FURTHER ZOOLOGICAL RESULTS

OF THE SWEDISH ANTARCTIC EXPEDITION

1901—1903

UNDER THE DIRECTION OF DR. OTTO NORDENSKJÖLD

EDITED BY T. ODHNER

VOL. II, No. 3.

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OSKAR CARLGREN

WITH 61 FIGURES

STOCKHOLM
P. A. NORSTEDT & SÖNER
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In the present paper are treated materials of Actiniaria and Zoantharia not only from the Swedish South-Polar Expedition 1901—1903 but also from other antarctic and subantarctic expeditions. I have especially made a completion to my paper "Zoantharia" in the Hamburger Magalhaensische Sammelreise (1899), the species of which were in certain respects only preliminarily described and figured. Besides, I have revised several of the Actinians from the Plate-collection, described by MC MURRICH 1904, 2 species from the Gazelle-Expedition determined by STUDER 1879, CLUBB's species from the "Southern Cross" and "Discovery" Antarctic Expeditions (1902, 1908) and the species described by PAX 1923 from the expedition of "Pourquoi pas". In the discussion of the geographical distribution I have had an opportunity of mentioning some forms from the German Deep-Sea Expedition, from the Scottish Antarctic ("Scotia") expedition and from the Australasian expeditions 1911—1914, the Actinians of which I will describe in my next papers. To all who have lent me material for comparison, especially to Professor Zimmer in Berlin and Professor Joubin in Paris, I beg to express my best thanks.

A survey of the species mentioned in this paper will be given in the zoogeographical remarks accompanying the description of the species.

I. Description of species.

Actiniaria.

Tribus **Protantheae** CARLGR.

Actiniaria with more or less distinct pedal disc, always without basilar muscles. Ciliated streaks of the filaments always absent. Column often with ectodermal longitudinal muscles and sometimes with spirocysts. No sphincter or more rarely a diffuse one. Tentacles arranged in cycles or in radial series. Mesenteries originating always in exocoels. Muscles of the mesenteries weak.

Subtribus **Ptychodactininae** nov.

Filaments of the imperfect mesenteries in their distal end forming curious half-funnels. Weak ectodermal muscles in the column. Spirocysts in the column, if present, very sparse. Nematocysts of usual structure. No differentiated sphincter. Tentacles arranged in cycles. Actinopharynx long or very short with or without siphonoglyphs. Pairs of perfect mesenteries 6, 12 or more. Reproductive organs in the lower part of the mesenteries below the filaments.

STEPHENSON (1921, 1922) has proposed a new tribus *Ptychodacteae* for the peculiar family Ptychodactiidae, a family referred by myself (1911) to the Protactininae under the Protantheae. There is, in fact, reason to separate this family from the real Protactininae, but it does not seem necessary to me to remove them from the Protantheae, as the family has many relations to these forms. I am therefore inclined to establish only a new subtribus *Ptychodactininae* with the characters given above. Thus the Protantheae to my mind includes three subtribus *Protactininae* with the families Gonactiniidae and Sideractiidae, *Ptychodactininae* with the family Ptychodactiidae and *Protostichodactylinae* with the families Corallimorphidae (Corynactiidae), Ricordeidae and Discosomidae.

Fam. **Ptychodactiidae.**

Dactylanthus antarcticus (CLUBB) CARLGR.

Cystiactis antarctica n. sp. CLUBB 1908 p. 5, Pl. 2, figs. 12—15.
Dactylanthus antarcticus (CLUBB). CARLGREN 1911 p. 2, Pl. 1 figs 1—5, Pl. 2 figs 1—5; STEPHENSON 1918 p. 19, Pl. 1 fig. 10, 1922 p. 250.

Colour?

Dimensions: Length of the body 4 cm. Largest breadth 3.4 cm. The specimen described by CLUBB was somewhat larger, 5.75 resp. 4 cm.

Occurrence: Graham region, SE from Seymour Isl., 64° 20′ S 56° 38′ W. 150 m. Sand and gravel. 16. 1. 1902. 1 spec.

Further distribution: Mc Murdo Bay, winter quarters 20 fms. (Discovery Exp.); Mc Murdo Sound, 77° 13′ S. 164° 18′ E., 207 fms, mud (Terra Nova Exp.).

