl-Oyster Fisheries, by Professor Herdman. It differs, however, in the form of the first abdominal segment, as well as in the structure of the antennules; it is also somewhat larger than that species, being about 1 mm. in length.

The antennules are composed of seven unequal joints; the first three are large, their combined lengths being equal to about two-thirds of the entire length of the antennule. The remaining joints are small, but the fourth and sixth are rather longer than the others (fig. 7). The antenna (fig. 8) has the outer ramus articulated to the end of the first joint of the inner one, and is composed of a single moderately long joint. The mouth appendages and swimming feet are similar to those in *Porcellidium ravanæ*. The first pair of swimming feet are short, and the first joint of the inner ramus is a broad angular plate widest near the proximal end, but becoming narrower distally; the end joint, which is very small, is provided with two stout claw-like spines of tolerable length, which usually extend outwardly at about a right angle to the leg; in the outer ramus the first joint is moderately expanded, but the second and third are smaller. The spiniform setæ on the outer margin are all dilated at the base and plumose, but the two at the end are tolerably long and slender. A stout seta also springs from the inner distal angle of the second joint. The claw-like spines on the end joint of the inner ramus are each furnished on the lower edge with a fringe of close-set delicate filaments (fig. 9).

The next three pairs have both rami three-jointed, and moderately elongated and slender.

The fifth pair are somewhat similar to those in *Porcellidium ravanæ*, both in their general outline and in having their extremity bluntly rounded (fig. 10).

The abdomen and caudal rami also resemble the same parts in *P. ravanæ*, but in that species the caudal rami do not reach to the end of the fifth pair of feet, whereas in the present form the caudal rami reach somewhat beyond these appendages. They are also more bluntly rounded at the end, and the terminal and marginal spines are somewhat differently arranged, as shown in the drawing (fig. 12).

Male.—The male, as is usual, is smaller than the female; the antennules are modified for grasping; the fifth pair of feet are different in form and armature, and the abdomen and caudal rami are shorter (see figs. 12 and 13).

The fifth pair of feet are small, and narrow at the proximal end, but they become wider distally; the extremity is obliquely truncated and fringed with about six short setiferous spines (fig. 11). Caudal rami are very short, and have the squarely truncated ends furnished with a few marginal setæ (fig. 13).

Habitat.—Scotia Bay, South Orkneys; collected in June 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W.

Remarks.—This species, as already stated, has some resemblance to *Porcellidium ravanæ*, Thompson & A. Scott, but differs in several anatomical details, as, for example, in the structure of the female antennules, as well as in the form and armature of the caudal segments. It also resembles in some respects the *Porcellidium wolfendeni* described by G. S. Brady.*

Genus *Tisbe*, Lilljeborg,† 1853.

Tisbe australina, new species. (Pl. III. figs. 26–30.)

Female.—This species, in its general appearance, is somewhat like *Tisbe minor* (T. Scott), but is rather more slender. Length about 0·6 mm.

Antennules composed of eight joints; the second and third joints are subequal and of moderate size; the fourth is fully half as long as the third; the fifth and sixth, which are subequal, are together about as long as the fourth, but the seventh is very small; the end joint was incomplete, but appeared to be about as long as the fourth joint. The antennæ are small, and the outer ramus reaches only to the end of the second joint of the inner ramus. Mouth organs somewhat similar to those in *Tisbe minor*, but the second maxillipedes are moderately stout. All the four pairs of swimming legs are also somewhat similar to those in the species mentioned.

In the fifth pair, the inner portion of the basal joint ends in a blunt pointed apex, which bears two setæ, one being moderately stout and elongated, and the other small;

* *Deutsche Südpolar Exped.*, 1901–1903: "Über die Copepoden der Stämme Harpacticoida," *et seq.*, p. 556 (1910). Separate reprint.

† "The name *Idya* having been previously given by Blainville to a genus of Acalephæ," was changed by G. O. Sars to *Idyæa*: see *Rept. of Second Norwegian Arctic Exped. in the "Fram,"* 1898–1902, No. 18; *Crustacea*, by G. O. Sars, p. 21 (1909). Rev. T. R. R. Stebbing, in *Annals of the South African Museum*, vol. vi. p. 544 (1910), restores Lilljeborg's name, *Tisbe*.

the second joint is of a broadly ovate form, its greatest width being equal to about half the length, and it carries four (or five) short setæ round the lower part of the outer margin and apex, as shown in the drawing (fig. 30).

Caudal rami short.

Habitat.—Scotia Bay, South Orkneys; collected in June 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W. No males observed.

Remarks.—As already stated, this species has a somewhat close resemblance to *Tisbe minor* (T. Scott), first described in the *Annals of Scottish Natural History* in October 1896, from specimens obtained in the Firth of Clyde. The same species has also been recorded from Norway by Professor G. O. Sars, and it was one of the Harpactids discovered by Dr Bruce in Franz Josef Land. But the Antarctic form, though closely resembling the northern species referred to, may be readily distinguished from it by the broadly ovate form of the second joint of the last pair of thoracic legs.

The genus *Tisbe*, as Professor G. O. Sars remarks, "seems to be represented in all parts of the oceans," and he has "even found one or two species of this genus in the Caspian Sea."* Dr Giesbrecht obtained two species belonging to the *Idyæa* in the collections brought home from the Antarctic by the *Belgica* in 1899;† both these species, however, differ in several respects from those observed in the material collected by the *Scotia*; and they differ especially in the structure of the first and fifth pairs of thoracic legs. I am also unable to identify the *Scotia* species with either of those recorded by Dr Brady in his account of the Copepoda-Harpacticoida of the *Deutsche Südpolar Expedition*, pp. 560, 561.‡

Tisbe gracilipes, new species. (Pl. I. figs. 23–29.)

Female.—The female of this species is somewhat like that of *Tisbe gracilis* (T. Scott) in its general form, being elongated and rather slender.

The antennules are tolerably elongated; the second joint is rather longer than the third, which, in its turn, is about one and a half times the length of the fourth joint. The three following joints are small, while the end one is equal to the two preceding joints combined (fig. 23).

Antennæ moderately slender, the outer ramus four-jointed and rather longer than the penultimate joint of the inner ramus (fig. 24). The mandibles and other mouth organs are somewhat similar to those in *Tisbe gracilis*.

The thoracic legs are also somewhat similar to those in the species mentioned, but in the first pair, the second joint of the inner ramus is proportionally more elongated, being fully one and a half times the length of the first joint. The outer ramus scarcely reaches to the end of the first joint of the inner one (fig. 26). In the fourth pair, the

* *Crustacea of Norway*, vol. v. p. 88 (1905).

† *Resultats du Voyage du s.y. "Belgica,"* "Copepoda," von Dr W. Giesbrecht, p. 38 (1902).

‡ *Deutsche Südpolar Exped.*, 1901–1903: "Über die Copepoden der Stamme Harpacticoida, Cyclopoida," etc. (1910).

end joint of the outer ramus is about twice as long as the preceding joint. It is also moderately narrow, and furnished with two rather stout marginal spines and two at the apex, the inner apical spine being nearly as long as the joint to which it is articulated (fig. 27).

The fifth pair are somewhat like the same pair in *Tisbe gracilis*; the second joint, however, differs in being rather wider in proportion to its length. The seta on its inner margin is also articulated nearer the middle of the joint, and the whole of the inner aspect of the joint is covered with minute hairs (fig. 28).

Habitat.—Scotia Bay, South Orkneys; collected in June 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W. Rare.

Remarks.—This form resembles *Idyæa gracilis*, and might be considered as only a variety of that species, but the inner ramus of the first pair of swimming legs is proportionally and distinctly more elongated, and the second joint of the fifth pair is also more broadly ovate. Because of these differences and one or two others alluded to in the description, the species ought, I think, to be considered distinct.

Genus *Psamathe*, Philippi, 1840.

Psamathe longicauda, Philippi. (Pl. V. figs. 16–22.)

1840, *Psamathe longicauda*, Philippi, *Archiv f. Naturgesch.* (1840), p. 89, pl. iv. fig. 1.
1866, *Scutellidium tisboides*, Claus, *Die Copepoden fauna von Nizza*, p. 21, pl. iv. figs. 8–15.
1880, „ „ Brady, *Monogr. Brit. Copep.*, vol. ii. p. 175, pl. lxviii. figs. 1–10.
1905, *Psamathe longicauda*, G. O. Sars, *Crustacea of Norway*, vol. v. p. 83, pl. xlix.

A single specimen of this Harpactid was obtained in a plankton gathering collected at Station 27 in 13° 38′ N., 25° 09′ W.

The body in this species is considerably flattened, and there is a distinct break between the anterior and the posterior portions, best seen when viewed from above, the former being expanded, while the latter is narrow (see fig. 16).

The antennules are composed of nine joints; the first three are elongated and moderately stout, and are together about twice the entire length of the remaining six joints: the end joint is slender and rather longer than the three preceding joints combined (fig. 17).

Antennæ with the outer ramus four-jointed and not more than half the length of the inner one; it is also articulated to the outer distal angle of the second basal joint (fig. 18).

Maxillipeds moderately stout; first pair smaller than the second and armed with two claw-like terminal spines (fig. 19). Second maxillipeds robust; the basal joint is provided with a stout plumose seta on its inner distal angle, and the end joint with three stout terminal claws and a small plumose bristle (fig. 20).

The first pair of thoracic legs are moderately stout, and both rami are composed of three joints, but the end joints are extremely small and bear peculiar recurved terminal

spines, as shown in the drawing (fig. 21); the outer ramus is considerably shorter than the inner, and the spiniform seta at the outer angle of the second basal joint is remarkably stout. The next three pairs have both rami also three-jointed, and are of normal form.

In the fifth pair, which were somewhat imperfect, the basal joint was bilobed and moderately expanded; the end joint, which is of a narrow ovate outline, is about three times longer than broad, but, being imperfect, its dimensions could not be accurately made out (see fig. 22).

The specimen—a female—represented by the drawing (fig. 16) measured 0·88 mm. in length. It agrees so closely in size and form and in the structure of its various appendages with the description and drawing of *Psamathe longicauda* given by G. O. Sars in the work referred to above, that I have no hesitation in ascribing it to the same species.

The distribution of *Psamathe longicauda* is apparently extensive, for in addition to the Mediterranean records by Philippi and Claus, it also belongs to the Copepod fauna of Britain and Norway. It has also been reported from Franz Josef Land as well as from the Black Sea. Its occurrence at the *Scotia* Station 27 extends its distribution to the south of the Cape Verde Islands.

Psamathe fucicola, new species. (Pl. VI. figs. 12–19.)

Female.—The female of this species has a general resemblance to *Psamathe longicauda*, Philippi, but is rather smaller. The length of the specimen represented by the drawings is 0·75 mm.

Antennules moderately stout and composed of nine joints; second joint tolerably large, and fully one and a half times longer than the next; the fifth, sixth, and seventh very small; the last two joints are slender, but rather longer than those immediately preceding (fig. 12).

The antennæ, mouth organs, and swimming feet are nearly as in *Psamathe longicauda*.

In the fifth pair the second joint is about three times longer than broad; both the lateral margins are fringed with minute bristles; a small spiniform seta also springs from near the distal end of the inner margin, and another from the apex of the joint (fig. 18). The caudal rami are short and broad (fig. 19.)

Habitat.—Found on floating seaweed—"Gulf-weed"—collected between the Cape Verde Islands and the Azores in June 1904; Station 538, 32° 11′ N., 34° 10′ W.

Remarks.—The Harpactid recorded above has a close resemblance to *Psamathe longicauda*, Philippi, and may be mistaken for that species. It is, however, rather smaller; the proportional lengths of the joints of the antennules are somewhat different; the thoracic legs are rather more slender, and the armature of the fifth pair, especially, differs distinctly from the species referred to.

Genus *Machairopus*, G. S. Brady, 1883.

Machairopus australis, new species. (Pl. VI. figs. 20–28.)

Female.—Body depressed, anterior portion considerably expanded. Length about 1·1 mm.

Antennules elongated and slender and composed of nine articulations; the second and third joints, which are nearly of equal length, are longer than any of the others; the fifth and sixth are also subequal, but very small, while the end joint is narrow and rather longer than the one immediately preceding. Antennæ and mouth organs somewhat similar to those in *Machairopus idyoides*, Brady.

First pair of thoracic legs stout; outer ramus much shorter than the inner one; while the first joint of the inner ramus is considerably longer than the second, as shown by the drawing (fig. 25). The next three pairs are slender.

Fifth pair lamelliform; proximal joint small; end joint elongate ovate, widest anteriorly, the greatest width equal to rather more than one-third of the length; both lateral margins fringed with minute bristles; this joint is also furnished with three apical setæ, the innermost being very short, while the other two are moderately elongated.

Caudal rami short, about as long as the last abdominal segment.

Habitat.—Scotia Bay, South Orkneys; obtained in siftings from some dredged material collected in April 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W.

Machairopus major, new species. (Pl. IV. figs. 14–24.)

Female.—Resembling the species last described, but larger. Length, 1·5 mm.

Antennules composed of nine joints; second and third joints moderately stout, subequal in length and longer than any of the others, the two combined being equal to the entire length of the following six joints; end joint longer than the preceding one (fig. 15).

Mandibles elongated and narrow, the masticatory end obliquely truncate; mandible pulp small and two-branched. First maxillipeds somewhat slender, but the second pair are moderately stout.

All the four pairs of swimming legs are tolerably stout; in the first pair, the outer ramus scarcely reaches to the end of the first joint of the inner ramus; the first and second joints of the inner ramus are nearly of equal length. In the next three pairs, the inner ramus is rather longer than the outer, and the marginal spines of the outer ramus are short and stout. In the fifth pair, the second joint is broadly foliaceous, somewhat ovate in outline and widest near the proximal end, the greatest width being equal to about half the length; a slender seta springs from a notch near the middle of the outer margin, and there are also about four slender and moderately elongated setæ on the bluntly rounded apex of the joint (fig. 23).

Caudal rami short.

Habitat.—South Orkney Islands; collected in April 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W.

Remarks.—This species differs from the last in the proportional lengths of some of the joints of the antennules, and in the form and armature of the last pair of thoracic legs. The other thoracic legs are also stouter.

One obvious character by which *Machairopus* may be distinguished from *Psamathe* is found in the armature of the outer branches of the first pair of thoracic legs. In *Psamathe* the terminal spines of both rami are somewhat similar, while in *Machairopus*, only the terminal spines of the outer ramus have their upper margins setiferous, as shown in the drawings.

Fam. Thalestridæ.

Genus *Parathalestris*, G. O. Sars, 1905.

Parathalestris clausi (Norman). (Pl. II. figs. 15–18.)

1869, *Thalestris clausi*, Norman, *Brit. Assoc. Report* (1868), p. 297.
1880, „ „ Brady, *Monogr. Brit. Copep.*, vol. ii. p. 128, pl. lxii. figs. 1–12.
1905, *Parathalestris clausi*, G. O. Sars, *Crust. of Norw.*, vol. v. p. 111, pls. lxv., lxvi.

A single specimen—a male—which undoubtedly belongs to this species, was obtained in a tow-net gathering collected by the *Scotia* at Station 62 on 13th December 1902; Station 61, 4° 15′ S., 33° 38′ W.; earlier on this date, the vessel passed Rocas Light, bearing WSW. about 30 miles, off the north-east coast of South America.

From what is known concerning the distribution of this species, its occurrence so far south appears to be somewhat unusual; its presence in this gathering may have therefore been accidental. It is moderately common round the British and Norwegian coasts, and Dr Canu records it from the French coast.

Parathalestris coatsi, new species. (Pl. III. figs. 7–16.)

Female.—Body depressed and somewhat expanded; thorax and abdomen not clearly defined; forehead broadly rounded, rostrum small, caudal rami short. Length of specimen represented by the drawing about 1 mm.

Antennules composed of nine joints; the first four are tolerably large, but the remaining five are small, their entire length being shorter than the second and third combined. Antennæ moderately stout, the outer ramus two- (or indistinctly three-) jointed.

The mandibles are moderately stout and provided with a small two-branched palp (fig. 10). Second maxillipeds stout; end joint short and armed with a strong and curved terminal claw which is furnished with a few minute spines on its inner edge; the end joint, to which the claw is articulated, has also a few minute spines on the margin on which the claw impinges (fig. 11).

The first pair of thoracic legs are stout and of moderate length; their outer ramus

is armed with elongated and tolerably stout terminal claws, and the setæ on its outer margin and apex are also elongated; the first joint of the inner ramus reaches to near the end of the second joint of the outer one; the end joints are small and the apical claws elongated; there is also a fringe of minute spines along the outer margin in both rami (fig. 12). The second, third, and fourth pairs are nearly as in *Parathalestris clausi* (Norman).

The fifth pair are broadly foliaceous, and both segments are furnished with several spines, all of which are tolerably stout, except the one at the outer distal angle of the inner segment, and the apical one on the outer segment, as shown in the figure (fig. 15).

Habitat.—Scotia Bay, South Orkneys; collected in June 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W. Only a few specimens were observed; they were in some material washed from zoophytes brought in the trawl-net or dredge.

This species is named in honour of the late Mr James Coats, junior, and of Major Andrew Coats, D.S.O., who were the two chief subscribers to the Expedition. Major Coats is also a member of the Scotia Committee.

Parathalestris affinis, new species. (Pl. III. figs. 17–25.)

Female.—In its general appearance, and also in the structure of some of its appendages, the female of this species is not unlike that of *Parathalestris jacksoni* (T. Scott), recorded from Franz Josef Land, except that the caudal rami are short. The body is elongated, tolerably stout, and tapers slightly towards the posterior end, and the integument is strongly chitinous. Head rounded and furnished with a small rostrum. Caudal rami short, their length about equal to that of the last segment of the abdomen (fig. 17). Length of the specimen represented by the figure about 1·5 mm.

Antennules short, and composed of nine articulations; the first four joints are moderately large, and the upper distal portion of the fourth joint extends forward to near the middle of the next one and carries a tolerably long and stout sensory filament; the sixth joint is rather longer than the preceding one, while the seventh and eighth, which are subequal, are shorter than any of the others; the end joint is about one and a half times the length of that which precedes it; all the joints except the first are moderately setiferous (fig. 18). Antennæ with the outer ramus small and biarticulate.

Mandibles slender and becoming attenuated towards the distal end. Maxillæ strongly developed, the truncated masticatory part armed with several spiniform setæ and extending rather beyond the supplementary lobes (fig. 21).

Maxillipeds small; the second pair short, but with the end joint dilated and armed with a short and rather stout and curved terminal claw (fig. 23).

The first pair of thoracic legs have the inner ramus rather shorter than the outer, and provided with long, terminal, claw-like spines; the end joint of the outer ramus is also armed with several claw-like spines somewhat similar to those of the inner ramus, and an elongated seta springs from its inner distal angle; the second joint of the same ramus has also its outer margin fringed with minute teeth as far forward as

the spine, which spring from near its distal end, while the inner margin of the same joint and the outer margin of the inner ramus are both fringed with delicate hairs, as shown in the drawing (fig. 24). Another feature here is the presence of three small teeth on the transverse end of the first joint of the outer ramus (see fig. 24).

The next three pairs are somewhat similar in structure to the same appendages in *Parathalestris jacksoni* (T. Scott).

The fifth pair are tolerably large and foliaceous; the outer segment, which is broadly ovate in form, is provided with six setæ; five of them spring from the distal half of the outer margin and apex, and one from the lower part of the inner margin; the uppermost three on the outer margin are moderately stout and widely apart, while the two at the apex are slender and close together. The inner portion of the basal joint is shorter than the outer, and is somewhat triangular in outline, being broad at the proximal end, and tapering from thence to the rounded extremity; five setæ spring from the distal end of this inner segment; the three on the inner aspect are moderately stout and placed widely apart; the other two spring from the lower half of the outer margin and are close together; they are smaller than the others (fig. 25).

Habitat.—Scotia Bay, South Orkneys; collected in June 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W. Only one or two specimens were observed.

Remarks.—The species now described is in its several appendages not unlike the northern form mentioned above, the fifth pair of thoracic legs being remarkably similar; there are, however, a few differences of more or less importance between them —the species referred to being, for example, distinctly larger, and the caudal rami entirely different.

Genus *Idomene*, Philippi, 1843.

Idomene forficata, Philippi. (Pl. III. figs. 1–6; Pl. IV. fig. 1; Pl. IX. fig. 29.)

