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PORIFERA.

PART II.—ANTARCTIC SPONGES.

BY

MAURICE BURTON, M.Sc.

(Assistant-Keeper in the Department of Zoology, British Museum (Natural History)).

WITH NINE TEXT FIGURES AND FIVE PLATES.

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PORIFERA.

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I.—INTRODUCTION.

The sponge-fauna of the Antarctic has been so well explored by the "Belgica," "Discovery," "Scotia," "Gauss," and "Charcot" expeditions that it is not surprising that the collection of the "Terra Nova" Expedition has added only eleven new species to the total. The collection is so rich, however, that, in conjunction with the older collections now in the British Museum, it has afforded material for a revision of all the described species. The Museum is indebted to the Berlin Museum authorities and to Professor E. Topsent for specimens of species obtained by the "Gauss," "Belgica," etc.

II.—GEOGRAPHICAL DISTRIBUTION.

For the purposes of this report the Antarctic is taken as defined by Regan in his report on the Fishes (Vol. I, 1914). The distribution of the sponges within the area follows very closely that of the fishes, with three well-marked areas around the Magellan Straits, Kerguelen, and the southern islands of New Zealand respectively, where the sponge-

fauna, while resembling to some extent that of the rest of the Antarctic, possesses marked peculiarities of its own.

The Antarctic sponge-fauna contains upwards of 230 species and varieties, including those now described as new, of which some 270 are peculiar to the region, the remainder being species common to the waters adjacent to the Antarctic.

The characteristic features of the fauna are :—(i) The paucity of the Euceratosa and the Pseudoceratosa (*i.e.* the Chalininæ) and the comparative rarity of the spongin-forming sponges in the other groups ; (ii) The rarity of the species of Astrosclerophora which, with two exceptions, have migrated in from New Zealand ; (iii) The richness of the Hexactinellida, particularly of those belonging to the family Rossellidæ ; (iv) The fact that while such groups of the Sigmatosclerophora as the Tetillidæ, Esperellinæ, and Cœlosphereæ are abundantly represented, the Ectyoninæ, so rich in species in other parts of the world, are here comparatively few.

The fauna of the Antarctic has much in common with that of the Arctic. In addition to the few species common to both regions, we find that, for the most part, the same genera are present in both areas although the species representing them are not always closely related.

III.—LIST OF ANTARCTIC SPECIES.

	Marion Is.	Kerguelen.	South Georgia.	South Orkneys.	Graham Land.	Victoria Land.	Wilhelm Land.	Coats Land.	Extra-Antarctic Distribution.
CALCAREA.									
Leucosolenia botryoides (Ellis and Solander)		×			×	×			N. Atlantic : Australia.
coriacea (Montagu)					×	×			Almost cosmopolitan.
Leucetta primigenia, Haeckel ..		×				×	×		
microrhaphis (Haeckel) ..					×				
†*leptoraphis* (Jenkin)						×			
Leucettusa vera, Poléjaeff		×							
†*lancifer*, Dendy..						×			New Zealand.
Sycon antarcticum (Jenkin) ..						×			
australe (Jenkin)						×			
longstaffi (Jenkin)						×			
Grantia hirsuta (Topsent)		×			×	×			
chartacea (Jenkin)						×			
aculeata, Urban		×							
Achromorpha glacialis, Jenkin ..						×			
grandinis, Jenkin						×			
nivalis, Jenkin						×			
†*truncata* (Topsent)					×				

Species marked (†) are those represented in the "Terra Nova" collections.

LIST OF ANTARCTIC SPECIES—*continued.*

	Marion Is.	Kerguelen.	South Georgia.	South Orkneys.	Graham Land.	Victoria Land.	Wilhelm Land.	Coats Land.	Extra-Antarctic Distribution.
†*Megapogon villosus*, Jenkin ..									
Leuconia ovata, Poléjaeff		×							
†*levis*, Poléjaeff		×				×			
frigida, Jenkin						×	×		
hiberna, Jenkin						×			
cirrhosa, Urban..		×							
kerguelensis, Urban		×							
minor, Urban		×							
anfracta, Urban		×							
joubini (Topsent)					×	×			
Amphoriscus elongatus, Poléjaeff ..		×							
HEXACTINELLIDA.									
EUPLECTELLIDÆ.									
Holascus fibulatus, Schulze ..		×							Tasmania.
Malacosaccus vastus, Schulze ..		×							
pedunculatus, Topsent ..								×	
coatsi, Topsent								×	
Acœlocalyx, Topsent									
brucei, Topsent..				×					
Docosaccus ancoratus, Topsent ..				×					
CAULOPHACIDÆ.									
Caulophacus latus, Schulze ..		×							
antarcticus, Schulze and Kirkpatrick							×		
instabilis, Topsent			×						
scotiæ, Topsent..								×	
ROSSELLIDÆ.									
Rossella antarctica, Carter, †subsp. *antarctica*, Schulze and Kirkpatrick					×	×	×		
antarctica, subsp. *solida*, Kirkpatrick		×							
†*racovitzæ*, Topsent				×	×	×	×		
†*nuda*, Topsent					×	×	×		
†*villosa* sp. n.						×			
Gymnorossella inermis, Topsent ..					×				
Bathydorus spinosus, Schulze ..					×				
levis var. *ciliatus*, Topsent ..								×	
Calycosoma validum, Schulze ..				×					N. Atlantic.
†*Anoxycalyx ijimai*, Kirkpatrick					×	×	×		
†*Scolymastra joubini*, Topsent ..					×				
Acanthascus grossularia, Schulze		×							
HYALONEMATIDÆ.									
Hyalonema drygalskii, Schulze and Kirkpatrick							×		

LIST OF ANTARCTIC SPECIES—*continued.*

	Marion Is.	Kerguelen.	South Georgia.	South Orkneys.	Graham Land.	Victoria Land.	Wilhelm Land.	Coats Land.	Extra-Antarctic Distribution.
COSCINOSPORIDÆ.									
Chonelasma lamella, Schulze ..		×							
lamella choanoides, Schulze and Kirkpatrick							×		
FARREIDÆ.									
Farrea occa, Bowerbank					×				Almost cosmopolitan.
Eurete gerlachei, Topsent					×				
DACTYLOCALYCIDÆ.									
Aulocalyx irregularis, Schulze ..							×		Bermudas, S. Africa,
Stylocalyx claviger, Schulze ..		×							[Crozet Is.
MYXOSPONGIDA.									
Oscarella lobularis (Schmidt) ..					×				Atlantic Ocean.
†*Halisarca dujardini* (Johnston), var. *magellanica*, Topsent ..						×			Londonderry Is., S. [America.
TETRAXONIDA.									
HOMOSCLEROPHORA.									
PLAKINIDÆ.									
Plakina monolopha, Schulze ..							×		Northern Hemisphere.
trilopha, Schulze							×		North Atlantic.
ASTROSCLEROPHORA.									
STELLETTIDÆ.									
†*Stelletta purpurea*, Ridley ..						×			Indian Ocean, Indo-Pacific Australia, N.Z.
†*maori*, Dendy						×			New Zealand.
†*crater*, Dendy						×			New Zealand.
†*Jaspis novæ-zealandiæ*, Dendy ..						×			New Zealand.
†*Penares tylotaster*, Dendy ..						×			New Zealand.
Monosyringa longispinum (Lendenfeld)							×		
†*bronstedi*, sp. n...						×			
GEODIIDÆ.									
†*Geodinella vestigifera*, Dendy ..						×			New Zealand.
STREPTASTROSCLEROPHORA.									
THENEIDÆ.									
Thenea delicata, Sollas		×							
Pœcillastra schulzii, Sollas ..		×							
SIGMATOSCLEROPHORA.									
TETILLIDÆ.									
Tetilla coronida, Sollas.		×							
†*leptoderma*, Sollas		×				×			South America.
†*metaclada* (Lendenfeld) ..						×			South Africa.
†*Cinachyra antarctica* (Carter) ..					×	×	×		
antarctica, var. *monticularis*, Kirkpatrick						×			
†*barbata*, Sollas		×			×	×	×		
coactifera (Lendenfeld) ..		×							

LIST OF ANTARCTIC SPECIES—*continued.*

	Marion Is.	Kerguelen.	South Georgia.	South Orkneys.	Graham Land.	Victoria Land.	Wilhelm Land.	Coats Land.	Extra-Antarctic Distribution.
HAPLOSCLERIDÆ.									
†*Chalina topsenti* (Thiele) ..		×				×			South America.
†*altera* (Topsent)					×	×			
†*penicillata* (Topsent)					×	×			
†*virens* (Topsent)					×	×			
dancoi (Topsent)					×	×	×		
spongiosissima (Topsent) ..					×				
†*Cladochalina dendyi*, sp. n. ..						×			Australia, Indian Ocean, New Zealand.
Siphonochalina gaussiana, Hentschel							×		
†*Calyx stipitatus*, Topsent ..					×				
Halichondria panicea (Pallas) ..							×		Atlantic and Northern Hemisphere generally.
†*variabilis* (Ridley)					×				Southern Hemisphere generally.
similis (Ridley and Dendy) ..		×							
Gellius glacialis var. *nivea*, Ridley and Dendy		×				×	×		
carduus, Ridley and Dendy ..		×							
flagellifer, Ridley and Dendy		×							Almost cosmopolitan.
†*rudis*, Topsent					×	×	×		
†*bidens*, Topsent					×	×	×		
cucurbitiformis, Kirkpatrick ..						×	×		
phakellioides, Kirkpatrick ..						×	×		
pilosa, Kirkpatrick							×		
†*benedeni*, Topsent					×	×	×		
arcuarius, Topsent				×					
†*Gelliodes spongiosus*, Topsent ..					×	×			
kerguelensis, Hentschel ..		×							
†*Microxina charcoti*, Topsent ..					×	×			
DESMACIDONIDÆ.									
Isodictya setifer, Topsent					×	×	×		
kerguelensis (Ridley and Dendy)		×							
antarctica (Kirkpatrick) ..						×			
†*cactoides* (Kirkpatrick) ..						×			
†*spinigera* (Kirkpatrick) ..						×			
†*verrucosa* (Topsent)						×			Burdwood Bank.
trigona (Topsent)			×		×				
erinacea (Topsent)					×				
†*kirkpatricki* (Topsent)			×			×			
†*cavicornuta*, Dendy					×				New Zealand.
obliquidens (Hentschel) ..							×		
kerguelensis var. *simillima* (Hentschel)							×		
doryphora (Brøndsted)						×			

LIST OF ANTARCTIC SPECIES—*continued.*

	Marion Is.	Kerguelen.	South Georgia.	South Orkneys.	Graham Land.	Victoria Land.	Wilhelm Land.	Coats Land.	Extra-Antarctic Distribution.
†*Desmacidon fruticosa* (Montagu)						×			Europe, S. Africa (Burton MSS.), Australia.
†*Plumocolumella meandrina* (Kirkpatrick)						×			
†*cribriporosa*, sp. n.						×			
†*Cercidochela lankesteri*, Kirkpatrick						×	×		
Guitarra fimbriata, Carter ..					×		×		Almost cosmopolitan.
Hoplokithara dendyi, Kirkpatrick						×	×		
MYCALEÆ.									
Esperiopsis villosa (Carter) ..						×			Atlantic, New Zealand.
Amphilectus edwardii (Bowerbank)							×		Atlantic, S. Africa, New Zealand.
†*rugosa* var. *major* (Hentschel)							×		
scotiæ (Topsent)								×	
Mycale magellanica (Ridley) ..						×			Burdwood Bank, S. America.
†*acerata*, Kirkpatrick					×	×	×		
acerata var. *sphærulosa*, Hentschel							×		
†*pellita*, Topsent..						×			Burdwood Bank.
†*tridens*, Hentschel					×	×	×		
antarctica, Hentschel							×		
rossi, Hentschel							×		
gaussiana, Hentschel							×		
Biemna macrorhaphis, Hentschel..							×		
†*Desmacella vestibularis* (Wilson)..						×			S. Pacific, S. Africa, New Zealand.
Artemisina apollinis (Ridley and Dendy)		×			×	×	×		N. Atlantic.
plumosa, Hentschel							×		
Asbestopluma belgicæ, Topsent ..					×				
callithrix, Hentschel							×		
calyx, Hentschel							×		
†*Chondrocladia clavata*, Ridley and Dendy						×			Fiji Is.
antarctica, Hentschel							×		
Phelloderma radiatum, Ridley and Dendy							×		S. America.
†*Acanthorhabdus fragilis*, sp. n. ..						×			
†*Chondropsis chaliniformis* (Carter)						×			Australia.
CLATHRIÆ.									
†*Axociella nidificata* (Kirkpatrick)						×			
†*flabellata* (Topsent)					×	×			
Clathria pauper, Brøndsted ..						×			
Raspailia irregularis, Hentschel ..							×		
†*Pseudanchinoë toxiferum* (Topsent)					×	×			Gough Is.

LIST OF ANTARCTIC SPECIES—*continued*.

	Marion Is.	Kerguelen.	South Georgia.	South Orkneys.	Graham Land.	Victoria Land,	Wilhelm Land.	Coats Land.	Extra-Antarctic Distribution.
HYMEDESMIEÆ.									
Hymedesmia exigua, Kirkpatrick..						×			
rufa (Kirkpatrick)					×	×			
areolata, Thiele						×			Chile.
simillina var. *antarctica*, Hentschel							×		
dermata var. *antarctica*, Hentschel							×		
leptochela, Hentschel							×		
gaussiana, Hentschel							×		
fristedti (Topsent)					×				
†*unguifera*, sp. n.						×			
†*Rhabderemia coralloides*, Dendy..						×			New Zealand.
†*Plocamia gaussiana*, Hentschel ..						×	×		
Myxilla incrustans (Johnston) ..						×			
spongiosa (Ridley and Dendy)						×			Patagonia.
spongiosa var. *asigmata*, Topsent					×	×	×		
australis (Topsent)					×				
†*elongata*, Topsent					×	×			
magna, Topsent					×				
pistillaris, Topsent					×				
Lissodendoryx decepta, Kirkpatrick						×			
styloderma, Hentschel							×		
antarctica, Hentschel							×		
†*flabellata*, sp. n...						×			
†*innomata*, sp. n.						×			
Ectyomyxilla mariana, Ridley and Dendy		×							
mariana var. *tylacantha*, Hentschel							×		
†*kerguelensis*, Hentschel ..		×				×			New Zealand.
hentscheli, sp. n.							×		
Ectyodoryx nobilis, Ridley and Dendy									
nobilis var. *plumosa*, Hentschel							×		
frondosa, Ridley and Dendy ..									
frondosa var. *anacantha*, Hentschel							×		
ramilobosa (Topsent)					×	×			
Myxodoryx hanitschi (Kirkpatrick)					×	×	×		
†*Anchinoë latrunculioides* (Ridley and Dendy)					×	×	×		S. America, S. Africa.
Kirkpatrickia variolosa (Kirkpatrick)						×			
coulmani (Kirkpatrick) ..						×			

LIST OF ANTARCTIC SPECIES—*continued*.

	Marion Is	Kerguelen.	South Georgia.	South Orkneys.	Graham Land.	Victoria Land.	Wilhelm Land.	Coats Land.	Extra-Antarctic Distribution.
†*Inflatella belli* (Kirkpatrick) ..						×	×		New Zealand.
CRELLEÆ.									
Crella crassa (Hentschel)							×		
stylifera, Hentschel							×		
Crellina tubifex, Hentschel ..							×		
Acanthoxa werthi, Hentschel ..							×		
TEDANIEÆ.									
Tedania charcoti, Topsent ..						×			Burdwood Bank.
†*oxeata*, Topsent					×	×			
†*Paratedania tarantula* (Kirkpatrick)					×	×	×		
IOPHONEÆ.									
Iophonopsis radiatus (Topsent) ..					×	×	×		
AXINELLIDÆ.									
Hymeniacidon kerguelensis, Hentschel		×							S. Africa.
centrotyla, Hentschel							×		
torquata, Topsent					×				
Thrinacophora simplex, Topsent ..					×				
†*Rhizaxinella australiensis*, Hentschel						×			Australia, S. Africa.
†*Homaxinella supratumescens*, Topsent					×	×	×		
CLAVULIDÆ.									
†*Latrunculia apicalis* var. *biformis*, Ridley and Dendy						×			
apicalis var. *basalis*, Kirkpatrick						×			
lendenfeldi, Hentschel							×		
†*Hemiastrella digitata*, sp. n. ..						×			
SUBERITIDÆ.									
Stylocordyla borealis subsp. *globosa* (Ridley and Dendy)		×					×		
†*borealis* subsp. *acuata* (Kirkpatrick)						×	×		
borealis subsp. *irregularis*, Hentschel							×		
Suberites massa (Nardo)		×			×				Europe, W. Indies, S. America, Mauritius.
microstomus, Ridley and Dendy		×				×			
microstomus var. *stellatus*, Kirkpatrick						×	×		
†*papillatus* (Kirkpatrick) ..					×	×			
mollis, Ridley and Dendy ..		×							
caminatus, Ridley and Dendy		×							

LIST OF ANTARCTIC SPECIES—*continued.*

	Marion Is.	Kerguelen.	South Georgia.	South Orkneys.	Graham Land.	Victoria Land.	Wilhelm Land.	Coats Land.	Extra-Antarctic Distribution.
†*Pseudosuberites hyalinus* (Ridley and Dendy)					×	×			Europe, Red Sea, Patagonia.
†*exalbicans*, Topsent						×			Gough Is.
†*Suberella topsenti*, sp. n.						×			Burdwood Bank.
†*Polymastia invaginata*, Kirkpatrick						×	×		
insidis var. *simplex*, Hentschel							×		
†*Sphærotylus antarcticus*, Kirkpatrick						×	×		
schœnus (Sollas)						×	×		
EUCERATOSA.									
†*Aplysina minima*, Hentschel ..						×	×		
†*Hircinia variabilis*, Schulze ..						×			Almost cosmopolitan.
†*Spongelia oculata*, *sp.n.*						×			
†*Dendrilla membranosa* (Pallas) ..					×	×	×		Indian Ocean, Australia.

IV.—SYSTEMATIC NOTES AND DESCRIPTION OF SPECIES.

ORDER CALCAREA.

IT is questionable whether sufficient allowance has been made hitherto for the individual variations in external form or in the shape and size of the spicules of calcareous sponges. Particularly is this so in the case of the Antarctic sponges described by Jenkin (1908). In studying the "Terra Nova" collections, particular attention has been paid to the variations of this kind, with Minchin's notes as a guide, with the result that it has been possible to reduce the number of valid species considerably.

FAMILY HOMOCOELIDÆ.

Leucosolenia botryoides (Ellis and Solander).

Spongia botryoides, Ellis and Solander 1786, p. 190, pl. lviii, figs. 1–4 : *S. complicata*, Montagu 1912, p. xcvii, pl. ix, figs. 2, 3 : *Leucosolenia variabilis*, Haeckel 1869*a*, p. 243 : *Ascandra botrys*, Haeckel 1872, p. 101, pl. xvi, figs. 1 *a–f* : *Leucosolenia lucasi*, Dendy 1891, p. 45, pl. i, fig. 1, pl. iv, fig. 1, pl. ix, fig. 1 : *L. discoveryi*, Jenkin 1908, p. 6, pl. xxviii, figs. 12–13 : *L. minchini*, Id. i, p. 8, pl. xxviii, figs. 14–15 : *L. incerta*, Urban, 1909, p. 5, pl. i, fig. 1.
(For further synonymy see Dendy and Row 1913, pp. 721–723.)

The seven species enumerated above are remarkably similar in external form and possess the same categories of spicules, and the only reason for their separation has been the differences spicule-size and in the general appearance of the sponge.

Nevertheless, according to Minchin (l.c.), both of these are extremely variable in at least three of the species so that I feel convinced that all the seven so-called species are nothing more than forms of the same species growing in differing habitats. Certainly those forms recorded by Jenkin (l.c.) from the Antarctic under the names *L. complicata*, *L. discoveryi* and *L. minchini* belong to one species.

Leucosolenia coriacea (Montagu).

Spongia coriacea, Montagu 1818, p. 116: *Leucosolenia lamarckii*, Haeckel 1869*a*, p. 243: *Prosycum primordialis*, Id. l.c., p. 236.
(For further synonymy see Dendy and Row 1913, pp. 725–726.)

I regard these three species as forms of a single species for the reasons given under *L. botryoides*. In fact, after examining a number of specimens of all three, it is hard to see why the distinction was ever made.

Family LEUCALTIDÆ.

Leucettusa lancifer, Dendy.

L. lancifer, Dendy 1924, p. 278, pl. i, figs. 11–18.

Occurrence.—Reg. 41, 42, stn. 220, off C. Adair, 45–50 faths.: Reg. 48, stn. 331, McMurdo Sound, 250 faths.

Family GRANTIIDÆ.

Grantia hirsuta (Topsent).

Leucandra hirsuta, Topsent 1907β, p. 541; Id. 1908, p. 7; *L. cirrata*, Jenkin 1908, p. 18, pl. xxxi, figs. 54–56: *Grantia tenuis*, Urban 1909, p. 14, pl. ii, figs. 43–55, pl. iii, figs. 1, 2: *G. tenuis*, Dendy and Row 1913, p. 760: *Leucandra cirrata*, Id. l.c., p. 770: *L. hirsuta*, Id. l.c., p. 770: *Grantia cirrata*, var. *auroræ*, Dendy 1918, p. 11: *G. tenuis*, Id. l.c., p. 12.

The species is particularly variable in respect of the various categories of oxea, so that it is small wonder that it should have been described under several different names. I have been able to examine the types of *Leucandra cirrata* and its var. *auroræ* and, after comparison with the very full descriptions originally given of *L. hirsuta* and *Grantia tenuis*, have little hesitation in including them under one name.

Grantia chartacea (Jenkin).

Dermatreton chartaceum, Jenkin 1908, p. 22, pl. xxvii, fig. 5, pls. xxxi, xxxii: *D. hodgsoni*, Id. l.c., p. 23, pl. xxvii, fig. 1, pl. xxxii, figs. 65–74: *Tenthrenodes scotti*, Id. l.c., p. 10, pl. xxvii, fig. 9, pls. xxviii, xxix: *Grantia chartacea*, Dendy and Row 1913, p. 759: *G. hodgsoni*, Id. l.c., p. 760: *G. scotti*, Id. l.c., p. 760.

I have examined the types of these three species and can see no reason for separating them.

Achramorpha truncata (Topsent).

Grantia truncata, Topsent 1908, p. 6, pl. v, fig. 4.

Occurrence.—Reg. 250, stn. 339, off McMurdo Sound, 140 faths.

The collection contains a fragmentary vase-shaped specimen of this species. The agreement between it and the holotype is very close.

It may well be doubted whether all four species of this genus from the Antarctic represent anything more than forms of one species.

Megapogon villosus, Jenkin.

Megapogon villosus, Jenkin 1908, p. 37, pl. xxxvi, figs. 115–119 : *M. raripilis*, Id. l.c., p. 38, pl. xxxvii, figs. 120–124 : *M. pollicaris*, Id. l.c., p. 40, pls. xxxvii, xxxviii, figs. 125–130 : *M. crispatus*, Id. l.c., p. 41, pl. xxvii, fig. 2, pl. xxxviii, figs. 131–136.
(For further synonymy see Dendy and Row 1913, p. 768.)

I see no reason to regard the "Discovery" sponges, which Jenkin divided into four species of *Megapogon*, as anything more than simple varieties of a single species.

Genus LEUCONIA, Grant (1833).

Genotype : *Spongia nivea*, Grant.

Considerable doubt exists as to whether this genus should be known as *Leuconia* or *Leucandra*. Several authors have persisted in the use of the former name (e.g. Bowerbank 1864, Gray 1867, Poléjaeff 1884, and Urban 1909), but none have thought it worth while to mention the original reference to the genus. Haeckel (1872) founded the genus *Leucandra*, in which he included *Leuconia nivea*, without reference to the genus *Leuconia* itself. Dendy and Row 1913 adopted Haeckel's nomenclature, again without comment. On the other hand, as Dr. G. P. Bidder has pointed out to me, Vosmaer 1887 states, "Der Name *Leuconia* ist schon 1825 einem Mollusken vergeben." No reference is given and I have been unable, even with the kind assistance of Mr. C. D. Sherborn, to discover where the name was used. In the circumstances, therefore, we must revert to Grant's name *Leuconia*.

Leuconia levis, Poléjaeff.

L. levis, Poléjaeff 1884, p. 58, pl. vii, fig. 4.

Occurrence.—Reg. 50, stn. 339, off McMurdo Sound, 140 faths.

Leuconia frigida (Jenkin).

Leucandra frigida, Jenkin 1908, p. 15, pl. xxvii, fig. 6, pls. xxix, xxx : *L. brumalis*, Id. l.c., p. 16, pl. xxx, figs. 41–43 : *L. gelatinosa*, Id. l.c., p. 17, pl. xxx, figs. 44–53 : *L. mawsoni*, Dendy 1918, p. 13, pl. i, figs. 5, 10.

Leuconia joubini (Topsent).