The species was before (1911) described in detail by myself.

Subtribus **Protostichodactylinae** CARLGR.

Filaments without special differentiation. Column sometimes with ectodermal muscles, but without spirocysts. Nematocysts partly of a particular type and then often very large, sometimes present also in the endoderm. No sphincter or a weaker or stronger diffuse one. Tentacles in radial series at least from the endocoels. Siphonoglyphs very weak or absent. Perfect pairs of mesenteries always more than 12, often numerous and irregularly arranged in connection with asexual reproduction (always?).

From reasons I have before (1924 a. p. 181) pointed out I cannot accept KREMPFF's and STEPHENSON's opinions that the Protostichodactylinae belong to the Madreporaria.

Fam. **Corallimorphidae.**

Corynactis carnea STUD.

Corynactis carnea n. sp. STUDER 1879 p. 542.
Anemonia variabilis n. sp. MC MURRICH 1893 p. 147, Pl. 21, figs. 18—19.
Corynactis carnea Stud. ANDRES 1883 p. 484; MC MURRICH 1893 p. 208; KWIETNIEWSKI 1896 p. 597, Pl. 26,figs 12, 13; MC MURRICH 1904 p. 291; STEPHENSON 1922 p. 303.

Diagnosis: Sphincter distinct in structure as that in *C. haddoni*. Unto about 40 radial rows of endocoel-tentacles, each row containing (2) 3—5 tentacles in larger individuals, (1) 2—4 in smaller. 1—2 (or more?) directives. Specific nematocysts in the filaments 72—84 × 23—29 μ, in the caput of the tentacles 60—94 × 13—18 μ, in

the actinopharynx 46—53 × 10—11 μ. Spirocyst-like cnidae with visible basal part to the spiral thread in the caput of the tentacles 58—74 × about 5 μ.

Colour: flesh-coloured, around the oral disc a grass-green annulus (STUDER).

Dimensions: unto about 0.9 cm high, breadth of the oral disc unto 0.8 cm.

Occurrence: Off Argentina, 37° 50′ S 56° 11′ W. 100 m. Gravel mixed with sand. 23. 12. 1901; several specimens. Chiloe, Guaitecas Isls, Melinca, 13 fms. leg. DUSÉN, several specimens.

Further distribution: Calbuco; Argentina 38° 10′ S 56° 26′ 6 W; East Patagonia 42° 24′ S 61° 38′ 30″ W. 43 fms.

The exterior and the anatomy of this species is described by MC MURRICH and KWIETNIEWSKI. The number of endocoel-tentacles varies in the rows, in smaller specimens from (1) 2—4, in larger from (2) 3—5. In one specimen the number of endocoel tentacles in the rows was as follows. 5, 5, 4, 4, 4, 4, 2, 3, 5, 4, 5, 4, 4, 5, 3, 5, 3, 5, 4, 5, 5, 3, 4, 4, 4, 4, 3, 4, 5, 5, 4 + 3 rows in regeneration (size of the specimen length 0.9 cm, breadth of the oral disc 0.8 cm). In about the half of the animal in three other specimens:

1) 3, 2, 4, 2, 2, 5, 3, 2, 4, 2, 2, 5, 2, 2, 4 (breadth of the oral disc 0.6 cm);

2) 3, 2, 3, 2, 4, 2, 3, 2, 2, 3, 1 (breadth of the oral disc 0.4 cm);

3) 3, 2, 2, 4, 2, 3, 2, 2, 4, 2, 2, 2, 3, 2, 4 (in somewhat more than half the oral disc).

The arrangement is thus very irregular. Concerning the size of the nematocysts compare the diagnosis. Besides the nematocysts named in the diagnosis there are in the caput of the tentacles other nematocysts with visible basal part to the spiral thread and of the same structure as in *C. haddoni* (CARLGREN 1924 a p. 184) partly 31—48 × (4) 4.5 μ, partly 34—48 × 6—7 μ. The corresponding nematocysts in the actinopharynx were 29—38 × about 4.5 μ resp. about 34 × 6.5 μ. The spirocysts in the caput of the tentacles were 22 × 1.5 μ—72 × 4.5 μ. The peduncle of the tentacles contained almost only spirocysts 22 × 1.5—60 × 3.5—4 μ. In conformity with MC MURRICH I have found the arrangement of mesenteries very irregular.