1843, *Idomene forficata*, Philippi, *Archiv f. Naturgeschichte*, p. 65, pl. iii. fig. 4.
1880, *Dactylopus flavus*, Brady, *Monogr. Brit. Copep.*, vol. ii. p. 116, pl. lvi. figs. 1–11.
1906, *Idomene forficata*, G. O. Sars, *Crust. of Norway*, vol. v. p. 131, pl. lxxxii.

Female.—Body somewhat depressed, expanded in front, but becoming narrower towards the distal end. Length, ·57 mm.

Antennules short and composed of seven joints; the first four joints are tolerably large, but the others are smaller, the penultimate joint being rather shorter than the preceding one, and about half as long as the next. Antennæ with the outer ramus small and biarticulate.

The second maxillipeds are of moderate size: a stout seta springs from the end of the first joint, while the second is armed with a long slender claw, and a small bristle also springs from near the distal end of its inner margin.

The four pairs of swimming feet have both rami three-jointed. The first pair are stout, and the second basal joint is furnished with a stout seta on both the outer and inner margins; the first and second joints of the outer ramus are tolerably large, but

the end one is only about half the length of the preceding joint; inner ramus considerably longer than the outer, and the first joint, which is as long as the entire outer ramus, is widest near the proximal end, but becomes narrower distally; the greatest width is equal to about two-fifths of the length; second and third joints are small; the last is provided with one or two apical setæ, and a moderately stout appendage which terminates in a small hook-like process (fig. 4). The fourth pair are small, and the inner ramus is shorter than the outer one; both rami are furnished with moderately long and slender marginal setæ, and the terminal setæ are also considerably elongated.

Fifth pair small; basal joint not greatly produced interiorly, the interior part broadly rounded and provided with five elongated setæ; the space between the outermost seta and the next one is rather greater than that between the others; second joint subtriangular, and furnished with one seta on the inner margin, two setæ on the outer, and two at the apex (see fig. 29, Pl. IX.).

The male does not differ greatly from the female, but the basal joint of the fifth pair of thoracic legs is only slightly produced interiorly, and bears two instead of five setæ, while the second joint has three instead of two setæ on its outer margin (fig. 6, Pl. III.).

Habitat.—Scotia Bay, South Orkneys; collected in June 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W.

Remarks.—This Antarctic *Idomene* so closely resembles the form described by PHILIPPI from the Mediterranean that I have scarcely any hesitation in referring it to the same species. The only difference of any importance is the small hook-like process at the end of the inner ramus of the first pair of thoracic legs. The occurrence of this species in the Antarctic collections made by the S.Y. *Scotia* is of considerable importance. The distribution of *Idomene* extends to the British and Norwegian coasts.

Genus *Dactylopusia*, Norman, 1903.

Dactylopusia frigida, new species. (Pl. II. figs. 19–25.)

Female.—Body moderately stout, and somewhat similar to *Dactylopusia neglecta*, G. O. Sars, in its general appearance. Length, 0·85 mm.

Antennules moderately short and composed of nine joints; the first four are stout and subequal; the sixth is about equal to the fourth, and rather longer than the preceding joint; the seventh and eighth joints are very short, but the terminal joint is about equal in length to the fifth. Antennæ small; outer ramus moderately elongated and composed of three joints, but the middle joint is very small.

Second maxillipeds with the end joint oblong and furnished with a tolerably long slender claw.

In the first pair of thoracic legs the inner ramus is moderately elongated and narrow, but the outer is short and only reaches to a little beyond the middle one; the second joint is nearly twice as long as the first, and the end one is very small. The next three pairs are tolerably stout; in the fourth pair the short inner ramus is some-

what triangular in its general outline, and both the inner and outer margins taper to the narrow distal extremity.

In the fifth pair, the inner portion of the basal joint, which is moderately produced, is transversely truncated, and furnished with about five apical setæ; the second joint is broadly ovate and is provided with six setæ; the three setæ on the inner margin, and one near the end of the outer margin, are tolerably stout, but the other two are somewhat slender. Caudal rami very short.

Habitat.—Scotia Bay, South Orkneys; collected in June 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W.

Dactylopusia ferrieri, new species. (Pl. XII. figs. 14–22.)

Female.—Body tolerably stout and elongated; rostrum short; abdomen somewhat reflexed; caudal rami short (fig. 14). Length about 1 mm.

Antennules short, scarcely reaching to the end of the first cephalothoracic segment, and apparently composed of seven joints, but the articulation between the fifth and sixth joints is not very clearly defined; the first and second joints are moderately robust; the third is narrower than the second, and equal to about one and a half times its length; the other joints are small and subequal, except the sixth, which is scarcely half the length of the one that precedes it; the antennules are tolerably setiferous, and the third joint bears an extremely long sensory filament (fig. 15).

Antennæ, as in *Dactylopusia frigida*.

Maxillipeds small; the first pair are each armed with a stout terminal claw, and are also provided with two small marginal setiferous lobes, as shown in the figure (fig. 17); second pair narrow and elongated, and furnished with slender terminal claws that reach beyond the middle of the joints to which they are articulated (fig. 18).

The first pair of thoracic legs have both rami tolerably stout; the first joint of the inner ramus, which is elongated and reaches nearly to the extremity of the outer ramus, bears a moderately stout seta near the middle of the inner margin; the end joints are very small, and bear stout, terminal, claw-like spines, as shown in the figure (fig. 19); a stout setiferous spine springs from the outer margin of the first and second joints of the outer ramus, and the second joint has also a seta on the inner margin; the end joint of the outer ramus is very short and carries a tolerably stout setiferous spine on the outer margin; it is also furnished with two terminal claw-like spines and two slender and elongated setæ—the inner one being considerably longer than the other; both rami are fringed on their outer margins with small bristles, and stout setiferous spines spring from the distal end of both the outer and inner margins of the second basal joint (fig. 19).

The second, third, and fourth pairs are somewhat similar in structure to the same appendages in *Dactylopusia brevicornis* (Claus), except that the second joint of the inner ramus of the second pair is provided with two setæ on the inner margin, while the same joint in the third and fourth pairs bears only one seta. In the third pair,

the end joint of the inner ramus carries three setæ on the inner margin, two at the apex and a tolerable stout spine at the outer distal angle; but in the fourth pair, the same end joint is furnished with only two setæ on the inner margin (see figs. 20 and 21).

In the fifth pair, which are comparatively small, the basal joint is moderately expanded interiorly and provided with five elongated and rather slender plumose setæ on the broadly rounded distal end; the second joint is small, oblong in form, and about twice as long as wide; the inner margin is nearly straight, but the outer is slightly rounded and fringed with minute setæ; it is also provided with six plumose setæ round the distal end, as shown in the drawing (fig. 22).

Habitat.—Scotia Bay, South Orkneys; collected in June 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W.

Remarks.—This species has a slight resemblance to the *Dactylopusia antarctica* of Giesbrecht, from the Belgian Antarctic Expedition, but it differs distinctly from it in the structure of the antennules and of the fifth pair of thoracic legs. Named in compliment to Mr James G. Ferrier, a member of Committee and Secretary to the Expedition.

Dactylopusia perplexa, new species. (Pl. II. figs. 26–30; Pl. VI. figs. 1 and 2.)

Female.—Body moderately stout. Length, 0·8 mm.

Antennules short, robust, and composed of nine joints, the first four of which are moderately large, and the second, third, and fourth are each rather shorter than the preceding one; the next two joints and the last joint are nearly equal in size, and are each fully half as long as the fourth; the seventh and eighth are also nearly equal, but they are shorter than any of the others.

Antennæ stout; outer ramus three-jointed and of moderate length; mandibles with the distal end somewhat attenuated; mandible-palp small and two-branched.

The second maxillipeds are short and rather robust, and they are provided with short but moderately stout terminal claws.

The first pair of thoracic legs are short and stout, and the rami are nearly of equal length; the outer ramus, which is slightly shorter than the other, is armed with short, stout terminal claws; in the outer ramus, the middle joint is about twice as long as the preceding one, but the end joint is small and is provided with tolerably stout terminal claws. The next three pairs are all moderately stout, with short margin spines on the outer rami.

The fifth pair are short, and both segments are somewhat expanded; the inner portion of the basal segment, which reaches to about the middle of the second, bears five setæ on its broadly rounded end; the two inner setæ are short and tolerably stout; the two outer are more slender and are close together, but the middle one, which is also stout, is moderately elongated. The second segment is broadly ovate, the greatest width being equal to about three-fourths of the length; this segment is furnished with three short setæ on the lower half of the outer margin, one on the inner margin, and

two at the apex; the apical setæ are slender, but the others are tolerably stout. Caudal rami short.

Habitat.—Scotia Bay, South Orkneys; collected in June 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W.

Genus *Pseudothalestris*, G. S. Brady, 1883.

Pseudothalestris intermedia, new species. (Pl. IX. figs. 1–4; Pl. XII. figs. 27–29.)

Female.—The female of this species is small, measuring only about 0·4 mm. (about $\frac{1}{60}$ of an inch), and has a general likeness to *Pseudothalestris pygmæa*, Scott.

The antennules are composed of seven joints; the second joint is tolerably large, but the next three are each shorter than the one that precedes it; the two end joints are small, and together are only about equal to the third, as shown in the formula, which gives approximately the proportional lengths of the various joints:

Numbers of the joints	1	2	3	4	5	6	7
Proportional lengths	7	8	7	3	2	3	4

In the first pair of thoracic legs, the two-jointed outer ramus is tolerably short, and the seta on the inner margin of the first joint of the inner ramus springs from slightly below the middle of the joint, instead of from near the proximal end.

The fifth pair of thoracic legs are small; the basal joint is moderately broad, and the produced inner portion is of a triangular form, and furnished with three setæ on the lower half of the inner margin, and with two on the outer margin near the apex: a distinct space also separates these two from the others; the second joint is small, and bears three setæ on the outer margin, one on the inner margin, and one at the apex—these setæ are all tolerably elongated, as shown in the drawing (fig. 5, Pl. XII.).

Male.—In the second pair of thoracic legs of the male, the second joint of the inner ramus is provided with five setæ—two on the inner margin, one near the proximal end of the outer margin, and two at the apex; and the innermost of the two apical setæ forms a stout and claw-like appendage, but the other four setæ mentioned are tolerably slender (see figs. 3 and 3A, Pl. IX.).

Fifth pair small; the inner portion of the basal joint moderately produced, and furnished with a short, stout seta on the inner margin, and with two at the apex, the outer being considerably smaller than the other (see fig. 4, Pl. IX.).

Habitat.—Scotia Bay, South Orkneys; collected in June 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W.

Remarks.—The species described above differs from *Pseudothalestris pygmæa*, Scott, and *Westwoodia minuta*, Claus (both of which it resembles to some extent), in the structure of the female antennules, in the armature of the inner ramus of the second pair of thoracic legs in the male, and in the form of the male and female fifth pair. There are also one or two other points of difference, but those referred to appear to be the most important.

Pseudothalestris assimilis, G. O. Sars, var. *antarctica*, nov. var. (Pl. IX. figs. 5–9.)

A single specimen—a male—closely resembling, if it be not identical with, the male of the species referred to, described by G. O. Sars in his *Crustacea of Norway*, vol. v. p. 141, was obtained in the same gathering with *P. intermedia*, collected in Scotia Bay, South Orkneys, Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W. But though agreeing with some of the more important characters of that species, it differed in one or two minor points. In the first pair of thoracic legs the seta on the inner margin of the first of the inner ramus was situated nearer the proximal end of the joint.

The inner produced portion of the basal joint of the fifth pair is narrower, and the second joint is broader, and further, this joint is only provided with five instead of six setæ (see fig. 8). On account of these differences, I am inclined to regard this as a variety of the species it otherwise so closely resembles.

Fam. Diosaccidæ.

Genus *Diosaccus*, Boeck, 1872.

Diosaccus tenuicornis (Claus).

1863, *Dactylopus tenuicornis*, Claus, *Die freileb. Copep.*, p. 127, pl. xvi. figs. 17–23.
1880, *Diosaccus tenuicornis*, Brady, *Monogr. Brit. Copep.*, vol. ii. p. 68, pl. lix. figs. 12–16, pl. lx. figs. 14–18.
1906, *Diosaccus tenuicornis*, G. O. Sars, *Crust. of Norway*, vol. v. p. 146, pl. lxxxix. and xc.

A single specimen—a male—was obtained in a tow-net gathering from Station 85, collected on 22nd December 1902, 23° 8′ S., 39° 40′ W.

Genus *Amphiascus*, G. O. Sars, 1905.

Amphiascus fucicolus, new species. (Pl. IX. figs. 23–28.)

Female.—Somewhat like *Amphiascus similis* (Claus) in general appearance; rostrum prominent; abdomen strongly flexed. Length about 0·8 mm.

Antennules eight-jointed; first and second joints robust and subequal; the next two shorter and not so much dilated; the fifth and seventh joints are smaller than any of the others; the sixth is nearly as long as the fourth, while the last, which is narrow, is about equal in length to the third (fig. 23).

In the first pair of thoracic legs, the outer ramus is considerably shorter than the inner one, and the middle joint is about twice the length of the first (fig. 26). In the fourth pair, the outer ramus is rather longer than the inner one (fig. 27).

The fifth pair of legs are of moderate size and broadly foliaceous; the interior of the basal joint, which is only slightly produced, is provided with two short and three tolerably long slender hairs on the distal margin; the second joint has a subquadriform outline, the length being only a little greater than the width; its distal end is obliquely truncated and furnished with five setæ of unequal lengths—one near the

middle of the outer margin; two, close together, at the apex; and two, also close together, situated nearly intermediate between the apical setæ and the outer one; there is also a seta on the lower half of the inner margin, as shown in the drawing (fig. 28). Tail segments very short.

Habitat. In siftings from Gulf-weed collected by the *Scotia* off the Canary Islands on 29th June 1904; Station 537, 29° 54′ N., 34° 10′ W.

Fam. Canthocamptidæ.

Genus *Ameira*, Boeck, 1865.

Ameira simulans, new species. (Pl. VII. figs. 23–28.)

Female.—Body resembling *Ameira tau* (Giesbrecht) in its general appearance. Length, 0·6 mm.

Antennules composed of eight joints; the second joint is large and nearly one and a-half times longer than the next, and about twice as long as the fourth joint, but the two end joints are very short. The approximate proportional lengths of the various joints are shown by the formula:

Number of the joints	1	2	3	4	5	6	7	8
Proportional lengths	6	11	8	6	4	5	2	2

The first pair of thoracic legs, and also the following three pairs, are all somewhat similar to those in *Ameira tau* already referred to.

The fifth pair are very small; the inner portion of the basal joint, which is transversally truncated at the end, is furnished with five setæ—four of them on the truncated apex and one on the lower half of the inner margin; the second joint (or segment) is tolerably expanded at the base, and tapers towards the bluntly rounded extremity; this joint is also provided with five setæ, one of which springs from the outer margin, and the other four from the rounded apex.

Caudal rami very short.

Habitat.—Scotia Bay, South Orkneys; collected in June 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W.

Remarks.—The species recorded above has a tolerably close resemblance to *Ameira tau*, described by Dr Giesbrecht in his work *Die freilebenden Copepoden der Kieler Föhrde*, p. 117 (1882), but it differs in one or two important particulars, and especially in the form of the last pair of thoracic legs.

Genus *Parastenhelia*, I. C. Thompson & A. Scott, 1903.

Parastenhelia antarctica, new species. (Pl. IV. figs. 25–33.)

Female.—Somewhat similar to *Parastenhelia anglica*, Norman & Scott, in its general appearance. Length, 0·85 mm.

Antennules composed of nine joints, the first two or three moderately stout, the

others becoming attenuated towards the distal extremity; the second joint is rather longer than the first or third; the fourth, fifth, and sixth are subequal in length, and are each rather shorter than the third; the three end joints are small, but the penultimate one is rather shorter than that on either side (fig. 25). The antennæ are similar to those in *Parastenhelia anglica*.

Mandibles small, tolerably slender, and narrower towards the apex, which is armed with three or four small teeth (fig. 26); mandible-palp very small and two-branched.

First maxillipeds simple; terminal claw moderately stout (fig. 27); second maxillipeds furnished with a stout spiniform bristle near the middle of the inner margin of the penultimate joint, and the terminal claw scarcely reaches beyond the proximal end of the same joint (fig. 28).

All the four pairs of swimming legs are slender. The inner ramus of the first pair is considerably longer than the outer and composed of two joints; the end joint is short, but the first is greatly elongated and furnished with a plumose bristle near the middle of the inner margin, and a few scattered spinules on the distal half of the outer margin; the terminal claws are slender; one is moderately elongated, the other shorter. The middle joint of the outer ramus is also tolerably elongated, and the first and second joints are each furnished with a slender spine near the distal end of the outer margin, and there are also several marginal spinules; the short end joint is armed with two slender terminal claws and two elongated setæ; the second basal joint of this pair has the lower margin fringed with small spinules, and a stout seta springs from both its inner and outer distal angles (fig. 28).

The second, third, and fourth pairs are similar to those in *Parastenhelia anglica* (fig. 29).

Fifth pair small; the inner portion of the basal joint, which is subtriangular in outline, reaches to about the middle of the outer second joint, and bears five setæ of unequal lengths round its distal end; the second joint is broadly ovate, and the outer and inner margins of the proximal portion of the joint are nearly parallel; but the distal end is somewhat rounded and furnished with six setæ arranged as shown in the drawing (fig. 32).

Habitat.—Scotia Bay, South Orkneys; collected in June 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W.

Remarks.—The genus *Parastenhelia* was established by I. C. Thompson & A. Scott in 1903 for two Harpactids from the pearl-oyster beds in the vicinity of Ceylon.* In the species belonging to this genus, the inner ramus of the first pair of thoracic legs is usually elongated and composed of two joints. Besides the two species from Ceylon, and the one now recorded, another is described in the *Crustacea of Devon and Cornwall*, by Canon A. M. Norman & T. Scott, p. 148, pl. x. figs. 10 and 11 *et seq.*

* *Report to the Government of Ceylon on the Pearl-Oyster Fisheries of the Gulf of Manaar*, by W. A. Herdman, D.Sc., F.R.S.; *Supplementary Report on the Copepoda*, by I. C. Thompson & A. Scott (1903), p. 263.

Genus *Phyllopodopsyllus*, Scott, 1896.

Phyllopodopsyllus mossmani, new species. (Pl. V. figs. 1–14.)

Female.—In its general appearance, the female of this species resembles that of *Phyllopodopsyllus bradyi*; there are, however, a few small but obvious differences which, though they may not be of so much importance as to separate this form generically, are yet sufficient to exclude it from any species hitherto described. The length of the specimen represented by the drawing on Pl. V. is 0·71 mm.

Antennules nine-jointed, like those of the type species; the first joint is large and about equal to the combined lengths of the next three joints: these three joints do not differ much in size, but the third and fourth are each rather smaller than the preceding joint; the seventh and eighth are smaller than any of the others, and are together only equal to about half the length of the end joint; the second joint wants the spur-like process with which that joint is armed in both the type species: *Phyllopodopsyllus bradyi* and the *Phyllopodopsyllus furcifer* described by G. O. Sars (fig. 2). The antennæ are similar to those of the type species, as are also the maxillæ, but the mandibles are rather stouter, and the two branches of the mandible-palp do not differ so much in length, the lower branch being in the type species distinctly smaller than the other. The two pairs of maxillipeds are similar to those in the type species (fig. 4).

The swimming legs have the inner rami all two-jointed and the outer rami three-jointed; in the first pair the inner ramus is fully one and a half times longer than the outer one, the first joint being considerably longer than the entire outer ramus; the end joint, which is much smaller than the first, is armed with a stout apical claw and an elongated seta. In the second and third pairs, the inner ramus, which scarcely reaches the end of the second joint of the outer, has the joints subequal. In the fourth pair, the inner ramus is very small, being shorter than the first joint of the outer one (see figs. 7–10).

The fifth pair form each a large foliaceous plate, somewhat oval in outline; its length is equal to about twice the width, its distal end is rounded but the inner portion slightly produced, and it is furnished with several small setæ round the inner margin and apex (fig. 11).

The caudal rami are about equal in length to the last segment of the abdomen, and the principal tail seta, which is somewhat dilated at the base, is long and slender.

Male.—The male is smaller than the female, and measures only about 0·55 mm. in length. The structure of the antennules is modified so that they form effective grasping organs. In the second pair of swimming feet the inner rami are proportionally rather longer than in the female.

The fifth pair are small and normal in structure (fig. 12). The caudal rami are more slender than in the female, and the principal tail seta is not only elongated but is also somewhat stout and spiniform.