Leucandra joubini, Topsent 1907β, p. 542 ; Id. 1908, p. 9 : *Leucetta macquariensis*, Dendy 1918, p. 9, pl. i, figs. 3, 8.

There appears to be no valid reason for separating Dendy's Macquerie Island species from *Leuconia joubini* (Topsent).

Family LEUCASCIDÆ.

Leucetta leptoraphis (Jenkin). (Pl. V, figs. 1–4.)

Leucandra primigenia var. *leptoraphis*, Jenkin 1908, p. 14, pl. xxix, figs. 33–34: *Leucetta antarctica*, Dendy 1918, p. 8, pl. i, figs. 2–7.

Occurrence.—*Reg. 34, 35, 38, stn. 331, off McMurdo Sound, 250 faths.: Reg. 36, stn. 220, off C. Adair, 45–50 faths.: Reg. 37, stn. 339, off McMurdo Sound, 140 faths.: Reg. 39, stn. 314, Inaccessible Is., 222–241 faths.: Reg. 40, stn. 194, off Oates Land, 180–200 faths.

The Antarctic forms described by Jenkin (l.c.) undoubtedly represent a species quite distinct from *L. primigenia* (Haeckel). The external form is extremely variable and ranges from simple or branching tubes to massive forms with numerous vents scattered over the surface. In the tubular forms, the centre of the sponge is occupied by a wide pseudogaster running from the base to the oscule at the apex. In the massive forms, the exhalant currents are conveyed by numerous smaller canals which penetrate the sponge in various directions but running generally from the base to the oscula on the surface. The massive sponges are undoubtedly derived from the simple, tubular forms by repeated branching and coalescence.

The colour, in spirit, varies from greyish-white to olive-green, or even pink.

The nuclei of the collared cells are basal.

Embryos, in the blastosphere stage, are present in large quantities in some of the specimens.

Order HEXACTINELLIDA.

Family ROSSELLIDÆ.

Genus ROSSELLA, Carter.

Genotype: *Rossella antarctica*, Carter.

Synonymy:—Aulorossella, Kirkpatrick 1907*a*, p. 14: *Anaulosoma*, Id. l.c., p. 20.

Reasons for including Kirkpatrick's two genera in the genus *Rossella* will be found below under *R. nuda*, Topsent.

The Antarctic representatives of this genus have been held to number hitherto some twenty-four species, subspecies and varieties. In my opinion, undue importance has been attached to small variations in spicule size and form, and to small variations in the external form. It is doubtful whether the species of *Rossella* found in the Antarctic number more than four.

After examining a considerable amount of material I consider it probable that

* All the Terra Nova sponges have been entered in the British Museum catalogue under the registered numbers 26.10.26. 1, 26.10.26. 2, &c. To obtain the full registered number of any given specimen it is necessary to add 26.10.26 to the number given in this report (e.g. Reg. 34, &c.).

the spicules of the Hexactinellida are more variable than those of other groups of sponges. The rays of the parenchymal hexactins and diactins may be wholly or partially spined or entirely smooth, and sharply or obtusely pointed; the gastralia, which are normally pentactin, may be occasionally hexactin or even, rarely, stauractin. The spicule-forms known as holo-, hemi-, and monoxyasters are simply examples of the degree to which an oxyaster may vary, and one, two, or all three forms may be found in different individuals of a single species. The capitulum may or may not be present in the calycocomes and its presence or absence does not appear to have any taxonomic significance. The numerical proportions of the different types of spicules have sometimes been used as a basis for specific distinction (Schulze and Kirkpatrick 1910*a*, p. 31). The mere fact that of two categories of spicules, the first is predominant in one individual and the second predominant in another does not imply a specific or even varietal difference, since the numerical proportions may vary widely within the limits of species whose integrity is unquestioned. Occasionally one form of spicule is abundantly present almost to the exclusion of other forms, or it may be almost entirely absent. This holds true for both megascleres and microscleres.

The four Antarctic species and their subspecies recognised in this report resemble each other so closely in size and shape of spicules that it is necessary to look elsewhere for good specific characters. These are to be found in the nature and disposition of the pentactin dermalia and basalia.

Key to the Antarctic species of Rossella.

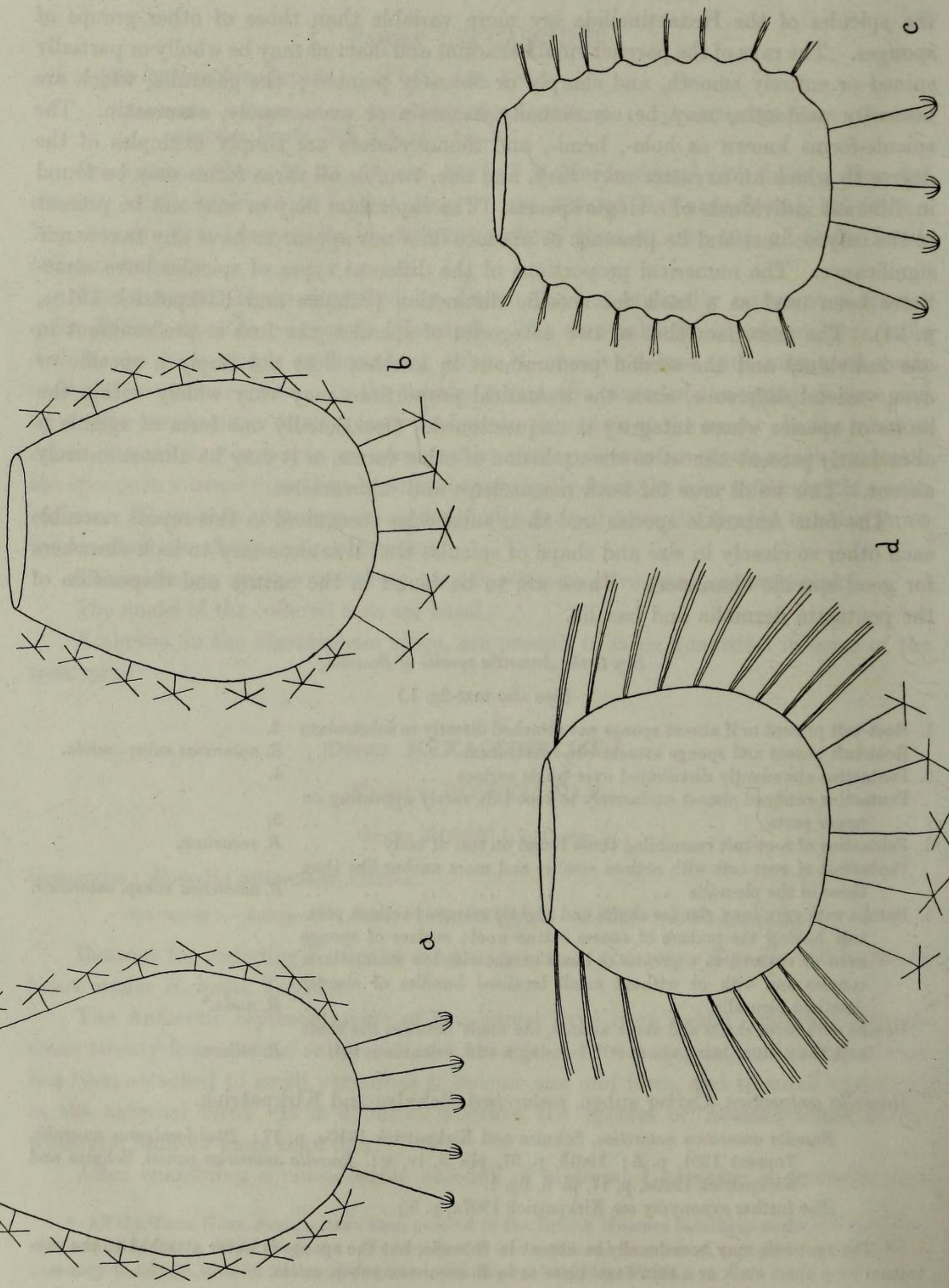
(See also text-fig. 1.)

1. Root-tuft present or if absent sponge not attached directly to substratum	2.
Root-tuft absent and sponge attached to substratum	*R. antarctica* subsp. *solida*.
2. Pentactins abundantly distributed over whole surface	4.
Pentactins confined almost exclusively to root-tuft, rarely appearing on upper parts	5.
3. Pentactins of root-tuft resembling those found on rest of body	*R. racovitzæ*.
Pentactins of root-tuft with actines smaller and more anchor-like than those of the pleuralia	*R. antarctica* subsp. *antarctica*.
4. Basalia with very long, slender shafts and slightly recurved actines, root-tuft having the texture of coarse cotton-wool; surface of sponge even or covered to a greater or lesser extent with low mammiform conules and with or without small localised bundles of slender diactinal pleuralia	*R. nuda*.*
Basalia with stout shafts and short actines, the angle between the shaft and the actines being about 90°, forming a stiff, erinaceous tuft ..	*R. villosa*.

Rossella antarctica, Carter subsp. *antarctica*, Schulze and Kirkpatrick.

Rossella antarctica antarctica, Schulze and Kirkpatrick 1910*a*, p. 17 : *Rhabdocalyptus australis*, Topsent 1901, p. 6; 1901*δ*, p. 37, pls. ii, iv, v : *Rossella antarctica gaussi*, Schulze and Kirkpatrick 1910*a*, p. 17, pl. ii, fig. 1.
(For further synonymy see Kirkpatrick 1907*a*, p. 5.)

* The root-tuft may occasionally be absent in *R. nuda*, but the sponge is never attached to the substratum by a short stalk or a thin basal plate as in *R. antarctica* subsp. *solida*.



TEXT-FIG. 1.—Diagram illustrating the shape of the body and the nature of the dermalia and basalia in (*a*) *Rossella antarctica*; (*b*) *R. racovitzæ*; (*c*) *R. nuda*; and (*d*) *R. villosa*.

Occurrence.—Reg. 57, stn. 356, off McMurdo Sound, 50 faths. : Reg. 80, 81, 82, McMurdo Sound (depth unknown) : Reg. 83, stn. 194, off Oates Land, 180–200 faths. : Reg. 210, 211, 212, stn. 316 , off McMurdo Sound, 190–250 faths. : Reg. 213, stn. 331, off McMurdo Sound, 250 faths.

Diagnosis.—The hypodermal pentacts, with long, prominent actines, project well beyond the ectosome forming a velum ; there is a palisade of vertically projecting diacts around the margin of the osculum ; the discohexasters have slender rays not differentiated into two categories ; the basalia are smaller than the pleuralia and are altogether different in character ; (the asexual ?) buds are small and become detached from the parent at an early stage in development. (See text-fig. 1 *a*.)

Remarks.—The species is obviously extremely variable, particularly in the characters of the smaller spicules (*vide* Kirkpatrick 1907*a*, pl. 4, figs. 2, 3, and Schulze and Kirkpatrick 1910*a*, pl. 1, fig. 2). It is idle therefore to insist on small variations in this and other members of the genus *Rossella* as indications of the existence of distinct species, subspecies or varieties.

The main and, in fact, the only difference between the typical form of *R. antarctica antarctica* and *R. antarctica gaussi* is, according to Schulze and Kirkpatrick (1910*a*, p. 18), that the primary rays of the calycocomes measure 0·012–0·016 mm. long and 0·003 mm. thick in the former and 0·018–0·022 mm. long and 0·0028–0·003 mm. thick in the latter. The " Gauss " specimens are very obviously young individuals of subsp. *antarctica*.

Rhabdocalyptus australis Topsent is clearly a synonym of the same subspecies.

Rossella racovitzæ, Topsent. (Pl. I.)

Rossella racovitzæ, Topsent 1901, p. 5 ; Id. 1901δ, p. 33, pl. i, fig. 5, pl. iv, figs. 1–7 : *R. podagrosa*, Kirkpatrick 1907*a*, p. 11, pl. iii, figs. 2–3, pl. v, fig. 1 : *R. hexactinophila*, Id. l.c., p. 12, pl. iii, fig. 4, pl. vi, fig. 1 : *R. racovitzæ*, Id. l.c., p. 14, pl. i, fig. 5, pl. iv, figs. 1–7 : *R. racovitzæ racovitzæ*, Schulze and Kirkpatrick 1910*a*, p. 20, pl. iii, fig. 2 : *R. racovitzæ minuta*, Schulze and Kirkpatrick 1910, p. 296 ; 1910*a*, p. 21, pl. iii, fig. 1 : *R. gaussi*, Schulze and Kirkpatrick 1910, p. 297 ; 1910*a*, p. 23, pl. iv, figs. 1–2 : *R. lynchnophora*, Schulze and Kirkpatrick 1910, p. 298 ; 1910*a*, p. 25, pl. iii, fig. 4 : *R. fibulata*, Schulze and Kirkpatrick 1910, p. 298 ; 1910*a*, p. 27, pl. vii, fig. 2 : *?R. sp.*, Schulze and Kirkpatrick 1910*a*, p. 29, pl. iii, fig. 5 : *R. mixta*, Schulze and Kirkpatrick 1910, p. 299 ; 1910*a*, p. 29, pl. iii, fig. 3 : *R. racovitzæ*, Topsent 1917, p. 9, pl. iv, figs. 7–8 : *R. racovitzæ microdiscina*, Id. l.c., p. 12, pl. iv, fig. 10, pl. v, fig. 5 : *R. podagrosa*, Id. l.c., p. 14 : *R. podagrosa tenuis*, Id. l.c., p. 15.

Occurrence.—Reg. 53, 54, 208, 209, 282, stn. 316, McMurdo Sound, 190–250 faths. : Reg. 60, 88, 89, stn. 194, off Oates Land, 180–200 faths. : Reg. 59, stn. 314, McMurdo Sound, 222–241 faths. : Reg. 55, stn. 355, off McMurdo Sound, 300 faths. : Reg. 61, stn. 331, McMurdo Sound, 250 faths. : Reg. 67, stn. 339, off McMurdo Sound, 140 faths.

Diagnosis.—The hypodermal pentacts form a velum but are more sparsely distributed and the velum less dense than in *R. antarctica antarctica ;* there is no definite palisade or fringe of vertically directed diacts around the margin of the oscule, but long

diacts, usually distributed singly, project beyond the feebly-formed velum especially in the adult, where they are found particularly towards the upper portions of the sponge projecting outwards and upwards; the rays of the discohexasters are differentiated into two categories; the basalia resemble the pleuralia in size and shape; the (asexual ?) buds are large and remain attached to the parent until a comparatively late stage in development. (See text-fig. 1 *b*.)

Remarks.—The original types of this species illustrate the external form very well (cf. also fig. 1 *b*). According to Topsent (1901δ, p. 34) there is no velum in the type specimens for "ses pentacts hypodermiques, au lieu de dépasser la surface, restent constamment implantés dans l'épaisseur de son ectosome." The same holds true for the single specimen described by Kirkpatrick (l.c.). The fourteen examples described by Schulze and Kirkpatrick (1910*a*) possessed a velum formed by the hypodermal pentacts, which "treten mehr oder weniger heraus und bilden ein undeutliches Velum." The last-named authors (l.c.) appear to have held the view that the absence or presence of a velum in species of Rossella is of no taxonomic importance, and all available evidence supports this view. In *R. antarctica* the degree to which a velum may be developed varies, but I have not seen a specimen in which it is entirely absent. In *R. nuda* (*vide infra*) it is characteristically absent and, so far as I have observed, is not even represented by occasional pentacts protruding from the apices of the surface conules. In *R. villosa* sp.n., it is characteristically absent but may be represented by the few pentacts which are occasionally found associated with the surface bundles of diacts. The four species form a series which illustrates how a single character may be developed to different degrees of intensity in different species of a single genus, a fact not generally, or sufficiently, recognised. Thus, in *R. antarctica* the velum may be strongly or feebly developed; in *R. racovitzæ* feebly developed or absent; in *R. villosa* it is characteristically absent or represented by a few isolated pentacts; while *R. nuda* is entirely without a velum throughout the species. The surface in *R. racovitzæ* is usually conulose, though not to the same extent as in *R. nuda*, but it may be smooth and even.

It is obvious from even a casual examination that the various species and subspecies included in the above list as synonyms of *R. racovitzæ*, form a compact group of very closely allied forms. When, as now, it is seen that such differences in spicule-form as have been used in the diagnosis of these species and subspecies are but normal variations, there can be no question of maintaining such distinctions.

Apart from the negligible differences in the size of the calycocomes and oxyhexasters of the two species, *R. podagrosa* and *R. hexactinophila* differ in one respect only, that the former has a mixture of hexactin and pentactin autodermalia while the latter has hexactin autodermalia only. This we now know to be of no systematic importance. Both resemble *R. racovitzæ* except in the absence of a velum.

R. racovitzæ racovitzæ and *R. racovitze minuta*, Schulze and Kirkpatrick 1910*a*, (pp. 20–21) differ only in the size of the calycocomes and microdiscohexasters. Subsp.

minuta is certainly nothing more than a young form of the species of which Topsent's types represent the half-grown adults.

R. gaussi and *R. lynchnophora*, the former characterised by "die grosse Häufigkeit der Discohexaster und die Seltenheit der Oxyhexaster" and very slight differences in the size and form of rays of the autogastral hexactins, are obvious synonyms of *R. racovitzæ*. Indeed, Schulze and Kirkpatrick (1910*a*, p. 27) suggested as much with regard to *R. lynchnophora*.

The heterostauractins, -triactins, and -diactins of *R. fibulatus* must be regarded merely as abnormal forms of the oxyhexaster and of no more importance than the similar abnormalities found in all other groups of sponges (cf. *Stelletta crater, infra*). But for these spicules the species differs in no way from *R. racovitzæ*.

Rossella nuda, Topsent. (Pl. II.)

Rossella nuda, Topsent 1901, p. 4; Id. 1901δ, p. 32, pl. i, figs. 7, pl. iv, fig. 8–13: *Hyalascus hodgsoni*, Kirkpatrick 1907*a*, p. 3, pl. iii, fig. 1, pl. iv, fig. 1: *Aulorossella pilosa*, Id. l.c., p. 16, pl. ii, fig. 1, pl. vi, fig. 2: *A. levis*, Id. l.c., p. 17, pl. ii, figs. 2, 3, pl. vi, fig. 3: *A. longstaffi*, Id. l.c., p. 19, pl. ii, fig. 4, pl. vii, fig. 1: *Anaulsoma schulzii*, Id. l.c., p. 21, pl. iii, figs. 5, 6, pl. v, fig. 2: *Aulorossella vanhöffeni vanhöffeni*, Schulze and Kirkpatrick 1910, p. 300; Id. 1910*a*, p. 33, pl. v, fig. 1, pl. vi, fig. 1: *A. vanhöffeni armata*, Id. 1910, p. 301; Id. 1910*a*, p. 36, pl. vi, figs. 2–5: *A. gaini*, Topsent 1917, p. 18, pl. v, fig. 2: *A. aperta*, Id. l.c., p. 20, pl. iv, fig. 4, pl. v, fig. 3.

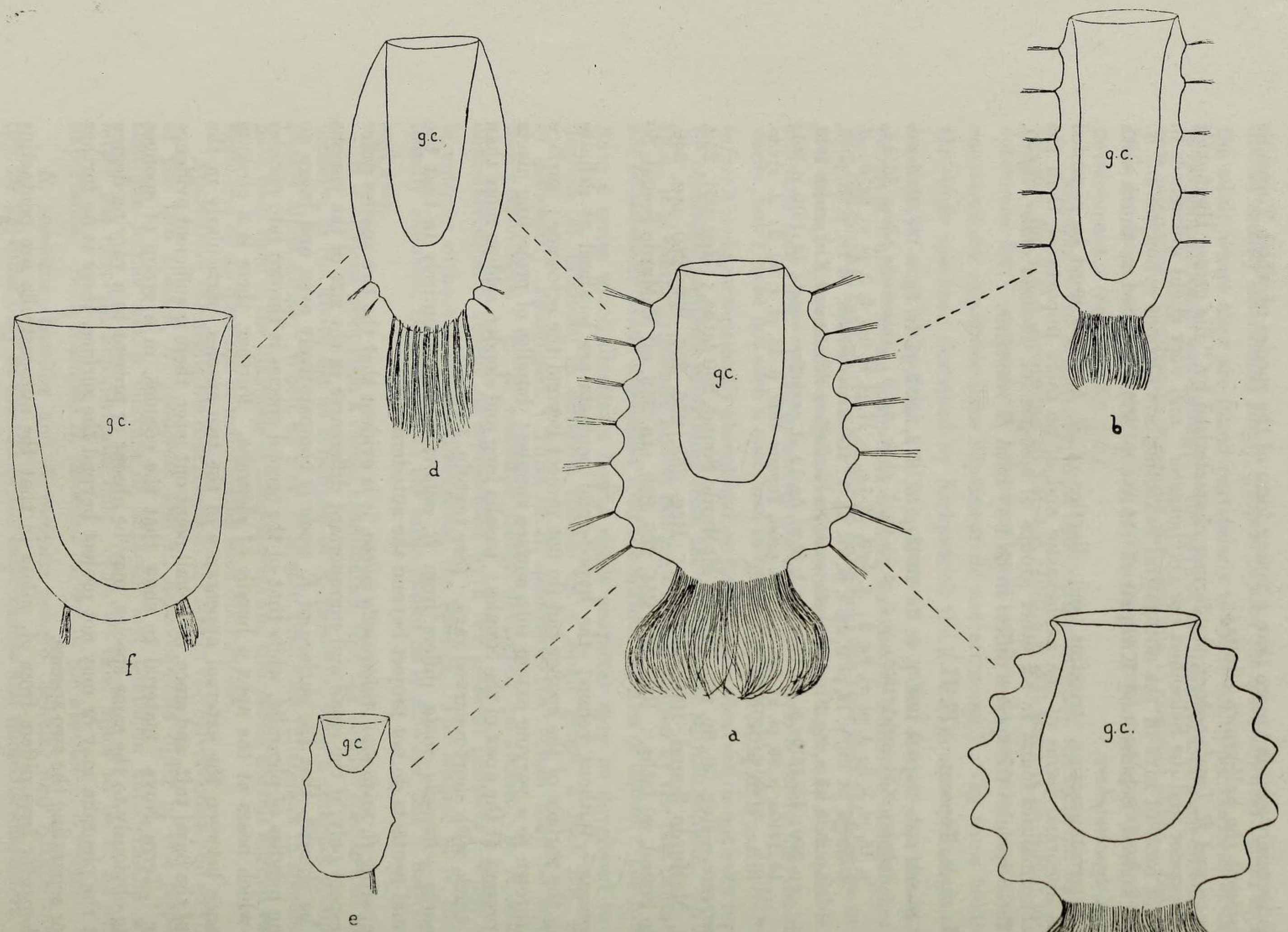
Occurrence.—Reg. 58, 66, stn. 331, off McMurdo Sound, 250 faths.: Reg. 251, 252, stn. 316, McMurdo Sound, 190–250 faths.: Reg. 253, 256, 257, 259, 260, stn. 349, McMurdo Sound, 80 faths.: Reg. 108, 254, 255, 258, stn. 356, off McMurdo Sound, 50 faths.

Diagnosis.—Without velum; the hypodermal pentacts are localised at definite points on the surface of the sponge but do not project beyond the ectosome; surface even or thrown to a varying extent into surface conules; bundles of projecting diacts may be present at the apex of the conules; basalia long and slender, seldom more than 0·1 mm. thick, with short recurved rays. (See text-fig. 1 *c*.)

Remarks.—Rossella nuda differs from *R. antarctica* almost entirely in that the hypodermal pentacts do not project beyond the autodermalia.

Comparing *R. nuda* and *Aulorossella pilosa*, it is evident that the two species differ in one respect only, if the small and unimportant differences in the size of the various spicules be ignored, that the surface of *R. nuda* is comparatively even and bears no projecting bundles of pleuralia, while that of the second species is thrown into conules each of which bears at the apex a bundle of pleuralia. Further, there is a striking resemblance between the external appearance of the two species, particularly in the texture of the basal tuft, and since, as I shall point out later, there is sufficient evidence from the "Terra Nova" material to show that the conules, in a group of sponges belonging obviously to the same species, may be absent or present to a varying degree and that the pleuralia may or may not project beyond the surface, there is no further reason for separating the two species.

Aulorossella levis differs from *A. pilosa* in that the autogastralia are pentactins



TEXT-FIG. 2.—*Rossella nuda*, Topsent. Diagram illustrating the variations in external form met with in the species: (*a*) *pilosa-levis*-form, the most common form and therefore probably the typical form; (*b*) *aperta*-form, with surface conules and the projecting bundles of diactinal pleuralia reduced; (*c*) a form commonly found in the present collection, without projecting pleuralia, but with the surface conules strongly developed; (*d*) *vanhöffeni*-form, with comparatively smooth surface almost devoid of surface conules and of projecting pleuralia; (*e*) *longstaffi*-form, abnormal (possibly pathological) with shallow gastral cavity, no projecting pleuralia and a vestigial basal tuft; (*f*) unusual form found among the "Terra Nova" specimens, without projecting pleuralia or surface conules and with vestigial basal tuft.

instead of hexactins. From my observations, it is certain that these spicules are variable in form and may be pentactin or hexactin, or a mixture of both. On rare occasions they may be reduced to stauractins. Clearly then, *A. levis* is also a synonym of *Rossella nuda*.