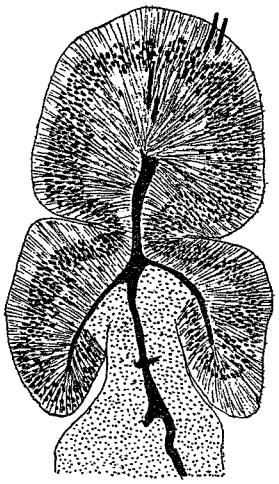


Fig. 1. *Corynactis carnea*. Transverse section of a piece of the undermost part of the actinopharynx with one mesentery (compare the text!).

MC MURRICH (1904 p. 295) has found »in sections which pass through the upper portions of the filaments distinct indication of the trefoil appearance» and interprets the lateral processes as ciliated streaks or at least as homologous with these structures. I have already pointed out (1924 a p. 183) that these lateral processes belong to the undermost part of the actinopharynx which splits in

the furrows before it ends. Sections through the undermost part of the actinopharynx therefore show figures recalling sections through filaments in the region of ciliated streaks. I have in the fig. 1 reproduced a figure showing a section through such a false filament. That in fact we have not to do with a part of a filament is clear, there are namely no traces of intermediate streaks present here.

It is very difficult to erect good characters separating the known *Corynactis*-species. In anatomic respect they agree very well. The diagnosis of *C. carnea* is therefore only tentative.

Tribus **Nynantheae** CARLGR.

Fam. **Edwardsiidae.**

Diagnosis of the family and of the genus *Edwardsia*. Compare CARLGREN 1921 p. 22, 27.

Edwardsia intermedia MC MURR.

Edwardsia intermedia n. sp. MC MURRICH 1893 p. 136, Pl. 19, figs 1—4.
Edwardsiella intermedia (MC MURR.). CARLGREN 1899 p. 6, figs. 4, 5.

Diagnosis: Physa well developed. Cuticle of the scapus rather thin. Nemathybomes small, very numerous, scattered, not collected in groups. Nematocysts in the nemathybomes of one kind (34) 36—48 (53) × 3—3.5 (4) μ. Nematocysts of the capitulum 15—19 × about 2.5 μ. Scapus and capitulum in contracted state of the body polygonal. Tentacles 16—about 28. Nematocysts of the tentacles 21—26 × about 2—2.5 μ, their spirocysts 14 × 1.5—about 24 × 3 (3.5) μ. Nematocysts of the actinopharynx partly 31—41 × 3—3.5 (4) μ, partly 24—26 × 5 μ. Longitudinal muscle pennons strong, rather elongated, in the upper part of the reproduction region with 15—25 high folds, here and there rather well branched; outermost fold most richly branched. Outer lamellar part of the mesenteries attached to the pennons rather close to their centrum. Parietal muscles strong, more or less fan-like or somewhat elongated. Expansion of the parietal muscles on the column considerable.

Colour: The scapus in all specimens dredged by the Sw. S. Polar-Expedition was dirty gray. In other specimens the scapus was ochre-coloured. (CARLGREN 1899).

Dimensions: In introverted state unto 3,7 cm long and about 0.45 cm broad.

Occurrence: Graham region, Admirality Sound, 64° 21′ S 54° 0′ W. 5—9 m. Small stones and gravel 1 spec. — Same locality. 6 m. Loose clay, 2 specimens. 12. 2. 1902, St. 9, 10.

South Georgia, Cumberland bay, Grytviken, 54° 22′ S 36° 28′ W. 12—15 m. Sand and algæ, 2 specimens. 1—2 m. 24. 5. 1902. St. 28. — Sand and gravel, several specimens .13. 6. 1902. St. 36.

Further distribution: South Chile, 51°02′ 30″ S 74°08′ 30″ W. 122 fms. Magelhan's Strait, Punta Arenas, Gente Grande. South Tierra del Fuego, Ushuaia, South Georgia (Locality?), low-water.