With these exceptions, the structure of the male and female is somewhat similar.

Habitat.—Amongst small shells and other things collected on the shores of the Falkland Islands in Port Stanley by the s.y. *Scotia*; Station 118, 51° 41′ S., 57° 51′ W.

Remarks.—Perhaps the most noticeable difference between the present species and the two already described is the absence of the tooth-like process on the second joint of the antennules. But there is also a slight difference in the form of the fifth pair of thoracic legs of the female, as well as of the caudal rami. Named in compliment to Mr Mossman, meteorologist to the Expedition.

Fam. Laophontidæ.

Genus *Laophonte*, Philippi, 1840.

Laophonte rottenburgi, new species. (Pl. VII. figs. 1–6.)

Female.—Body narrow, elongated. Length, 1 mm. ($\frac{1}{25}$ of an inch).

Antennules seven-jointed; first three moderately stout and of nearly equal length; the fourth and fifth joints are short, while the next two are each about twice as long as the fifth. The second joint is produced behind into a stout, blunt-pointed tooth (fig. 1).

Antennæ and mouth-organs somewhat similar to those of the next species.

The first pair of thoracic legs are moderately stout; the outer ramus is composed of three subequal joints, and reaches to about the middle of the first joint of the inner ramus. The inner ramus is tolerably elongated; the first joint is long and narrow, and bears seven or eight widely scattered hairs on the inner margin; the terminal claw is long and tolerably stout (fig. 3). In the next three pairs, the first joint of the inner ramus is very short, but the second is moderately elongated.

In the fifth pair, which are comparatively small, the proximal joint is of moderate size and broadly subtriangular, and the distal end, which reaches beyond the middle of the second joint, is obliquely truncated and furnished with about five setæ; the three on the inner margin are set widely apart, while the two at the outer distal angle of the joint are moderately close together, with a considerable space between them and the nearest of the other three; the second joint is broadly ovate, transversely truncated at the end, and furnished with four setæ on the truncated margin and two on the outer margin, as shown in the drawing (fig. 5).

Caudal rami short.

Habitat.—South Orkney Islands, in siftings from some dredged material collected in June 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W.

Remarks.—This species is easily distinguished from the other species of *Laophonte* described here by the structure of the antennules and of the last pair of thoracic legs. Named in compliment to Dr Paul Rottenburg, a subscriber and one of the members of Committee.

Laophonte australis, new species. (Pl. XI. figs. 10–17.)

Female.—Body slender and elongated; similar to *Laophonte minuta*, Boeck, in general appearance. Length, 0·77 mm. (fig. 10).

Antennules moderately stout and composed of seven articulations. Antennæ with the outer ramus very rudimentary or wanting (see figs. 11 and 12).

Second maxillipeds rather slender; end joint moderately elongated and narrow, widest near the middle; inner margin nearly straight, the outer slightly gibbous; terminal claw long and slender (fig. 13).

Inner ramus of the first pair of thoracic legs elongated; outer ramus three-jointed, and scarcely half the length of the inner, and with the second joint rather longer than the first or third (fig. 14). In the second pair, the inner ramus is moderately stout and composed of two joints, the end one of which scarcely reaches beyond the second joint of the three-jointed outer ramus; the end joint of the outer ramus is tolerably elongated and slender, and about one and a half times longer than the preceding joint (fig. 15).

In the fifth pair, the basal joint is broadly expanded and its inner lobe is obliquely truncated and carries about six setæ along the truncated margin, but the third one from the inside is very small; end joint small, ovate, and furnished with five setæ on the subtruncated end, as in the drawing (fig. 16), width being equal to about two-thirds of the length; the end of this segment is obliquely truncated and provided with six setæ, arranged as shown in the drawing (fig. 14).

Caudal rami about as long as the last abdominal segment.

Habitat.—Scotia Bay, South Orkneys, in siftings from dredged material, collected in June 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W.

This species may be distinguished from the others by the structure and armature of the antennules and of the first and fifth pairs of thoracic legs.

Laophonte exigua, new species. (Pl. VII. figs. 16–22.)

Female.—Body small, narrow, elongated. Length, 0·62 mm.

Antennules composed of seven joints; second and third joints subequal and moderately long, fourth and fifth small; but the sixth and seventh, which are nearly equal, are each about twice as long as the fifth joint. Antennæ and mouth organs nearly as in *Laophonte wiltoni*.

The inner ramus of the first pair of thoracic legs is long and slender, but the outer is very short and composed of only two joints. In the next three pairs, the inner ramus is short, moderately stout, and composed of two nearly equal joints, the first joint being slightly larger than the other.

The fifth pair are small, and the inner portion of the basal joint scarcely reaches the middle of the second joint, and is furnished with four setæ. The second joint has the apex broadly but irregularly rounded, and furnished with six setæ, three on the inner aspect and three on the outer, with a distinct space between each group of three.

Caudal rami as long as the last abdominal segment: each ramus ends in a tolerably stiff and moderately long bristle, and one or two smaller setæ (fig. 17).

Habitat.—Scotia Bay, South Orkneys; collected in June 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W.

Remarks.—The present form has at first sight a superficial resemblance to *Laophonte minuta*, Boeck, but a closer examination reveals certain differences in the structure and armature of the first and fifth pairs of thoracic legs, as well as one or two other anatomical details sufficient to exclude it from that species.

Laophonte wiltoni, new species. (Pl. VII. figs. 7–15.)

Female.—Body slender and elongated and somewhat similar to the species described above in its general appearance. Length of the specimen represented by the drawing is about 0·9 mm.

The antennules are composed of seven joints, and the first three are tolerably large and subequal; the fourth and fifth are very short, while the next two, which are nearly of equal size, are each about one and a half times as long as the fifth. Antennæ and mouth organs nearly as in the species previously described.

The first pair of thoracic legs are tolerably slender, the outer ramus, which reaches to the middle of the first joint of the inner ramus, is three-jointed, and the middle joint is rather longer than the first or third. The next three pairs are somewhat similar to those in *Laophonte australis*.

In the fifth pair, the basal joint is somewhat narrow and subtriangular in outline, and reaches to beyond the middle of the second joint; it is provided with six setæ, three of which spring from the inner margin and two from the outer margin, and one is articulated close to the apex. The second joint is moderately expanded, the greatest width more than half the length; distal end produced, triangular in form and provided with one seta on the inner margin, one at the apex, and five on the outer margin.

Caudal rami as long as the last segment of the abdomen.

Habitat.—Scotia Bay, South Orkneys, in some siftings from dredged material collected in June 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W.

Remarks.—This species is rather smaller than any of the other *Laophontes* described here, and it may be distinguished from them not only by its size but also by the structure of the first pair of thoracic legs, and by other, though perhaps less obvious, differences. The species is named in compliment to Mr D. W. Wilton, one of the naturalists who took part in the Scottish National Antarctic Expedition.

Genus *Laophontodes*, T. Scott, 1894.

Laophontodes whitsoni, new species. (Pl. VIII. figs. 1–8.)

Female.—Body narrow, elongated, and tapering slightly towards the distal extremity; the animal has a general resemblance to the female of *Laophontodes typicus*, T. Scott, but is rather more slender, and the caudal rami are short, whereas in the species men-

tioned they are elongated. The length of the specimen represented by the drawing (fig. 1) is 0·62 mm. ($\frac{1}{40}$ of an inch).

Antennules tolerably slender, and composed of five joints, the penultimate being very small. Antennæ small; outer ramus wanting.

Mandibles and other mouth-organs nearly as in *Laophontodes typicus*; the second maxillipeds are slender, and are each provided with a long and slender terminal claw.

The first pair of thoracic legs resemble those of the species mentioned, and the next three pairs are also similar to those in the same species. In the second, third, and fourth pairs, the inner ramus is short, two-jointed, and very slender, the first joint being very small; the inner ramus of the pair is, however, proportionally rather more elongated than the others.

In the fifth pair, the basal joint is rather longer than the second one, and both are provided with a few setæ.

Caudal rami short, scarcely longer than the last segment of the abdomen.

Habitat.—Scotia Bay, South Orkneys, in some siftings from dredged material collected in June 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W.

Remarks.—The form described above may be at once recognised from any previously described species by its short caudal rami; it is also rather more slender and elongated than any of those previously described.

Its occurrence in the *Scotia* collections is a further indication of, in some respects, the close similarity between the Copepod fauna of the Antarctic and that of our northern seas. G. O. Sars has recorded three species of *Laophontodes* from the coasts of Norway, and two of them also occur in British waters. Moreover, one of these northern forms (*Laophontodes typicus*) was also collected by Dr Bruce as far north as Franz Josef Land. All the three northern species are provided with long caudal rami, and are thus readily distinguished from the one now described. This species is named in compliment to Mr Thomas B. Whitson, a member of Committee and Honorary Accountant to the Expedition.

Fam. Cletodidæ.

Genus *Orthopsyllus*, Brady & Robertson, 1873.

Orthopsyllus linearis (Claus). (Pl. IX. figs. 10–22.)

1866, *Liljeborgia linearis*, Claus, *Die Copepoden-fauna von Nizza*, p. 22, t. ii. figs. 1–8.
1873, *Orthopsyllus linearis*, Brady & Robertson, *Ann. and Mag. Nat. Hist.*, vol. xii. p. 138.
1880, *Cletodes linearis*, Brady, *Monogr. Brit. Copep.*, vol. ii. p. 95, pl. lxxx. figs. 1–14.
1909, *Orthopsyllus linearis*, G. O. Sars, *Crust. of Norway*, vol. v. p. 289, pl. cxcix.

Female.—The body, viewed from above, is narrow and elongated; the posterior margins of the segments are dentated; rostrum blunt and slightly produced. Caudal rami short; each ramus is provided with a stout and tolerably elongated terminal bristle. The specimen represented by the drawing (fig. 10) measures about 1·7 mm. in length.

The antennules are short and composed of four joints; the second joint is armed

with a tolerably stout, short, but prominent tooth on the lower aspect, while the third joint carries a moderately long sensory filament. Antennæ small; outer ramus uniarticulate. Mandibles small and provided with a small one-branched palp.

Thoracic legs small. In the first pair, the inner ramus is rather longer than the outer, and the proximal joint is nearly twice as long as the end one. In the next three pairs, the inner ramus is very short, and the proximal joint extremely small (see figs. 16–19).

The fifth pair has the basal joint tolerably broad and lamelliform, and produced interiorly to near the end of the second joint; the distal half of the inner margin of the basal joint is obliquely and somewhat unevenly rounded, and furnished with five setæ, three on the inner margin and two at the apex; the second joint is moderately narrow, its width at the widest part being scarcely equal to half the length: this joint bears six setæ; the apical seta is tolerably stout and elongated, but the one on either side of it is small; the other three setæ, which are of moderate length, spring from the outer margin, as shown in the drawing (fig. 20).

Male.—In the male, the antennules are modified to form grasping organs. The inner ramus of the second pair of thoracic legs is three-jointed, and the second joint is produced into a long and tolerably stout spiniform appendage (fig. 21). In the fifth pair, which are very small, the basal joint is scarcely produced interiorly, and is provided with two short setæ; the outer joint is short and narrow, and furnished with three small setæ on the outer margin and two at the apex (fig. 22).

Habitat.—Scotia Bay, South Orkneys, in siftings from some dredged material collected in June 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W.

Remarks.—This species, though not very common, has apparently an extensive distribution. Professor G. O. Sars records it from Skjærstad Fjord in Norway—just within the Arctic Circle, and Dr G. S. Brady from a few British localities. Dr Claus obtained the species in the Mediterranean, and it also occurred in collections from the Gulf of Guinea brought home by the telegraph steamer *Buccaneer*. After a careful examination of the South Orkney specimens, I am unable to discover any essential difference between them and those described by the authors mentioned above.

Tribe *CYCLOPOIDA*.

Fam. Oithonidæ.

Genus *Oithona*, Baird, 1843.

Oithona plumifera, Baird.

1843, *Oithona plumifera*, Baird, "Notes on British Entomostraca," *Zoologist*, vol. i. pp. 193–197.

This species was observed in gatherings from various stations, extending from Station 11, 23° 50′ N., 21° 34′ W., in the North, to Station 68 in the South Atlantic, Pernambuco, 7° 42′ S., 34° 32′ W. Its distribution, which is widely extended, reaches to at least as far north as the British Islands.

Oithona minuta, T. Scott.

1894, *Oithona minuta*, T. Scott, *Trans. Linn. Soc.*, Ser. 2, "Zool.," vol. vi. p. 90, pl. ix. figs. 14–25.

This somewhat rare form was observed in only a single plankton sample collected at Station 66 in 7° 09′ S., 34° 30′ W.—that is, between two of the stations where *Calanopia americana*, Dahl, was obtained. The specimens from which the species was described were obtained in Bananah Creek, at the mouth of the river Congo, and in Loanda Harbour.

Oithona similis, Claus.

1866, *Oithona similis*, Claus, *Die Copepoden fauna von Nizza*, p. 14.
1902, „ „ Giesb., *Expéd. Antarct. Belge* (1897–1899), "Copepoda," p. 28.

The only stations where this species was met with were 102 and 116, in 36° 31′ S., 51° 56′ W., and 49° 35′ S., 57° 40′ W. respectively; Station 116 was the last station but one before reaching the Falkland Islands. *Oithona similis* was obtained in many of the plankton samples collected by the s.y. *Belgica* during its visit to the Antarctic in 1897–1899. These samples were collected between lat. 69° 48′ S. and lat. 71° 24′ S., and long. 81° 19′ W. and long. 89° 12′ W. The distribution of this species is very extensive, and it is usually of more or less frequent occurrence all over the North Sea, as well as in the North Atlantic.

Fam. Cyclopidæ.

Genus *Cyclopina*, Claus, 1863.

Cyclopina belgicæ, Giesbrecht. (Pl. I. figs. 2–13.)

1902, *Cyclopina belgicæ*, Giesb., *Expéd. Antarct. Belge*, "Copep.," p. 3, pl. vii. figs. 1–15.

A few specimens of a *Cyclopina* that agrees generally with *Cyclopina belgicæ*, Giesbrecht, were obtained in one of the gatherings collected by the *Scotia* in Scotia Bay, South Orkneys, in June 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W.

In the female of this species, the antennules are composed of eighteen articulations; the first three joints are tolerably large, and do not differ greatly in size, but the second is rather smaller than the one on either side; the next three are very short, more so than any of the others; the seventh and eighth are larger; the remaining ten joints are small, but the last two are rather longer than those immediately preceding (fig. 3).

The end joint of the posterior antennæ is provided with several geniculated setæ at its apex, and there are also one or two setæ near the middle of the upper margin; the end joint is about twice as long as the third, while the third is rather longer than the second (fig. 4).

The mandibles have their masticatory edge truncated and armed with several tolerably large teeth (fig. 5).

The other mouth organs and the swimming feet do not differ very much from those

in *Cyclopina littoralis*, G. S. Brady. The fifth pair in the female has the end joint elongated and narrow; it is about three times longer than broad, and its armature comprises four setæ, three terminal and one near the middle of the outer margin (fig. 12).

As stated above, these *Scotia* specimens agree fairly well with GIESBRECHT's description and figures of his *Cyclopina belgicæ*, and are therefore ascribed to that species.

Genus *Euryte*, Philippi, 1843.

Euryte similis, new species. (Pl. I. figs. 14–22.)

Description of the Female.—The female of this species somewhat resembles that of *Euryte robusta*, Giesbrecht, in its size and general appearance (fig. 14).

The antennules are tolerably stout, and composed of twenty-one joints; the first joint is robust and about twice the length of the second, while the second is about one and a half times as long as the third; the next six joints are very short, and the others, though somewhat longer than those immediately preceding, are also tolerably short and are all more or less of similar size, except the end joint, which is rather longer than the penultimate one (fig. 15). The posterior antennæ closely resemble those of *Euryte robusta*, Giesbrecht.

Both pairs of maxillipeds, which are moderately stout, also resemble those of the species mentioned. The first pair have the basal joint furnished near the distal end with a spine which is gibbous at the base and with a furcated process; the end joints, which terminate abruptly, bear several tolerably stout, elongated, and slightly curved apical spines (fig. 17). The second maxillipeds are four-jointed; the third joint is short, but the others are of moderate length; the last one is narrow, and armed with two apical claws of unequal length (fig. 18).

The first four pairs of swimming feet are nearly all similar to those of *Euryte robusta*; both branches are moderately stout and three-jointed, and the inner is rather longer than the outer branch; in all the four pairs, the end joint of the inner branch is provided with dagger-shaped spines, but with no setæ; in the first, third, and fourth pairs, the number of spines on the end joint of the inner branch is seven, while the end joint of the second pair bears only five, arranged as shown in the drawings. In the fourth pair, the end joint of the outer branch is armed with nine dagger-shaped spines, three on both the inner and outer margins and three at the apex; the end joint of the outer branch in the third pair is also similarly armed (figs. 19–21).

The fifth pair are similar to those of *Euryte longicauda*, Philippi (fig. 21). The third and fifth segments of the abdomen are nearly of equal length and rather longer than the fourth segment; furcal segments about one and a half times the length of the last abdominal segment (fig. 22).

Remarks.—*Euryte longicauda*, Philippi, has been recorded from the Mediterranean, the Black Sea, and the coasts of France, Britain, Norway, and East Greenland. It has

been obtained with other interesting Crustacea in collections made by Dr Bruce in Franz Josef Land, and G. M. Thomson records a variety (*E. longicauda* var. *antarctica*, G. M. Thom.) from New Zealand; and another species—*E. robusta*, Giesbrecht—is recorded from the Mediterranean. The form described above resembles the species last referred to, but appears to differ in one or two minor points, such as in the armature of the first and fourth pairs of thoracic legs and in the proportional lengths of the abdominal segments.

Habitat.—Scotia Bay, South Orkneys, June 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W.

Fam. Lichomolgidæ.

Genus *Lichomolgus*, Thorell, 1859.

Lichomolgus fucicola, G. S. Brady. (Pl. XII. figs. 23–26.)

1872, *Macrocheiron fucicolum*, Brady, *Nat. Hist. Trans. Northumb. and Durham*, vol. iv. p. 434, pl. xviii. figs. 9–18.

1880, *Lichomolgus fucicola*, Brady, *Mon. of the Free and Semi-parasitic Copepoda of the British Islands*, vol. iii. p. 41, pl. lxxxv. figs. 1–11.

A few specimens of this species were obtained from some floating seaweed collected by the s.y. *Scotia* in July 1904; Station 539, 33° 53′ N., 32° 27′ W. The roughly serrated margin of the strongly curved claws—terminal claws—with which the female antennæ are armed, seems to be characteristic of this *Lichomolgus* (see fig. 24).

The antennules are composed of seven joints, the third joint being the smallest (fig. 23). The inner branch of the fourth pair of thoracic legs is short and biarticulate, the two joints being subequal, and the end one furnished with two terminal setæ.

The fifth pair are uniarticulate, tolerably elongated, and narrow (fig. 25). Caudal rami about as long as the last abdominal segment.

The distribution of *Lichomolgus fucicola* appears to be extensive. It has been recorded from several British localities, usually from the laminarian zone, where it lives apparently about the roots and among the fronds of the seaweeds, such as *Laminaria*. This is one of the more easily identified members of the genus.

Genus *Pseudanthessius*, Claus, 1889.

Pseudanthessius fucicolus, new species. (Pl. XII. figs. 1–13.)

Description of the Female.—In its general appearance, the female of this species resembles *Lichomolgus hirsutipes* from the Firth of Forth, and, but for the difference in the structure of the fourth pair of swimming feet, it might be referred to that genus.

The antennules, which are composed of seven joints, have the second one rather longer than the others, while the third is the smallest; the next four joints gradually

decrease in length, as indicated by the formula, which shows approximately the proportional lengths of all the joints:

Proportional lengths of the joints	11	21	7	15	11	10	9
Numbers of the joints	1	2	3	4	5	6	7

The second joint bears three small teeth on its upper edge, as shown in the drawing (fig. 2).

Antennæ moderately stout, and armed with an elongated and slightly curved terminal spine and a few moderately long setæ.

Mandibles and maxillæ somewhat resembling those of the *Lichomolgus* mentioned above.

The first maxillipeds are also somewhat similar to those of the same species.

The second maxillipeds are each composed of two joints of nearly equal length; the second joint is narrow at the proximal end, but increases in width towards the distal extremity, which is obliquely truncated; the external part of the truncated end appears to be slightly hollow, and armed with four short spines, while the inner angle is produced into a stout spiniform tooth (fig. 6).