Aulorossella longstaffi, on the other hand, differs from *Rossella nuda* in that the surface is thrown into conules, the gastral cavity is shallow and there is no basal tuft. The first difference has been shown to be comparatively insignificant. Regarding the third, there is some evidence that the degree of development of the basal tuft is subject to variation and I am inclined to think that it may occasionally be absent even in more normal individuals of the species. The small size of the gastral cavity appears to be due to the fact that the sponge called *A. longstaffi* by Kirkpatrick is in reality a deformity or " monstrosity " belonging to the species *Rossella nuda* and that the cavity has been to some extent obliterated by hypertrophy of the adjacent tissues. In any case the sponge has so much in common with the other members of the species that I think there can be no doubt as to its identity with *Rossella nuda*.

Aulorossella vanhöffeni vanhöffeni, *A. gaini* and *A. aperta* differ among themselves and from *Rossella nuda* in the degree to which the surface conules and projecting pleuralia are developed and in small differences in the size and shape of the spicules. The comparative account of the morphology of *R. nuda* as here understood, given below, will help to place the differences between these various species in their correct proportion.

A. vanhöffeni armata is obviously a young form of *A. vanhöffeni vanhöffeni* and does not constitute a sub-species. It is worthy of note that in the several specimens assigned by Schulze and Kirkpatrick to *A. vanhöffeni armata* some have surface conules and others have not, so that the variability in this feature is evidently not confined to the adult.

Hyalascus hodgsoni differs from the species already mentioned in the absence of calycocomes. Categories of microscleres may drop out as readily and as frequently in the Hexactinellida as in the Tetraxonida. Some of the present specimens of Rossellidæ not only lack calycocomes but possess remarkably few discohexasters and the absence of one, or even more, categories of microsclere, all other things being equal, is no evidence of the existence of a distinct species or even of a distinct variety (cf. Schulze and Kirkpatrick 1910*a*, p. 14).

Anaulosoma schulzii must be regarded as a synonym of *Rossella nuda*, because the type specimens are nothing more than the papillæ torn from a large specimen, or specimens, of " *Aulorossella levis*." Among the " Terra Nova " Rossellids was a jar of specimens similar in all respects to those described by Kirkpatrick as *Anaulosoma schulzii*, but it was clear that they must be papillæ detached from the large dried specimens so abundantly present in the collection. Actually, I was able to find the exact places, on the larger specimens, from which they had been torn. The surface described by Kirkpatrick as the gastral surface is really the torn surface. This would explain the absence of the hypodermal pentacts, or rather, the apparent absence. The " few

small tufts of diactin basalia extending downwards" are really the bundles of diacts found at the apex of the surface conules in a complete specimen of "*Aulorossella levis*." The apex of the two figured specimens of *Anaulosoma schulzii* is bifid, a character which is rare but not unknown in the conules of these species of *Rossella*, and it is probable that they were selected by the collector for special preservation because of this unusual character. The other two specimens described, but not figured, by Kirkpatrick, are pieces of the dermal surface bearing, in one case, two and, in the other case, several conules.*

The thirteen examples contained in the "Terra Nova" collections show quite clearly that it is impossible to separate the various forms contained in the above synonymy list into separate species or even sub-species. All either belong to or are intermediate between the *pilosa*- or *levis*- forms, or to a new form, shown in fig. 2 *c*, of *R. nuda*, in which the surface is devoid of projecting spicules, except at the base, and is beset with strongly developed conules instead.

Regarding the variation in the development of the surface conules in this species, it is of importance to note that a similar but less clearly-marked variation of the surface exists in *Rossella antarctica* and *R. racovitzæ* but that it is masked by the velum.

In Text-fig. 2, an attempt is made to illustrate the variation in external form found in this species. Fig. 2 *a* shows the most typical form.

Rossella villosa, **sp. n.** (Pl. III.)

Diagnosis.—Without velum but occasional, isolated, projecting pentactins may be seen associated with the surface bundles of diacts; the surface may or may not be conulose, but is always covered by projecting bundles of stout diacts; basalia stout without short actines, never less than 0·2 mm. in thickness and usually between 0·3 and 0·4 mm. thick. (See text-fig. 1 *d*.)

Occurrence.—Reg. 261–278, stn. 349, McMurdo Sound, 80 faths.: Reg. 279–281, stn. 194, off Oates Land, 180–200 faths.

Remarks.—The holotype, the largest of the twenty specimens, is a typical example of the species, sac-shaped, more or less spherical in outline, with a capacious gastral cavity. It has a total height of 30 cms. including the basal root-tuft, is 16 cms. in diameter at the widest point and bears an apical oscule measuring 8 cms. in diameter. The porcupine-like appearance is due to numerous bundles of long diacts, each containing about 6 spicules, which beset the entire surface, projecting outwards and slightly downwards. The diacts are usually about 13 cms. long, of which 9 cms. project beyond the ectosome, while the diameter at the centre of the spicule averages 0·3 mm. A single, occasional pentactin may be seen among the diacts. The surface is even or raised into low conules at the bases of the pleuralia. All specimens are dry and in every case

* In fairness to Kirkpatrick it must be confessed that the appearance of these papillæ is misleading and that I had spent nearly a whole day in unsuccessful attempts to identify them before the truth as to their exact nature occurred to me.

the oscular region has been slightly damaged. From the remains of broken spicules in this region, however, it appears that the sponge possessed a palisade of vertically directed diacts around the lip of the osculum, very much as in *R. antarctica antarctica*. The basalia are pentactins with stout shafts and actines directed at right-angles to the shafts. The dimensions of a single spicule are, shaft 18 cms. long and 0·4 mm. thick, actines, very variable, but frequently 1·5 mm. long.

The rest of the spiculation approximates very closely to that of *R. nuda :* in fact, I have been unable to find a single feature in the spiculation upon which a distinction between the two species might be founded. In the adult state, at all events, the present species is quite readily recognised by its distinctive external appearance.

Gymnorossella inermis, Topsent.

G. inermis, Topsent 1916, p. 164 ; Id. 1917, p. 22, pl. i, fig. 1, pl. v, fig. 4.

It is extremely doubtful whether this species is anything more than an aberrant *Rossella* which has neither diactin nor pentactin pleuralia, but which has the hypodermal pentactins confined to the basalia.

Anoxycalyx ijimai, Kirkpatrick.

Anoxycalyx ijimai, Kirkpatrick 1907*a*, p. 23 ; Schulze and Kirkpatrick 1910*a*, p. 44, pl. vii, fig. 1 ; Topsent 1917, p. 26.

Occurrence.—Reg. 73, i, ii, stn. 338, off McMurdo Sound, 207 faths.

Two typical specimens are present, the largest measuring about 2 cms. along the long axis. There are eight specimens of the species in the British Museum Collection and I find on examination that the character of the autodermalia is not constant. In the holotype they are chiefly stauractins, in the present specimens pentactins with a few hexactins and stauractins.

To the notes on the development of this species given by Schulze and Kirkpatrick (1910*a*, p. 47) the following may be added. Very early in the life of the detached buds a distinction becomes evident in the grouping of the projecting diacts with the formation of circumoral fringe and an aboral tuft. The anchor-like basalia do not appear, as a general rule, until the sponge has attained a length of between 20–30 mm. Regarding the dispersal of these asexually-formed buds, it is obvious that the species producing them will be at a disadvantage as compared with those species which produce a ciliated, free-swimming larva. It may be noted, however, that the density of the buds is approximately the same as the medium in which they live, so that probably their buoyancy is such that they do not readily sink to the bottom until an advanced stage of development is reached and will be, as a consequence, able to make use of the smallest currents as a means of dispersal.

Scolymastra joubini, Topsent.

S. joubini, Topsent 1916, p. 163 ; Id. 1917, p. 27, pl. ii, fig. 4, pl. v, fig. 1.

Occurrence.—Reg. 68–70, stn. 314, McMurdo Sound, 222–241 faths.

But for the difference in the characters of the autodermalia of this species and *Anonycalyx ijimai* Kirkpatrick, there seems little to choose between the two, in which case a generic distinction seems rather superfluous.

Order MYXOSPONGIDA.

Halisarca dujardini, Johnston var. *magellanica*, Topsent.

Halisarca dujardini, Johnston var. *magellanica*, Topsent 1901δ, p. 44, pl. i, fig. 2, pl. vi, figs. 11–14.

Occurrence.—Reg. 238, stn. 339, off McMurdo Sound, 140 faths.

Order TETRAXONIDA.

Sub-order HOMOSCLEROPHORA.

Family PLAKINIDÆ.

Plakina monolopha, Schulze.

P. monolopha, Schulze 1880, p. 407, pl. xx, figs. 1–7.

Lendenfeld (1907*a*, p. 333) recognises two sub-species of *Plakina monolopha*, viz.: subsp. *eurasia* from the Northern Hemisphere and subsp. *antarctica* from the Antarctic. The only difference apparently is that the spicules in the latter are slightly larger.

Plakina trilopha, Schulze.

P. trilopha, Schulze 1880, p. 422, pl. xx, figs. 8–11.

Here again Lendenfeld (1907*a*) recognises a subsp. *antarctica* which he claims to be distinct from the Mediterranean form. Topsent (1901δ), on the other hand, is unable to distinguish between the Mediterranean form and his Antarctic specimens.

The fact that a gap occurs in the distribution of this and the preceding species is probably because they are both somewhat rare sponges and that the South Atlantic has not been so assiduously searched as either the North Atlantic and Mediterranean or the Antarctic.

Family STELLETTIDÆ.

Stelletta maori, Dendy. (Text-fig. 3.)

S. maori, var. *bistellata*, Dendy 1924, p. 291 : *S. sandalinum* Brøndsted 1924, p. 438, fig. 3.

Occurrence.—Reg. 249, stn. 339, off McMurdo Sound, 140 faths.

A comparison of the present specimen and the holotype of *S. maori* with Brøndsted's description of *S. sandalinum* leaves no doubt as to the identity of the two species with one another. The division, partial or complete, of the microscleres into two categories

in the Stellettidæ is too common to justify the erection of a variety purely on these grounds, as in *S. maori* v. *bistellata*.

Stelletta purpurea, Ridley.

Myriastra biformis, Brøndsted 1924, p. 435, fig. 1.
(For further synonymy see Burton 1926.)

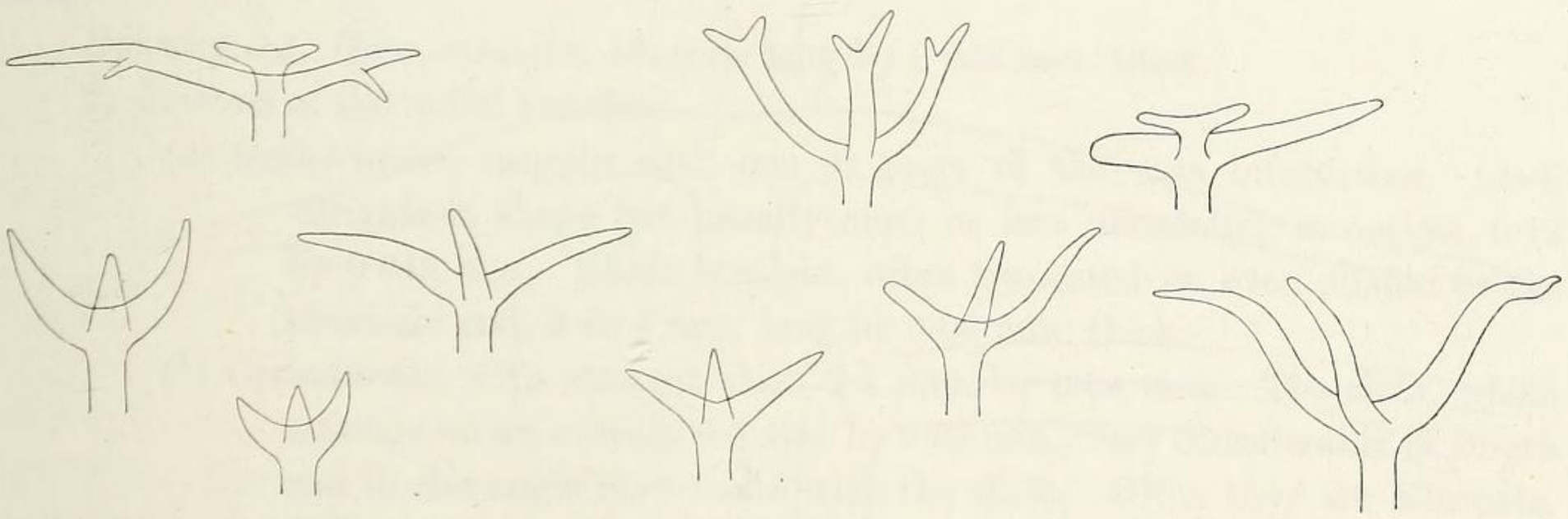
Occurrence.—Reg. 347, stn. 339, off McMurdo Sound, 140 faths.

Myriastra biformis is a typical example of the common species *Stelletta purpurea*.

Stelletta crater, Dendy.

S. crater, Dendy 1924, p. 292, pl. ix, fig. 5, pl. vii, figs. 5–7.

Occurrence.—Reg. 250, stn. 339, off McMurdo Sound, 140 faths.



TEXT-FIG. 3.—*Stelletta maori*, Dendy. Various forms of abnormal cladi found in the triænes of R.N. 249.

Jaspis novæ-zealandiæ, Dendy.

J. novæ-zealandiæ, Dendy 1924, p. 305, pl. vii, figs. 20–23.

Occurrence.—Reg. 283, stn. 339, off McMurdo Sound, 140 faths.

Penares tylotaster, Dendy.

P. tylotaster, Dendy 1924, p. 303, pl. vii, figs. 16–19.

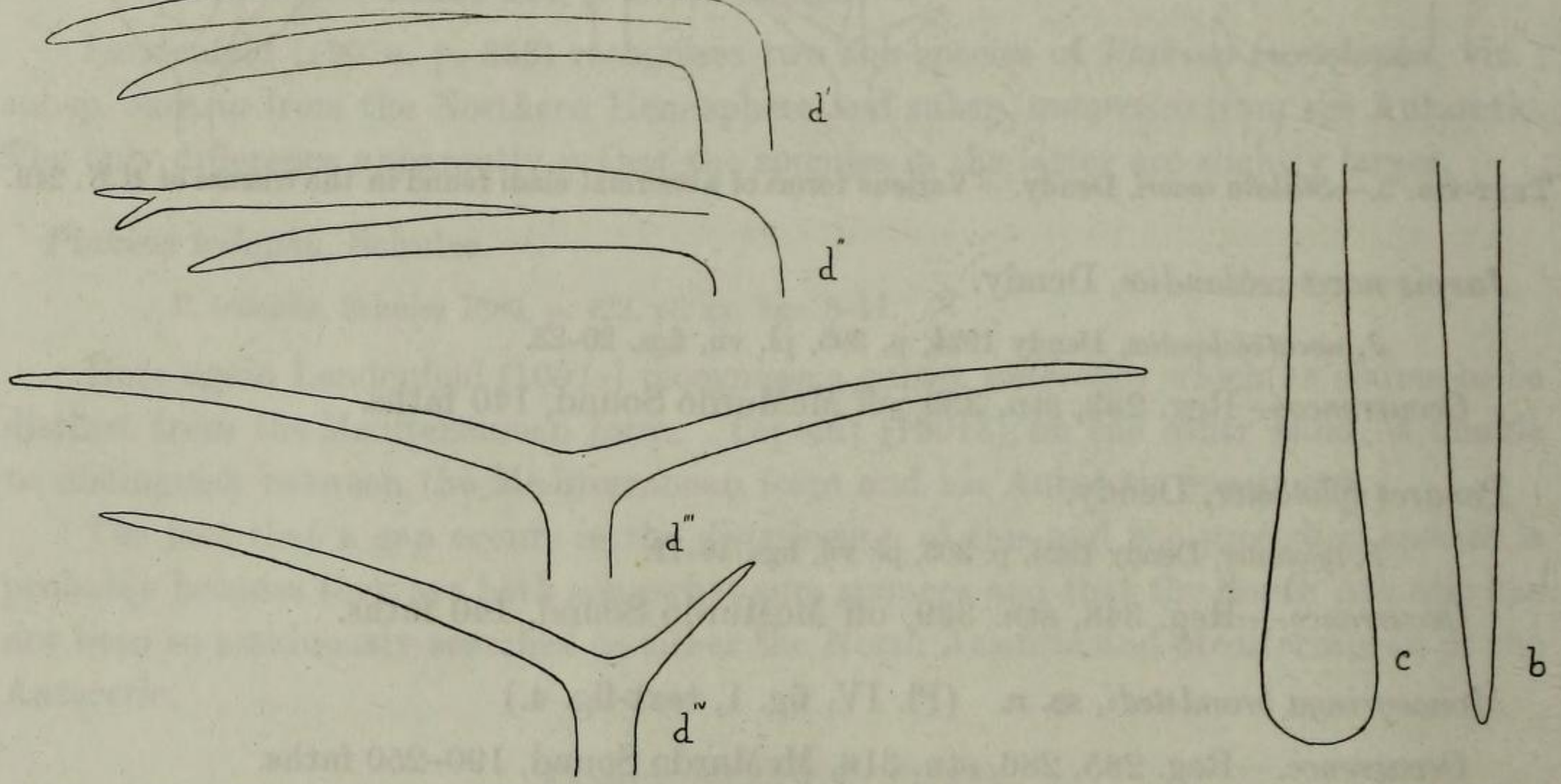
Occurrence.—Reg. 348, stn. 339, off McMurdo Sound, 140 faths.

Monosyringa brondstedi, **sp. n.** (Pl. IV, fig. 1, text-fig. 4.)

Occurrence.—Reg. 285, 286, stn. 316, McMurdo Sound, 190–250 faths.

The holotype Reg. 285 consists of a spherical body, 23 mm. in diameter, from which three oscular tubes are given off, the largest measuring 20 mm. long and 3 mm. in diameter. The latter are very fragile and the ends have been considerably damaged so that it is impossible to decide whether they were closed or open in life. The surface of the sponge is covered with a layer of small pebbles, fragments of polyzoa, and other débris held in position by slender ectosomal processes. The processes are filled with tylasters and the ends are trumpet or funnel-shaped and appear to form adhesive discs

which hold the débris in position on the surface of the sponge. *Monosyringa* (*Tribrachion*) *longispinum* (see Lendenfeld 1907*a*, pl. 24, figs. 6, 7), a closely-related species from the Antarctic, has similar processes but the surface of the sponge is without the coating of débris found in the "Terra Nova" specimens. Brøndsted (1924, p. 442), referring to



TEXT-FIG. 4.—*Monosyringa brondstedi*, sp. n. (*a*) Triænes and diænes of the radial bundles of the body, × 100; (*b*) normal and (*c*) occasional abnormal endings of the shafts of the triænes and diænes of the radial bundles, × 100; (*d*) various forms of cladi found in the diænes of the oscular tubes, × 100.

a third, and again closely-related species from New Zealand, remarks, "the surface of the body is completely covered with sand, fragments of shells, etc.; the sand grains can only with difficulty be removed from the sponge; where they have been there are seen small corresponding hollows in the surface of the sponge."

The pores are difficult to locate but appear to be situated in the " intercladal areas " (see Sollas 1888, p. 154). The walls of the oscular tubes are perforated by groups of pores, each pore about 0·016 mm. in diameter, a precisely similar state of affairs to that found in *Tribrachium schmidtii* (*cf.* Sollas, l.c.), so that it may reasonably be inferred that the ends of the cloacal tubes are closed in life, as in the species of *Tribrachium*.

The cortex is slightly fibrous and 0·5 mm. thick.

The skeleton is radial and composed of bundles of oxea and triænes set at regular intervals with an occasional single triæne between the bundles. The triænes of the body are orthotriænes usually more or less modified to form dichotriænes, anatriænes and orthodiænes. The cortex is abundantly filled with small tylasters while the choanosome contains large quantities of both tylasters and oxyasters. The oscular or cloacal tube is supported by a series of orthodiænes whose rays are usually bifurcated at the ends.

Spicules.—1. *Oxea*, straight, 4·0 mm. long by 0·048 mm. thick.

2. *Triænes* of the radial bundles.

(*a*) *Orthotriænes*, usually with one or more of the rays bifurcating. Cladi variable in shape but usually more or less undulating in outline, 0·72 by 0·048 mm. Shaft, straight, often truncated or even dilated at the proximal end, 3 to 4 mm. long by 0·06 mm. thick.

(*b*) *Orthodiænes*, with straight shaft 2·4 mm. by 0·04 mm. The cladi, which measure on an average 0·5 mm. by 0·05 mm., vary considerably in length and in the angle they make with the shaft. Often they are bifurcate. The average length of a cladus is 0·5 mm. and the thickness 0·05 mm.

(*c*) *Anatriænes*, with straight shaft, 3·0 by 0·022 mm., and cladi 0·12 mm. long.

3. *Orthodiænes*, of the cloacal tube, with straight shaft and gently undulating cladi. Shaft 4·0 mm. long by 0·07 mm. thick. Cladi about 1·5 mm. long by 0·06 mm. thick, usually bifurcating at about 0·5 mm. from the free end.

4. *Chiasters*, with numerous conical, truncate or slightly tylote rays, scattered throughout both cortex and choanosome, 0·012 mm. in diamter.

5. *Choanosomal oxyasters* with from 5 to 20 rays and a diameter up to 0·06 mm.

Numerous embryos are present, almost spherical but slightly longer in one plane, 0·18 by 0·144 mm. The specimen is almost identical in external form with both *Monosyringa* (*Tribrachion*) *longispinum* (Lendenfeld) and *M. mortenseni* Brøndsted, and differs from them only in the shape of the triænes and the sizes of the microscleres.

Family GEODIIDÆ.

Geodinella vestigifera, Dendy.

G. vestigifera, Dendy 1924, p. 313, pl. viii, figs. 29–37.

Occurrence.—Reg. 183, stn. 339, off McMurdo Sound, 140 faths.

Since the present specimen possesses neither large oxea (spicule 4, Dendy l.c.) nor anatriænes, it may be assumed that these spicules found in the holotype were extraneous.

Sub-order SIGMATOSCLEROPHORA.

Family TETILLIDÆ.

Tetilla metaclada (Lendenfeld).

Tethyopsilla metaclada, Lendenfeld 1907, p. 135, pl. xxxiv, figs. 8–16.

Occurrence.—Reg. 339, stn. 339, off McMurdo Sound, 140 faths.

Tetilla leptoderma (Sollas).

T. leptoderma, Sollas 1886, p. 179 : *T. grandis*, Id. l.c., p. 180 : *T. leptoderma*, Id. 1888, p. 3, pl. i, figs. 1–15 : *T. grandis*, Id. l.c., p. 10, pl. v, figs. 1, 2, 4–14 : *T. grandis* var. *alba*, Id. l.c., p. 13, pl. v, fig. 3 : *T. leptoderma*, Lendenfeld 1903, p. 19 : *T. grandis grandis*, Id. l.c., p. 20 : *T. grandis alba*, Id. l.c., p. 21 : *Tethya grandis*, Id. 1907, p. 69, pl. xv, figs. 10–18 : *T. sagitta*, Id. 1907*a*, p. 306, pl. xxi, figs. 1–16 : *Craniella leptoderma*, Kirkpatrick 1908*β*, p. 4, pl. xi, figs. 4–14 : *C. sagitta* var. *microsigma*, Id. l.c., p. 1, pl. iii, figs. 1–13, pl. ix, figs. 15, 16 : *C. sagitta* var. *pachyrrhabdus*, Id. l.c., p. 4, pl. viii, figs. 14, 15, pl. ix, figs. 17–19.

Occurrence.—Reg. 344, stn. 314, McMurdo Sound, 222–241 faths. : Reg. 345, stn. 316, McMurdo Sound, 190–250 faths.

Remarks.—In *Tetilla leptoderma*, *T. grandis*, *Tethya stylifera*, *T. coactifera*, *T. sagitta*, *Craniella sagitta* var. *microsigma*, and *C. sagitta* var. *pachyrrhabdus* we have a group of sponges whose skeletons differ only in the dimensions of the spicules. The suspicion arises, therefore, that they all belong to a single species. The differences in size of the spicules may be ignored since they are not so great as those recorded for all the well-known species of Tetillidæ, such as *Cinachyra barbata*, *Craniella cranium*, etc. On the other hand, there are certain differences in the external form of these six sponges which cannot be ignored.