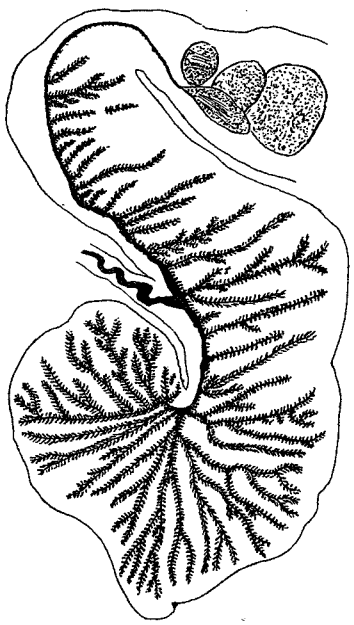


Fig. 2.

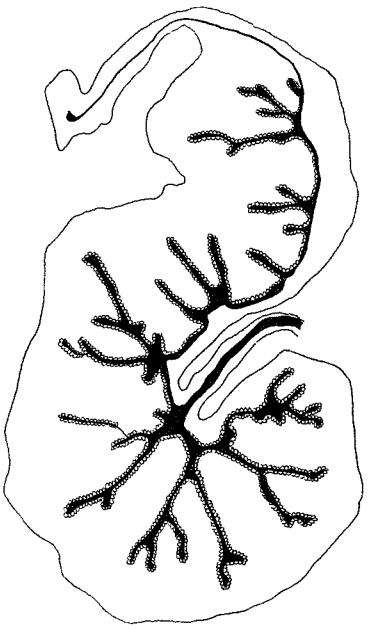


Fig. 3.

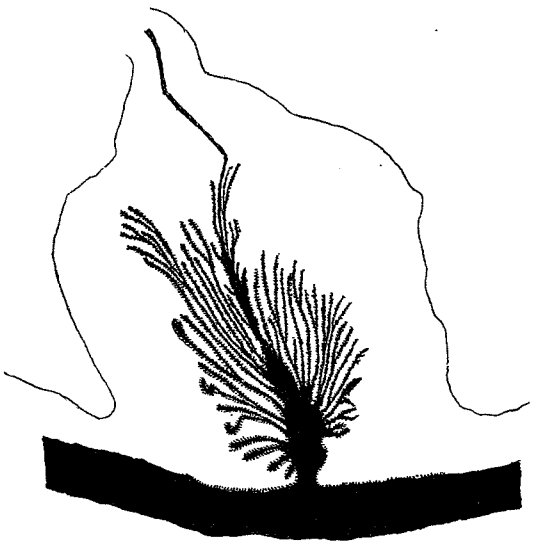


Fig. 4.

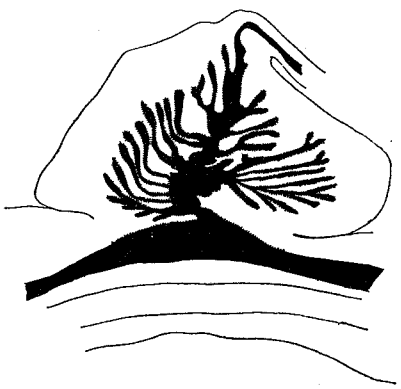


Fig. 5.

Figs. 2—5. *Edwardsia intermedia*. Transverse sections of pennons (figs. 2, 3) and parietal muscles (figs. 4, 5) from two specimens. (Compare the text.)

The specimens from the Swedish South Polar-Expedition were mostly larger than the specimens before examined by myself. The number of tentacles is also greater. In three examined specimens there were 26, 28 and 28 tentacles. The single siphonoglyph, the ventral, is distinct. Concerning the nematocysts in the nemathybomes their size agrees well in the different specimens although the nematocysts in the smaller specimens are somewhat shorter than in the larger as shown in the following table.

Habitat.	Size of the body.	Nematocysts in the nemathybomes.
Punta Arenas	length 1.5 cm, breadth 0.15 cm	36—43 × 3—3.5 μ
Ushuaia	» 0.9 »	35—36 × about 3
»	» about 2 cm (strongly bent)	36—48 (53) × 3—3.5
South Georgia locality? . .	» 3.5, breadth 0.45 cm	41—48 (53) × (3) 3.5 (4)
» locality? . .	» 2.1 (expanded) »	36—48 × 3—3.5
» » St. 36	» 3.7, breadth 0.4 cm	41—48 × 3.5—4
» » » 36		38—50 × 3.5 (4)
» » » 28	» 0.7 » 0.9 »	37—43 × 3.5 (4)
Graham Region, Sw. S. Pol-Exp.	» 10 » 1.0 » 0.3 »	(34) 38—46 × 3.5 (4)