The first and second pairs of swimming feet are somewhat similar to those of other species of the Lichomolgidæ. In the third pair, the end joint of the outer ramus carries five dagger-shaped spines round the outer margin and apex, and five setæ on the inner margin. A dagger-shaped spine also springs from the outer distal angles of the first and second joints, while the second has also a seta on its inner edge. The inner ramus has the end joint furnished with three dagger-shaped spines and two setæ, while the second joint bears two setæ and the first one seta on the inner margin, as shown in the drawing (fig. 9).

In the fourth pair, the inner ramus is uniarticulate, rather longer than the first joint of the outer ramus, and carries two setæ at the apex; there is also a small but distinct tooth near the middle of the inner margin (fig. 10).

The fifth pair consist each of a single, elongated, narrow joint which bears two setæ at its distal end.

Abdomen narrow, elongated, the penultimate segment rather shorter than that on either side. Caudal rami short, about equal in length to the last abdominal segment (fig. 12).

The male differs from the female in being provided with larger second maxillipeds, which are each armed with a moderately long and slender terminal claw; the end joint is also fringed with minute bristles, as shown in the drawing (fig. 7). The genital segment of the abdomen is also considerably enlarged (fig. 13). The length of the female is fully one millimetre, but the male is rather smaller.

Habitat.—Obtained from Gulf-weed collected by the *Scotia* in June and July 1904, between Stations 499 and 553, St Helena, 15° 57′ S., 5° 40′ W., to Tuskar Rock, 51° 13′ N., 7° 20′ W.

Fam. Asterocheridæ.

Genus *Asterocheres*, Boeck, 1859.

Asterocheres suberites, Giesbrecht, var. *antarctica*, nov. var. (Pl. VI. figs. 3–11.)

Like *Asterocheres suberites*, Giesbrecht, in general appearance. Length, ·94 mm.

Antennules composed of twenty-one joints, moderately elongated and slender; first joint stouter and longer than any of the others, the second to the eleventh very short, especially the last two; each joint is also somewhat narrower than the one that precedes it; the twelfth to the eighteenth are of moderate length and subequal, the three end joints rather small, but the penultimate one is somewhat longer than either of the other two. The formula shows approximately the proportional lengths of the various joints:

Number of the joints	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Proportional lengths of joints	21	4	3	3	3	3	3	3	2	3		5	7	7	7	8	9	9	4	5	4

Antennæ moderately slender and armed with a long claw-like spine; the first and fourth joints short, the second and third elongated; outer ramus small, uniarticulated, and bearing two or three short terminal bristles (fig. 3).

Siphon short, somewhat triangular; mandibles styliform; maxillæ and maxilliped nearly as in *A. suberites*, Giesbrecht.

The four pairs of swimming legs also resemble those of the species named. The fifth pair are very small and uniarticulate. The caudal furca are rather longer than the last segment of the abdomen, and about equal to the length of the penultimate segment (fig. 11).

Habitat.—Scotia Bay, South Orkneys, June 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W.

Remarks.—The species recorded above so closely resembles *Asterocheres suberites*, Giesbrecht, as to be scarcely separable from it. There is a slight difference in the form of the siphon; the outer marginal spines of the exopods of some of the swimming feet are stouter, and the fifth pair of feet are distinctly smaller. One or two other slight differences may be observed, as, for example, in the proportional lengths of the joints of the antennules, and of the abdominal segments, but this Antarctic form can scarcely be regarded as more than a variety of *A. suberites*.

Fam. Artotrogidæ.

Genus *Artotrogus*, Boeck, 1859.

Artotrogus proximus, new species. (Pl. XI. figs. 1–9.)

Description of the Female.—The outline of the female, seen from above, is suborbicular; the cephalothoracic segment is greatly expanded, and forms the largest portion of the animal; the remaining thoracic segments are comparatively small; the abdomen is also small, but the genital segment of the abdomen is larger than the other segments, and is produced backwards on each side so as partly to enclose them, as

shown in the drawing (fig. 1); the length of the specimen represented by this drawing is 2 mm. The siphon is short and subtriangular, and the mandibles are elongated and slightly dentated on the inner edge near the apex (fig. 4).

The antennules are composed of nine joints; the second joint is small, but the first and third are elongated; these three joints are together about half the entire length of the antennule; the next four joints are small, while the end one is about as long as the preceding two joints combined; a moderately long sensory filament springs from near the extremity of the end joint (fig. 2). The antennæ are composed of three joints; the first is elongated, and bears a small secondary branch; the other two are shorter, and the end one is furnished with a long, slender appendage, slightly hooked at the apex (fig. 3).

The mandibles and maxillæ are somewhat similar to the same organs in *Artotrogus orbicularis*, Boeck.

The first and second maxillipeds and the first three pairs of swimming feet are also similar to those of the species mentioned. In the fourth pair of thoracic legs, the inner ramus is more slender and rather shorter than the outer, and the end joint is provided with a single plumose seta on the inner margin; the same joint is furnished with two apical setæ, which are also plumose, and there is a minute bristle on the outer margin (fig. 8).

The fifth pair are small, uniarticulate, and furnished with two terminal setæ of unequal length (fig. 9).

Habitat.—Scotia Bay, South Orkneys; collected in June 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W. Two specimens occurred in a small sample of siftings from trawled material. The species approaches so near to *Artotrogus orbicularis*, Boeck, both in its general form and in the structure of its appendages, that there was at first some doubt as to whether it should be regarded as a distinct species. A careful examination, however, reveals certain differences, which it may be as well meanwhile to recognise, as, for example, the difference in the armature, and to some extent also in the structure of the antennæ; the difference in the form of the siphon; the rather more slender maxillipeds; the difference in the form of the fifth pair of thoracic legs and in the structure of the abdomen. These differences, while in themselves inconsiderable, are, I think, when taken together, sufficiently important to warrant the separation of this Antarctic *Artotrogus* under a distinct name.

Fam. Sapphirinidæ.

Genus *Sapphirina*, J. V. Thompson, 1829.

Sapphirina ovatolanceolata, Dana.

1849, *Sapphirina ovatolanceolata*, Dana, *Proc. Amer. Acad.*, Boston, vol. ii. pp. 8–16.

The only gatherings in which this *Sapphirina* was observed were collected at Stations 14, 32, 36, and 49, 21° 28′ N., 22° 40′ W., to 1° 53′ N., 27° 26′ W., and at Station 60, 3° 25′ S., 33° 13′ W., and Station 105, 38° 45′ S., 53° 30′ W. Only a few specimens were noticed.

Sapphirina gemma, Dana.

1849, *Sapphirina gemma*, Dana, *op. cit.*, vol. ii. pp. 8–61.

This species occurred in gatherings from two stations widely separated from each other, viz., Station 15, 20° 34′ N., 23° 12′ W., and Station 104, 37° 05′ S., 52° 22′ W.

Sapphirina iris, Dana.

1849, *Sapphirina iris*, Dana, *op. cit.*, vol. ii. pp. 8–61.
1863, „ *salpæ*, Claus, *Die freilebenden Copepoden*, p. 152.

The gatherings in which this species was met with were collected at Stations 26, 49, 72, 98, 102, 104, and 105, 14° 33′ N., 25° 09′ W., to 38° 45′ S., 53° 30′ W.; it occurred only sparingly.

Sapphirina angusta, Dana.

1849, *Sapphirina angusta*, Dana, *op. cit.*, vol. ii. pp. 8–61.

This rather distinct *Sapphirina* was obtained in gatherings from Stations 35, 36, 98, 102, 104, and 105, 9° 5′ N., 25° 28′ W., to 38° 45′ S., 53° 30′ W.

Sapphirina lactens, Giesbrecht.

1893, *Sapphirina lactens*, Giesb., *Fauna u. Flora des Golfes von Neapel*, Monogr. xix., "Pelag. Copep.," p. 619, pl. lii. figs. 15, 16, 30 *et seq.*

The only gathering in which this species was met with was from Station 104 in 37° 05′ S., 52° 22′ W.

Sapphirina vorax, Giesbrecht.

1891, *Sapphirina vorax*, Giesb., *Atti Accad. Lincei*, Roma (4), Rend., vol. vii. See also *Fauna u. Flora des Golfes von Neapel* (1893), p. 619, pl. lii. figs. 23, 28 *et seq.*

This species occurred very sparingly in three gatherings collected at Stations 12, 13, and 104, 22° 19′ N., 22° 07′ W., to 37° 05′ S., 52° 22′ W.

Sapphirina auronitens, Claus.

1863, *Sapphirina auronitens*, Claus, *op. cit.*, p. 153.

This also occurred very sparingly in gatherings from three stations, viz., from Stations 12, 13, and 44, 22° 19′ N., 22° 07′ W., to 3° 42′ N., 26° 26′ W.

Sapphirina nigromaculata, Claus.

1863, *Sapphirina nigromaculata*, Claus, *op. cit.*, p. 152, pl. viii.

The gatherings in which this species was observed were collected at Stations 12, 29, and 85, 22° 19′ N., 22° 07′ W., to 23° 8′ S., 39° 40′ W.

Sapphirina intestinata, Giesbrecht.

1891, *Sapphirina intestinata*, Giesb., *op. cit.* (4), Rend., vol. vii. p. 478.

This species was collected at Stations 26, 44, and 90, 14° 33′ N., 25° 09′ W., to 26° 50′ S., 42° 20′ W., and was apparently not very common.

Sapphirina opalina, Dana.

1849, *Sapphirina opalina*, Dana, *Proc. Amer. Acad.*, Boston, vol. ii. pp. 8–61.

The only gathering in which this species was obtained was from Station 59, 2° 30′ S., 32° 42′ W.

Sapphirina gastrica, Giesbrecht.

1891, *Sapphirina gastrica*, Giesb., *op. cit.* (4), Rend., vol. vii. p. 478.

This species was collected at Stations 7, 8, and 12, 26° 23′ N., 20° 20′ W., to 22° 19′ N., 22′ 07° W., but only a few specimens were observed.

Sapphirina stellata, Giesbrecht.

1891, *Sapphirina stellata*, Giesb., *op. cit.* (4), Rend., vol. vii. p. 478.

This *Sapphirina* was obtained in a gathering collected at Station 28, 13° 07′ N., 25° 09′ W.

Sapphirina darwinii, Haeckel.

1864, *Sapphirina darwinii*, Haeckel, *Zeitschr. med. Naturw.* (Jena), 1 Bd. p. 105, pls. ii. and iii.

The only gathering in which this species was observed was that from Station 68A in the South Atlantic—Pernambuco bearing 12 miles W., 8° 00′ S., 34° 34′ W.

Genus *Saphirella*, T. Scott, 1894.

Saphirella abyssicola, T. Scott. (Pl. IV. figs. 2–4.)

1894, *Saphirella abyssicola*, Scott, *Trans. Linn. Soc.* (2, "Zool."), vol. vi. p. 126, pl. xiii. figs. 57, 58, pl. xiv. figs. 5–10.

This species, which appeared to be of rare occurrence in the *Scotia* collections, was obtained in a gathering from Station 68A—Pernambuco bearing 12 miles W., 8° 00′ S., 34° 34′ W.

Genus *Copilia*, Dana, 1849.

Copilia mirabilis, Dana.

1852, *Copilia mirabilis*, Dana, *U.S. Explor. Exped.*, 1838–1842 ("Crust."), vol. xiii. p. 1232, pl. lxxxvi.

This species was observed in gatherings from the following twelve stations: 12, 14, 18, 22, 25, 26, 27, 29, 33, 35, 36 and 85, 22° 19′ N., 22° 07′ W., to 23° 8′ S., 39° 40′ W.

Copilia denticulata, Claus.

1863, *Copilia denticulata*, Claus, *Die freilebenden Copepoden*, p. 161, Taf. 25, figs. 14–20.

This species was only met with in a gathering from Station 36, 8° 42′ N., 25° 28′ W.

Fam. Oncæidæ.

Genus *Oncæa*, Philippi, 1853.

Oncæa venusta, Philippi.

1843, *Oncæa venusta*, Phil., *Wiegman's Archiv für Naturgesch.* (1843), p. 62, pl. iii. fig. 3.

This species was observed in gatherings from Stations 18, 25, 36, 49, 56, and 62, 19° 59′ N., 23° 34′ W., to 4° 15′ S., 33° 38′ W.

Oncæa mediterranea, Claus, var.

1863, *Antaria mediterranea*, Claus, *Die freilebenden Copepoden*, p. 159, Taf. 30.

The only gatherings in which this form occurred were from three stations in the South Atlantic, viz., 55, 64, and 93, 0° 22′ S., 31° 00′ W., to 30° 5′ S., 45° 28′ W.

Oncæa conifera, Giesbrecht.

1891, *Oncæa conifera*, Giesb., *Atti Accad. Lincei*, Roma (4), vol. vii. p. 8.

This species, which appeared to be of more frequent occurrence than the two just referred to, was observed in gatherings from Stations 14, 18, 19, 26, 29, 32, and 33, 21° 28′ N., 22° 40′ W., to 9° 40′ N., 25° 28′ W., in the North Atlantic, and at Stations 56, 59, 62, and 90 in the South Atlantic, 0° 42′ S., 31° 20′ W., to 26° 50′ S., 42° 20′ W.

Fam. Corycæidæ.

Genus *Corycæus*, Dana, 1845.

Corycæus venustus, Dana.

1849, *Corycæus venustus*, Dana, *Proc. Amer. Acad.*, Boston, vol. ii. p. 8.

This *Corycæus* occurred sparingly in gatherings from three stations in the South Atlantic, viz., 90, 93, and 95, 26° 50′ S., 42° 20′ W., to 32° 15′ S., 47° 30′ W.

Corycæus oralis, Claus.

1863, *Corycæus oralis*, Claus, *Die freilebenden Copepoden*, p. 158.

The only gathering in which this species was obtained was from Station 44. 3° 42′ N., 26° 26′ W.

Corycæus obtusus, Dana.

1852, *Corycæus obtusus*, Dana, *Crust. U.S. Expl. Exped.*, p. 1214, pl. lxxxv. fig. 6.

With the exception of *Corycæus speciosus* this appeared to be the most commonly distributed member of the genus in the *Scotia* collection. It was observed in gatherings from about twenty-seven stations, ranging from Stations 13, 15, and 19, North Atlantic, 21° 58′ N., 22° 26′ W., to 19° 12′ N., 24° 08′ W., to 85, 90, and 95, South Atlantic, 23° 8′ S., 39° 40′ W., to 32° 15′ S., 47° 30′ W., but it was nowhere very plentiful.

Corycæus flaccus, Giesbrecht.

1891, *Corycæus flaccus*, Giesb., *Atti Accad. Lincei*, Roma (4), vol. vii. p. 480.

This tolerably distinct species was met with, though somewhat sparingly, in gatherings collected at Stations 7, 12, 15, 22, 85, and 86, 26° 23′ N., 20° 20′ W., to 24° 26′ S., 40° 25′ W.

Corycæus rostratus, Claus.

1863, *Corycæus rostratus*, Claus, *op. cit.*, p. 480.

The only gatherings in which this *Corycæus* was obtained were collected at Station 26, 14° 33′ N., 25° 9′ W., and Station 95, 32° 15′ S., 47° 30′ W., the one in the North, and the other in the South Atlantic.

Corycæus speciosus, Dana.

1849, *Corycæus speciosus*, Dana, *Proc. Amer. Acad.*, Boston, vol. ii. pp. 8–61.

This fine species was of frequent occurrence in the *Scotia's* tow-net collections; the remarkably divergent caudal rami made it easily recognised. It was observed in gatherings from thirty-six different stations, ranging from Stations 7 and 12 in the North Atlantic to Stations 93 and 95 in the South, 26° 23′ N., 20° 20′ W., to 32° 15′ S., 47° 30′ W.

Corycæus longistylis, Dana.

1849, *Corycæus longistylis*, Dana, *op. cit.*, vol. ii. pp. 8–61.

This species occurred sparingly in gatherings from Stations 7, 11, 12, 13, and 14, 26° 23′ N., 20° 20′ W., to 21° 28′ N., 22° 40′ W.

Corycæus carinatus, Giesbrecht.

1891, *Corycæus carinatus*, Giesb., *op. cit.* (4), vol. vii. p. 481.

This *Corycæus* was observed in gatherings from twenty-five different stations, extending from Stations 11, 13, and 15 to 88, 90, and 94, 23° 50′ N., 21° 34′ W., to 30° 25′ S., 45° 45′ W. The species was apparently more or less uniformly distributed throughout the area traversed by the *Scotia* between the limits stated.

Corycæus longicaudis, Dana.

1849, *Corycæus longicaudis*, Dana, *op. cit.*, vol. ii. pp. 8–61.

The distribution of this species appeared to be somewhat limited; the only gatherings in which it was met with were those collected at Stations 25, 27, 29, 30, and 31, 15° 15′ N., 25° 09′ W., to 11° 10′ N., 25° 20′ W.

Corycæus elongatus, Claus.

1863, *Corycæus elongatus*, Claus, *Die freilebenden Copepoden*, p. 157, pl. xxiv. figs. 3 and 4.

This species occurred very sparingly at Station 11, 23° 50′ N., 21° 34′ W., and Station 85, 23° 8′ S., 39° 40′ W.

Tribe *CALIGOIDA*.

Genus *Dysgamus*, Steenstrup & Lütken, 1861.

Dysgamus atlanticus, Steenstrup & Lütken. (Pl. XIII. fig. 13.)

1861, *Dysgamus atlanticus*, Steenstrup & Lütken, *Bidrag til Kundskab om det aabne Hars Snyltekreb og Lernæer*, p. 368, Tab. iv. fig. 8.

Only the males of *Dysgamus* have apparently been observed hitherto, and it is doubtful if the genus can be considered a valid one till females are obtained.

The specimens on which the genus was founded were taken, probably while

Fig. 1. Foot of first pair.

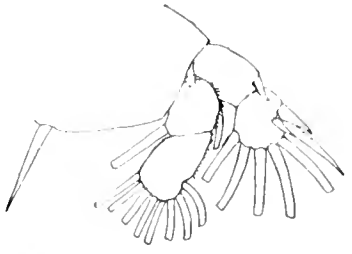


Fig. 2.—Foot of second pair.

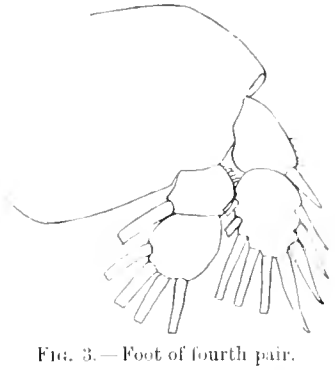
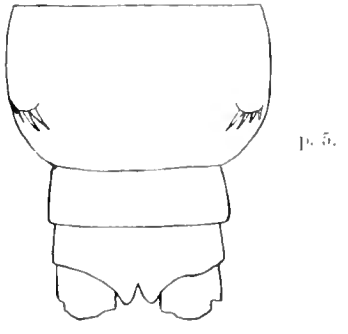


Fig. 3.—Foot of fourth pair.



p. 5.

Fig. 4.—Abdomen and fifth pair of feet.
Dysgamus atlanticus, Steenstrup & Lütken.

swimming freely at the surface, at several places in the North Atlantic, between lat. 8° and 28° N., and long. 21° and 36° W.

This species has a close resemblance to *Caligus* in its general form and colour; the frontal plates are, however, without lunules or sucker-disks. The carapace is broadly ovate and depressed, but the last two thoracic as well as the abdominal segments are short and comparatively narrow. The first four pairs of thoracic legs are all two-branched, and the branches two-jointed; the first pair has the inner branch very small, but in the other three pairs the branches are subequal; there is, as in *Caligus*, a fifth pair, very minute but quite distinct (see text-figures annexed). The eyes, though visible, are not very conspicuous. The *Scotia* specimens were collected in the Atlantic at the

following stations: 25, 31, 44, 79, 82, 83, and 98. The first two stations are north of the equator, viz., 15° 15′ N., 25° 09′ W., and 11° 10′ N., 25° 20′ W. The other stations are south of the equator, Station 98 being in 34° 02′ S., 49° 07′ W. The *Scotia* specimens differ somewhat from the drawings given by STEENSTRUP & LÜTKEN in the work referred to, in having the abdominal portion rather stouter and shorter, but they agree so well otherwise that I have little hesitation in ascribing them to their species. CHARLES BRANCH WILSON, in his work on "American Copepoda parasitic on Fishes," * describes a *Dysgamus*, of which he obtained a single specimen, and his drawings show it to be not unlike the specimens collected by the *Scotia;* this *Dysgamus* he ascribes to a new species, *Dysgamus ariommus*, and speaks of the fifth legs as being entirely lacking, whereas in the *Scotia* specimens the fifth pair, as already stated, are, though small, quite distinct.