The holotype of *Tetilla leptoderma* is small and obviously immature and is useless for the purposes of a comparative study of external form. The mature specimens described by Sollas under the name of *T. grandis* fall into two groups : (*a*) Spherical with a pilose surface and without root-tuft, and (*b*) sub-spherical with apilose surface and well-developed root-tuft. The young forms are spherical with or without a pilose surface. *T. leptoderma* resembles the young form of *T. grandis*, therefore. *Tethya stylifera* approaches type (*b*) and *T. coactifera* type (*a*). In describing the last two species, Lendenfeld comments on their close resemblance to *T. grandis*, and it is a remarkable fact that on re-examining his types, I find that they more nearly resemble the holotype of *T. grandis* than do those specimens which he refers to this species in the same memoir. The type-specimens of *Tethya sagitta* represent the immediate post-larval stages of *T. grandis* while *Craniella sagitta* var. *microsigma* corresponds to form (*b*) of the same species. *C. sagitta* var. *pachyrrhabdus* is founded

on a fragment of sponge whose skeleton is practically identical with that of the type of *Tetilla grandis* (= *T. leptoderma*), even to the strongyles and styles on which the variety is founded. These modifications of the radial oxea are not only found in small quantities in the holotype of *T. grandis* but are present in most of the examples of the species I have examined.

Cinachyra barbata, Sollas.

C. barbata, Sollas 1886, p. 183; Id. 1888, p. 23, pls. iii, xxxix; Lendenfeld 1903, p. 27; Kirkpatrick 1905, p. 662; Lendenfeld 1907, p. 138, pl. xv, figs. 40–53; Id. 1907*a*, p. 309, pl. xxiii, figs. 20–23; Kirkpatrick 1908*β*, p. 6, pl. ix, figs. 1–14.

Occurrence.—Reg. 33, stn. 321, off Inaccessible Is., 180–250 faths.: Reg. 101, stn. 356, off McMurdo Sound, 50 faths.: Reg. 102, 341, 342, stn. 314, off McMurdo Sound, 222–241 faths.: Reg. 103, stn. 331, off McMurdo Sound, 250 faths.: Reg. 343, stn. 330, off McMurdo Sound, 140 faths.

It is interesting to note that of the six mature specimens present, four are practically devoid of the characteristic surface pile of projecting spicules and the remainder nearly so. (*Cf. Polymastia invaginata* below.)

Cinachyra antarctica (Carter).

Tethya antarctica, Carter 1872, p. 412, pl. xx: *Tetilla antarctica*, Sollas 1888, p. 42: *Cinachyra vertex*, Lendenfeld 1907*a*, p. 310, pl. xxi, figs. 17–24, pl. xxii, figs. 1–42, pl. xxiii, figs. 1–19: Kirkpatrick 1908*β*, p. 9, pl. x, figs. 1–14: Topsent 1917, p. 33, pl. iii, fig. 5.

Occurrence.—Reg. 1, 2, 20, stn. 331, off McMurdo Sound, 250 faths.: Reg. 3, stn. 355, off McMurdo Sound, 300 faths.: Reg. 4, 18, stn. 316, McMurdo Sound, 190–250 faths.: Reg. 5, 6, 15, 19, stn. 194, off Oates Land, 180–200 faths.: Reg. 7–10, 13–14, stn. 314, McMurdo Sound, 222–241 faths.: Reg. 11, stn. 294, Ross Sea, 158 faths.: Reg. 12, stn. 348, McMurdo Sound, 200 faths.: Reg. 16, 17, stn. 339, off Murdo Sound, 140 faths.

Carter's figures of *Tethya antarctica* and Lendenfeld's of *Cinachyra vertex* suffice to show that the two species are synonymous. Although sigmata were said to be absent in the holotype, the original preparations contain two measuring 0·012 mm. long.

Family HAPLOSCLERIDÆ.

Genus CHALINA, Grant 1861.

The close relationships between *Reniera cinerea* and *Chalina oculata* indicated in my revision of the British species of *Reniera* (1926*β*, p. 422) renders it impossible to separate the two species generically. The Antarctic fauna contains several species of *Reniera* closely allied to *Reniera cinerea* and these, together with the British species, are here transferred to the genus *Chalina*.

Chalina topsenti (Thiele).

Reniera cinerea var. *porosa*, Topsent, 1901*δ*, p. 12, pl. ii, fig. 2, pl. iii, fig. 2: *R. topsenti*, Thiele 1905, p. 462, figs. 4, 78, 104: *R. kerguelensis*, Hentschel 1914, p. 134, pl. iv, fig. 15, pl. viii, fig. 15: Non *Reniera topsenti*, Dendy 1916, p. 109.

Occurrence.—Reg. 44–47, stn. 220, off Cape Adare, 45–50 fathoms.

Remarks.—*Reniera cinerea* var. *porosa* differs from the typical form of *Reniera cinerea* in the more porous appearance of the surface only. Among my specimens of the latter from the coasts of Britain are some which are practically identical with Topsent's Antarctic variety. Since the species is world-wide in its distribution there is no reason to suppose that the Antarctic forms differ specifically from those of the adjacent waters. For the time being, however, I prefer to regard them as belonging to a distinct species. *Reniera kerguelensis* Hentschel differs in no way from *Reniera cinerea*, so far as I can judge.

Chalina altera (Topsent).

Reniera altera, Topsent 1901, p. 2; Id. 1901δ, p. 13, pl. iii, fig. 12: *R. protelaria*, Topsent 1908, p. 17, pl. iii, fig. 7.

Occurrence.—Reg. 185, stn. 316, McMurdo Sound, 180–250 faths.

Chalina penicillata (Topsent).

Reniera penicillata, Topsent 1908, p. 20, pl. ii, figs. 2, 3, pl. v, fig. 14.

Occurrence.—Reg. 182, 185, stn. 220, off C. Adare, 45–50 faths.

Chalina virens (Topsent).

Reniera virens, Topsent 1908, p. 19, pl. v, fig. 10.

Occurrence.—Reg. 248, stn. 339, off McMurdo Sound, 140 faths.

Chalina dancoi (Topsent).

Reniera dancoi, Topsent 1901, p. 1; Id. 1901δ, p. 12, pl. ii, fig. 1, pl. iii, fig. 3: *Petrosia fistulata*, Kirkpatrick 1907, p. 290: *Reniera scotti*, Id. l.c., p. 291: *Petrosia fistulata*, Id. 1908β, p. 51, pl. xviii, fig. 4, pl. xxiv, fig. 7: *Reniera scotti*, Id. l.c., p. 52, pl. xviii, figs. 1, 2, pl. xxiv, fig. 6: *R. dancoi*, Id. l.c., p. 53, pl. xviii, fig. 3: *R. flaccida*, Topsent 1908, p. 16, pl. iii, fig. 7, pl. v, fig. 7: *R. cylindrica*, Id. 1913*a*, p. 639, pl. ii, fig. 6: *R. dancoi?* Hentschel 1914, p. 134.

Occurrence.—Reg. 134, stn. 339, off McMurdo Sound 140 faths.: Reg. 135, 181, stn. 316, McMurdo Sound, 190–250 faths.

Remarks.—From the twenty odd specimens of tubular Antarctic "*Renieras*" now in the British Museum Collection, it is abundantly clear that the very slight differences between the five so-called species included in the above list of synonyms have little or no taxonomic value. The conuli and mæandrine ridges often found (*e.g. R. scotti*) are evidently correlated with either the age or growth of the sponge since they are most abundantly found in the more mature individuals.

Petrosia fistulata, with its one category of spicules, has little relationship with *Petrosia dura*, the genotype of the genus, in which the skeleton is composed of large and small oxea and strongyla. It appears to be nothing more than an immature form of *Chalina dancoi*.

Cladochalina dendyi, nom. n.

Chalina oculata var. *novæ-zealandiæ*, Dendy 1924, p. 326.

Occurrence.—Reg. 284, stn. 220, off C. Adare, 45–50 faths.

Remarks.—The species resembles the common *Chalina oculata* in external form but is distinguished from it by the possession of a well-defined special dermal skeleton composed of a network of primary and secondary meshes of spiculo-fibre.

Halichondria variabilis (Ridley).

Schmidtia variabilis, Ridley 1884, p. 415, pl. xxxix, fig. N, pl. xli, fig. t: *Petrosia similis*, Ridley and Dendy 1886, p. 327: *P. truncata*, Id. l.c., p. 327: *P. similis*, Id. 1887, p. 9, pl. ii, fig. 10, pl. iii, figs. 3, 4: *P. similis*, var. *massa*, Id. l.c., p. 11, pl. ii, fig. 11, pl. iii, fig. 6: *P. similis*, var. *compacta*, Id. l.c., p. 12, pl. ii, fig. 13, pl. iii, fig. 5: *P. truncata*, Id. l.c., p. 12, pl. ii, fig. 14, pl. iii, fig. 1: *P. variabilis*, Id. l.c., p. 13, pl. ii, fig. 12; Topsent 1901δ, p. 11, pl. ii, fig. 9: *Pellina depellens*, Topsent 1908, p. 15, pl. ii, figs. 1, 5, pl. v, fig. 9: *Reniera tabernacula*, Row 1911, p. 316, fig. 9: *Petrosia depellens*, Topsent 1913a, p. 638: *Reniera cribricutis*, Dendy 1921β, p. 32, pl. iii, fig. 1, pl. xii, fig. 1: *Halichondria retiderma*, Dendy 1921β, p. 38, pl. ii, fig. 5, pl. xii, fig. 7: *Reniera tabernacula*, Burton 1927, p. 74.

Diagnosis.—Sponge polymorphic varying from massive to lobate or sub-ramose; oscules usually large and prominent but varying according to shape of sponge; surface finely reticulate; skeleton confused or regularly reticulate; spongin never present in large quantities but may thinly envelope both primary and secondary lines of skeleton; spicules oxea, sharply- or obtusely-pointed, 0·17 to 0·45 by 0·006 to 0·022 mm.

Remarks.—This species occupies approximately the same position in the Southern Hemisphere that *Halichondria panicea* occupies in the Northern Hemisphere. The British Museum Collection contains a large number of authentic specimens of *Halichondria panicea*, but I have so far been unable to find a single example from the Indian Ocean, South Pacific or Australia, although many have been recorded under this name. This region is, however, inhabited by the present species which, though closely allied, differs markedly from *H. panicea* in many respects, particularly in the more delicate texture of the dermal skeleton. Undoubtedly many more species of so-called Renierinæ will ultimately prove to be synonymous with this one. *Pellina depellens*, excellently described and figured by Topsent, agrees closely with several of the numerous examples of *Halichondria variabilis* at my disposal. *Petrosia variabilis* Topsent (1901δ) appears to be a somewhat macerated fragment of the same species.

Halichondria panicea (Pallas).

This, the typical *Halichondria* species of the Northern Hemisphere, may possibly have penetrated into the Antarctic. It has been recorded by Topsent (1901δ) and some of the specimens, at least, described by Hentschel (1914) may possibly be identical with the Northern forms of the species. Typically a shallow-water sponge, *Halichondria panicea* has been recorded from the Atlantic, the Arctic and Antarctic Oceans. In the British Museum there are hitherto unidentified specimens which show that the

species extends round the Northern coasts of Europe and Asia down to Japan, and round the Northern coasts of Canada to Vancouver. In the South Atlantic it has been recorded by Stephens (1915) from South Africa, while some specimens I have examined from Ancud, Chiloe, differ in no respect from the European forms. There is no record of its existence, however, outside this area. The various forms of *Halichondria panicea* described by Carter, Dendy, and Ridley from various parts of the Indian Ocean really belong to *Trachyopsis*.

Calyx stipitatus, Topsent. (Pl. V, figs. 5, 6.)

C. stipitatus, Topsent 1916, p. 171 ; Id. 1917, p. 81, pl. iv, fig. 13, pl. vi, fig. 24.

Occurrence.—Reg. 235, stn. 356, off McMurdo Sound, 50 faths. : Reg. 236, stn. 331, off McMurdo Sound, 250 faths. : Reg. 237, stn. 294, Ross Sea, 158 faths.

Remarks.—The three specimens differ slightly from the holotype in external form. Two are broadly flabellate and stipitate with the body of the sponge composed of neatly rounded, thin, flattened lobes, while the third consists of flattened branches which tend to expand into laminæ or lobes. The spicules are slightly smaller than those of the holotype, measuring 0·2 to 0·3 mm. long by 0·012 to 0·015 mm. thick. There is a tendency for the exhalent apertures to be grouped on one face of the sponge only.

The " orifices circulaires " (Topsent l.c., p. 81) of the holotype are absent from the " Terra Nova " specimens. Their curious disposition and general appearance suggests that they have been formed by commensal cirripedes and are in no way connected with the canal system of the sponge. Assuming this to be so, their presence or absence has little significance.

Gellius rudis (Topsent).

G. rudis, Topsent 1901, p. 2 ; Id. 1901δ, p. 14, pl. i, fig. 9, pl. iii, fig. 4 ; Id. 1907, p. 77, pl. iii, fig. 2 : *G. fimbriatus*, Kirkpatrick 1907, p. 86 : *G. pilosa*, Id. l.c., p. 86 : *G. rudis*, Id. 1908β, p. 45, pl. xvii, fig. 1, pl. xxiv, fig. 1 : *G. fimbriatus*, Id. l.c., p. 46, pl. xvii, fig. 2, pl. xxiv, fig. 2 : *G. rudis*, Hentschel 1914, p. 287 : *G. tenellus*, Topsent 1916, p. 171 ; Id. 1917, p. 80, pl. vi, fig. 2, 3.

Occurrence.—Reg. 111, stn. 339, off McMurdo Sound, 140 faths. : Reg. 113–230, 289, stn. 356, off McMurdo Sound, 50 faths.

Remarks.—The difference in the appearance of the surface of *Gellius rudis* and *Gellius fimbriatus*, the only point by which the two species might be separated, is simply one of degree. If the skeleton be loosely knit as in the latter the surface is areolated, if compact as in the former the areolation is largely lost. Intermediate forms between the two conditions may be readily found.

The sponge is usually massive or composed of massively cylindrical branches. One specimen combines the two forms, consisting of a broad massive base from which arise a number of stout cylindrical branches which frequently anastomose. The oscules are usually level with the general surface of the sponge, but often the margins may be

carried upwards to form chimney-like vents, or even, in rare cases, the vents may be in the form of Siphonochalina-like tubes, several cms. long.

Gellius tenellus appears to be no more than a form of *Gellius rudis*. In the majority of specimens of *Gellius* the sigmata are present in large quantities. Occasionally, however, they may be only sparingly present. In Reg. 289, which has the external form and general structure of *Gellius rudis*, no trace of sigmata was found.

Gellius bidens, Topsent.

G. bidens, Topsent 1901δ, p. 14, pl. ii, fig. 8, pl. iii, fig. 7.

Occurrence.—Reg. 149, stn. 321, off Inaccessible Island, 180–250 faths.

Gellius phakellioides (Kirkpatrick).

Sigmaxynissa phakellioides, Kirkpatrick 1907, p. 272; Id. 1908β, p. 23, pl. xvii, fig. 6, pl. xxiv, fig. 4: *Gellius flabelliformis*, var. Hentschel 1914, p. 131, pl. viii, fig. 12.

Occurrence.—Reg. 112, stn. 316, McMurdo Sound, 190–250 faths.

Gelliodes benedeni (Topsent).

Gellius benedeni, Topsent 1901, p. 2: *Gelliodes benedeni*, Id. 1901δ, p. 16, pl. ii, fig. 3, pl. iii, fig. 5: *G. benedeni*, var. *fortior*, Id. 1917, p. 75, pl. ii, fig. 1, pl. vi, fig. 22.

Occurrence.—Reg. 108*a–c*, stn. 316, McMurdo Sound, 190–250 faths.

Remarks.—Of the three specimens, two have the same external form as var. *fortior*, the third is sac-shaped like the holotype. The oxea in all three measure 0·5 by 0·024 mm., and the sigmata, 0·039 mm. long. There is no trace of rhaphides.

Assuming that the rhaphides, "pas trés nombreux," in the type of var. *fortior* were foreign, as seems most probable, there appears to be no valid reason for retaining the variety.

Gelliodes spongiosus, Topsent.

G. spongiosus, Topsent 1916, p. 171; Id. 1917, p. 74, pl. vi, fig. 21.

Occurrence.—Reg. 234, stn. 316, McMurdo Sound, 190–250 faths.

Remarks.—Reg. 234 is a large, spherical, much-macerated specimen in which the sigmata range from 0·024 to 0·06 mm. long, and the toxa, fairly constant in size, measure 0·09 mm. long.

Microxina charcoti, Topsent.

M. charcoti, Topsent 1916, p. 170; Id. 1917, p. 72, pl. i, fig. 3, pl. ii, fig. 3, pl. vi, fig. 17.

Occurrence.—Reg. 338, stn. 339, off McMurdo Sound, 140 faths.

Family ISODICTYEÆ.

The Isodictyeæ, as revived by Dendy 1924, may be divided into four groups corresponding to the general *Isodictya* Bowerbank, *Desmacidon* Bowerbank, *Strongylacidon*

Lendenfeld, and *Plumocolumella*, **gen. n.** In addition, *Cercidochela* Kirkpatrick, here regarded as an aberrant form with specialised chelæ, is now included.

Isodictya cactoides (Kirkpatrick).

Desmacidon kerguelensis, var. *cactoides*, Kirkpatrick 1908β, p. 38, pl. xix, fig. 2, pl. xxiii, fig. 2.

Occurrence.—Reg. 309–311, stn. 316, McMurdo Sound, 190–250 faths.

Isodictya spinigera (Kirkpatrick).

Desmacidon spinigera, Kirkpatrick 1907, p. 283; Id. 1908β, p. 39, pl. xix, fig. 3, pl. xxiii, fig. 3.

Occurrence.—Reg. 107, stn. 339, off McMurdo Sound, 130 faths.

Isodictya verrucosa (Topsent).

Homœodictya verrucosa, Topsent 1913*a*, p. 636.

Occurrence.—Reg. 350, stn. 316, McMurdo Sound, 190–250 faths.

Isodictya kirkpatricki (Topsent).

Homœodictya kirkpatricki, Topsent 1916, p. 170; Id. 1917, p. 70, pl. i, fig. 2, pl. vi, fig. 14.

Occurrence.—Reg. 313, stn. 314, McMurdo Sound, 222–241 faths.: Reg. 314, stn. 339, off McMurdo Sound, 140 faths.: Reg. 315, stn. 331, off McMurdo Sound, 250 faths.

Isodictya cavicornuta, Dendy.

I. cavicornuta, Dendy 1924, p. 335, pl. x, figs. 2–3.

Occurrence.—Reg. 317–318, stn. 316, McMurdo Sound, 190–250 faths.: Reg. 319, stn. 314, McMurdo Sound, 222–241 faths.: Reg. 320–329, 330–332, stn. 194, off Oates Land, 180–200 faths.: Reg. 333, stn. 331, off Cape Bird, 250 faths.

Desmacidon fruticosa (Montagu).

Spongia fruticosa, Montagu 1818, p. 112, pl. xiv, figs. 3, 4: *Desmacidon fruticosa*, Ridley and Dendy 1887, p. 104.

Occurrence.—Reg. 308, stn. 339, off McMurdo Sound, 140 faths.

The present specimen is practically identical with the European forms of the species and the Australian specimen of the "Challenger" Expedition.

Genus PLUMOCOLUMELLA, **gen. nov.**

Genotype: *Fibulia carnosa*, Carter 1886 (Holotype: Reg. 86.12.15. 372, British Museum Coll.).

Diagnosis.—Isodictyeæ with skeleton composed of bundles of oxea running from centre of sponge to surface, where they end in dermal brushes; fibres formed by these bundles usually slightly curved or even sinuous, often slightly branching and

anastomosing; frequently, by repeated branching and anastomosis, a network is formed with an apparent differentiation into primary and secondary fibres; spongin may or may not be present; microscleres, when present, small isochelæ unguiferæ, to which sigmata may be added; surface of sponge usually marked with a curious pattern due to branching of dermal brushes.

The species which fall more or less naturally into one group and for which this genus was established are :—

P. (*Fibulia*) *carnosa* (Carter).
P. (*Dysidea*) *chaliniformis* (Carter).
P. (*Desmacidon*) *intermedia* (Dendy).
P. (*Desmacidon*) *arenosa* (Whitelegge).
P. (*Desmacidon*) *hispida* (Whitelegge).
P. (*Desmacidon*) *conulissima* (Whitelegge).
P. (*Desmacidon*) *ramosa* (Ridley and Dendy).
P. (*Desmacidon*) *mæandrina* (Kirkpatrick).
P. (*Desmacidon*) *novæ-zealandiæ* (Brøndsted).

Plumocolumella mæandrina (Kirkpatrick).

Desmacidon mæandrina, Kirkpatrick 1907, p. 282; Id. 1908*β*, p. 40, pl. xix, fig. 4, pl. xxiii, fig. 4.

Occurrence.—Reg. 312, stn. 356, off McMurdo Sound, 50 faths.

Plumocolumella cribriporosa, sp. n. (Pl. V, fig. 7.)

Holotype : Reg. 26.10.26. 187, British Museum Coll.

Occurrence.—Reg. 187, stn. 356, off McMurdo Sound, 50 faths. : Reg. 188, stn. 338, off McMurdo Sound, 207 faths.

Diagnosis.—Sponge composed of several cylindrical, more or less erect, branches arising from a stolon-like basal portion; surface smooth, marked by numerous circular pore areas; oscules few, chimney-like; spicules, oxea only.

Remarks.—The pore areas, so abundantly scattered over the whole surface of the sponge, are usually circular in outline and range from 1 to 1·5 mm. in diameter. In each case, the margin is slightly raised above the level of the general surface. Stretched across the circular pit so formed is a delicate pore-bearing membrane. The pores, which are only just visible when viewed with a hand lens, open into a sub-dermal cavity lying beneath the pore-bearing membrane.

A collenchymatous ectosome, about 0·2 mm. thick, is present.

The skeleton consists of abundant oxea, 0·48 by 0·012 mm., arranged in dense radially-arranged wisps running from the centre of the branch to the surface, where the ends of the outermost spicules project slightly beyond the ectosome. There are no chelæ but the general structure of the sponge, particularly of its skeleton, suggests a

strong affinity between it and those species for which the genus *Plumocolumella* is established.

A few oval embryos, 0·18 by 0·15 mm. are present.

Cercidochela lankesteri, Kirkpatrick. (Pl. V, fig. 8.)

C. lankesteri, Kirkpatrick 1907, p. 284; Id. 1908*β*, p. 42, pl. xix, fig. 5, pl. xxiii, fig. 5; Hentschel 1914, p. 74.

Occurrence.—Reg. 151, stn. 314, McMurdo Sound, 222–241 faths.: Reg. 179, stn. 294, Ross Sea, 158 faths.: Reg. 180, stn. 356, off McMurdo Sound, 50 faths.

Remarks.—The only specimens hitherto recorded have been young, but the present examples are apparently fully-grown flabello-digitate or flabellate sponges. The total height of the figured specimen is 20 cms., the breadth 10 cms. and the thickness of the frond 1·3 cms. The stout stalk, 8 cms. long by 1 cm. in diameter, bears the remains of rooting processes.

The exhalant apertures are not simple as in the holotype but consist of comparatively deep, cavernous pseudoscula receiving the openings of the exhalant canals whose margins are invariably raised above the surface to a height of 3 to 4 mm. They are confined to one side of the sponge.

Section GUITARREÆ.

Guitarra fimbriata, Carter.

G. fimbriata, Carter 1874, p. 4, pl. xiii, figs. 2–5, pl. xv, fig. 34; Schmidt 1880, p. 84, pl. ix, fig. 7: *G. voluta*, Topsent 1904*a*, p. 209, pl. v, figs. 13, 14, pl. xvi, fig. 9: *G. antarctica*, Hentschel 1914, p. 75, pl. vi, fig. 4: *G. indica*, Dendy 1916, p. 124, pl. i, fig. 5, pl. iii, fig. 21: *G. sigmatifera*, Topsent 1916, p. 170; Id. 1917, p. 71, pl. i, fig. 6, pl. vi, fig. 16: *G. antarctica*, var. *novæ-zealandiæ*, Dendy 1924, p. 336: *G. bipocillifera*, Brøndsted 1924, p. 458, fig. 16.

Diagnosis of species.—Sponge cushion-shaped; skeleton a more or less regular reticulation of tornota; no special dermal skeleton; tornota measure 0·266–0·735 by 0·006–0·017 mm., and are variable in form, with one end usually oxeote, mucronate, stylote or strongylote while the other is invariably exeote; microscleres, fimbriated placochelæ, showing a tendency to differentiation into two categories, measuring 0·03–0·14 mm. long, and minute bipocilli of peculiar form, 0·008–0·028 mm. long.

Remarks.—Brøndsted (l.c.) called attention to some curious, minute microscleres which looked, at first sight, like sigmata but which proved to be a form of bipocillum. He further suggested that "the sigmata of some of the other described *Guitarra*-species will prove to be of the same nature." I have found this to be a fact in every specimen examined, although in every case their precise character had been misinterpreted by the authors describing them. Further, as the result of the examination of a considerable quantity of material, including many type-specimens, it seems extremely probable

that the six species hitherto described are no more than simple variations of a single species.