The anatomy agrees with that in other *Edwardsia*-species. The muscle pennons are strong, not circumscribed but more elongated, the main folds in the largest specimen are about 25 in number, about half of them are ramificated especially in the outermost part of the pennons. The outer lamellar part of the mesenteries is in the upper part of the reproductive region attached to the pennons rather close to their centrum (several specimens sectioned, in the pennon reproduced in fig. 3 somewhat more outwards). The parietal muscles are strong, fan-like, in large specimens with rather close folds. The expansion of the parietal muscles on the body-wall is considerable. I have in figs. 2—5 reproduced two pennons and two parietal muscles, one pennon and one parietal muscle belong to the largest specimen (from South-Georgia, St. 36) and are figured from the upper part of the reproductive region (figs. 2, 4), the other pennon and parietal muscle from a not sexually ripe specimen from Ushuaia (figs. 3, 5). Most of the sectioned specimens were not sexually ripe. The species is dioecious.

Fam. **Limnactiniidae.**

Genus **Limnactinia** CARLGREN.

Concerning diagnosis of the family and genus compare CARLGREN 1921, p. 75.

Limnactinia nuda n. sp.

Diagnosis: The thickened wall of the oral disc high. Radial muscles of oral disc weak. Uppermost part of the actinopharynx with numerous mucus cells. Muscle pennons very strong, in the upper part of the reproductive region with rather few (at most 20) mostly high folds which are very strongly ramificated. The inner and outer lamellar part of the macrocnemes issuing from the pennons close to each other. Parietal muscles in the reproductive region elongated with the highest fold in their middle part; the main folds with rather numerous by-folds. Extension of the parietal muscles on the body-wall rather considerable. Microcnemes of about the same structure as the parietal muscles. Nematocysts in the ectoderm of the column about $17(-22) \times 1.5$ μ, numerous in the middle part of the column, more sparse in the distal, those of the actinopharynx $25-31 \times 3.5-5$ μ (with perspicuous basal part to the spiral thread). Spirocysts in the distal part of the column $24 \times 1.5-36 \times 2-2.5$ μ.

Colour?

Dimensions of the largest specimen: length 1.4 cm, largest breadth 0.7 cm., those of the smallest specimen: length 0.5 cm, breadth 0.3 cm.

Occurrence: South Georgia, Cumberland bay, 54° 22′ S 36° 28′ W, Grytviken, 22 m. Clay with algæ. 30. 5. 1902. 3 specimens.

Exterior aspect: The elongated body is cylindrical, in the proximal part rounded and forming a physa. The physa is provided with pores arranged in an annulus around one central pore. The number of pores in the annulus I have not been able to determine. The column shows no distinct division in regions, it lacks a cuticle and *Halcampa*-papillae. Because of the contraction it is transversely rugose and in the visible distal part — the most distal part of the column was invaginated — there were weak longitudinal ridges, 12 in the smallest specimen, 16 in the two larger. Between the ridges there are shallow furrows corresponding to the insertions of the mesenteries. I have not been able to find any tentacles neither under the magnifying glass nor on series of sections (the two largest specimens examined). I have not observed any trace of a loosening of the tentacles having taken place nor of a reduction of tentacles to stomidia. Thus there is no doubt that the species lacks tentacles. The outer part of the oral disc is provided with a very thickened ectoderm forming an annular wall, in the inner part the ectoderm is considerably

thinner. The actinopharynx is long, in its aboral part furnished with 8 longitudinal ridges, in the other part irregularly wrinkled.