Only one, or at most two, specimens were obtained in any single gathering, and males only were observed, and, like the *Caligus ropax* frequently found in tow-net collections in British waters, they were captured apparently as free-swimming organisms.

The only other writer who records *Dysgamus* is Dr BASSETT-SMITH in his work "A Systematic Description of Parasitic Copepoda found on Fishes," published in *Proc. Zool. Soc. London*, 18th April 1889.

CLADOCERA AND OSTRACODA.

Cladocera were very scarce in the *Scotia* collections. The few specimens observed belong to the genus *Evadne*, two species of which are represented in the collection, viz. :—

Genus *Evadne*, Lovén, 1836.

Evadne tergestina, Claus. (Pl. XIII. fig. 14.)

This species occurred in a tow-net gathering collected at Station 85, 23° 8′ S., 39° 40′ W. Only one or two specimens were noticed.

Evadne spinifera, P. E. Müller. (Pl. XIII. fig. 15.)

E. spinifera was also obtained in the gathering from Station 85, 23° 8′ S., 39° 40′ W, and was equally scarce with the species previously mentioned.

OSTRACODA.

The Ostracoda observed in the *Scotia* collections belong chiefly to the two groups Podocopa and Myodocopa, and include representatives of the families Cypridæ, Cytheridæ, Cypridinidæ, and Conchœciadæ.

* "North American Parasitic Copepods belonging to the Family Caligidæ: Part II. The Trebinæ and Euryphorinæ," *Proc. U.S.A. National Museum*, vol. xxxi. p. 713, pl. xx. figs. 62–70.

PODOCOPA.

Fam. Cypridæ.

Genus *Macrocypris*, G. S. Brady, 1868.

Macrocypris maculata, G. S. Brady. (Pl. XIV. figs. 1 and 2.)

1865, *Cytherideis maculata*, Brady, *Trans. Zool. Soc.*, vol. v. p. 367, pl. lvii. fig. 12, *a–b*.
1880, *Macrocypris maculata*, Brady, *Ostracoda of the "Challenger" Exped.*, p. 41, pl. i. fig. 2, *a–d*.

Habitat.—Scotia Bay, South Orkneys; collected April 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W. Several specimens were obtained; they varied somewhat in size. One of the larger specimens measures 1·5 mm. in length; height rather less than half the length, highest in the middle; dorsal margin arcuate, sloping about equally towards both ends, but the posterior is rather narrower than the other; lower margin slightly concave and sinuate, especially towards the front. Seen from above, the shell is elliptical in outline, widest in the middle, width equal to about one-third of the length, tapering equally to each end; both ends narrow; colour brownish. This species appears to be widely distributed.

Fam. Cytheridæ.

Genus *Cythere*, O. F. Müller, 1785.

Cythere inornata, new species. (Pl. XIV. figs. 9 and 10.)

Shell, seen from the side, oblong; height equal to about half the length; dorsal margin nearly straight, ventral margin slightly incurved. The posterior extremity slopes at first abruptly downwards, then becomes boldly rounded; the anterior end is somewhat similar, but is rather more produced, especially below. Seen from above, the shell is moderately tumid, widest in the middle, greatest width equal to rather more than half the length, sides evenly rounded, but tapering rather more towards the anterior end, which is wedge-shaped. Shell surface rough, with numerous small circular pits and setiferous papillæ between. Length of shell about 1·2 mm.

Habitat.—Scotia Bay, South Orkneys, June 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W.

Cythere quadrideus, new species. (Pl. XIV. figs. 15 and 16.)

Shell, seen from the side, oblong, highest in front, the height equal to rather more than half the length; anterior end boldly rounded; posterior extremity truncated above, slightly produced below the middle, and provided with about four more or less distinct tooth-like projections. The dorsal margin shows a slight elevation immediately over the anterior hinge, thence it slopes backwards to the posterior extremity in a nearly straight line, where it is abruptly angulated; lower margin slightly excavated behind the anterior extremity, and thence converges gently backwards. Seen from above, the shell is widest behind the middle, greatest width scarcely equal to half the

length; the margins taper gently towards the bluntly rounded anterior end, but behind they converge somewhat abruptly, the posterior extremity being slightly produced and expanded; the dorsal margin also shows a slight foliation. The general surface of the shell is sculptured with numerous small rounded pits. Length of the shell about ·85 mm.

Habitat.—Scotia Bay, South Orkneys; collected June 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W.

Cythere latibrosa, new species. (Pl. XIV. figs. 3 and 4.)

This form, seen from the side, is somewhat similar in its general outline to that described above, but differs in the following particulars: it is higher in front in proportion to the length, the dorsal slope is rather greater, and the shell sculpture is rather different. Seen from above, the shell is somewhat tumid, the outline very irregularly hastate, greatest width equal to about half the length; lateral margins incurved in the middle, converging gently in front, and abruptly behind; both extremities somewhat truncated, the posterior end rather more so than the other, and with two or three tooth-like projections. Surface of the shell sculptured with numerous irregular and angular excavations. Length, ·74 mm.

Habitat.—Scotia Bay, South Orkneys; collected June 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W.

This species has a somewhat close resemblance to *Cythere wyville-thompsoni*, G. S. Brady, but the anterior serrations observed in that species are wanting in this, and the armature of the posterior end also differs.

Cythere foveolata, G. S. Brady. (Pl. XIV. figs. 7 and 8 (♂), and figs. 13 and 14 (♀).)

1880, *Cythere foveolata*, Brady, *Ostracoda of the "Challenger" Exped.*, p. 75, pl. xiii. 5, *e–h*.

Shell of the female tumid; seen from the side, subrhomboidal, highest in the middle, greatest height rather more than half the length; both ends obliquely rounded; dorsal margin gently rounded in the middle part, then sloping somewhat steeply towards each end, but more distinctly so in front; ventral margin slightly sinuate in front, and curving upwards behind. Seen from above, the shell is broadly ovate, widest in the middle, greatest width equal to about half the length; sides slightly arcuate in the middle, converging rapidly to the pointed anterior extremity, but abruptly rounded behind. Shell surface marked all over with closely set and conspicuous excavations, and with the hinge line somewhat prominent. The outline of the male is more compressed and angular. Length, female ·77 mm.; male ·74 mm.

Habitat.—Scotia Bay, South Orkneys; collected June 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W.

The *Scotia* specimens differ slightly from those recorded by Dr Brady in being somewhat larger and in the general contour being also slightly different, but notwithstanding these differences, I am inclined to consider them as belonging to Brady's species.

Cythere antarctica, new species. (Pl. XIV. figs. 5 and 6.)

Shell, seen from the side, elongated, highest over the posterior hinge, greatest height equal to rather more than half the length; the dorsal margin slopes steeply backwards from the highest point, and more gently towards the front, and with a shallow notch near the anterior extremity; posterior end boldly rounded and somewhat produced below; anterior end truncated above, rounded below, with a small subcentral projection separating the upper from the lower portion; ventral margin incurved and sinuous. The shell, seen from above, widest in front, the greatest width equal to rather less than half the length; sides not very boldly rounded, converging gently backwards to the sharp-pointed posterior end; anterior extremity blunt and slightly produced. Shell surface thickly covered with minute circular pits. Length, ·7 mm.

Habitat.—Scotia Bay, South Orkney Islands; collected June 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W.

Cythere peregrina, new species. (Pl. XIV. figs. 11 and 12.)

Shell, seen from the side, oblong, highest behind the middle, greatest height scarcely equal to half the length; dorsal margin sloping gently from behind the middle in a nearly straight line towards the front, but the hinder slope is shorter and steeper; both ends evenly and not very boldly rounded; ventral margin slightly and evenly convex. Shell tumid when seen from above, widest in the middle, width equal to half the length; sides rather boldly arcuate and converging towards both ends; both extremities acuminate. Shell covered with numerous and extremely fine lines extending longitudinally over its surface. Length about ·75 mm., but varies to some extent; one or two rather larger specimens reach to about 1 mm. in length.

Habitat.—Scotia Bay, South Orkneys; collected June 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W.

Genus *Xestoleberis*, G. O. Sars, 1865.

Xestoleberis reniformis, G. S. Brady. (Pl. XIV. figs. 17 and 18.)

1907, *Xestoleberis reniformis*, Brady, *National Antarctic Exped.: Natural History*, vols. iii.–v., "Ostracoda," p. 6, pl. i. figs. 4, 5.

A few specimens—adult and (?) young—of a *Xestoleberis* occurred among other Ostracoda collected in Scotia Bay, South Orkneys; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W. They so closely resemble the form described by Dr Brady in his paper on the "Ostracoda of the English National Antarctic Expedition" that I ascribe them to the same species. They differ a little from the description and figures given by Brady, but the peculiar outline of the shell, both when seen from the side and from above, seems to be characteristic of the species. Length of specimen represented by the drawings, ·62 mm.

Genus *Cytherura*, G. O. Sars, 1865.

Cytherura ornata, new species. (Pl. XIV. figs. 19–21.)

Carapace moderately tumid; seen from the side, subrhomboidal, highest in front of the middle, greatest height equal to rather more than half the length; dorsal margin well rounded, sloping more steeply in front than behind; ventral margin flexuous; anterior margin broadly rounded, obscurely crenulate; posterior extremity somewhat produced in the middle to a blunt angular point. Seen from above, the sides are evenly and not very strongly convex, widest in the middle, greatest width equal to half the length; anterior extremity somewhat acuminate, posterior end forming a short angular projection. Surface of the shell ornamented with minute excavations and lines, as shown in the drawing (fig. 19). Length, ·54 mm.

Habitat.—Scotia Bay, South Orkneys; collected June 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W.

Cytherura porrecta, new species. (Pl. XIV. figs. 22 and 23.)

Carapace elongated; seen from the side, oblong, about equal in height at both ends, greatest height less than half the length; dorsal and ventral margins sinuous; anterior end boldly and evenly rounded; posterior extremity produced in the middle line into a prominent subtriangular and blunt-pointed beak; a sinuous and moderately conspicuous longitudinal fold extends backwards along the middle line, then curves round to meet the ventral margin. Seen from above, shell outline sagittate, widest in front of the middle, width rather less than half the length; sides sinuate, abruptly rounded behind, converging in front; anterior end acuminate; posterior extremity produced into a prominent beak. Shell surface covered with numerous small and rounded excavations. Length, ·45 mm.

Habitat.—This small form was obtained in the same gatherings from *Scotia* with those described above; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W.

Cytherura sculptilis, new species. (Pl. XIV. figs. 24 and 25.)

Shell somewhat like *Cytherura similis*, Brady & Norman; seen from the side, broadly ovate, highest just in front of the middle, height equal to more than half the length; dorsal margin strongly arched, sloping towards the anterior end; anterior slope flattened; posterior slope evenly rounded and terminating in the posterior angulation; ventral margin arcuate behind, flexuous in front; anterior extremity bluntly rounded, the margin obscurely crenulated; posterior extremity produced and somewhat acuminate below the middle, lower edge sloping backwards in a curved line continuous with the ventral margin. Shell, seen from above, broadly elliptical, widest in the middle, width rather less than half the length; sides evenly rounded, converging more gradually behind than in front; both extremities somewhat acuminate. Shell surface

ornamented with fine but irregular reticulations, and with the interspaces minutely punctate; there are also small whitish papillæ where the lines intersect. Length of the specimen represented by the drawing, ·5 mm., but another specimen measured only ·53 mm.

Habitat.—Scotia Bay, South Orkneys; collected June 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W.

Genus *Paradoxostoma*, Fischer, 1855.

Paradoxostoma retusum, G. S. Brady. (Pl. XIV. fig. 26.)

1890, *Paradoxostoma retusum*, Brady, *Trans. Roy. Soc. Edin.*, vol. xxxv. p. 513, pl. iv. fig. 20.

Shell, seen from the side, oblong, narrower in front than behind, highest behind the middle; height rather less than half the length; dorsal margin moderately convex, evenly rounded except near the posterior extremity, where it becomes slightly flexuous; anterior end narrow, evenly rounded; posterior extremity produced above the middle into a bluntly rounded beak, thence, sloping downwards and forwards in a nearly straight line, it merges into and becomes continuous with the sinuated ventral margin. Seen from above, compressed, widest in the middle, about four times longer than wide; sides evenly rounded, the front end somewhat obtuse, the posterior extremity acuminate. Shell smooth, semitransparent, with a few faint impressed lines at the posterior end (fig. 26). Length, ·78 mm.

Habitat.—Scotia Bay, South Orkneys; collected June 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W.

The *Scotia* specimens differ slightly from the form described by Dr Brady in their larger size, as well as to a small extent in their general outline; the peculiar conformation of the posterior extremity is, however, quite characteristic of the species referred to.

Paradoxostoma antarcticum, new species. (Pl. XIV. figs. 27 and 28.)

Carapace ovate; seen from the side, highest behind the middle, height scarcely equal to half the length; dorsal margin boldly arched, forming a continuous even curve backwards to the blunt angulation of the posterior extremity, but with a longer slope to the front than to the rear; anterior end narrow and rounded; posterior obliquely truncated, slightly produced above, thence sloping downwards and forwards to meet the ventral margin, which is slightly convex. Shell, seen from above, compressed, fusiform, widest behind the middle, fully three times longer than broad; extremities equal and acuminate. Surface of shell smooth, with small, round, indistinct markings scattered over it. Length, ·8 mm.

Habitat.—Scotia Bay, South Orkneys; collected in June 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W.

Paradoxostoma læve, new species (Pl. XIV. figs. 29 and 30.)

Shell, seen from the side, elongate, subovate, higher behind than in front, greatest height just behind the middle, and equal to fully two-fifths of the length; anterior extremity subangular, narrowly rounded; greatest projection below the middle; posterior end obtusely rounded, dorsal margin evenly but not very boldly arcuate, sloping gradually towards the front and more convex behind; ventral margin slightly sinuate in front of the middle. Seen from above, the outline is narrowly ovate, the greatest width, which is near the centre, is equal to about one-third of the length; the sides are flatly arcuate, and both extremities subacuminate; valves smooth, polished, with a few scattered opaque white points. Length about ·65 mm.

Habitat.—Obtained in the same gatherings with those described above, collected in Scotia Bay, South Orkney Islands, in June 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W.

MYODOCOPA.

Fam. Cypridinidæ.

Genus *Philomedes*, Liljeborg, 1853.

Philomedes assimilis, G. S. Brady. (Pl. XIII. figs. 16 and 17.)

1907, *Philomedes assimilis*, Brady, *National Antarctic Exped.*: "Ostracoda," p. 5, pl. i. figs. 16–21, pl. ii. figs. 1–6.

One or two specimens of a *Philomedes*, which I ascribe to the species mentioned, occurred in a small sample of dredged material from Scotia Bay, collected in April 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W. The length of the specimen represented by the drawing (fig. 16) is 1·8 mm.

Genus *Asterope*, Philippi, 1840.

Asterope australis, G. S. Brady. (Pl. XIII. figs. 18 and 19.)

1890, *Asterope australis*, Brady, *Trans. Roy. Soc. Edin.*, vol. xxxv. (pt. ii.), p. 515, pl. ii. figs. 1, 2.
1898, ,, ,, ,, *Trans. Zool. Soc.*, vol. xiv. (pt. viii.), p. 431, pl. xliii. figs. 1–8.
1906, *Cylindroleberis australis*, G. W. Müller, *Die Ostracoden der "Siboga" Exped.*, p. 14.

This species was obtained in a small gathering of dredged material collected in Scotia Bay, South Orkneys, on 3rd June 1903; Station 325, 60° 43′ 42″ S., 44° 38′ 33″ W. The length of the specimen—a female—represented by drawing (fig. 18) is 2·75 mm.

Asterope oculata, G. S. Brady. (Pl. XIII. figs. 20 and 21.)

1902, *Asterope oculata*, Brady, *Trans. Zool. Soc.*, vol. xvi. p. 179, pl. xxi. figs. 6–13.

This species occurred in a small gathering collected off Gough Island on 22nd April 1904; Station 461, 40° 20′ S., 9° 56′ 30″ W. The size of the specimen represented by the drawing (fig. 20) is 1·8 mm. Dr Brady records *A. oculata* from Trincomalee, Ceylon.

Fam. Halocypridæ.

The Halocypridæ being for the most part pelagic in their habits, are widely dispersed throughout the Atlantic, Pacific, and Indian Oceans, but appear to be more frequent in tropical regions. The species recorded here are chiefly from these regions, and were collected by the s.y. *Scotia* on the outward voyage to the Antarctic; no Halocypridæ were observed in the collections from the South Orkneys.

Genus *Halocypris*, Dana, 1852.

Halocypris inflata, Dana. (Pl. XIII. figs. 29–31.)

1852, *Halocypris inflata*, Dana, *U.S. Explor. Exped.*, 1837–1842, vol. xiii. p. 1301, pl. xci. fig. 8.
1852, ,, *brevirostris*, Dana, *op. cit.*, p. 1303, pl. xci. fig. 9.
1906, ,, *inflata*, G. W. Müller, "Ostracoda," "*Siboga*" *Exped.*, p. 2.

This species was obtained in gatherings from Stations 21, 26, and 59, the first in 18° 28′ N., 24° 28′ W., the last in 2° 30′ S., 32° 42′ W. The specimen represented by the drawing measures 1·65 mm. The species is widely distributed in the Atlantic, the Pacific, and Indian Oceans, and appears to be subject to some amount of variation, and has been described under several names (*cf.* G. W. Müller, *op. cit.*).

Halocypris globosa, Claus. (Pl. XIII. fig. 32.)

1874, *Halocypris globosa*, Claus, "Die Fam. Halocypriden," *Schriften Zool. Inhalt*, Heft i. (Wien, 1874), p. 7, Taf. 3, figs. 36 and 39.
1906, *Halocypris globosa*, G. W. Müller, *op. cit.*, p. 2.

H. globosa was obtained in a gathering from Station 16, 20° 29′ N., 23° 16′ W., collected 29th November 1902. In this species the shell has a short rotund form; seen from the side, the dorsal margin is flattened, but the lower is boldly arched in the form of a semicircle, the depth across the middle being equal to about four-fifths of the length. The specimen represented by the drawing (fig. 32) measured ·85 mm.

Genus *Conchœcia*, Dana, 1852.

Conchœcia spinirostris, Claus. (Pl. XIII. fig. 26.)

1874, *Conchœcia spinirostris*, Claus, "Die Fam. Halocypriden," p. 6, Taf. 1, figs. 1, 6*a*, 8; Taf. 2, figs 11, 14, 15.
1890, *Conchœcia porrecta*, Claus, *Arbeit. Zool. Institut Wien*, vol. ix., Heft i., p. 12; Heft iii. (1891), p. 61, Taf. 7.
1896, *Conchœcia spinirostris*, Brady & Norman, *Trans. Roy. Dublin Soc.* (N.S.), vol. v. p. 689, pl. lx. fig. 22.
1906, *Conchœcia spinirostris*, G. W. Müller, "Ostracoda," "*Siboga*" *Exped.*, p. 7.

This widely distributed species occurred in surface gatherings from Stations 14, 16, and 59; the first in 21° 28′ N., 22° 40′ W., the last in 2° 30′ S., 32° 42′ W., collected

November and December 1902. According to Dr G. W. Müller, *C. spinirostris*, Claus, and *C. porrecta*, Claus, are forms of the same species.

Conchœcia procera, G. W. Müller. (Pl. XIII. figs. 27 and 28.)

1891, *Conchœcia variabilis* (pr. prt.), G. W. Müller, *Zool. Jahrb.*, Abtheil Syst., vol. v. p. 273, Taf. 28, figs. 27, 38.
1894, *Paraconchœcia oblonga*, Claus, *Denkschriften d. Akad. Wien*, vol. lxi. p. 3, Taf. 3, figs. 21–23 (non *C. oblonga*, Cl., 1890, 91).
1894, *Conchœcia procera*, G. W. Müller, *F. Fl. Neapel*, vol. xxi. p. 228, pl. iii. figs. 47, 48, 50, 58.
1906, „ „ *idem*, "Ostracoda," "*Siboga*" *Exped.*, p. 4.

Specimens which I have ascribed to this species were obtained in a surface townetting collected at Station 14, 21° 28′ N., 22° 40′ W., on 28th November 1902. The specimen represented by the drawing measured about 1·5 mm.

Conchœcia elegans, G. O. Sars.