All agree closely in external form, the arrangement of the skeleton and the shape of the spicules, and their only differences concern the dimensions of the spicules. These are set forth in the following table :—

Species.	Placochelæ.		Bipocilla.	Tornostrongyla.
	Large.	Small.		
fimbriata	0·09–0·1 *	0·04–0·05 *	0·01–0·011 *	0·31 × 0·005 *
voluta, spec. 1	0·12–0·14	0·067–0·07	0·013–0·015 †	0·6–0·735 × 0·013–0·015
„ „ 2	0·08	?	0·013–0·015 †	0·54 × 0·009
antarctica	0·095–0·11	0·044–0·055	0·023–0·028	0·408–0·496 × 0·007–0·011
indica	0·041	?	0·01 *	0·266 × 0·007
sigmatifera	0·087–0·095	?	0·01–0·011	0·57–0·68 × 0·015–0·017
antarctica, var. *novæ-zealandiæ*	0·04	?	0·01	0·3 × 0·006
bipocillifera	0·1	0·4	0·01–0·014	0·45 × 0·009

The first thing to be noticed in this table is that *G. antarctica* and *bipocillifera* are practically identical except for the size of the bipocilla; but since those of the former are less curved than those of the latter, and their length in a straight line correspondingly greater, the difference is clearly unimportant. These two species, moreover, differ from the genotype only in the slightly larger size of the tornostrongyla, and from *sigmatifera* in that these same spicules are slightly smaller. For the rest, *indica* is indistinguishable from *antarctica* var. *novæ-zealandiæ*, while the holotype of *voluta* differs from all other species by the large size of all its spicules. We are left, therefore, with three "species," *fimbriata*, with its synonyms *antarctica*, *sigmatifera* and *bipocillifera*; *indica*, with its synonym *antarctica* var. *novæ-zealandiæ*; and *voluta*. The only differences between them are that the spicules of the first are slightly larger than the second but smaller than those of the third. Since the two specimens described by Topsent under *voluta*, specimens coming from exactly the same locality, differ as much from each other as the three so-called species differ among themselves, it does not seem reasonable to regard the mere difference in the dimensions of spicules as of taxonomic significance.

It must be admitted that to regard two specimens, one with placochelæ 0·04 mm.

* From measurements taken from the types.

† Topsent 1917, p. 72.

? The authors have failed to give measurements of the small placochelæ, regarding them, no doubt, as young forms of the larger. In two cases, *indica* and *antarctica* var. *novæ-zealandiæ*, I have seen by re-examination of the types that they are really present, and assume, therefore, that the same holds true for the others.

long and the other with placochelæ 0·14 mm. long, as members of the same species is to allow a greater range in variation in the spicules of a single species than is usually the case. Nevertheless, in addition to the disparity in the size of the spicules of Topsent's two specimens from the same locality, to which reference has already been made, we find that *G. bipocillifera* and *G. antarctica* var. *novæ-zealandiæ*, from almost identical localities, have placochelæ measuring 0·1 and 0·04 mm. long respectively. The only conclusion seems to be, therefore, that *G. fimbriata* is a species extending from the Northern Atlantic to the Indian Ocean, New Zealand and the Antarctic, in which the size of the spicules, especially of the placochelæ, is more variable than is usual in species of sponges while all other features are more or less constant.

Section MYCALEÆ.

The various species at present included in the genus *Esperiopsis* may be divided into four homogeneous groups corresponding to four genera :—

Esperiopsis, Carter 1874, p. 7 : genotype, *E. villosa*.

Diagnosis.—Mycaleæ with main skeleton composed of plumose columns of large subtylostyli running vertically to the surface ; microscleres including three categories of isochelæ, except where absent by reduction, and two of sigmata. No special dermal skeleton.

Amphilectus, Vosmaer 1880, p. 109 : genotype, *Isodictya gracilis*, Bowerbank.

Diagnosis.—Mycaleæ with a reticulate skeleton of short styli ; microscleres of one form only, small palmate isochelæ. No special dermal skeleton.

Remarks.—The genus *Amphilectus* has been badly used in the past and has served as a receptacle for all the aberrant Mycaleæ and some reduced Ectyoninæ whose relations were not properly understood. The genotype is an undoubted synonym of *Isodictya fucorum* (Johnston) Bowerbank, and the genus must include the numerous species of *Esperiopsis*, so-called, conforming to that type.

Corybas, Gray 1867, p. 527 : genotype, *Spongia lobata* Montagu (= *Isodictya lobata* Bowerbank).

Diagnosis.—Mycaleæ with a reticulate skeleton of short styli ; microscleres of one form only, small palmate anisochelæ. No special dermal skeleton.

There is only one species, a sponge of rare occurrence on the British Coasts.

Brondstedia, **gen. nov.** : genotype, *Esperiopsis glaber*, Brøndsted.

Diagnosis.—Mycaleæ with a reticulate skeleton of short styli and with a special dermal layer of tangentially-arranged styli differing in no respect from the styli of the main skeleton ; microscleres, small palmate isochelæ to which sigmata may be added.

Esperiopsis villosa (Carter).

Esperia villosa, Carter 1874, p. 7, pl. xiii, figs. 13–15, pl. xv, fig. 36 : *Esperiopsis villosa*, Carter 1882, p. 296 : *Esperia villosa*, Fristedt 1887*a*, p. 451, pl. xxv, figs. 33–38, pl. xxix, fig. 19 : *Desmacidon bosei*, Noll 1888, p. 6, pl. i : *Esperiopsis prædita*, Topsent 1892, p. 92, pl. x, fig. 4 : *E. villosa*, Id. 1904, p. 211, pl. xviii, fig. 2 : *E. decora*, Id. l.c., p. 212, pl. lxxxviii, fig. 8 : *E. prædita*, Id. l.c., p. 212 : *E. villosa*, Lundbeck 1905, p. 9, pl. i, fig. 4, pl. viii, fig. 1 : *E. flagellum*, Id. l.c., p. 20, pl. ix, fig. 1 : *E. villosa*, Kirkpatrick 1908*β*, p. 35, pl. xx, fig. 3, pl. xxiv, fig. 9 : *E. incognita*, Stephens 1921, p. 18, pl . ii, fig. 3 : *E. macrosigma*, Id. l.c., p. 19, pl. ii, fig. 4 : *E. macrosigma*, var. *novæ-zealandiæ*, Dendy 1924, p. 341, pl. xiii, figs. 14–20 : *E. megachela*, Dendy 1924, p. 341, pl. xiii, figs. 21–25.

Remarks.—The species and varieties included above as synonyms of *Esperiopsis villosa*, Carter, may be divided into three groups : (*a*) with three categories of isochelæ of which the larger are the so-called placochelæ (*i.e.* those of the typical *E. villosa*-type) ; (*b*) with three categories of isochelæ in which the larger differ slightly in form from the so-called placochelæ ; (*c*) with two categories of isochelæ.

Group (*a*) includes *E. villosa*, Carter (Faröe Is.), Topsent (Azores), Lundbeck (Greenland), and *Desmacidon bosei* Noll (an obvious synonym of *E. villosa*, from Norway). Group (*c*) includes *E. prædita* Topsent (Azores), *E. flagellum* Lundbeck (Greenland), *E. decora* Topsent (Azores), *E. incognita* Stephens (Irish Seas) and *E. villosa* Kirkpatrick (Antarctic). The only differences between the sponges of these two groups, apart from the minor differences in spicule size, which may very well be ignored, are that the so-called placochelæ are absent in the second group. On the other hand, the two groups resemble each other very strongly in all other respects. Considering the similarity of the geographical distribution, if we exclude for the moment Kirkpatrick's Antarctic specimen, the only view to take is that group (*c*) consists of forms identical with those of group (*a*) except that they have lost the larger chelæ.

Group (*b*) includes *E. macrosigma* Stephens (Irish Seas) *E. macrosigma* var. *novæ-zealandiæ* Dendy and *E. megachela* Dendy (New Zealand). These three differ from the typical form of *E. villosa* (group (*a*)) in one respect only, that the larger chelæ are somewhat broader, and, although very similar to them in appearance, are no longer called placochelæ.

Since all the species and varieties of these three groups are almost identical in habitat, external form and spiculation (except for the presence or absence of the larger chelæ or for slight differences in shape) I can see no alternative to regarding them all as synonyms of one and the same species.

Admitting this view to be correct, we ascribe to the larger chelæ of *E. villosa*, as here understood, a range of variation in form which is no greater than that demonstrated in the various species of *Mycale*, an allied genus, by Topsent in 1924*a*.

E. decora Topsent is, however, unlike the rest in that it possesses small trichodragmata in addition to the chelæ and sigmata. Trichodragmata of this type are problematic bodies. I have found isolated trichodragmata in several species of sponges which ordinarily do not possess them but their occurrence is so sporadic that they

cannot be regarded as of systematic importance unless it can be proved that their occurrence is constant for the species as a whole.

Curiously enough, I have found a few isolated trichodragmata in the holotype of *E. villosa* so that I am even more inclined to regard their presence in *E. decora* as of no systematic importance.

Amphilectus rugosa, Thiele, var. *major* (Hentschel).

Esperiopsis rugosa, Thiele, var. *major*, Hentschel 1914, p. 68.

Remarks.—There is a strong possibility that *E. rugosa* may be synonymous with *E. edwardii* var. *americana* (Ridley and Dendy), a species closely allied to *E. edwardii* but localised on the Southern shores of South America. Since the differences between the var. *major* and the typical form of *E. rugosa* are so slight as to be almost negligible, the species affords a link between the S. American and Antarctic faunas.

Mycale acerata, Kirkpatrick.

M. acerata, Kirkpatrick 1907, p. 280; Id. 1908β, p. 36, pl. xx, fig. 1, pl. xxiv, fig. 10: *M. acerata*, var. *minor*, Hentschel 1914, p. 63: *M. acerata*, Topsent 1917, p. 63.

Occurrence.—Reg. 150, stn. 339, off McMurdo Sound, 140 faths.

Remarks.—Re-examination of the holotype has shown that the average size of the megascleres is about 0·6 by 0·012 mm. In the third of the "Discovery" specimens the average is 0·48 by 0·012 mm. Further, although Kirkpatrick (1908β) mentions only two categories of anisochelæ, a third is present whose average length is 0·025 mm. It is clear therefore that Hentschel's var. *minor* is much more like the typical form than that author suspected.

Mycale pellita, Topsent.

M. sp., Kirkpatrick 1908β, p. 37: *M. pellita*, Topsent 1913a, p. 633, pl. v, fig. 2.

Remarks.—Topsent described this species as "voisine d'une *Mycale* sp. de l'Antarctique signalée par Kirkpatrick." I have re-examined the *Mycale sp.* referred to (Kirkpatrick l.c.) and find it a typical example of *M. pellita*. Kirkpatrick's measurements are those of the maximum size and, in addition, the second category of chelæ is present but in very small quantities.

Mycale tridens, Hentschel.

M. tridens, Hentschel 1914, p. 56, pl. v, fig. 6; Topsent 1917, p. 63.

Occurrence.—Reg. 93, stn. 314, McMurdo Sound, 222–241 faths.

Remarks.—The only representative is a large, massive sponge, whose surface is thrown into low rounded tubercles, or plateaux, separated by deep meandering grooves. The oscules are trumpet-shaped, very like those of *Inflatella belli*, about 1 cm. high.

The appearance of the sponge, apart from the oscules, recalls the external form of *M. lingua*, so that although it has not been possible to study satisfactorily the character of the dermal skeleton it is probable that the species belongs to the sub-genus *Mycale*.

Desmacella vestibularis (Wilson).

Tylodesma vestibularis, Wilson 1904, p. 139, pl. xviii, figs. 8–9, pl. xix, fig. 1, pl. xxii, fig. 4, pl. xxiii, figs. 1–3 : *Desmacella vestibularis*, Dendy 1924, p. 345.

Occurrence.—On *Stelletta crater*, Reg. 250, stn. 339, off McMurdo Sound, 140 faths.

Artemisina apollinis (Ridley and Dendy).

Amphilectus apollinis, Ridley and Dendy 1886, p. 350; Id. 1887, p. 125, pl. xix, fig. 10, pl. xxv, fig. 2 : *Artemisina apollinis*, Kirkpatrick 1908β, p. 34, pl. xx, fig. 4 : *A. dianæ*, Topsent 1907, p. 22, pl. iii, fig. 4, fig. pl. v, fig. 1 ; Hentschel 1914, p. 70.
(For further synonymy see Kirkpatrick l.c.)

I have here adopted the suggestion, made by both Kirkpatrick (l.c.) and Hentschel (l.c.), that *A. dianæ* is only a form of *A. apollinis*.

Artemisina plumosa, Hentschel.

A. plumosa, Hentschel 1914, p. 70, pl. iv, fig. 5, pl. vi, fig. 1 : *A. plumosa*, var. *lipochela*, Id. l.c., p. 72 : *A. strongyla*, Id. l.c., p. 72, pl. vi, fig. 2.

Remarks.—*A. plumosa*, with its variety *lipochela*, and *A. strongyla* form a well-defined group, sufficiently alike to be regarded as a single species, readily distinguishable from the only other Antarctic species of the genus, *A. apollinis*. When, in a sponge, some of the styli are modified to strongyla, the modification is very frequently accompanied by the appearance of siliceous spheres, and, since the phenomenon is so familiar, it is not worth while emphasising the fact by the erection of a distinct species for the specimen in which it occurs. *A. strongyla* is such a sponge, which has so much in common with *A. plumosa* that I do not see how they may be reasonably separated.

Chondrocladia clavata, Ridley and Dendy.

C. clavata, Ridley and Dendy 1886, p. 345 ; Id. 1887, p. 100, pl. xx, fig. 1, pl. xxi, fig. 11.

Occurrence.—Reg. 152, 153, stn. 316, McMurdo Sound, 190–250 faths. : Reg. 154, stn. 314, McMurdo Sound, 222–241 faths.

Remarks.—The largest of the three specimens present is 8 cms. high, including the stalk, and the diameter of the head is 2 cms. The surface of the head bears numerous long processes. In the other two, the processes are represented by numerous low conules. The following are the measurements of the spicules : styli, 1·26 by 0·024 mm. ; larger chelæ, 0·048 mm., smaller chelæ, 0·024 mm. long ; sigmata, 0·045 mm. long. In one specimen, some of the styli attained a length of over 2 mm. but this was the only respect in which the three sponges differ from the holotype.

ACANTHORHABDUS, gen. nov.

Genotype : *Acanthorhabdus fragilis*, sp. n.

Diagnosis.—Mycaleæ whose principal megasclere is a modified style (always ?) arranged in a coarse but ill-defined reticulation ; accessory megascleres, acanthorhabds, are present forming a loose tangential dermal layer, and scattered between fibres of main skeleton, occasionally actually associated with them ; microscleres, anisochelæ.

Remarks.—The principal spicule of this genus is really a modified style, although, at first sight, it appears to be an oxeote. This and the fact that the microsclere is an anisochela has suggested that the correct position for the genus is with the Mycaleæ, of which group it is a somewhat aberrant member.

Acanthorhabdus fragilis, sp. n. (Pl. IV, fig. 2 ; text-fig. 5.)

Holotype.—Reg. 26.10.26. 189, British Museum Coll.

Occurrence.—Reg. 189–196, stn. 314, McMurdo Sound, 222–241 faths. : Reg. 197, stn. 220, off C. Adare, 45–50 faths.

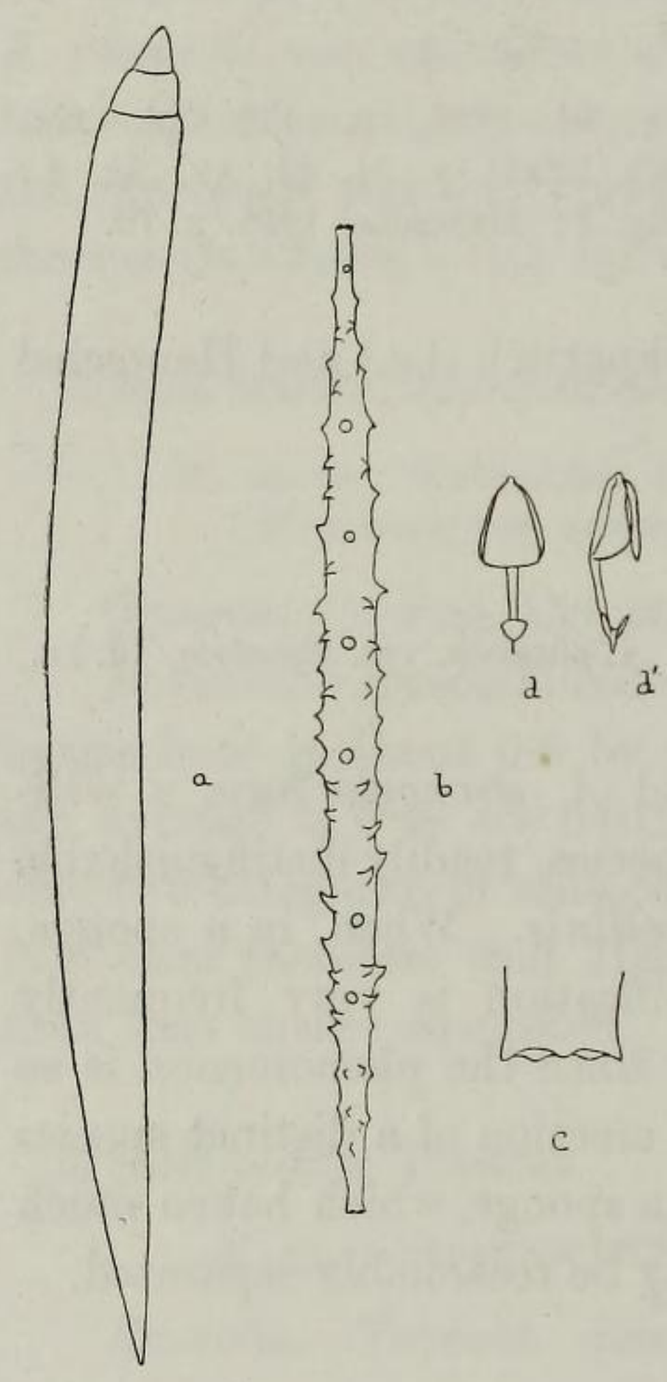
Diagnosis. — Sponge sub-spherical or regularly massive ; surface minutely conulose ; texture friable ; oscules, on level with general surface or raised on small papillæ ; pores scattered generally over surface ; colour, in spirit, green to greenish-yellow. Spicules, modified styli, acanthorhabds and anisochelæ.

Remarks.—The specimens are extremely friable and have lost nearly all trace of the ectodermal tissues. For that reason, fig. 2, pl. IV, is inadequate for depicting the characters of the surface. These have to be reconstructed from the portions of the ectoderm remaining intact.

The main skeleton is a coarse reticulation of bundles of principal megascleres, the bundles being 12 spicules thick.

Spicules.—(1) *Styli* (fig. 5 *a*). These are of peculiar form and resemble oxea in appearance. Indeed, in the young stages there appears to be nothing to distinguish them from oxea. However, the fact that one end of the spicule is distorted in the adult stage, makes it probable that they are modified styli rather than oxea. Size of spicule 0·408 mm. by 0·024 mm.

(2) *Acanthorhabds* (fig. 5 *b*), fusiform, truncated at each end, strongly spined



TEXT-FIG. 5.—*Acanthorhabdus fragilis*, sp. n. *a*. Modified style of the main skeleton, × 250 ; *b*. Acanthorhabd, × 250 ; *c*. End of an acanthorhabd, × 600 ; *d*, *d'*. Anisochelae, front and side views, × 600.

throughout the whole length of the spicule and with a short terminal crown of spines at each end, 0·3 by 0·014 mm.

(3) *Anisochelæ* (fig. 5 *c*), 0·02 mm. long.

Chondropsis chaliniformis (Carter).

Dysidea chaliniformis, Carter 1886, p. 217 : *Phoriospongia chaliniformis*, Lendenfeld 1889, p. 600, pl. xxxvii, fig. 8, pl. xl, figs. 1, 2, pl. xli, fig. 2.

Occurrence.—Reg. 287, stn. 339, off McMurdo Sound, 140 faths.

Remarks.—The larger of the two specimens consists of a single branch, 14 cms. in length and 0·7 cm. in diameter, with the oscules arranged in a linear series along one side. The internal structure agrees so closely with that of the holotype, given by Lendenfeld (1889, p. 600), that there can be no doubt as to the identification of the Antarctic form with those from Australia. The dimensions of the spicules, however, are more nearly those given by Dendy (1895, p. 253) than those of the holotype, viz. strongyla, 0·13 by 0·004 mm., sigmata, from 0·015 to 0·03 mm. in length.

Chondropsis ceratosus Kirkpatrick, from Funafuti, appears to be a chalinopsilloid *Gelliodes* rather than a *Chondropsis*, in which the structure of the fibres resembles that of the typical *Gelliodes*. The megascleres are oxea and the sigmata are much more those of a typical *Gellius* than of a *Phoriospongia*.

Section CLATHRIÆ.

Axociella nidificata (Kirkpatrick).

Ophlitaspongia nidificata, Kirkpatrick 1907, p. 274 : Id. 1908β, p. 25, pl. xxii, fig. 6, pl. xxvi, fig. 5.

Occurrence.—Reg. 84, stn. 316, McMurdo Sound, 190–250 faths. : Reg. 85, stn. 314, McMurdo Sound, 222–241 faths. : Reg. 86, stn. 355, off McMurdo Sound, 300 faths. : Reg. 87, stn. 331, McMurdo Sound, 250 faths.

Axociella flabellata (Topsent).

Ophlitaspongia flabellata, Topsent 1917, p. 41, pl. i, fig. 4, pl. vi, fig. 2.

Occurrence.—Reg. 199, stn. 294, Ross Sea, 158 faths.

Remarks.—The present example, although quite typical in regard to the spiculation, differs a little from the holotype in external form. Instead of the simple lamina it consists of a number of cylindrical or flattened branches which anastomose to form small secondary laminæ.

PSEUDANCHINOË, gen. nov.

Genotype : *Stylostichon toxiferum*, Topsent.

Diagnosis.—Clathriæ with skeleton composed of vertical bundles of basally-spined styli echinated throughout their length by entirely spined acanthostyles set more or

less at right angles to them ; microscleres, palmate isochelæ and toxa ; there is a special dermal skeleton of basally spined subtylostyles.

Remarks.—The similarity between *Stylostichon toxiferum* and the typical species of *Anchinoë* is due to convergence and not to a direct relationship. *Anchinoë* possesses vertical columns of tornota, a spicule characteristic of the Myxilleæ, while the present genus has similar columns composed of basally-spined styli and dermal subtylostyles which are characteristic of the Clathriæ.

Pseudanchinoë toxiferum (Topsent).

Stylostichon toxiferum, Topsent 1913*a*, p. 621, pl. iv, fig. 7, pl. vi, fig. 14 : *Anchinoë toxiferum*, subsp. *antarctica*, Topsent 1917, p. 43, pl. iv, fig. 5, pl. vi, fig. 5.

Occurrence.—Reg. 242, stn. 314, McMurdo Sound, 222–241 faths.

Remarks.—The present example of the species is intermediate in form between the holotype and the type of the subspecies. It is a brownish massive sponge about 3 cms. by 3 cms. by 2 cms. and bears on its upper surface a few mammiform processes. In spiculation it is also to some extent intermediate, the few characteristic features present being sufficient to show that the species is a variable one but are not of sufficient interest to justify their being recorded here. Since Topsent (1917) founded his subspecies on these small differences in spiculation, and since the species is now known to be more variable than at first appeared, it is no longer necessary to recognise the subspecies.

Section HYMEDESMIEÆ.

Genus HYMEDESMIA, Bowerbank 1864.

Suberotelites, Schmidt 1868, p. 12 ; *Stylopus*, Fristedt 1885, p. 28 : *Leptosia*, Topsent 1892*a*, p. xxii : *Hymenancora*, Lundbeck 1910, p. 116.

The supposed distinction between the chelæ of *Hymedesmia* and *Hymenancora* is inadequate for the purpose of generic distinction (cf. Dendy 1921*β*, p. 81) and the two genera are here regarded as synonymous. Again, *Stylopus* is identical with *Hymedesmia* except for the absence of chelæ and, in view of the ease with which whole categories of microscleres may be lost, it is not possible to make this feature one of generic importance. A preparation of the type of Schmidt's *Suberotelites mercator*, in the British Museum Collection, shows the species to be a typical *Hymedesmia*.

Hymedesmia unguifera, **sp. n.** (Text-fig. 6.)

Holotype.—Reg. 26.10.26. 233, British Museum Coll.

Occurrence.—Reg. 233, stn. 356, McMurdo Sound, 50 faths.

Diagnosis.—Sponge forming a thin incrustation on a small branching alga : skeleton of usual form consisting of acanthostyles, incompletely divided into two categories, dermal tylota, and two sorts of chelæ.

Spicules.—(1) *Large acanthostyles* (fig. 6 *a*), sparingly spined in the basal portion only, 0·54 by 0·013 mm.