Anatomical description: The ectoderm of the column is rather high, sometimes a little thicker than the mesogloea, mostly thinner, certainly according to different stages of contraction. The nematocysts in the middle part of the column are numerous, the spirocysts few. More distally the nematocysts dwindle, the spirocysts increase in number. I have not observed any ectodermal muscles in the column. The mesogloea of the column recalls in its structure that in *Halcampa* (CARLGREN 1893, Pl. 5, fig. 11). The endodermal circular muscles are rather well developed but form no sphincter. The ectoderm of the oral disc shows in the inner part another structure than in the outer (Fig. 6). In the inner thinner part (c) it is low and contains only scattered nematocysts and small spirocysts, in the outer (d) thickened wall it is very high, its nematocysts are considerably larger and close packed, the »nerve»-layer is well developed and the radial muscles more distinct than in the inner part. The upper part of the actinopharynx was in both examined specimens turned out (Fig. 6). In the area next to the oral disc (b) its ectoderm is provided with very numerous mucus cells, while the ectoderm in the lower part of the actinopharynx (a) contains numerous granulous gland cells, solitary mucus cells and numerous nematocysts, somewhat broader in their basal ends than in their proximal (size compare diagnosis). The fig. 6 shows a longitudinal section through the distal part of the evaginated pharynx, the oral disc and the uppermost part of the column. There is a distinct but weak longitudinal muscle-layer in the actinopharynx. I have not observed any differentiated siphonoglyphs.

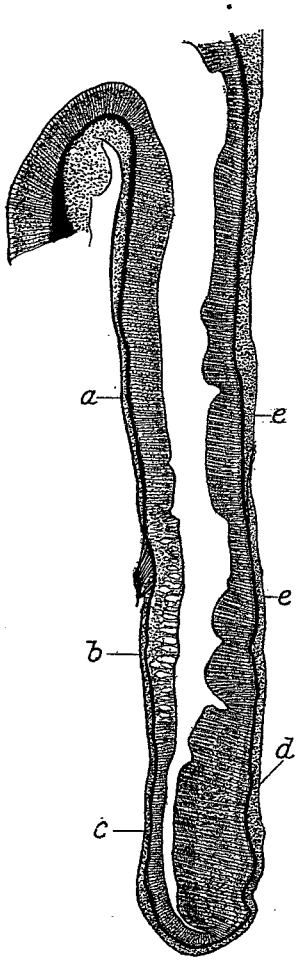


Fig. 6. *Limnactinia nuda*. Longitudinal section of the evaginated actinopharynx (*a*, *b*), the oral disc (*c*, *d*) and the upper part of the column (*e*). (Compare the text!)

In both examined specimens the mesenteries were 16 in number, of which 8 »*Edwardsia*»-mesenteries perfect, the others — the fifth and sixth couples and the dorsolateral pairs of second order — imperfect. All mesenteries were extended in the whole length of the body. The 8 macrocnemes were fertile and provided with well developed muscle pennons and filaments, the 8 microcnemes sterile and lacking pennons and filaments. The pennons are very strong and almost circumscript. Their main folds are high in general, about 20 in number in the re-

productive region and extraordinarily richly branched (Fig. 7). The numerous byfolds sometimes seem to be united in the central part of the pennons. However, I cannot decide it with certainty because of the rather bad preservation of the folds. The inner and outer lamellar part of the macrocnemes are attached to the pennons close to each other. That is also the case in the region of the actinopharynx although not always so distinctly as in the reproductive region. The parietal muscles are elongated and comparatively strong. The muscle-folds are strongest in the middle

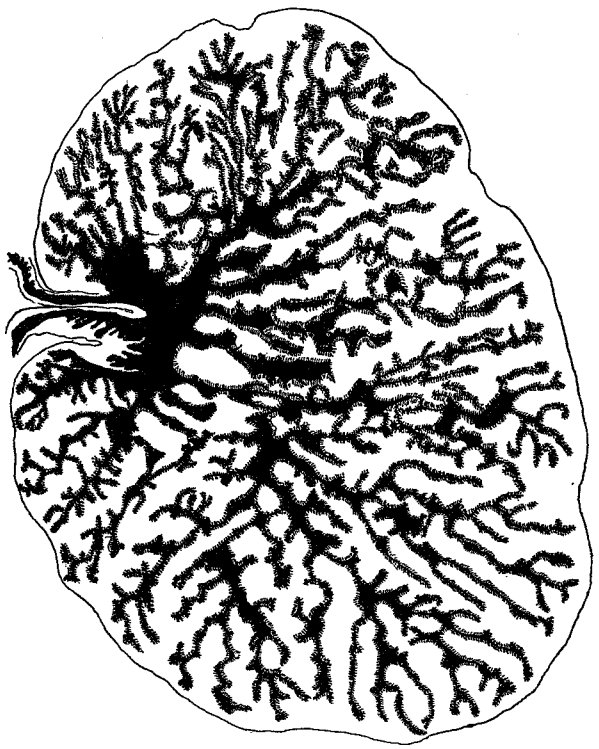


Fig. 7.