1865, *Conchœcia elegans*, G. O. Sars, *Forhandl. Vidensk.-Selsk. Chr.*, p. 117.
1891, *Paraconchœcia gracilis*, Claus, *Die Halocypriden des atlantischen Oceans und Mittelmeeres*, p. 66, pl. xii.
1896, *Conchœcia elegans*, Brady & Norman, *Trans. Roy. Dublin Soc.* (N.S.), vol. v. p. 684, pl. lx. fig. 23, pl. lxv. figs. 11–22.
1906, *Conchœcia elegans*, G. W. Müller, "Ostracoda," "*Siboga*" *Exped.*, p. 4.

A single specimen of this species occurred in a surface gathering collected at Station 14, 21° 28′ N., 22° 40′ W., 28th November 1902. This species has been found fairly common in Loch Etive, Scotland, and is said to be very abundant among the Lofoten Islands down to 300 fathoms (G. O. Sars), while Dr Claus reports it as having been taken at a depth of 1500 metres in lat. 37° 45′ N., long. 13° 38′ W. *C. elegans* is also a Mediterranean species. Dr G. W. Müller gives its distribution as extending to lat. 35° in the South Atlantic.* *Paraconchœcia gracilis*, Claus, is considered by Dr G. W. Müller to be identical with *C. elegans*, G. O. Sars.

Genus *Euconchœcia*, G. W. Müller, 1890.

Euconchœcia chierchiæ, G. W. Müller. (Pl. XIII. figs. 22–25.)

1890, *Euconchœcia chierchiæ*, G. W. Müller, "Ueber Halocypriden," *Zool. Jahrb.*, Bd. v. p. 227, pl. xxviii. figs. 1–10 (1890).
1894, *Halocypris aculeata*, T. Scott, *Trans. Linn. Soc.: Zool.*, ser. 2. vol. vi. p. 142, pl. xv. figs. 5, 6, 33, 34, 38.
1902, *Euconchœcia chierchiæ*, G. S. Brady, *Trans. Zool. Soc.*, vol. xvi. p. 190, pl. xxiv. figs. 9–15.

A few specimens of this species occurred in a surface gathering collected at Station 49, 1° 53′ N., 27° 26′ W., and at Station 68, 7° 42′ S., 34° 32′ W., off Pernambuco, in December 1902.

* "Sie findet sich weiter im nördlichen und südlichen Atlantischen Ocean bis zu 35° südlicher Breite," *Nordisches Plankton*, vii., "Ostracoda," p. 4 (1901).

ALPHABETICAL INDEX TO GENERA AND SPECIES.

EXPLANATION OF PLATES.

Plate I.

Parathalestris affinis, sp. n.

Fig. 1. Foot of fourth pair.

Cyclopina belgica, Giesbrecht.

Fig. 2. Female, dorsal view.
„ 3. Antennule.
„ 4. Antenna.
„ 5. Maxilla.
„ 6. Mandible and palp.
„ 7. First maxilliped.
„ 8. Second maxilliped.
„ 9. Foot of first pair.
„ 10. „ second pair.
„ 11. „ fourth pair.
„ 12. „ fifth pair.
„ 13. Abdomen and caudal rami.

Euryte similis, sp. n.

Fig. 14. Female, dorsal view.
Fig. 15. Antennule.
„ 16. Antenna.
„ 17. First maxilliped.
„ 18. Second maxilliped.
„ 19. Foot of first pair.
„ 20. „ second pair.
„ 21. „ fourth pair.
„ 22. „ fifth pair.

Tisbe gracilipes, sp. n.

Fig. 23. Antennule, female.
„ 24. Antenna.
„ 25. Second maxilliped.
„ 26. Foot of first pair.
„ 27. „ fourth pair.
„ 28. „ fifth pair.
„ 29. Abdomen and caudal rami.

Plate II.

Bradya proxima, sp. n.

Fig. 1. Female, side view.
„ 2. Antennule, female.
„ 3. Antenna.
„ 4. Mandible.
„ 5. Second maxilliped.
„ 6. Foot of third pair.
„ 7. „ fourth pair.
„ 8. „ fifth pair, female.
„ 9. Abdomen and caudal rami.

Ectinosoma antarctica, Giesbrecht.

Fig. 10. Antennule, female.
„ 11. Antenna.
„ 12. First maxilliped (*a*); second maxilliped (*b*).
„ 13. Foot of fifth pair, female.

Parathalestris clausi (Norman).

Fig. 14. Second maxilliped.
Fig. 15. Foot of first pair.
„ 16. „ second pair.
„ 17. „ fifth pair, male.

Dactylopusia frigida, sp. n.

Fig. 18. Antennule, female.
„ 19. Antenna.
„ 20. Second maxilliped.
„ 21. Foot of first pair.
„ 22. „ fourth pair.
„ 23. „ fifth pair, female.
„ 24. Abdomen and caudal rami.

Dactylopusia perplexa, sp. n.

Fig. 25. Antennule, female.
„ 26. Antenna.
„ 27. Mandible and palp.
„ 28. Foot of first pair.
„ 29. „ fifth pair, female.

Plate III.

Idomene forficata, Philippi.

Fig. 1. Female, seen dorsally.
„ 2. Outer ramus of antenna.
„ 3. Second maxilliped.
„ 4. Foot of first pair.
„ 5. „ fourth pair.
„ 6. „ fifth pair, male.

Parathalestris coatsi, sp. n.

Fig. 7. Female, seen dorsally.
„ 8. Antennule, female.
„ 9. Antenna.
„ 10. Mandible and palp.
„ 11. Second maxilliped.
„ 12. Foot of first pair.

Parathalestris coatsi—contd.

Fig. 13. Foot of second pair.
„ 14. „ fourth pair.
„ 15. „ fifth pair, female.
„ 16. Abdomen and caudal rami.

Parathalestris affinis, sp. n.

Fig. 17. Female, seen dorsally.
„ 18. Antennule, female.
„ 19. Antenna.
„ 20. Mandible.
„ 21. Maxilla.
Fig. 22. First maxilliped.
„ 23. Second maxilliped.
„ 24. Foot of first pair.
„ 25. „ fifth pair.

Tisbe austrina, sp. n.

Fig. 26. Antennule, female.
„ 27. Antenna.
„ 28. Second maxilliped.
„ 29. Foot of first pair.
„ 30. „ fifth pair, female.

Plate IV.

Idomene forficata, Philippi.

Fig. 1. Antennule, female.

Saphirella abyssicola, T. Scott.

Fig. 2. Female, seen dorsally.
„ 3. Antennule, female.
„ 4. Mandible (*a*), maxilla (*b*).

Porcellidium affine, Quidor.

Fig. 5. Female, seen dorsally.
„ 6. Male, seen dorsally.
„ 7. Antennule, female.
„ 8. Antenna.
„ 9. Foot of first pair.
„ 10. „ fifth pair, female.
„ 11. „ fifth pair, male.
„ 12. Abdomen and caudal rami, female.
„ 13. „ „ male.

Machairopus major, sp. n.

Fig. 14. Female, dorsal view.
Fig. 15. Antennule, female.
„ 16. Mandible and palp.
„ 17. Maxilla.
„ 18. Second maxilliped.
„ 19. Foot of first pair.
„ 20. „ second pair.
„ 21. „ third pair.
„ 22. „ fourth pair.
„ 23. „ fifth pair, female.
„ 24. Abdomen and caudal rami.

Parastenhelia antarctica, sp. n.

Fig. 25. Antennule, female.
„ 26. Mandible.
„ 27. First maxilliped.
„ 28. Second maxilliped.
„ 29. Foot of first pair.
„ 30. „ second pair.
„ 31. „ fourth pair.
„ 32. „ fifth pair, female.
„ 33. Abdomen and caudal rami.

Plate V.

Phyllopodopsyllus mossmani, sp. n.

Fig. 1. Female (♀), and male (♂), side view.
„ 2. Antennule, female.
„ 3. Antennule, male.
„ 4. Antenna.
„ 5. Mandible and palp.
„ 6. Second maxilliped.
„ 7. Foot of first pair.
„ 8. „ second pair, female.
„ 9. „ second pair, male.
„ 10. „ fourth pair.
„ 11. „ fifth pair, female.
„ 12. „ fifth pair, male.
„ 13. Abdomen and caudal rami, female.
Fig. 14. Abdomen and caudal rami, male.

Harpacticus piriei, sp. n.

Fig. 15. Foot of fifth pair, female.

Psamathe longicauda, Philippi.

Fig. 16. Female, seen dorsally.
„ 17. Antennule, female.
„ 18. Antenna.
„ 19. First maxilliped.
„ 20. Second maxilliped.
„ 21. Foot of first pair.
„ 22. „ fifth pair, female.

Plate VI.

Dactylopusia perplexa, sp. n.

Fig. 1. Second maxilliped.
„ 2. Foot of fourth pair.

Asterocheres suberites, Giesbrecht, var.

Fig. 3. Antennule, female.
„ 4. Antenna.
„ 5. First maxilliped.
„ 6. Second maxilliped.
„ 7. Siphon.
„ 8. Foot of first pair.
„ 9. „ second pair.
„ 10. „ fourth pair.
„ 11. Abdomen and caudal rami.

Psamathe fucicola, sp. n.

Fig. 12. Antennule, female.
„ 13. Antenna.
Fig. 14. Mandible and palp.
„ 15. Maxilla.
„ 16. Foot of first pair.
„ 17. „ fourth pair.
„ 18. „ fifth pair.
„ 19. Abdomen and caudal rami.

Machairopus australis, sp. n.

Fig. 20. Antennule, female.
„ 21. Antenna.
„ 22. Mandible and palp.
„ 23. First maxilliped.
„ 24. Second maxilliped.
„ 25. Foot of first pair.
„ 26. „ second pair.
„ 27. „ fourth pair.
„ 28. „ fifth pair.

Plate VII.

Laophonte rottenburgi, sp. n.

Fig. 1. Antennule, female.
„ 2. Second maxilliped.
„ 3. Foot of first pair.
„ 4. „ third pair.
„ 5. „ fifth pair, female.
„ 6. Abdomen and caudal rami.

Laophonte wiltoni, sp. n.

Fig. 7. Female, dorsal view.
„ 8. Antennule, female.
„ 9. Antenna.
„ 10. Second maxilliped.
„ 11. Foot of first pair.
„ 12. „ second pair.
„ 13. „ fourth pair.
„ 14. „ fifth pair.
„ 15. Abdomen and caudal rami.

Laophonte exigua, sp. n.

Fig. 16. Antennule, female.
„ 17. Antenna.
„ 18. Foot of first pair.
„ 19. „ second pair.
„ 20. „ fourth pair.
„ 21. „ fifth pair, female.
„ 22. Abdomen and caudal rami.

Ameira simulans, sp. n.

Fig. 23. Antennule, female.
„ 24. Second maxilliped.
„ 25. Foot of first pair.
„ 26. „ fourth pair.
„ 27. „ fifth pair, female.
„ 28. Abdomen and caudal rami.

Plate VIII.

Laophontodes whitsoni, sp. n.

Fig. 1. Female, dorsal view.
„ 2. Antennule, female.
„ 3. Antenna.
„ 4. Second maxilliped.
„ 5. Foot of first pair.
„ 6. „ second pair.
„ 7. „ fourth pair.
„ 8. „ fifth pair, female.

Pseudozosime browni, sp. n.

Fig. 9. Female, dorsal view.
„ 10. „ side view.
„ 11. Antennule, female.
„ 12. Antenna.
„ 13. Maxilla.
„ 14. First maxilliped.
„ 15. Second maxilliped.
„ 16. Foot of first pair.
„ 17. „ second pair.
„ 18. „ fourth pair.
„ 19. „ fifth pair, female.

Harpacticus fucicolus, sp. n.

Fig. 20. Antennule, female.
,, 21. Antenna.
Fig. 22. Second maxilliped.
,, 23. Foot of first pair.
,, 24. ,, fifth pair, female.

PLATE IX.

Pseudothalestris intermedia, sp. n.

Fig. 1. Antennule, female.
,, 2. Second maxilliped.
,, 3. Foot of second pair, male; third inner ramus of left foot.
,, 4. Fifth pair, female.

Pseudothalestris assimilis, var. *antarctica*.

Fig. 5. Second maxilliped.
,, 6. Foot of first pair.
,, 7. ,, second pair, male.
,, 8. Foot of fifth pair, male.
,, 9. Abdomen and caudal rami.

Orthopsyllus linearis, Claus.

Fig. 10. Female, dorsal view.
,, 11. Antennule, female.
,, 12. Antenna.
,, 13. Mandible and palp.
,, 14. First maxilliped.
Fig. 15. Second maxilliped.
,, 16. Foot of first pair.
,, 17. ,, second pair, inner ramus.
,, 18. ,, third pair, inner ramus.
,, 19. ,, fourth pair.
,, 20. ,, fifth pair, female.
,, 21. ,, third pair, male, inner ramus.
,, 22. ,, fifth pair, male.

Amphiascus fucicolus, sp. n.

Fig. 23. Antennule, female.
,, 24. Antenna.
,, 25. Second maxilliped.
,, 26. Foot of first pair.
,, 27. ,, fourth pair.
,, 28. ,, fifth pair, female.

Idomene forficata, Philippi.

Fig. 29. Foot of fifth pair, female.

PLATE X.

Atteutha dubia, sp. n.

Fig. 1. Female, seen dorsally.
,, 2. Antennule, female.
,, 3. Antenna.
,, 4. Second maxilliped.
,, 5. Foot of first pair.
,, 6. ,, fourth pair.
,, 7. ,, fifth pair, female.
,, 8. Abdomen and caudal rami.

Alteutha austrina, sp. n.

Fig. 9. Female, dorsal view.
,, 10. Antennule, female.
,, 11. Second maxilliped.
,, 12. Foot of first pair.
Fig. 13. Foot of fourth pair.
,, 14. ,, fifth pair, female.
,, 15. Abdomen and caudal rami.

Paralteutha typica, gen. et sp. n.

Fig. 16. Female, dorsal view.
,, 17. Antennule, male.
,, 18. Antenna.
,, 19. Mandible and palp, male.
,, 20. Second maxilliped.
,, 21. Foot of first pair.
,, 22. ,, fourth pair.
,, 23. ,, fifth pair, female.
,, 24. ,, fifth pair, male.
,, 25. Abdomen and caudal ramus.

PLATE XI.

Artotrogus proximus, sp. n.

Fig. 1. Female, dorsal view.
,, 2. Antennule, female.
,, 3. Antenna.
,, 4. Mandible.
,, 5. Maxilla.
,, 6. First maxilliped.
,, 7. Second maxilliped.
,, 8. Foot of fourth pair.
,, 9. ,, fifth pair, female.

Laophonte australis, sp. n.

Fig. 10. Female, side view.
,, 11. Antennule, female.
,, 12. Antenna.
,, 13. Second maxilliped.
,, 14. Foot of first pair.
,, 15. ,, second pair.
,, 16. ,, fifth pair, female.
,, 17. Abdomen and caudal rami.

Harpacticus pirieï, sp. n.

Fig. 18. Antennule, female.
,, 19. Antenna.
,, 20. Second maxilliped.
,, 21. Foot of first pair.
Fig. 22. Foot of second pair.
,, 23. ,, third pair.
,, 24. ,, fourth pair.
,, 25. Abdomen and caudal rami.

Plate XII.

Pseudanthessius fucicolus, sp. n.

Fig. 1. Female, dorsal view.
,, 2. Antennule, female.
,, 3. Antenna.
,, 4. Mandible.
,, 5. Maxilla.
,, 6. First maxilliped.
,, 7. Second maxilliped.
,, 8. Foot of first pair.
,, 9. ,, third pair.
,, 10. ,, fourth pair.
,, 11. ,, fifth pair.
,, 12. Abdomen and caudal rami, female.
,, 13. Abdomen and caudal rami, male, *a* = fifth foot.

Ductylopusia ferrieri, sp. n.

Fig. 14. Female, side view.
,, 15. Antennule, female.
Fig. 16. Maxilla.
,, 17. First maxilliped.
,, 18. Second maxilliped.
,, 19. Foot of first pair.
,, 20. ,, second pair.
,, 21. ,, fourth pair.
,, 22. ,, fifth pair.

Lichomolgus fucicola, Brady.

Fig. 23. Antennule, female.
,, 24. Antenna.
,, 25. Foot of fourth pair.
,, 26. Abdomen and caudal rami.

Pseudothalestris intermedius, sp. n.

Fig. 27. Foot of first pair.
,, 28. ,, second pair.
,, 29. ,, fifth pair.

Plate XIII.

Fig. 1. *Calanopia americana*, Dahl. Antennule, ♂.
,, 2. ,, ,, ,, Foot of first pair.
,, 3. ,, ,, ,, ,, fourth pair.
,, 4. ,, ,, ,, ,, fifth pair, ♀.
,, 5. ,, ,, ,, ,, fifth pair, ♂.
,, 6. ,, ,, ,, Abdomen and caudal rami, ♂.
,, 7. *Pleuromamma gracile* (Claus). Fifth pair of feet, ♀.
,, 8. ,, ,, var. *Esterleyi*, nov. Foot of second pair, ♀, basal part.
,, 9. ,, ,, ,, ,, Fifth pair of feet, ♀.
,, 10. ,, ,, ,, ,, Abdomen, ♀, side view.
,, 11. *Clytemnestra scutellata*, Dana, ♀. Terminal joints of antennule.
,, 12. ,, ,, ,, Last abdominal segment and caudal rami.
,, 13. *Dysgamus atlanticus*, Stp. and Ltk., ♂. Dorsal view.
,, 14. *Evadne tergestina*, Claus. Side view.
,, 15. ,, *spinifera*, P. E. Muller. Side view.
,, 16. *Philomedes assimilis*, Brady, ♀. Side view.
,, 17. ,, ,, ,, Post abdomen.
,, 18. *Asterope australis*, Brady, ♀. Side view.
,, 19. ,, ,, ,, Post abdomen.
,, 20. ,, *oculata*, ,, Side view.
,, 21. ,, ,, ,, Post abdomen.
,, 22. *Euconchoecia chierchia*, G. W. Muller, ♀. Side view.
,, 23. ,, ,, ,, Antennule.
,, 24. ,, ,, ,, Post abdomen.

Fig. 25. *Conchœcia spinirostris*, Claus, ♂. Side view.
„ 26. „ „ „ Post abdomen.
„ 27. „ *procera*, G. W. Müller, ♂. Side view.
„ 28. „ „ „ Post abdomen.
„ 29. *Halocypris inflata*, Dana, ♀. Side view.
„ 30. „ „ „ Antennule.
„ 31. „ „ „ Post abdomen.
„ 32. „ *globosa*, Claus, ♀. Side view.

Plate XIV.

Fig. 1. *Macrocypris maculata*, G. S. Brady. Side view.
„ 2. „ „ „ Seen from above.
„ 3. *Cythere latibrosa*, sp. n. Side view.
„ 4. „ „ „ Dorsal view.
„ 5. „ *antarctica* „ Side view.
„ 6. „ „ „ Dorsal view.
„ 7. „ *foveolata*, Brady, ♂. Side view.
„ 8. „ „ „ Dorsal view.
„ 9. „ *inornata*, sp. n. Side view.
„ 10. „ „ „ Dorsal view.
„ 11. „ *peregrina* „ Side view.
„ 12. „ „ „ Dorsal view.
„ 13. „ *foveolata*, Brady, ♀. Side view.
„ 14. „ „ „ Dorsal view.
„ 15. „ *quadridens*, sp. n. Side view.
„ 16. „ „ „ Dorsal view.
„ 17. *Xestoleberis reniformis*, Brady. Side view.
„ 18. „ „ „ Dorsal view.
„ 19. *Cytherura ornata*, sp. n. Side view.
„ 20. „ „ „ Dorsal view.
„ 21. „ „ „ Ventral view
„ 22. „ *porrecta* „ Side view.
„ 23. „ „ „ Dorsal view.
„ 24. „ *sculptilis*, sp. n. Side view.
„ 25. „ „ „ Dorsal view.
„ 26. *Paradoxostoma retusum*, Brady. Side view.
„ 27. „ *antarcticum*, sp. n. Side view.
„ 28. „ „ „ Dorsal view.
„ 29. „ *lævc*, sp. n. Side view.
„ 30. „ „ „ Dorsal view.

Note.—I am indebted to my son, Andrew Scott, A.L.S., for the drawings mentioned below—viz., all the figures on Plate V. except figure 15; figures 1–19 on Plate VIII.; and figures 1–9 on Plate XI. Also for the undernoted figures on Plate XIV., viz., figures 3–8, 13–16, and 19–23.