(2) *Small acanthostyles* (fig. 6 *b*), spined throughout with distinct globular head bearing strongly developed spines. Length of spicule, 0·162 by 0·009 mm.

(3) *Tornota* (fig. 6 *c*), smooth, asymmetrically-ended, slightly dilated at each end into a small head, 0·235 by 0·008 mm.

(4) *Isochelæ arcuatæ* (fig. 6 *e*), 0·024 mm. long.

(5) *Isochelæ unguiferæ* (fig. 6 *d*), with three distinct teeth, two directed laterally and the third directed forwards, 0·012 mm. long.

Remarks.—The distinctive feature of this species is the presence of the chelæ unguiferæ.

Rhabderemia coralloides, Dendy.

R. coralloides, Dendy 1924, p. 357, pl. xii, fig. 3, pl. xv, figs. 1–4.

Occurrence.—Reg. 92, stn. 339, off McMurdo Sound, 140 faths.

Section PLOCAMIÆ.

Plocamia gaussiana, Hentschel.

P. gaussiana, Hentschel 1914, p. 120, pl. viii, fig. 5.

Occurrence.—Reg. 90, stn. 316, McMurdo Sound, 190–250 faths.: Reg. 91, stn. 194, off Oates Land, 180–200 faths.

Family MYXILLEÆ.

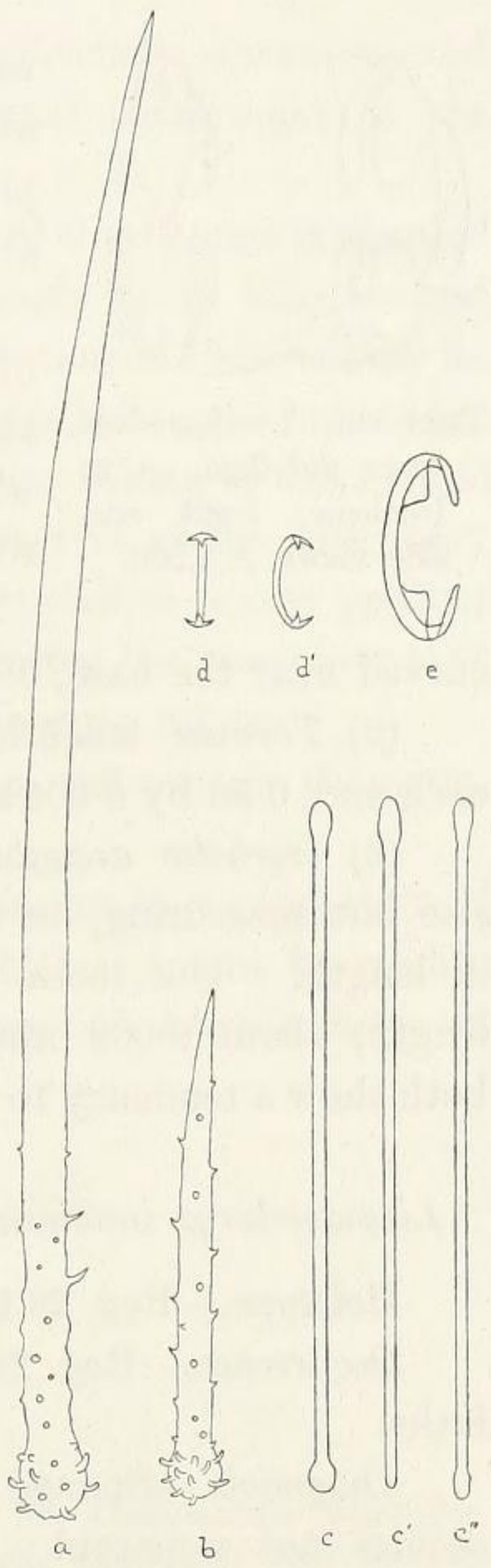
Genus MYXILLA, Schmidt.

Dendoryx, Gray 1867, p. 535: *Emplocus*, Gray 1867, p. 535; *Tereus*, Gray 1867, p. 537; *Hastatus*, Vosmaer 1880, p. 136.

Myxilla elongata, Topsent.

M. elongata, Topsent 1917, p. 54, pl. iv, fig. 3, pl. vi, fig. 11.

Occurrence.—Reg. 116, stn. 316, McMurdo Sound, 190–250 faths.: Reg. 216–231, stn. 314, McMurdo Sound, 222–241 faths.

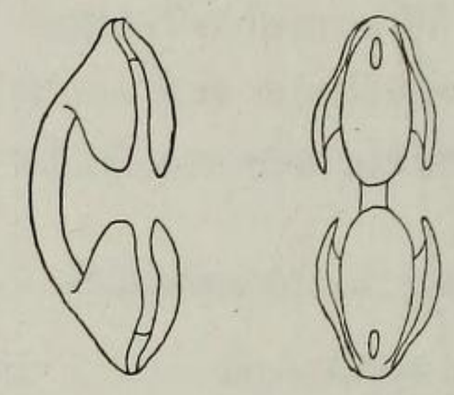


Text-fig. 6.—*Hymedesmia unguifera* sp. n. (*a*) Large basally-spined acanthostyle, × 250; (*b*) Small entirely-spined acanthostyle, × 250; (*c*, *c'*, *c''*) Tornota, × 250; (*d*, *d'*) Isochelæ unguiferæ, front and side views, × 600; (*e*) Palmate isochela, × 600.

Lissodendoryx flabellata, **sp. n.** (Pl. IV, fig. 3, text-fig. 7.)

Holotype.—26.10.26. 232; British Museum Coll.

Occurrence.—R.N. 232, stn. 314, McMurdo Sound, 222–224 faths.



TEXT-FIG. 7.—*Lissodendoryx flabellata*, sp. n. Isochelæ, front and side views, × 1,200.

Diagnosis.—Sponge flabellate, erect; surface irregular, uneven, minutely conulose; oscules not apparent; pores probably evenly distributed; colour, in spirit, grey externally, pink internally; spicules, smooth styli, tornota and chelæ arcuatæ.

Remarks.—The main skeleton is an irregular reticulation of bundles of smooth styli, the bundles containing from six to twenty spicules. There is the usual dermal skeleton of tornota while the dermal membrane, and to a lesser extent, the choanosome are crowded with numerous chelæ arcuateæ.

Spicules.—(1) *Styli* of the main skeleton, smooth, gently curved near the base, 0·45 by 0·016 mm.

(2) *Tornota* smooth, straight, with a mucron at each end, 0·36 by 0·005 mm.

(3) *Isochelæ arcuatæ* (fig. 7), varying slightly in size but measuring, on the average, about 0·021 mm. in length. The teeth and alæ are nearly equal in length, about 0·008 mm. in a typical example, and both show a tendency to curve in towards the shaft.

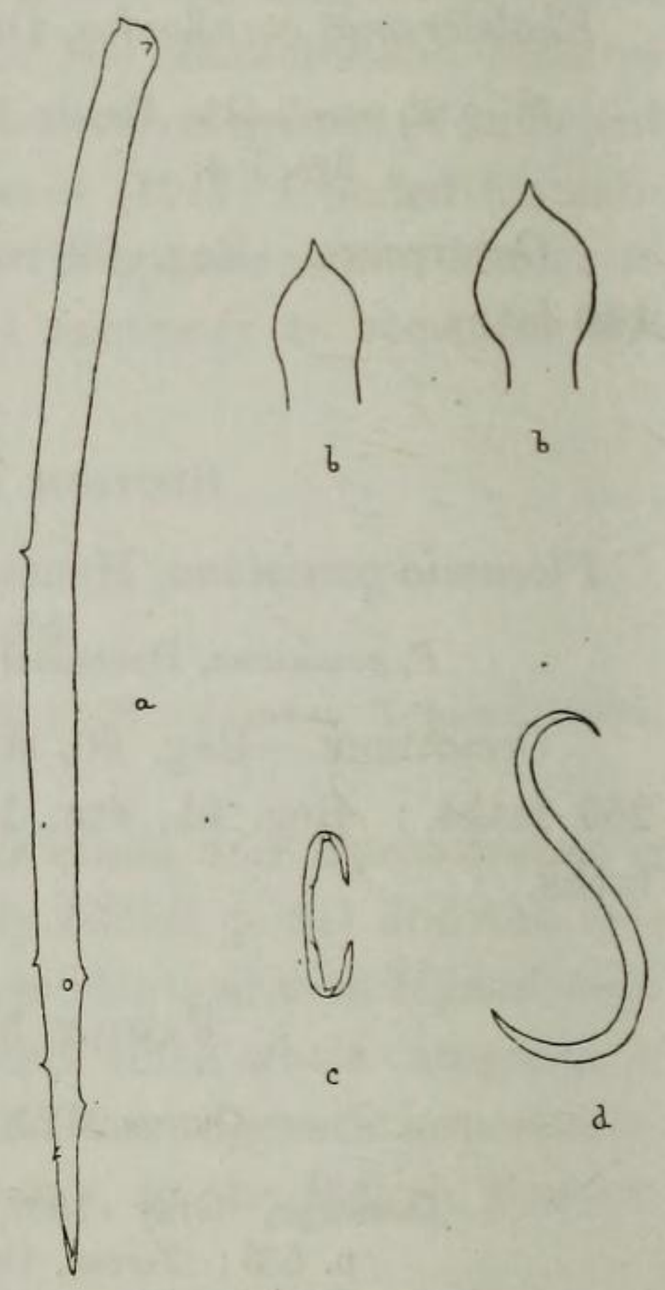
Lissodendoryx innominata, **sp. n.** (Text-fig. 8.)

Holotype.—Reg. 26.10.26. 244, British Museum Coll.

Occurrence.—Reg. 244, stn. 344, off C. Royds, 200 faths.

Diagnosis.—Sponge pyriform; surface uneven; oscules not apparent; pores probably evenly distributed over general surface; colour, in spirit, greyish-yellow; spicules, acanthostyles, tornota, chelæ arcuatæ, sigmata and trichodragmata (?).

Remarks.—The skeleton is of the usual type, consisting of a stout reticulation of styli with dermal brushes of tornota. The microscleres consist of isochelæ, arcuatæ and sigmata.



TEXT-FIG. 8.—*Lissodendoryx innominata* sp. n. (*a*) Acanthostyle of the main skeleton, × 250; (*b*) Ends of tornota, × 1000; (*c*) Isochela, × 600; (*d*) Sigma, × 600.

Spicules.—(1) *Styli* (fig. 8 *a*), usually smooth for the greater part of their length and sparingly spined in the distal part, but spination varies a great deal; with a slight tendency to become subtylostylote at the base, usually slightly curved, measuring 0·372 by 0·012 mm.

(2) *Tornota* (fig. 8 *b*), smooth, equi-ended, with sharply-pointed, mucronate or hastate ends, 0·28 by 0·006 mm.

(3) *Isochelæ arcuatæ* (fig. 8 *c*), of very rare occurrence, 0·021 mm. long.

(4) *Sigmata* (fig. 8 *d*), of the usual form, 0·045 mm. long.

Both forms of microsclere are extremely rare but sufficiently constant and evenly distributed to be regarded without doubt as a normal constituent of the spiculation.

(5) *Trichodragmata* (??). In certain parts the choanosome of this sponge is charged with a number of trichodragmata-like bodies which occur singly or in bundles and measure 0·012 mm. in length. Their appearance and distribution is different in an almost indefinable way from trichodragmata proper, so that one is led to the belief that they are not spicules, *sensu stricto*, but something which does not belong to the normal spiculation of the species. For one thing, they are not so refractive as the customary trichodragmata and give the impression of being rather a crystalline waste product than a siliceous spicule. Under *Esperiopsis villosa* I have suggested the possibility that the so-called trichodragmata of *E. decora* Topsent may be of the same nature.

The choanosome contains a large number of spherical eggs, 0·3 mm. in diameter, in various stages of segmentation.

This species is rather unsatisfactory in that the holotype is not in a good state of preservation and that there are no distinctive features by which it might be readily recognised. It is different, however, from any known species of *Lissodendoryx* in numerous details of the spiculation.

Genus ECTYOMYXILLA, Lundbeck.

Crellomyxilla, Dendy 1924, p. 363.

Ectyomyxilla kerguelensis, Hentschel.

E. kerguelensis, Hentschel 1914, p. 103, pl. iv, fig. 10, pl. vii, fig. 10 : *Crellomyxilla intermedia*, Dendy 1924, p. 364, pl. xv, figs. 16–21 : *Myxilla tornotata*, Brøndsted 1923, p. 142, fig. 21.

Occurrence.—Reg. 94, 95, stn. 339, McMurdo Sound, 140 faths.

Remarks.—The two specimens differ in external form and slight details of spiculation from both the "Gauss" and the New Zealand forms. They are both flabellate with distinct poral and oscular surfaces. The oscular surface is concave with one or two irregular ridge-like projections from the surface so that the sponge comes to resemble the human ear more than any other common object. They are, therefore, intermediate in character between the "Gauss" specimens, which were massive, and the New Zealand forms, which were flabellate or branching. The oscules are evenly distributed over the concave face of the sponge and rarely exceed 1 mm. in diameter. The colour, in spirit, is white.

The measurements of the spicules for both specimens are as follows : Larger acanthostyles, maximum length 0·15 mm. ; smaller acanthostyles, maximum length 0·12 mm. ; tornota, usually 0·13 mm. long ; sigmata, maximum length 0·036 mm. ; chelæ, varying considerably, from 0·12 to 0·033 mm. long.

The only difference between the present specimens and those described by Hentschel rests in a slight difference in external form, small differences in the dimensions of the spicules and the shape of the chelæ. According to Hentschel, these latter measure 0·0125 to 0·019 mm. in length, while the teeth are a quarter the length of the whole spicule. In my specimens they are from 0·012 to 0·033 mm. in length and the teeth are a third the length of the whole spicule. As to the first point, the larger chelæ are not abundant and it is just possible that in Hentschel's specimens they were even less abundant. Dendy speaks of the chelæ of his specimen as being divided into two categories and of the larger chelæ as "not very numerous." A curious feature of these spicules is that when seen in profile they appear to have teeth one-third the length of the whole spicule. From the front, however, they appear to be only one quarter of the total length. This probably accounts for the discrepancy between the measurements of the chelæ of the "Gauss" and "Terra Nova" specimens. Re-examination of the holotype of *Crellomyxilla intermedia* shows that there are not two categories of chelæ as Dendy suggests, and that the two sizes of this spicule merge insensibly into each other. Further, there is no possible doubt that his specimens and the present specimens belong to the same species.

Myxilla tornotata Brøndsted (1923) also appears to be a synonym of the present species. Although Brøndsted places all the acanthostyles in a single category, his figures give the impression that they are probably divisible into two, as in the other specimens regarded here as belonging to *Ectyomyxilla kerguelensis*.

Ectyomyxilla hentscheli, **nom. n.**

Myxilla spongiosa, Hentschel 1914, p. 97, pl. vii, fig. 5.

The holotype of *Myxilla spongiosa* Ridley and Dendy possesses but one category of stylote megascleres while the specimens described by Hentschel (l.c.) contain echinating acanthostyles in addition. Since the latter do not belong to any known species, I propose the above new species for their reception.

GENUS MYXODORYX, **gen. nov.**

According to Topsent (1900, p. 258), the genotype of *Lissomyxilla* Hanitsch, *L. spinosa*, belongs to the genus *Tethyspira*. *Lissomyxilla* is therefore a synonym of *Tethyspira*. Since *Lissomyxilla hanitschi* Kirkpatrick is a reduced Myxillid and not a Clavulid, like *L. spinosa*, I propose the new genus *Myxodoryx* for its reception.

Genus ANCHINOË, Gray.

Plumohalichondria, Carter 1876, p. 236 ; *Clathrissa*, Lendenfeld 1888, p. 217.

Anchinoë latrunculioides (Ridley and Dendy).

Halichondria latrunculioides, Ridley and Dendy 1886, p. 326 ; Id. 1887, p. 6, pls. iii, xlvi : *Pyloderma latrunculioides*, Kirkpatrick 1908*β*, p. 51 : *Inflatella latrunculioides*, Hentschel 1914, p. 83 : *Clathrissa glaberrima*, Topsent 1917, p. 46, pl. ii, fig. 2, pl. vi, fig. 3 : *Pyloderma demonstrans*, Dendy 1924, p. 370, pl. ix, fig. 4, pl. xv, figs. 22–23*b*.

Occurrence.—Reg. 137, 140, stn. 331, off Cape Bird Penin., 250 faths. : Reg. 138, stn. 356, off Granite Harbour, 50 faths. : Reg. 139, 142, 143, stn. 194, off Oates Land, 180–200 faths. : Reg. 141, stn. 314, off Inaccessible Is., 222–241 faths. : Reg. 144, stn. 316, off Hut Point, McMurdo Sound, 190–250 faths.

Remarks.—Halichondria latrunculioides Ridley and Dendy is identical with *Clathrissa glaberrima* Topsent in all respects but the absence of acanthostyles and chelæ, while *Pyloderma demonstrans* Dendy lacks only the acanthostyles to make it identical with Topsent's species. The three species represent, therefore, three successive stages in the reduction of a typical *Anchinoë* by the loss of one or more categories of spicules. The nine specimens in the present collection show varying stages in this reduction, which suggests that it is not a sign of the existence of subspecies, variations or even local forms, but that we have here a species which seems capable of losing very readily one or more categories of spicules without that loss altering its shape, appearance, or method of growth in the slightest. The significance of this should not be underestimated since it is quite possible that this state of affairs is quite common and has been merely overlooked in other species, as has hitherto been the case in this one.

Inflatella belli (Kirkpatrick).

Joyeuxia belli, Kirkpatrick 1907, p. 283 ; Id. 1908*β*, p. 41, pl. xvi, figs. 1–5 : *Inflatella tubulosa*, Hentschel 1914, p. 82 : *Non Joyeuxia tubulosa*, Topsent 1904*a*, p. 206, pl. v, fig. 5, pl. xiv, fig. 16 : *Inflatella fistulosa*, Hentschel 1914, p. 83, pl. iv, fig. 8, pl. vi, fig. 8 : *Amphiastrella kirkpatricki*, Dendy 1924, p. 371, pl. ix, fig. 2 ; pl. xiv, figs. 28–31 : *Inflatella spherica*, Dendy 1924, p. 373, pl. ix, fig. 3.

Occurrence.—Reg. 291–292, stn. 340, off McMurdo Sound, 160 faths. : Reg. 293, 300–302, stn. 314, McMurdo Sound, 222–241 faths. : Reg. 294–296, stn. 316, McMurdo Sound, 190–250 faths. : Reg. 297–299, stn. 339, McMurdo Sound, 140 faths. : Reg. 303–304, stn. 294, Ross Sea, 158 faths. : Reg. 305–307, stn. 356, McMurdo Sound, 50 faths.

Remarks.—The nineteen specimens of the present collection range from 0·7 to 7 cms. in diameter. For the most part they are more or less spherical, but a few are pyriform. Several among them bear short rooting processes at the base, which are about 1 mm. in diameter and seldom exceed a length of 5 mms. The surface of the sponge may be quite smooth or may be covered with a dense pile of spicules projecting

outwards from the dermal layer. The spicules are symmetrically-ended tornota varying between 0·3 and 0·85 mm. in length, and their ends may be oxeote, strongylote or subtylostylote. Some of the specimens possess spicules which are chiefly oxeote, others chiefly strongylote, and the remainder chiefly subtylostylote, but in no case are the ends of the spicules quite constant in shape.

All the species contained in the list of synonyms given above are quite obviously identical with the same species as the "Terra Nova" specimens with the exception of *Amphiastrella kirkpatricki*. In this species, however, the external form and the shape and disposition of the spicules are so absolutely the same as those of the present examples of *Inflatella belli* that we can only regard the relation between the two species as being exactly that which exists between *Pyloderma latrunculioides* and *Clathrissa glaberrima*. In other words, *Amphiastrella kirkpatricki* is a form of *Inflatella belli* in which the full complement of spicules is present. None of the present specimens possess microscleres, but many have a quite definite, though rather diffuse, choanosomal skeleton of megascleres.

This curious species has, therefore, an affinity with the Myxilleæ. The only megascleres present are tornota which closely resemble the auxiliary spicules of the Myxilleæ, while the presence of chelæ, occasional though that may be, strengthens this view. It is feasible to suppose, therefore, that the genus *Inflatella* represents a group of specialised Myxilleæ, of peculiar external form, in which a tough cortex and a special dermal layer of spicules are developed in correlation therewith, and in which the skeleton usually undergoes a reduction involving the loss of both the microscleres and the choanosomal megascleres.

Inflatella pellicula Schmidt, the genotype, from the North Atlantic, is very closely related to the present species.

Section CRELLEÆ.

Genus CRELLA, Gray.

Grayella, Carter 1869γ, p. 190; *Yvesia*, Topsent 1890α, p. 29; *Pseudoclathria*, Dendy 1897, p. 285; *Kowalewskyella*, Swartschewsky 1905, p. 53.

Diagnosis.—Myxilleæ of varying habit in which main skeleton consists of fibres or irregular tracts of slender oxea, styli, or strongyla (? all tornota) running more or less vertically to surface; acanthostyli or acanthoxea present scattered throughout choanosome and forming a dense ectosomal layer; often (? always) there is a layer of acanthostyles at the base of the sponge whose distal ends are directed vertically; microscleres, chelæ and sigmata, one or both of which may be absent.

Remarks.—Much confusion has existed hitherto as to the validity of this and allied genera. Gray (l.c.) established the genus *Crella* for one of Schmidt's species, *Cribrella elegans*, whose generic name was preoccupied (Note.—*Cribrella* Agassiz, Echinoderms), while *Grayella* Carter (l.c.), genotype *G. cyathophora*, is clearly a synonym

of it. Topsent's (l.c.) genus *Yvesia*, genotype *Halichondria albula* Bowerbank, differs in no essential degree from the foregoing but for the presence of chelæ. Nevertheless, in the same memoir that author gives a list of species which he proposes to allocate to *Yvesia*, and of these some have chelæ, others chelæ and sigmata, others sigmata only, while the remainder have no microscleres at all. Assuming Topsent to be justified in grouping these species together, and there is no reason to think otherwise, his genus cannot be separated from *Crella*. In all probability the absence of chelæ in the genotype of the latter is purely secondary. *Halichondria compressa* Carter, the genotype of *Pseudoclathria* Dendy (l.c.), is a perfectly typical *Crella*, while *Kowalewskyella* Svarczevsky (l.c.), genotype *K. gracilis*, differs from *Crella* only in the presence of a basal layer of acanthostyles. Curiously enough, *Crella stylifera* Hentschel from the Antarctic also possesses this character, and it is highly probable that it forms a regular feature of all species of *Crella*, but that it has so far been overlooked in all but the encrusting forms.

Section TEDANIEÆ.

Tedania oxeata, Topsent.

Tedania oxeata, Topsent 1916, p. 169 ; 1917, p. 61, pl. iv, fig. 14, pl. vi, fig. 19.

Occurrence.—Reg. 71, stn. 356, McMurdo Sound, 50 faths. : Reg. 72, stn. 316, McMurdo Sound, 190–250 faths.

Genus PARATEDANIA, **gen. nov.**

Diagnosis.—Tedanieæ of symmetrical form with megascleres in form of styli or some derivative thereof, to which are added tornota, rhaphides and roughened microxea ; skeleton composed of an irregular reticulation of megascleres with tornota, rhaphides and microxea occurring between the meshes ; dermal skeleton composed of a layer of densely-packed megascleres lying parallel to surface, not more than one spicule thick.

Remarks.—The genotype, *P. tarantula* (Kirkpatrick), is somewhat similar in external appearance to the members of the genera *Histoderma*, *Phlœodictyon*, *Oceanapia*, etc., and differs from all known species of the Tedanieæ in the presence of the tangential dermal skeleton and tough, chitinoid ectosome.

Paratedania tarantula (Kirkpatrick).

Oceanapia tarantula, Kirkpatrick 1907, p. 289 ; Id. 1908β, p. 50, pl. xviii, fig. 5, pl. xxiv, fig. 8 : *Tedania actiniiformis*, Ridley and Dendy, var. *antarctica*, Hentschel 1914, p. 92, pl. iv, fig. 9, pl. vii, fig. 1 : *T. actiniiformis*, var. *amphistrongyla*, Id. l.c., p. 94, pl. vii, fig. 2 : *Oceanapia kirkpatricki*, Id. l.c., p. 125, pl. iv, fig. 13, pl. vii, fig. 10 : *Tedania charcoti*, Topsent 1917, p. 59, pl. iv, fig. 11, pl. vi, fig. 18 (*non* Topsent 1907, 1908, 1913a).

Occurrence.—Reg. 28–30, stn. 340, off McMurdo Sound, 160 faths. : Reg. 21–24, stn. 316, McMurdo Sound, 190–250 faths. : Reg. 25–27, stn. 355, off McMurdo Sound, 300 faths. : Reg. 31–32, stn. 194, off Oates Land, 180–200 faths.

The specimens represented by the above list of synonyms, while differing in slight details of the spiculation, have such a strong general resemblance to each other that there can be no doubt that they belong to the same species.

Perhaps the most remarkable feature of this species is the extraordinary similarity between its skeleton and that of *Tedania charcoti*, a species from which it differs entirely in external form and the nature of the ectosomal skeleton.

The present twelve specimens vary considerably in size and are pale-yellow to olive-green and dark-brown in colour. All are marked with the characteristic annulations which probably represent nothing more than growth-lines. Topsent's (1917, p. 60) view, that the curious external form may be due to the larvæ having settled in the empty chitinous tubes of some unknown animal, is improbable though not impossible. A totally different species of Desmacidonidæ from South Africa, as yet undescribed, has the same external form but was clearly attached to the substratum by rooting processes. The processes could hardly have attached themselves to the rock had the sponge been enveloped in a tube. A more probable explanation seems to be that the symmetrical form is an extreme example of the condition found in such forms as *Tedania actiniiformis*. (*Cf.* also *Tedaniopsis turbinata* Dendy.)

Section IOPHONEÆ.

Iophonopsis radiatus (Topsent).

Iophon radiatus, Topsent 1901, p. 3; 1901δ, p. 21, pl. iii, fig. 13: *I. spatulatus*, Kirkpatrick 1907, p. 276: *I. flabello-digitatus*, Id. l.c., p. 277: *I. unicornis*, Topsent 1908, p. 27, pl. v, fig. 3: *I. pluricornis*, Id. l.c., p. 29, pl. iii, fig. 5, pl. v, fig. 5: *I. radiatus*, Kirkpatrick 1908β, p. 28, pl. xxi, figs. 3, 4, pl. xxv, fig. 4: *I. spatulatus*, Id. l.c., p. 29, pl. xxi, fig. 5, pl. xxv, fig. 5: *I. flabello-digitatus*, Id. l.c., p. 30, pls. xxi, xxv, xxvi: *I. pluricornis*, Topsent 1913*a*, p. 627, pl. vi, fig. 9: *I. unicornis*, Id. l.c., p. 628, pl. iii, fig. 9: *I. spatulus*, Id. l.c., p. 628: *I. flabello-digitatus*, Id. l.c., p. 628, pl. iii, figs. 7, 8: *I. pluricornis*, var. *trullifera*, Hentschel 1914, p. 84, pl. vi, fig. 9: *I. flabello-digitatus*, Id. l.c., p. 85: *I. flabello-digitatus* var. *gaussi*, Id. l.c., p. 86, pl. vi, fig. 10: *I. spatulatus* var. *gaussi*, Id. l.c., p. 87, pl. vi, fig. 11: *I. unicornis*, Id. l.c., p. 87: *I. aceratus*, Id. l.c., p. 88, pl. vi, fig. 12: *I. proximus* var. *reticularis*, Id. l.c., p. 89: *I. pluricornis*, Topsent 1917, p. 58: *I. flabello-digitatus*, Id. l.c., p. 58, pl. iv, fig. 9.

Remarks.—No fewer than six species and four varieties of *Iophon* have been recorded from the Antarctic. In general appearance, colour and form, as well as in the general structure of the skeleton and the types of spicules present, they form a group of very closely allied organisms. The only differences worthy of notice concern: (*a*) the spining of the bases of the styli; (*b*) the shape of the bipocilla.

(*a*) The styli of *I. unicornis* have a single mucro at the base which, according to Topsent (1908, p. 28), "est équivalent au groupe d'épines que les mégasclères correspondants de *I. radiatus* portent quelquefois sur leur base." Carrying the modification still further would produce the "ganz echte Amphioxe" of *I. acerata* Hentschel

(1914, p. 89). Further, it is extremely probable that the transition between the style of *I. radiatus* with a crown of spines and the false oxeote of *I. acerata* (not a true oxeote as Hentschel suggests) may take place in a single species, if we may accept as analogy the evidence of a similar phenomenon in *Higginsia bidentifera*, whose variations I have recently investigated.

(*b*) All Antarctic species of *Iophon* have one category of anisochelæ at least, while some have a second, larger form. The smaller form common to all is practically the same in every individual so far recorded from the Antarctic, and this, together with the strong general resemblance between the various so-called species in other respects, points to the fact that they are all members of a single species in which one category of anisochelæ is always present but in which a second, larger form may occasionally be present. In this respect, there is a close parallel to *Guitarra fimbriata*.

(*c*) The bipocilla of all species of *Iophonopsis* are of such variety of form that it is not extravagant to say that the transition from the crenulate condition to that figured by Hentschel (1914, pl. vi, fig. 9) is nothing more than evidence of the normal meristic and substantive variations in the genus.

In my opinion, the Antarctic sponges hitherto referred to the genus *Iophon* are so obviously members of a single species, when examined in the light of the variations in spicule-form found in other groups of sponges, that I think it unnecessary to consider the subject in greater detail.

Family AXINELLIDÆ.

Rhizaxinella australiensis, Hentschel.

R. australiensis, Hentschel 1909, p. 397, pl. xxii, figs. 4, 5 ; text-figs. 27, 28.

Occurrence.—Reg. 202, 205, 206, stn. 194, off Oates Land, 180–200 faths. : Reg. 203, stn. 339, off McMurdo Sound, 140 faths. : Reg. 204, stn. 316, McMurdo Sound, 190–250 faths.

The eight Antarctic examples agree with the Australian forms described by Hentschel in spiculation but differ slightly in external form. On the whole the branches are much more slender. The same thing may be said of a number of forms apparently belonging to the same species sent me from South Africa.

Homaxinella supratumescens (Topsent).

Axinella supratumescens, Topsent 1907, p. 6 ; 1908, p. 32, pls. ii, iii, v ; Kirkpatrick 1908*β*, p. 23, pl. xxii, fig. 8, pl. xxvi, fig. 6 ; Hentschel 1914, p. 122 : *Homaxinella supratumescens*, Topsent 1917, p. 38.

Occurrence.—Reg. 200, 201, stn. 220, Robertson's Bay, 5 faths.

Family CLAVULIDÆ.

Latrunculia apicalis, Ridley and Dendy, var. *biformis*, Kirkpatrick.

L. apicalis var. *biformis*, Kirkpatrick 1908β, p. 14, pl. xv, figs. 1–7.

Occurrence.—Reg. 145, stn. 294, Ross Sea, 158 faths. : Reg. 146, stn. 316, McMurdo Sound, 190–250 faths. : Reg. 147, stn. 349, McMurdo Sound, 80 faths. : Reg. 148, stn. 355, Ross Sea, 300 faths.

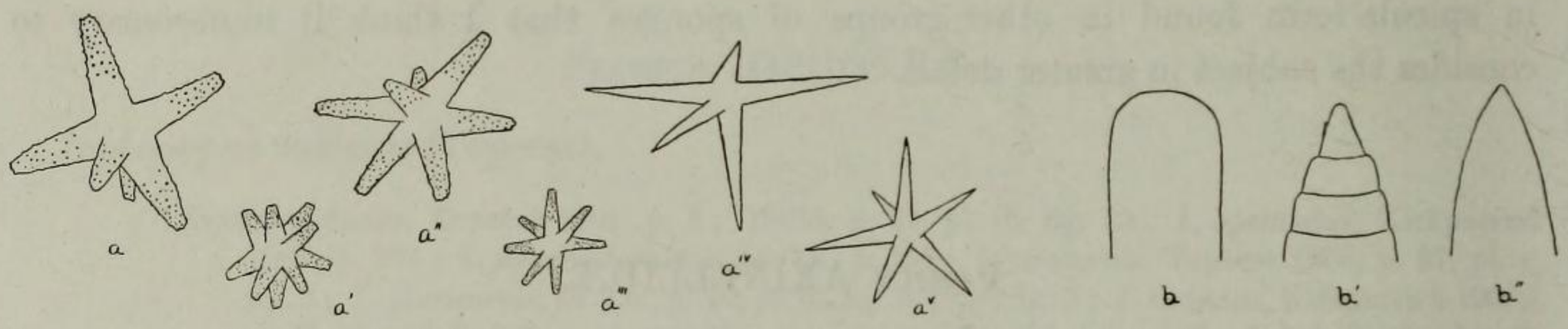
Genus HEMIASTRELLA, Carter.

Epallax, Sollas 1888, p. 423 : *Kalastrella*, Kirkpatrick 1903*a*, p. 238 : *Hemiastrella*, Topsent 1919, p. 6.

Hemiastrella digitata, **sp. n.** (Pl. IV, fig. 4, text-figure 9.)

Occurrence.—Reg. 335, stn. 339, off McMurdo Sound, 140 faths.

Diagnosis.—Sponge palmo-digitate, tough and incompressible ; surface glabrous but occasionally strongly hirsute in small patches ; neither oscules nor pores visible ; colour, in spirit, white ; skeleton composed of an axial core of megascleres from



Text-fig. 9.—*Hemiastrella digitata*, sp. n. (*a*–*a*″) Pseudasters, ×600 ; (*b*–*b*″) Various forms assumed by the bases of the megascleres.

which radial bundles are given off at right angles ; megascleres styli ; microscleres pseudasters, forming a dense surface layer and scattered throughout choanosome.

Spicules.—(1) *Styli* (Fig. 9 *b*), smooth, usually straight, variable in size, measuring on an average 1·0 by 0·022 mm. In a large number of these spicules the stylote end has become considerably modified so that the spicule ends in a series of annulations crowned by a terminal mucron. Less frequently the spicule presents the appearance of a true oxeote, but since this form is directly connected by intermediate forms with the true styli there can be no question but that they are modified styli and not true oxea. The Antarctic Desmacidonidæ seem to be particularly subject to this modification of the style (cf. *Mycale acerata*, *Acanthorhabdus fragilis*, etc.), and the present case provides strong support for the remarks concerning *Iophonopsis radiatus* (see pp. 442–3).

(2) *Pseudasters* (Fig. 9 *a*), with stout, usually truncate rays, minutely spined or tuberculate particularly towards the ends. The number of rays on a single spicule varies from 6 to 10, and the total diameter of the spicules from 0·012 to 0·027 mm.

Family SUBERITIDÆ.

Stylocordyla borealis (Lovén) var. *acuata*, Kirkpatrick.

S. borealis var. *acuata*, Kirkpatrick 1908*β*, p. 22, pl. xvi, figs. 6–10; Hentschel 1914, p. 34.

Occurrence.—Reg. 119–121, stn. 331, McMurdo Sound, 250 faths.: Reg. 122, stn. ?, off New Land, S. of Balleny Islands: Reg. 123, stn. 314, McMurdo Sound, 222–241 faths.: Reg. 124, stn. 355, off McMurdo Sound, 300 faths.: Reg. 125, stn. 356, McMurdo Sound, 50 faths.: Reg. 126–7, stn. 339, off McMurdo Sound, 140 faths.: Reg. 128, stn. 340, off McMurdo Sound, 160 faths.: Reg. 129, stn. 349, McMurdo Sound, 80 faths.: Reg. 130–133, exact locality unknown.

Suberites papillatus, Kirkpatrick.

S. caminatus var. *papillatus*, Kirkpatrick 1908*β*, p. 20, pl. xv, fig. 16, pl. xvi, figs. 11–14: *Tentorium papillatum*, Topsent 1917, p. 36, pl. iv, fig. 2.

Occurrence.—Reg. 155–158, stn. 194, off Oates Land, 180–200 faths.: Reg. 159–163, stn. 316, McMurdo Sound, 190–250 faths.: Reg. 164–166, stn. 355, Ross Sea, 300 faths.: Reg. 167–171, stn. 314, McMurdo Sound, 190–250 faths.: Reg. 172–177, stn. 356, McMurdo Sound, 50 faths.

Remarks.—Topsent (l.c.) removed this species to the genus *Tentorium*. The reason for this step appears to be the similarity in external form between the present species and *Tentorium semisuberites*. On the other hand, the skeleton of *Suberites papillatus* is that of a typical *Suberites* and is without the characteristic tangential dermal layer of megascleres of *Tentorium*.

Pseudosuberites hyalinus (Ridley and Dendy).

Hymeniacidon (?) *hyalinus*, Ridley and Dendy 1887, p. 168, pl. xlv, fig. 6: *Pseudosuberites hyalinus*, Topsent 1898*β*, p. 103; Id. 1900, p. 170, pl. vii, fig. 9; Id. 1913*a*, p. 26, pl. iii, fig. 10; Kirkpatrick 1908*β*, p. 21, pl. xxvi, fig. 7; Row 1911, p. 305; Hentschel 1914, p. 52: *P. hyalinus* var. *compacta*, Id. l.c., p. 53, pl. iv, fig. 1; Topsent 1917, p. 37.

Occurrence.—Reg. 62–65, 75, 76, stn. 316, McMurdo Sound, 190–250 faths.: Reg. 74, stn. 194, off Oates Land, 180–200 faths.

Remarks.—The present examples show that the supposed variety *compacta* is nothing more than a variation normal to the species.

Pseudosuberites exalbicans, Topsent.

P. exalbicans, Topsent 1913*a*, p. 614, pl. iv, fig. 5.

Occurrence.—Reg. 77, stn. 340, off McMurdo Sound, 160 faths.: Reg. 78, stn. 314, McMurdo Sound, 222–241 faths.

Remarks.—Although agreeing very closely with the holotype in external features,

the present examples contain tylostyles measuring up to 1·1 by 0·03 mm. In view of the wide range in size of the spicules of *P. hyalinus*, however, this may be regarded as nothing unusual.

GENUS SUBERELLA, **gen. nov**

Genotype : *S. topsenti*, **nom. n.**

Holotype.—Reg. 26.10.26. 186, British Museum Coll.

Diagnosis.—Suberitidæ with specialised pore-areas ; with a single spicule form, a subtylostyle, forming a confusedly reticular skeleton in the choanosome, with a tendency to the formation of wisps or bundles of spicules, and a cortical layer of spicules, of the same size as those of the choanosome, with the apices directed towards and slightly projecting beyond the surface of the sponge.

The genus is intermediate between *Suberites* and *Pseudosuberites*.

Suberella topsenti, **nom. n.** (Pl. IV, fig. 5.)

Suberites montiniger, Topsent 1915, p. 39 ; (non *Suberites montiniger*, Carter).

Occurrence.—Reg. 186, stn. 356, McMurdo Sound, 50 faths.

Remarks.—*Suberites montiniger* Carter from the North Atlantic belongs to the genus *Pseudosuberites*, and although showing a remarkable similarity to the present species in external form, differs in the structure of its skeleton, in which a tangential dermal layer of tylostyles is the distinctive feature.

Polymastia invaginata, Kirkpatrick.

P. invaginata, Kirkpatrick 1907, p. 271; Id. 1908β, p. 15, pl. xii, fig. 1, pl. xiv, figs. 5–15:
P. invaginata var. *gaussi*, Hentschel 1914, p. 49, pl. v, fig. 4.

Occurrence.—Reg. 104, stn. 331, McMurdo Sound, 250 faths. : Reg. 105, 160, 240, stn. 314, McMurdo Sound, 222–241 faths. : Reg. 107, stn. 356, McMurdo Sound, 250 faths.

Remarks.—The present forms are fairly typical except that Reg. 240 has no surface pile of spicules. Some, however, possess characters intermediate between those of the " Discovery " and the " Gauss " specimens, so that the retention of the var. *gaussi* seems to be no longer necessary.

Sphærotylus antarcticus, Kirkpatrick.

S. antarcticus, Kirkpatrick 1907, p. 272 ; Id. 1908β, p. 16, pl. xii, figs. 1–16, pl. xiii, figs. 1–7 :
S. antarcticus var. *drygalskii*, Hentschel 1914, p. 51.

Occurrence.—Reg. 96, stn. 356, McMurdo Sound, 50 faths. : Reg. 97, 99, stn. 314, McMurdo Sound. 222–241 faths. : Reg. 98, 351, stn. 331, McMurdo Sound, 250 faths.

Remarks.—Hentschel's var. *drygalskii* is founded on the difference in size between the spicules of the " Gauss " specimens and those of the " Discovery " specimens, but

in view of the variability of spicule-size in the species, such features are negligible from a taxonomic point of view, and the variety is accordingly abandoned.

Sphærotylus schœnus (Sollas).

S. capitatus var. *vanhöffeni*, Hentschel 1914, p. 50, pl. v, fig. 5.
(For further synonymy, *see* Kirkpatrick 1908*β*, p. 18, and Topsent 1923, p. 23.)

Remarks.—The use of the varietal name is here abandoned for the same reason as in the case of the preceding species.

Order EUCERATOSA.

Aplysina minima, Hentschel.

A. minima, Hentschel 1914, p. 137, pl. iv, fig. 18.

Occurrence.—Reg. 207, 353, stn. 339, off McMurdo Sound, 140 faths.

Remarks.—A small conical specimen, about 3 cms. high and 4 cms. across the base, agreeing very closely in structure and appearance with the holotype. In one respect it differs, however, in that the main fibres, the ectosome and the choanosome are crowded with a mixture of foreign spicules. In the ectosome the spicules form a very decided, densely-packed layer, while in the fibres they are arranged in a line at the centre longitudinally to the axis.

A second small macerated horny sponge (Reg. 207) may possibly belong to the same species.

Hircinia variabilis, Schulze. (Pl. IV, fig. 6.)

H. variabilis, Schulze 1879*a*, p. 12, pls. i, iii, iv.

Occurrence.—Reg. 352, stn. 339, off McMurdo Sound, 140 faths.

Remarks.—The single specimen is about 8 cms. long, 3 cms. across and 1·5 cms. high. Some $\frac{2}{5}$ths of the sponge correspond exactly in the characters of the surface with some Mediterranean sponges in the British Museum identified by Schulze as *H. variabilis*. In the remainder of the sponge, the character of the surface is very different. The surface conules are more pronounced; there are no projecting ends of the primary fibres to give a sparsely hirsute appearance; and between the conules, the surface itself shows a pronounced reticulation.

It is most improbable that the specimen represents two sponges which have grown together, yet the surface characters of its two portions are so different that, found in two separate individuals, they would lead to the two sponges being placed in different species. The probable explanation is that the two portions of the sponge grew at different seasons of the year under differing conditions of the environment.

Possibly many of the so-called species of this and other genera are no more than individuals of a single species which have achieved the maximum amount of their growth either at different seasons of the year or under different environmental conditions.

Spongelia oculata, **sp. n.** (Pl. IV, fig. 7.)

Holotype.—Reg. 26.10.26. 245, British Museum Coll.

Occurrence.—Reg. 245–247, stn. 339, off McMurdo Sound, 140 faths.

Diagnosis.—Sponge erect, branching or flabellate-digitate; surface even but slightly roughened by projecting ends of primary fibres; oscules, 1–2 mm. in diameter, arranged in linear series; colour, in spirit, pale yellow; skeleton, a reticulation of primary, secondary and, occasionally, tertiary fibres, primaries being filled with sand and foreign spicules.

Remarks.—Of the three specimens, the first, the holotype, consists of a number of cylindrical branches which show a strong tendency to anastomose. The total height of the sponge is 14 cms. and the average diameter of the branches about 1 cm. The second consists of a single branch, 14 cms. long and 1 cm. in diameter, on an average, with three small branchlets set in one plane and leaving the main branch at right angles to it. The third is flabello-digitate, about 6 cms. high and 4 cms. across at the top. In all the texture is very much that of *Spongelia fragilis* but slightly more compressible.

The skeleton consists of a reticulation of fibres composed of a clear, pale-yellow spongin, with the primaries, about 0·08 mm. in diameter, running vertically to the surface, filled with sand grains, foreign sponge spicules, foraminifera, etc. Throughout their course the primaries are connected by transverse secondary fibres, about 0·024 mm. thick, at intervals varying from 0·12 to 0·4 mm. The primaries themselves are usually about 0·5 mm. apart. Here and there the secondaries become somewhat irregular and show a tendency to break up into tertiary fibres about 0·012 mm. thick. Especially is this so at or near the surface.

The general agreement between the present specimens and the common European *Spongelia fragilis* leaves no doubt as to their generic position.

Dendrilla membranosa (Pallas).

D. antarctica, Topsent 1908, p. 11, pl. iii, fig. 2, pl. iv; Hentschel 1914, p. 137; Topsent 1917, p. 31.
(For further synonymy see Ridley 1884, p. 391.)

Occurrence.—Reg. 22, stn. 355, off McMurdo Sound, 300 faths.: Reg. 112, stn. 356, McMurdo Sound, 50 faths.

The only real difference between *D. membranosa* and *D. antarctica* lies in the colour, but since this is recognised as variable in both, no valid distinction remains between the species.

Of the present two specimens, Reg. 22 is practically identical with Ridley's specimens of *D. membranosa* and Reg. 112 with the holotype of *D. antarctica*.

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[The more important references are given in black type.]

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Porifera, Part II.—Antarctic Sponges, Pl. I.

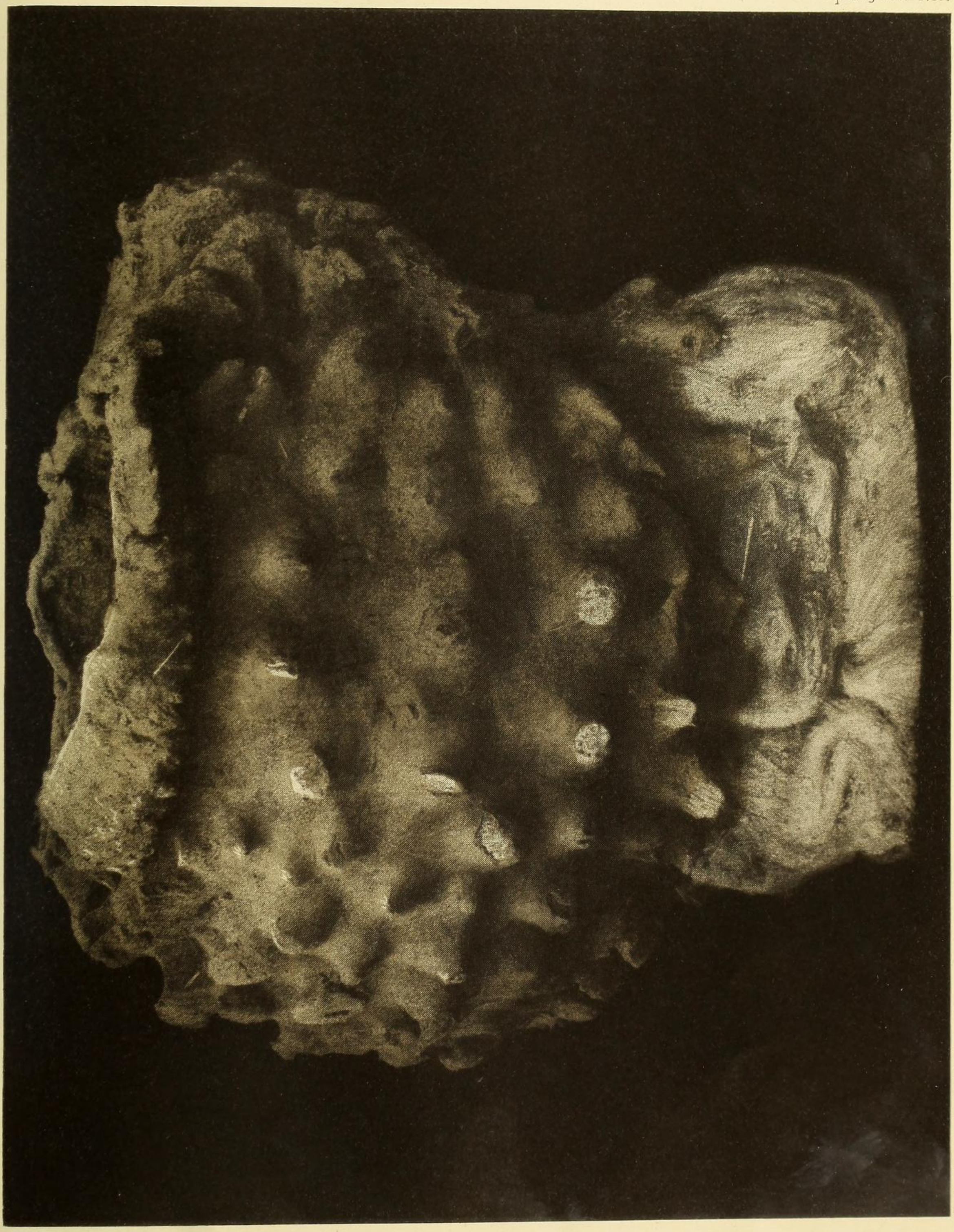
PLATE I.

Rossella racovitzæ, showing the rapid proliferation of buds which occasionally takes place. About natural size.

P.Highley phot. et C.Hodges imp.

PLATE II.

Rossella nuda, × 1/2.



P. Highley phot. et C. Hodges imp.

Sponges. Pl. II.

PLATE III.

Rossella villosa, × 1/2.

Sponges. Pl. III.