ADDENDA.

Oithona frigida, Giesb., *Expéd. Antarct. Belge*, "Copep.," p. 29, pl. vi. In a *Scotia* gathering, 0–200 fathoms, lat. 69° 22′ S., 26° 36′ W., 28th February 1903, Station 273.

Lepeophtheirus nordmanni, M.-Edw.

Cecrops latreillii, Leach.

These two parasitic Copepods were obtained on a short Sunfish, *Orthagoriscus mola* (Lin.), captured in lat. 39° 1′ S., long. 53° 40′ W., the first on the skin, the other on the gills, 1st January 1903, Station 107.

Alebion carchariæ, Kroyer. This species was obtained on a shark, *Carcharias*, sp., captured in lat. 9° 23′ N., long. 25° 31′ W., on 5th December 1902, Station 34.

One or two specimens of *Labidocera lubbocki*, Giesb., were obtained in a gathering from the South Atlantic, but the exact locality is somewhat uncertain.

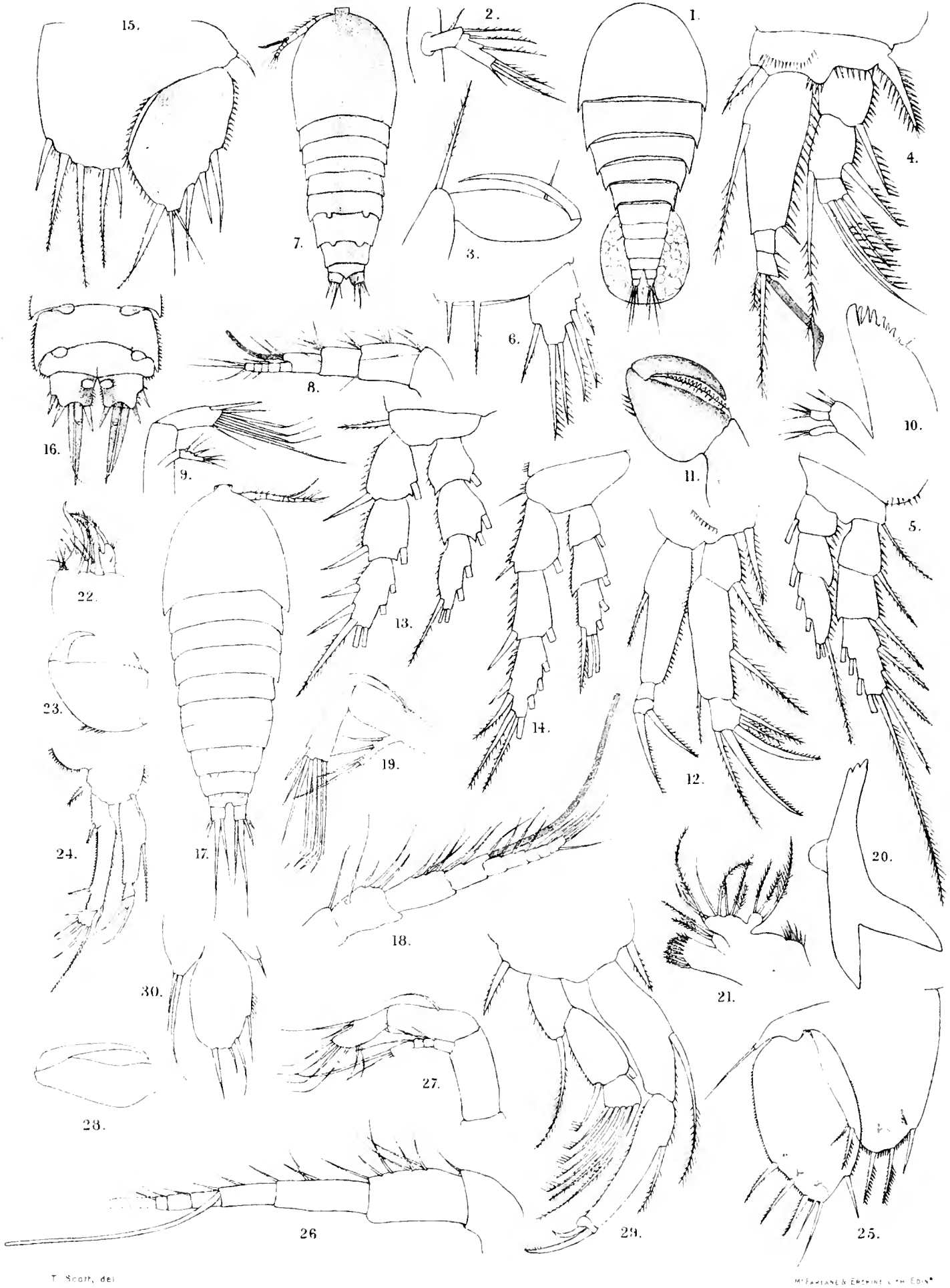
SCOTT: "SCOTIA" ENTOMOSTRACA.—PLATE I.

T. Scott, del

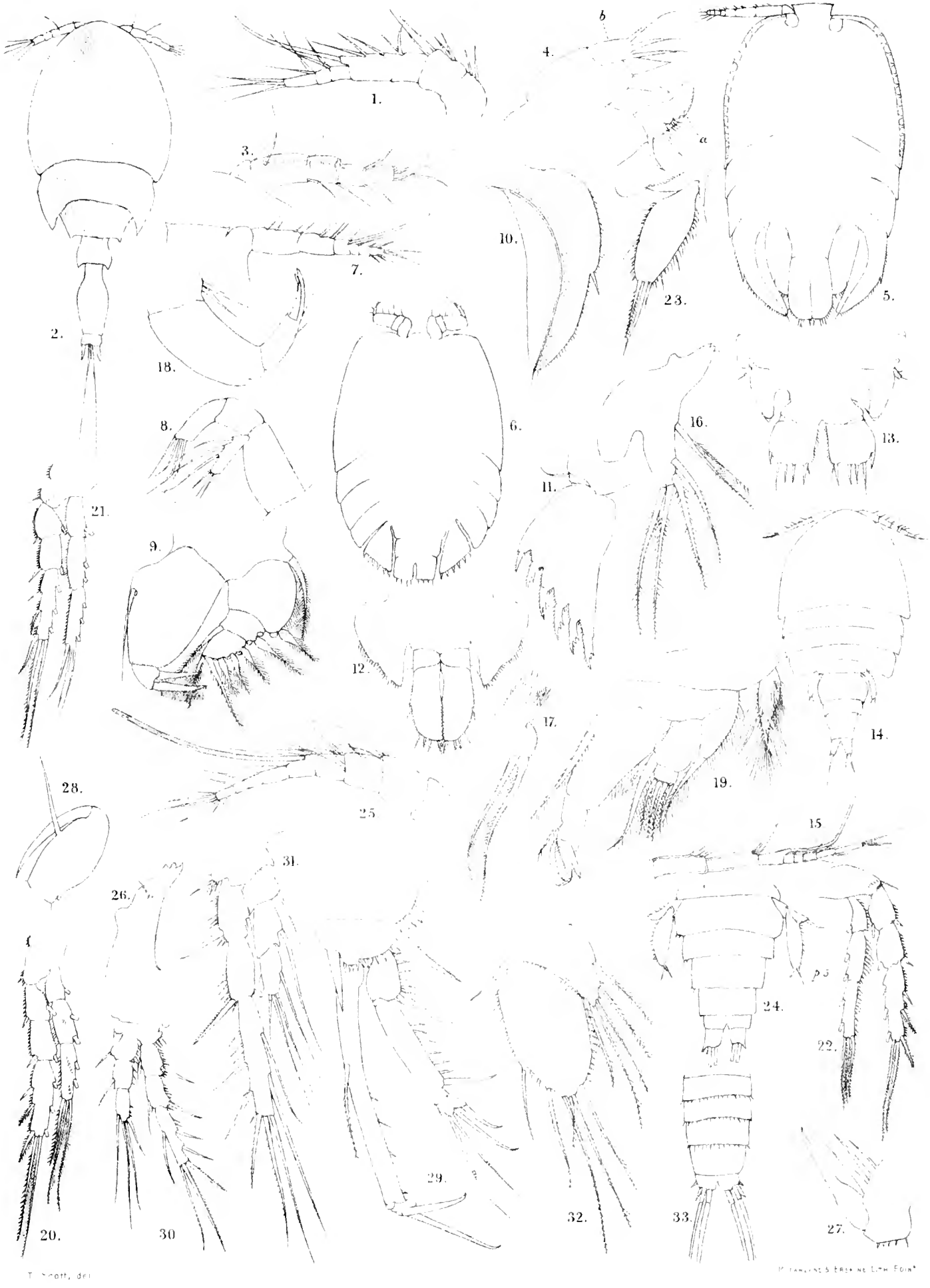
SCOTT: "SCOTIA" ENTOMOSTRACA.—PLATE II.

T. Scott, del.

SCOTT: "SCOTIA" ENTOMOSTRACA.—PLATE III.



SCOTT : "SCOTIA" ENTOMOSTRACA.—PLATE IV.



SCOTT: "SCOTIA" ENTOMOSTRACA.—PLATE V.

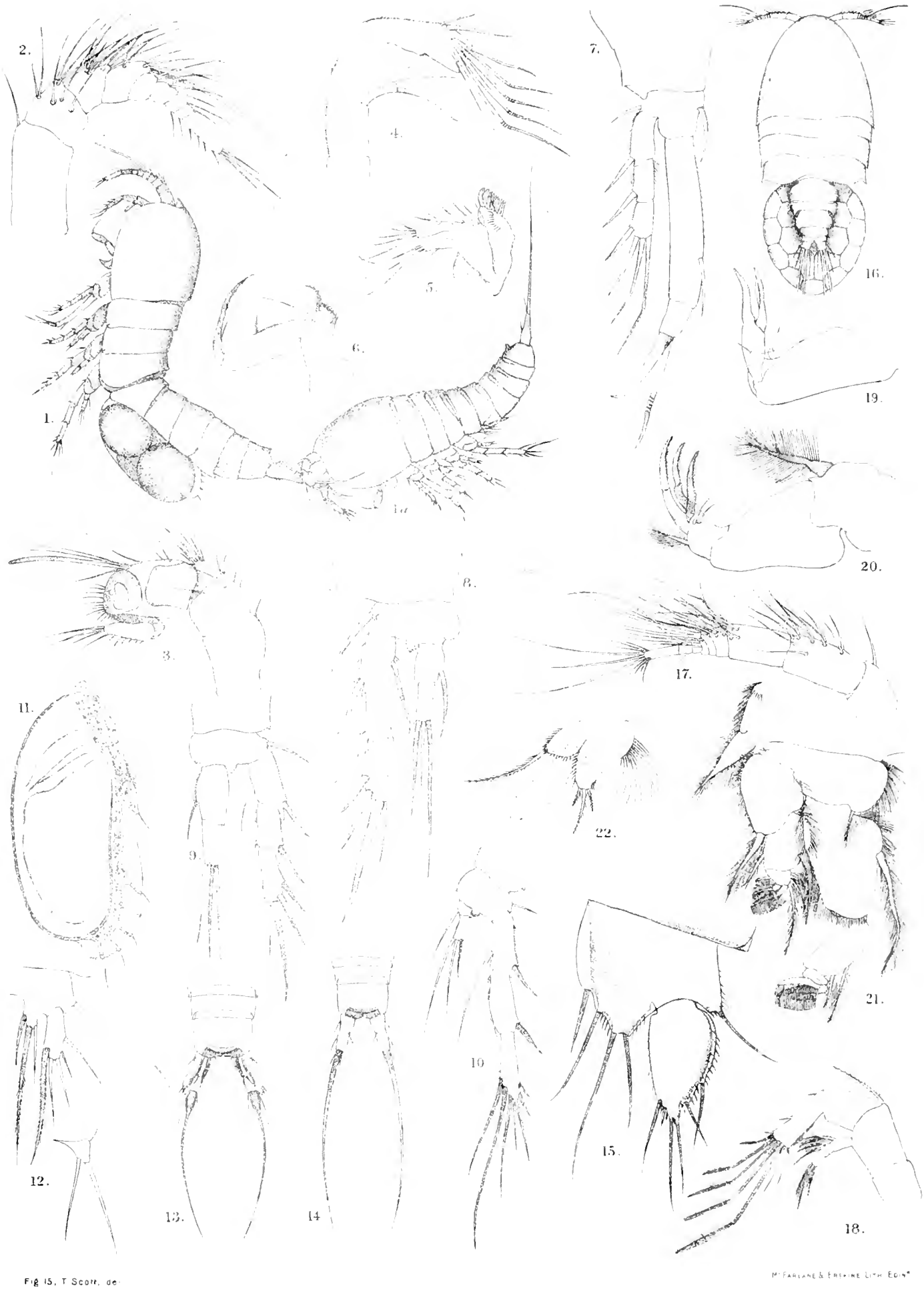
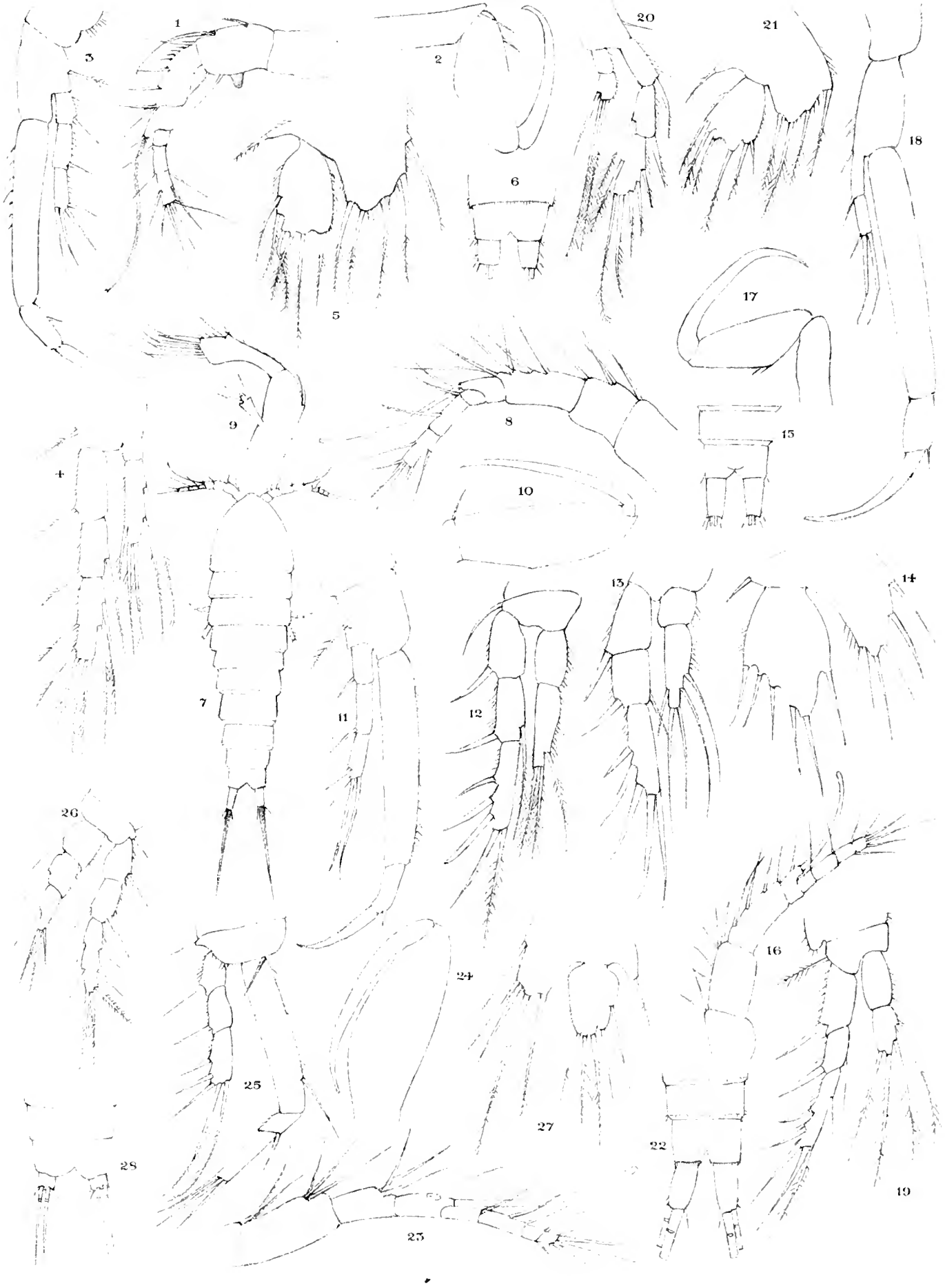


Fig 15, T Scott, de
others. A Scott, del

M'FARLANE & ERSKINE LITH. EDIN.

SCOTT: "SCOTIA" ENTOMOSTRACA—PLATE VI.

SCOTT: "SCOTIA" ENTOMOSTRACA—PLATE VII.



T. Scott, del.

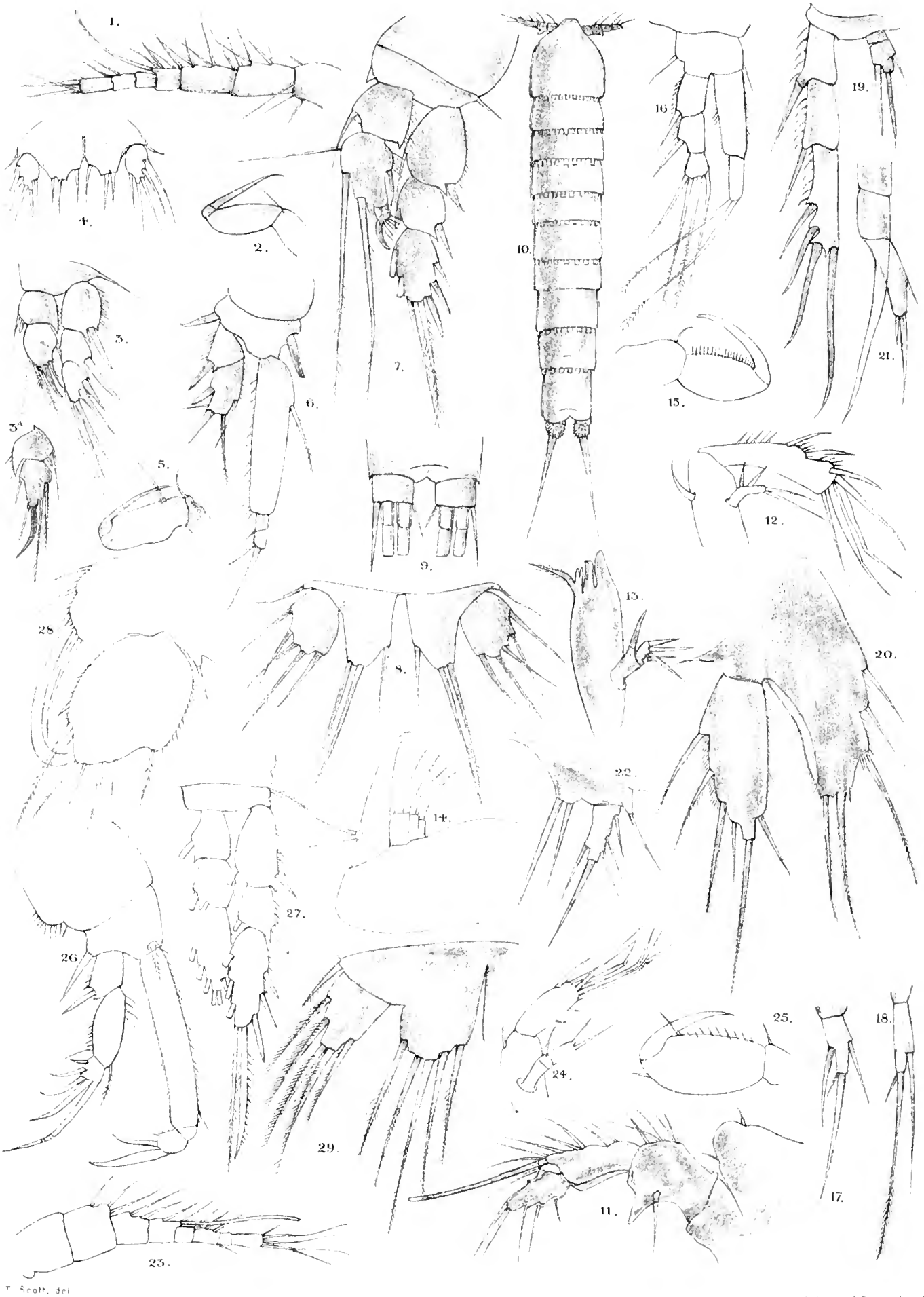
M'FARLANE & ERSKINE LTH EDIN.