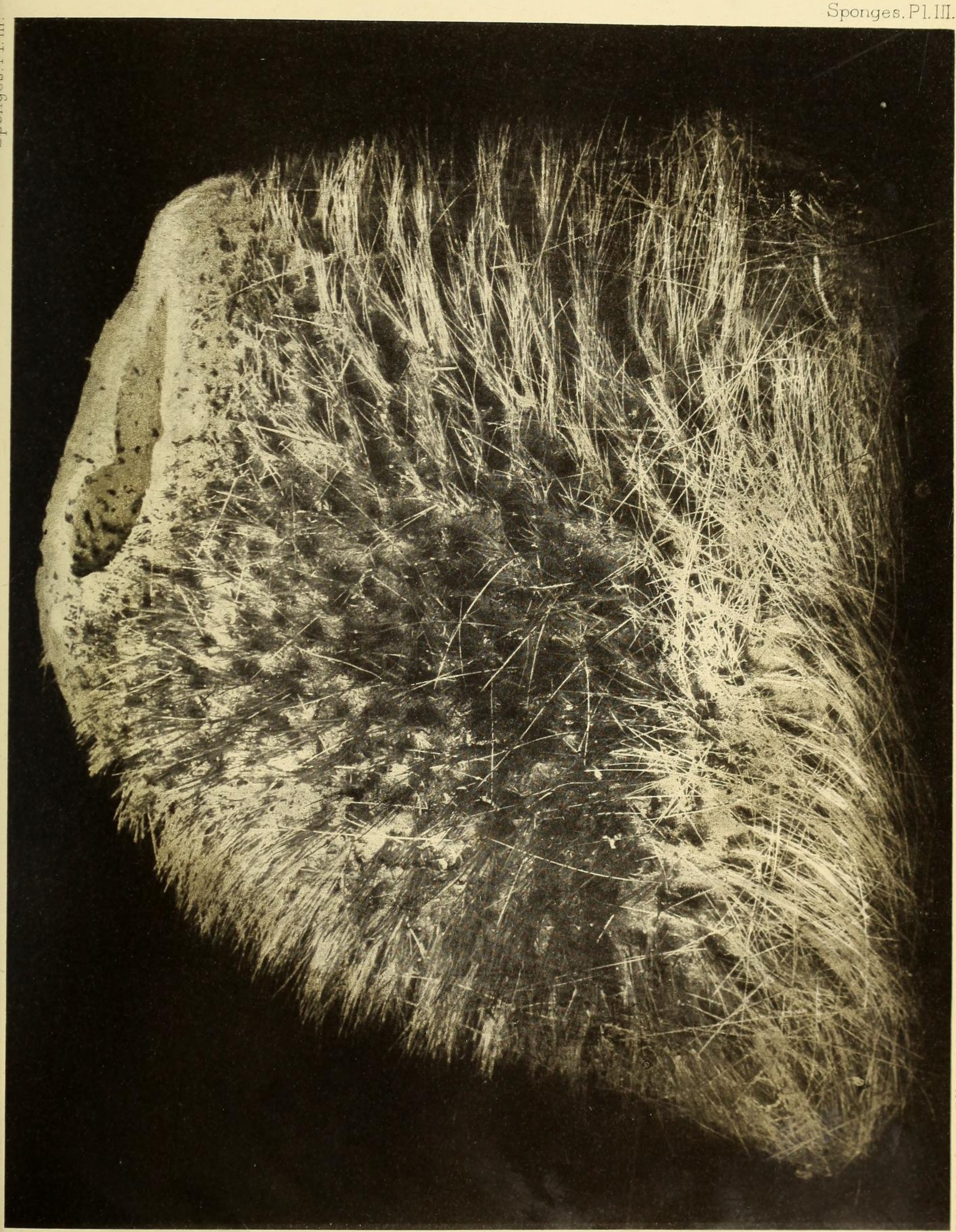


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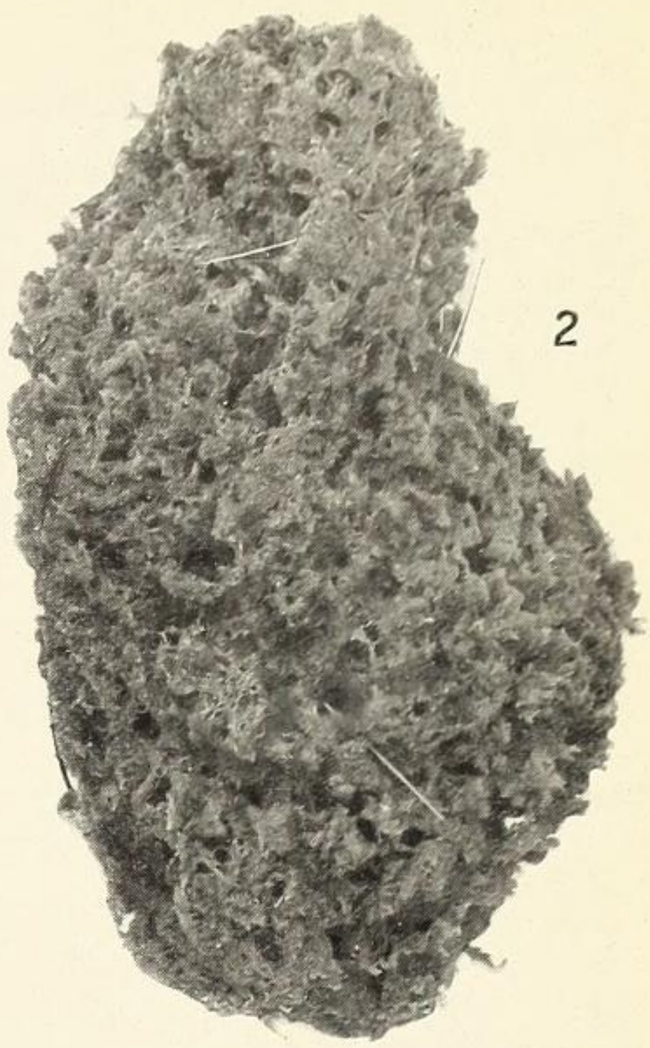
PLATE IV.

FIG. 1.—*Monosyringa brondstedi*, sp. n., × 1/1.
„ 2.—*Acanthorhabdus fragilis*, sp. n., × 2/3.
„ 3.—*Lissodendoryx flabellata*, sp. n., × 1/1.
„ 4.—*Hemiasterella digitata*, sp. n., × 1/1.
„ 5.—*Suberella topsenti*, sp. n., × 1/1.
„ 6.—*Hircinia variabilis*, Schulze, × 1/1.
„ 7 *a–c*.—*Spongelia oculata*, sp. n., × 1/1.

7a

7b

7c



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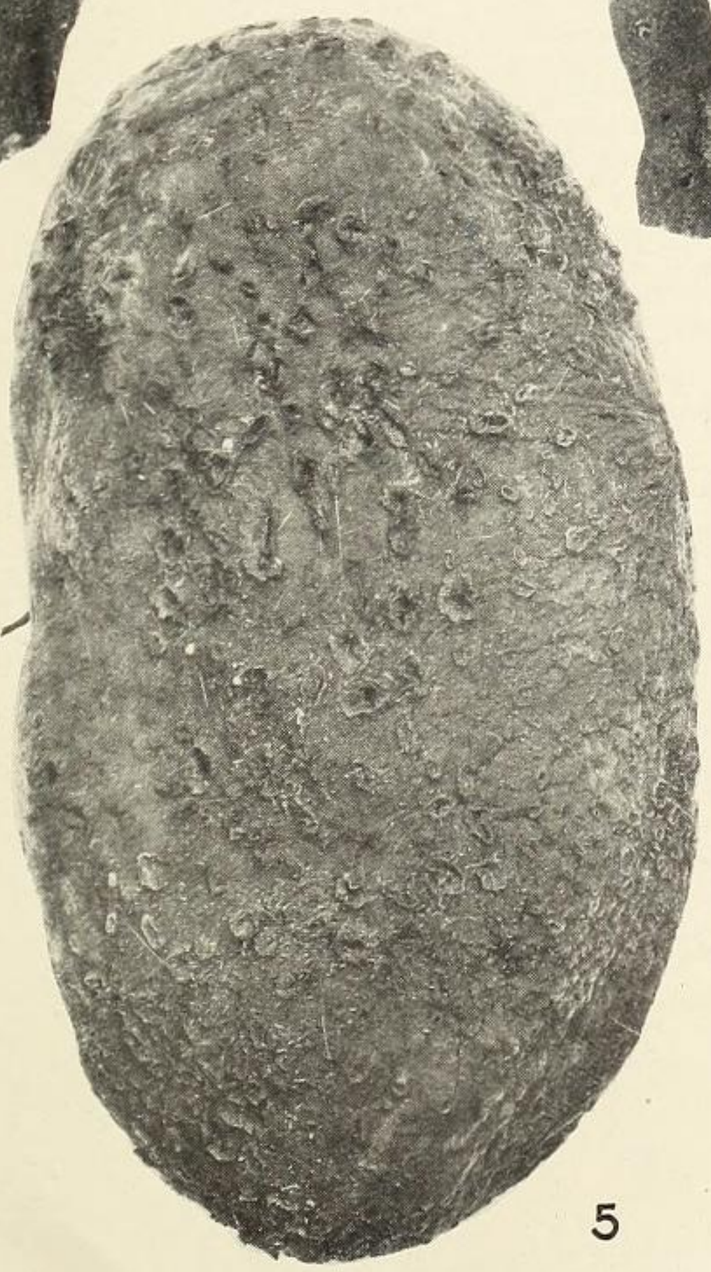

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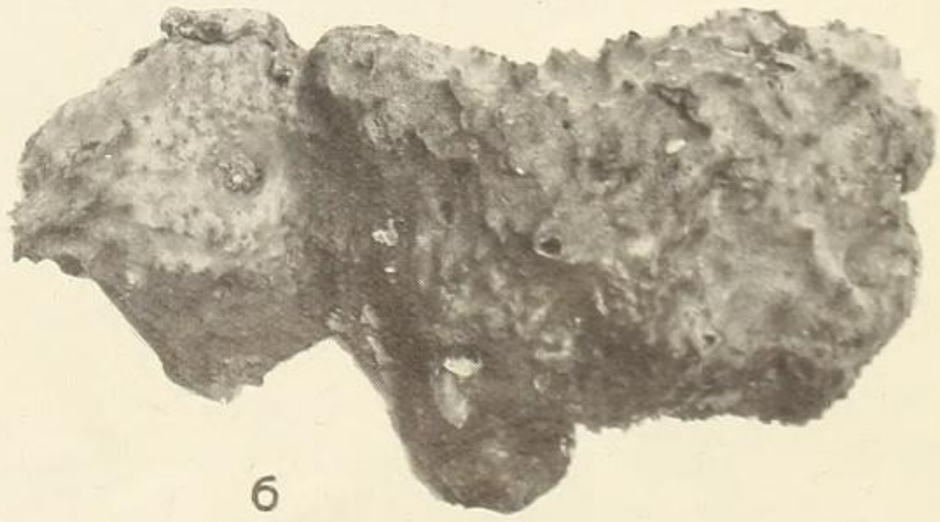

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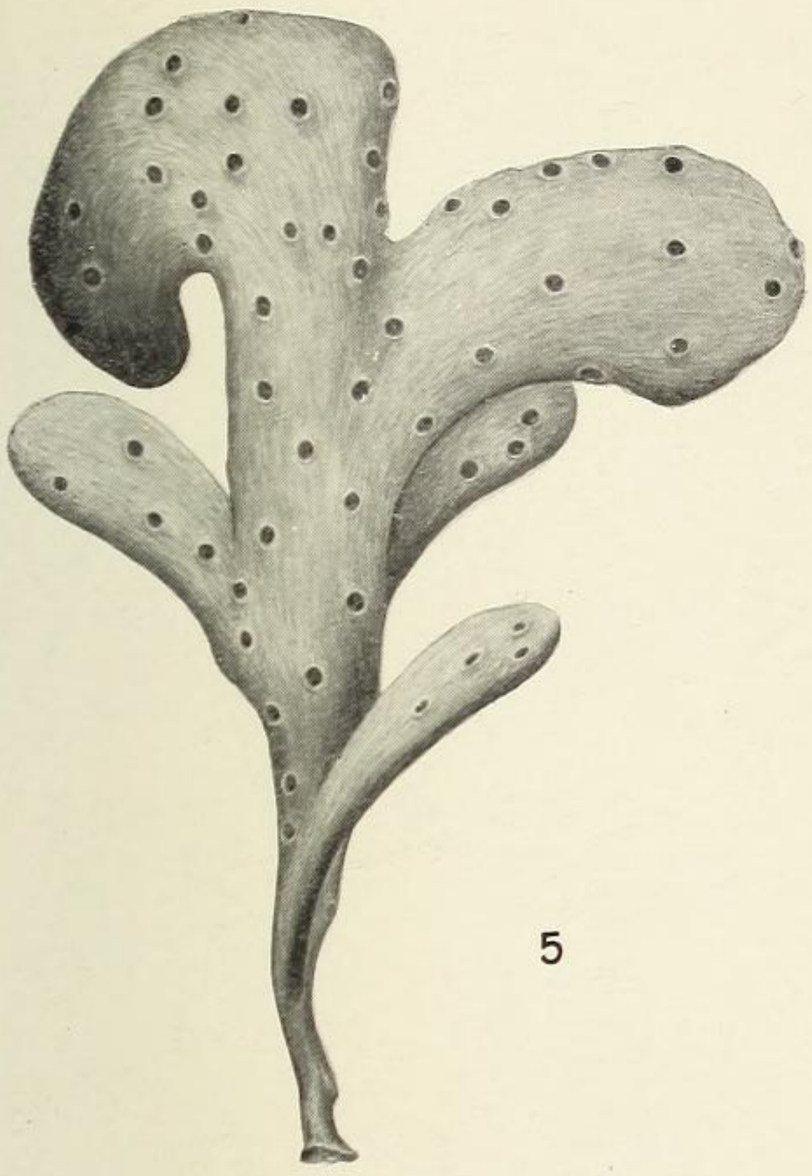
PLATE V.

FIGS. 1–4.—*Leuconia leptorhaphis* (Jenkin), × 3/4.
„ 5, 6.—*Calyx stipitatus*, Topsent, × 1/3 ; 5, flabellate form ; 6, branching form.
„ 7.—*Plumocolumella cribriporosa*, sp. n., × 1/2.
„ 8.—*Cercidochela lankesteri*, sp. n., × 1/2.



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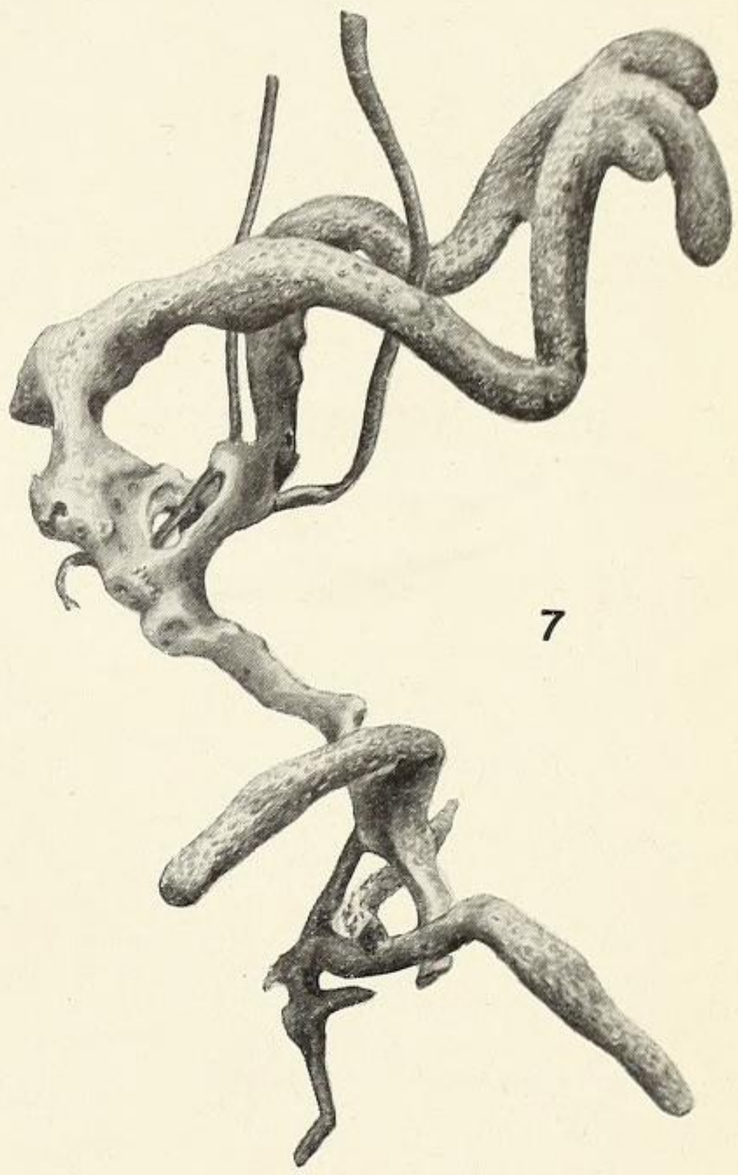

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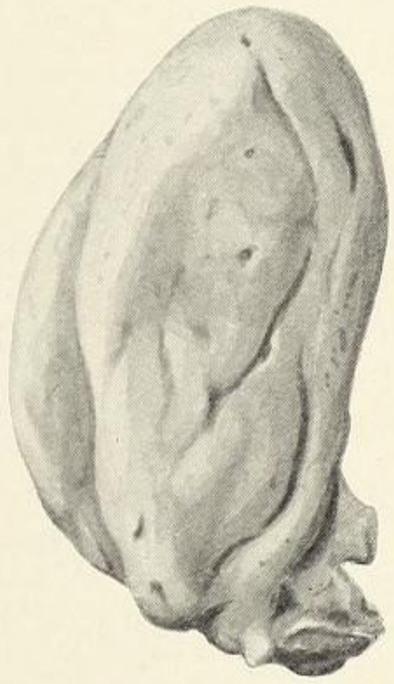

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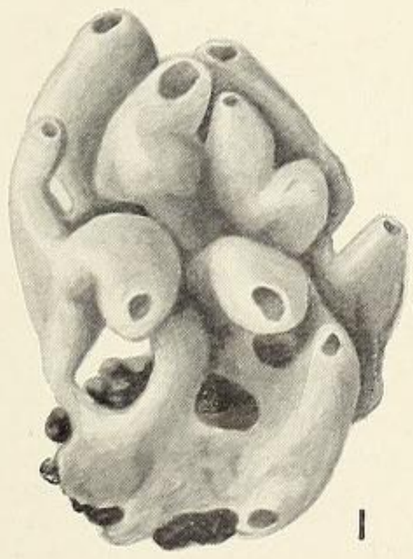

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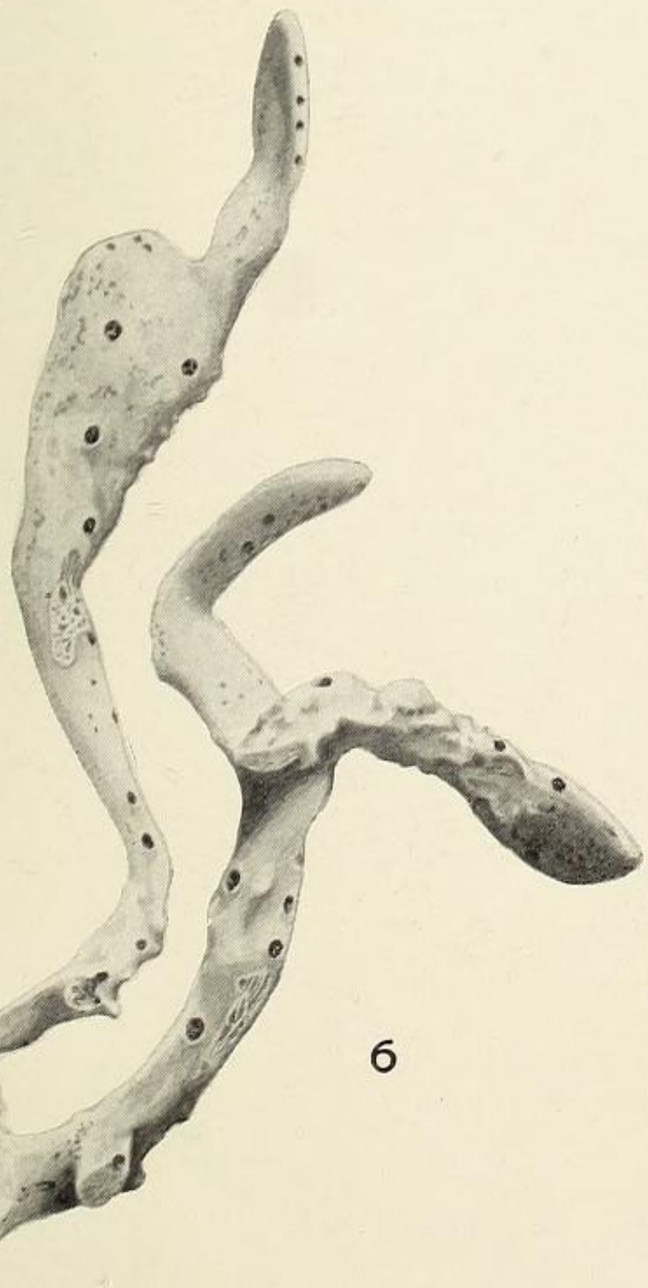

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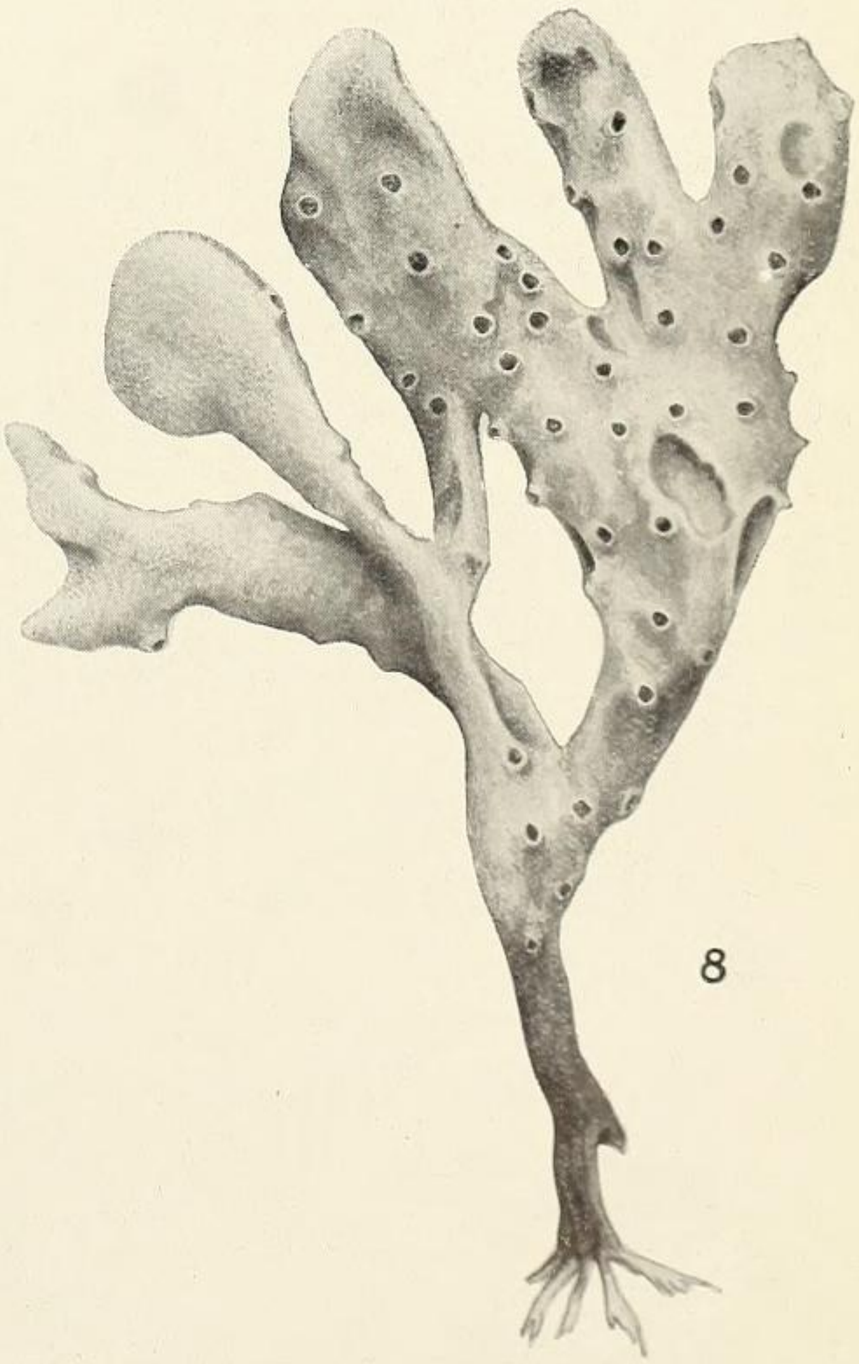

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