SCOTT: "SCOTIA" ENTOMOSTRACA.—PLATE VIII.

Figs 1–19. A Scott, del
Figs 20–24. T Scott, del

M'FARLANE & ERSKINE, LITH EDIN.

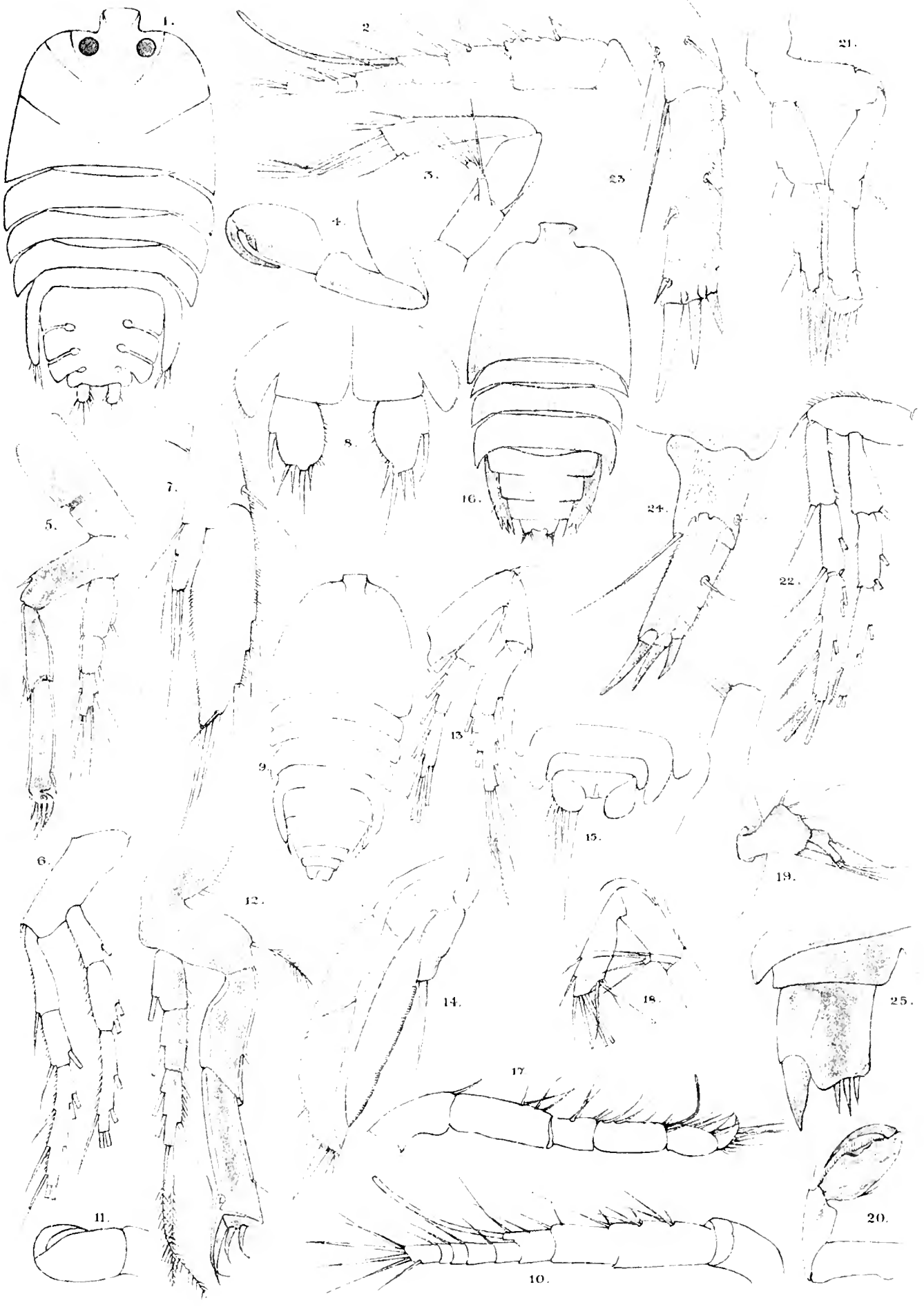
SCOTT: "SCOTIA" ENTOMOSTRACA—PLATE IX.



T. Scott, del.

M'FARLANE & ERSKINE Lith. EDIN.

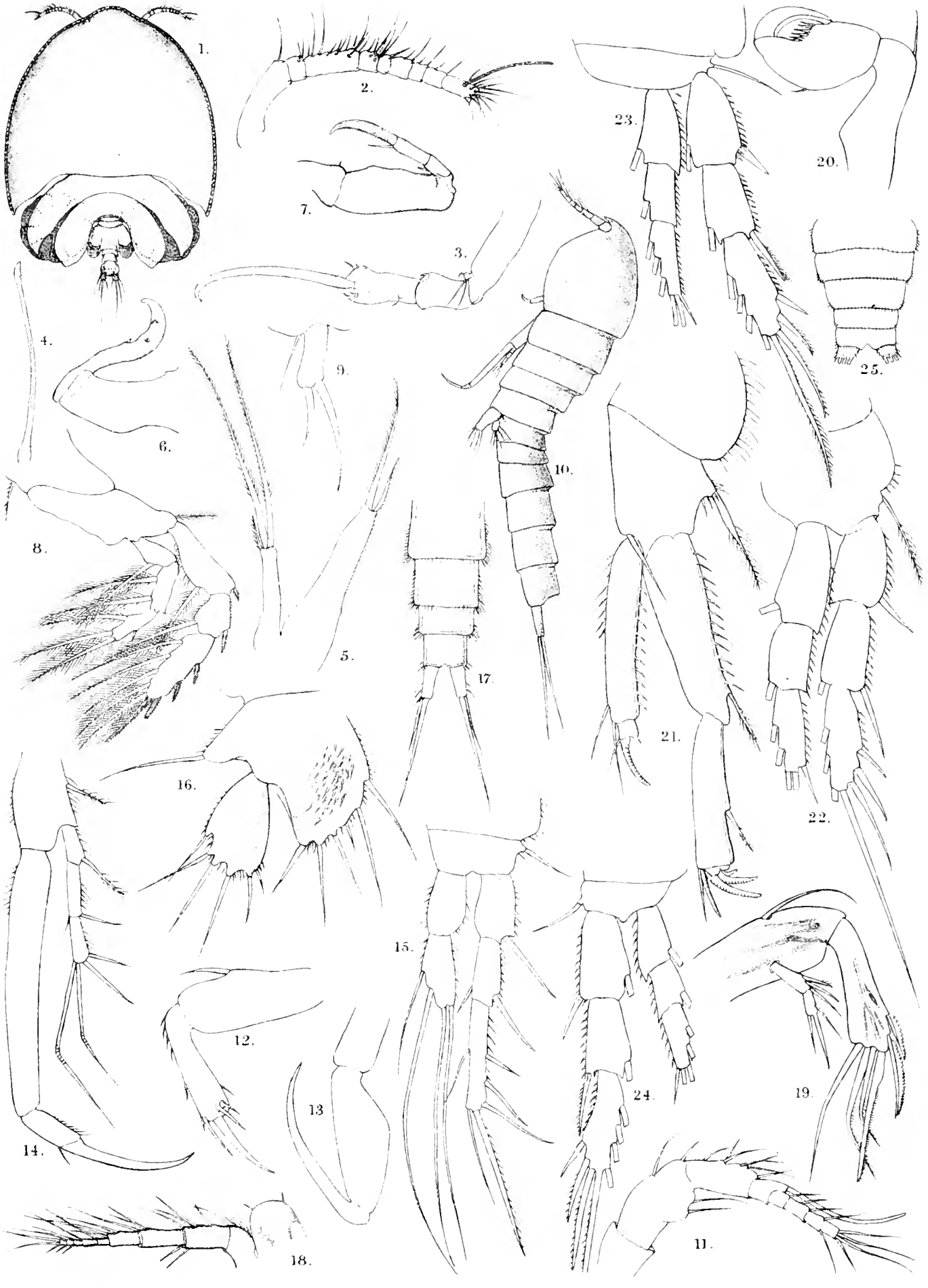
SCOTT: "SCOTIA" ENTOMOSTRACA—PLATE X.



T. Scott, del

M'FARLANE & ERSKINE LITH. EDIN.

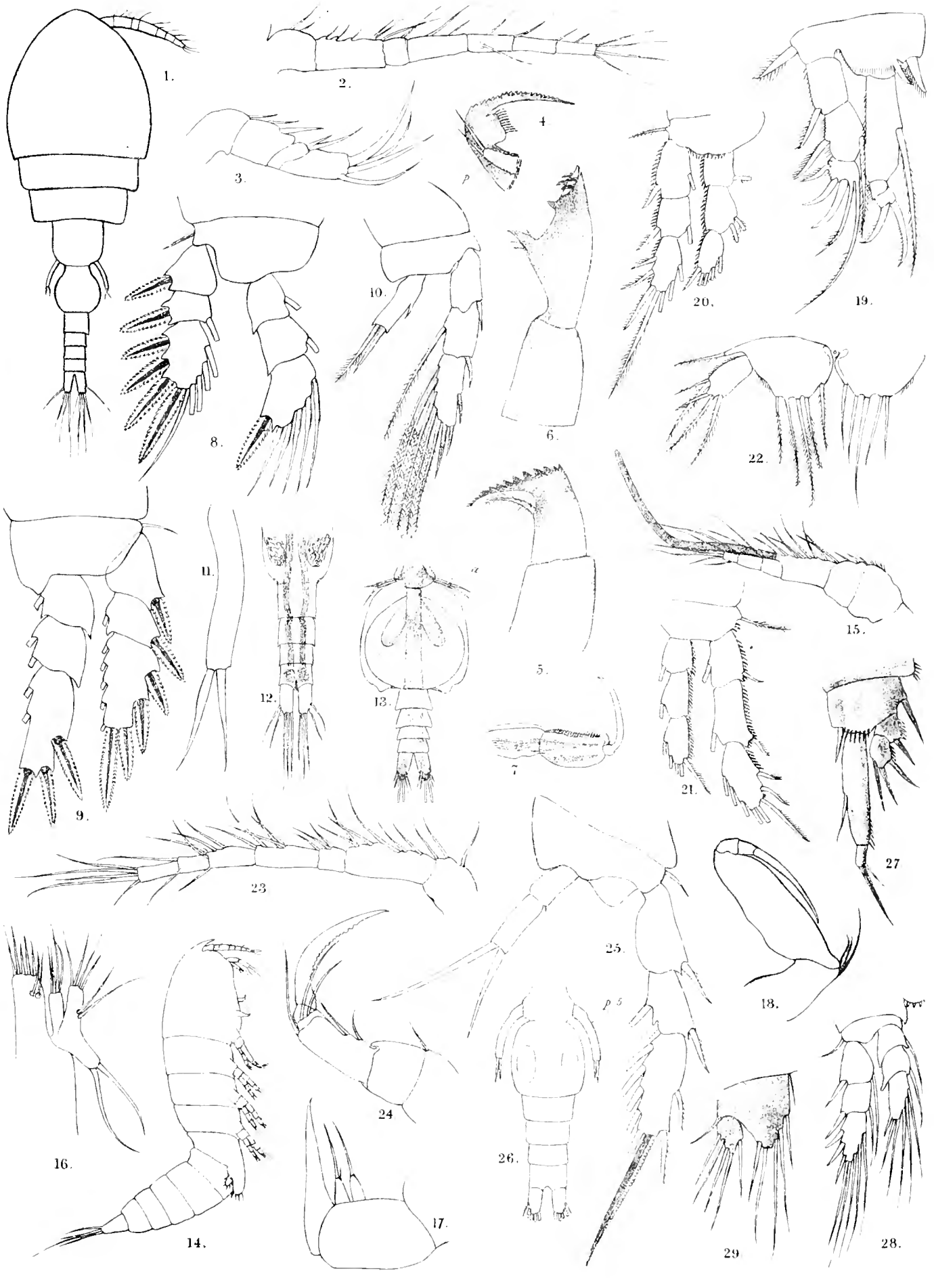
SCOTT · "SCOTIA" ENTOMOSTRACA.—PLATE XI.



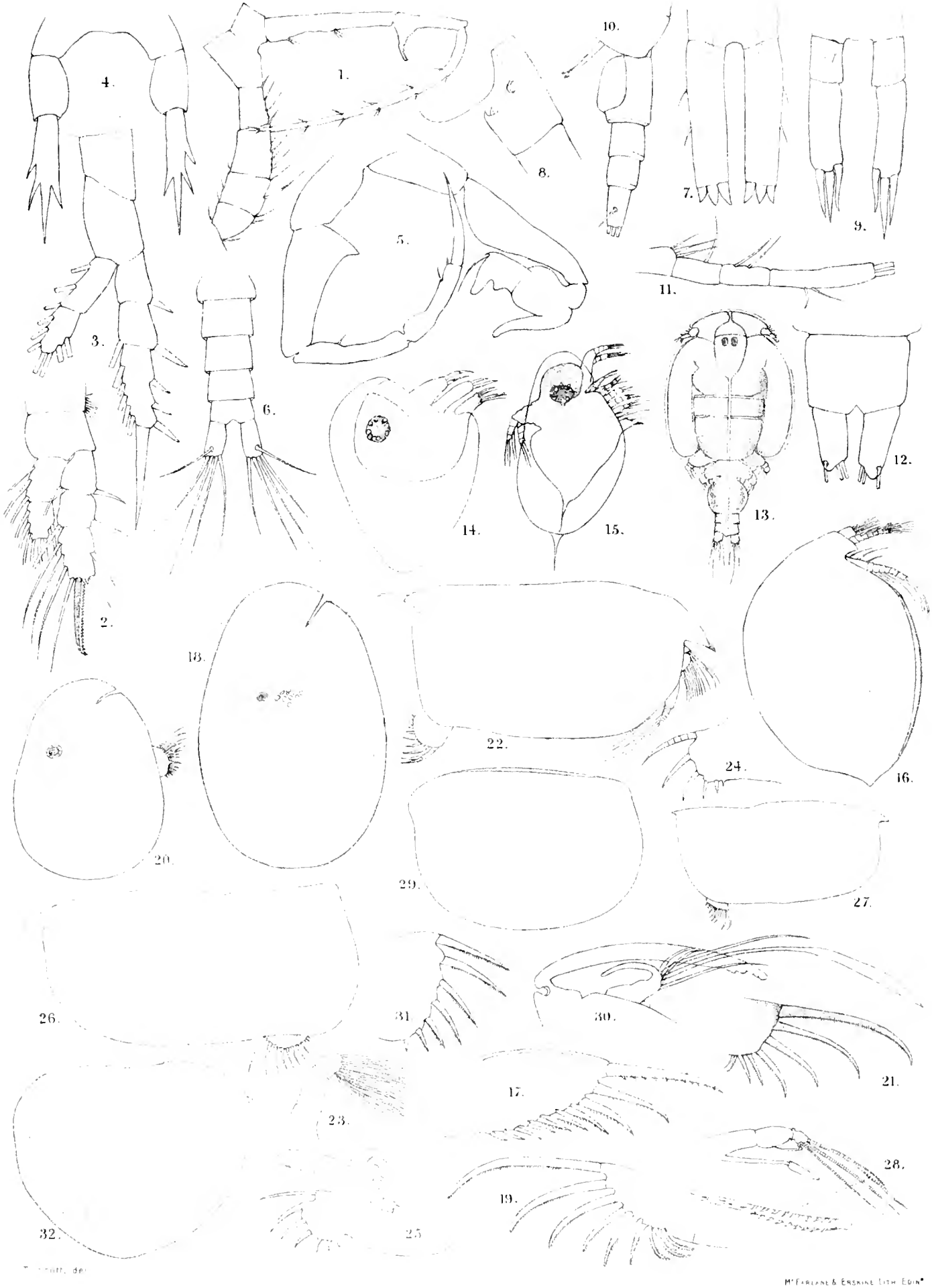
Figs 1–9 A. Scott, del
others T. Scott, del

M'FARLANE & ERSKINE, LITH. EDIN.

SCOTT: "SCOTIA" ENTOMOSTRACA.—PLATE XII.

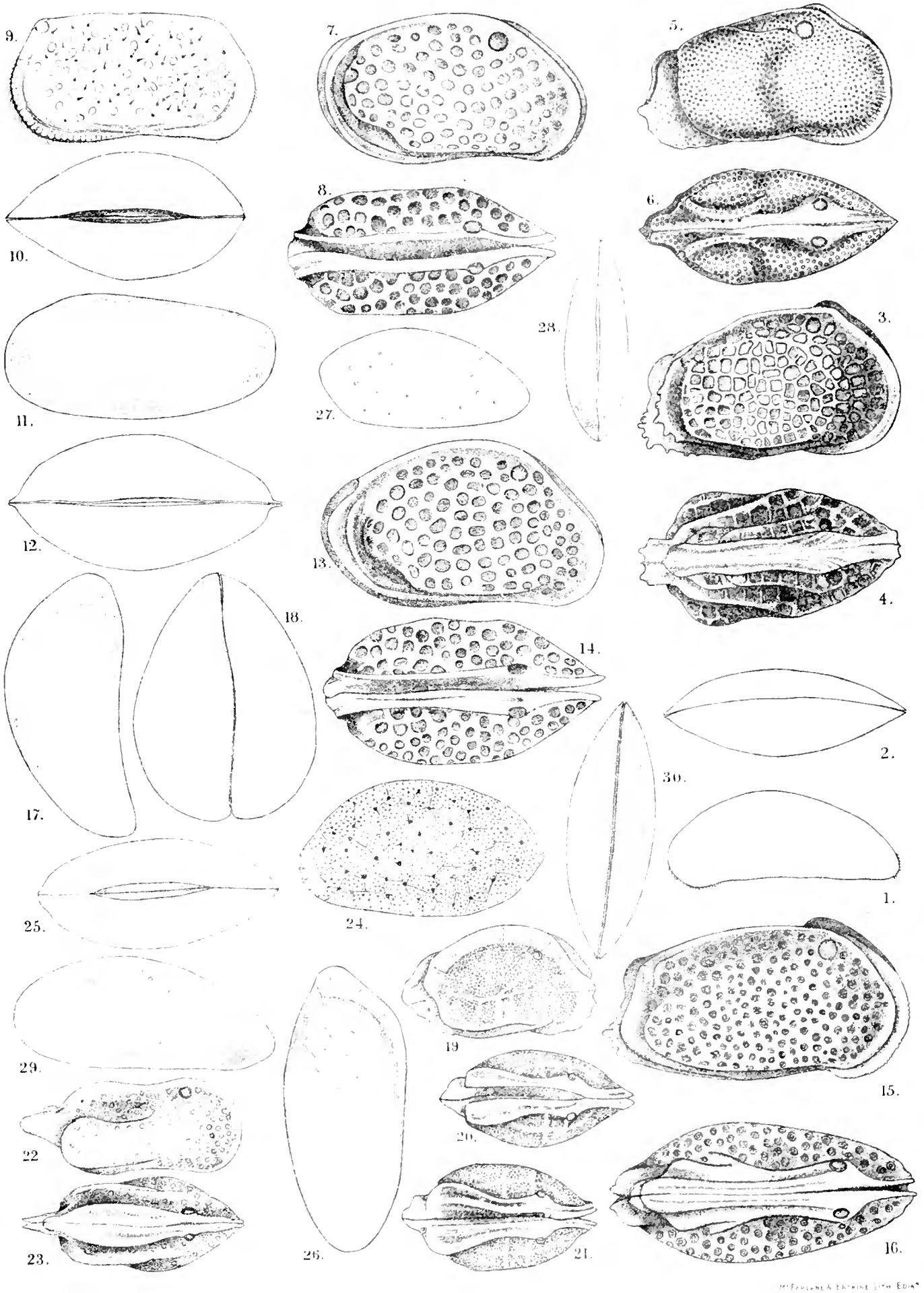


Scott: "Scotia" Entomostraca.—Plate XIII.



M.Farlane & Erskine Lith. Edin.

SCOTT: "SCOTIA" ENTOMOSTRACA.—PLATE XIV.



Figs. 1–8, 13–16, 18–23, A. Scott, del.
others, T. Scott, del.

McFarlane & Erskine, Lith. Edin.