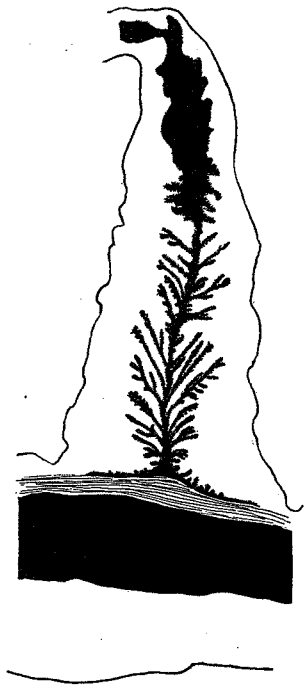


Fig. 8.

Figs. 7, 8. *Limnactinia nuda.* Fig. 7. Transverse section of the pennon of a ventrolateral macrocneme in the upper part of the reproductive region. Fig. 8. A similar section of the parietal muscles of a dorsolateral macrocneme in the reproductive region.

part, in the inner and outer part weaker. The extension of the parietal muscles on the column is considerable and the muscles form here and there weak folds (fig. 8). The microcnemes agree in their structure with the region of the parietal muscles, the muscle folds in the inner part of the microcnemes are however a little more numerous than in the corresponding part of the parietal muscles, the mesogloea of which is here strongly thickened. The filaments are provided with well developed ciliated streaks, the intermediate streaks are distinct. The mesogloea in the region of the filaments is almost without cells.

Fam. **Halcampoididae.**

Diagnosis compare CARLGREN 1921, p. 80.

Halcampoides purpurea (STUD.) CARLGR.

Halcampoides purpurea (STUD.). CARLGREN 1921, p. 82, Taf. 1, Fig. 34, 35, Taf. 2, Fig. 11, 12, textfig. 108—118. In this work a complete list of literature until 1921. In addition to it:

Halcampoides kerguelensis n. sp. PAX 1922, p. 75.

» *macrodactyla* n. sp. PAX 1922, p. 65, 1923, p. 4.

Dimensions of the largest specimen (from Graham region). Length of the column 4.5 cm. Largest breadth 1.3 cm. Length of tentacles 1.1 cm.

Occurrence: South Georgia, Grytviken, Cumberland bay, 54° 22′S 36° 28′ W, 22 m. Clay and algae, 1 spec.

South Georgia, Cumberland Bay, 54° 11′ S 36° 18′ W, 252—310 m. Gray clay with stones. Bottomtemperature 1°45, 1 spec.

Graham region, about 64° 3′ S 56° 37′ W, 360 m? Clay. 1 spec.

Further distribution compare CARLGREN 1921, p. 84—85. In addition to it: South Shetland Isls, King George's Isl. 62° 12′ S 60° 55′ W from Paris. 420 m. Mud and stones. Bottomtemp. +0.3° (Pourquoi pas Exp.).

Concerning the anatomy and the synonyms of this species compare CARLGREN 1921. I have identified *Halcampoides macrodactyla* with *purpurea* because I cannot find any real difference between the two forms. The macroscopical sections made by PAX through the pennons and the parietal muscles recall much the figures 106 and 118 in my paper of 1921. The nematocysts of the tentacles were 29—35 × 2.5—well 2.5 μ, those of the actinopharynx partly 22—38 × about 3.5—4.5 μ, partly 24—36 × 5.5—6 μ (partly 22 × 2 μ, only 1 capsule observed). Also *H. kerguelensis* PAX is probably the same species, although PAX states that there is only one aboral porus in his species — in the short description, however, he does not say whether he has sectioned the aboral end or not. The middle of the aboral end in the specimen from Graham region was drawn in and here one aboral porus was clearly visible under the magnifying glass. An examination of the end, cleared up in glycerine, showed however an annulus of pores on the one side, the other side was so much contracted that it was impossible to decide their presence there.

Genus **Scytophorus** R. HERTW.

Diagnosis: Halcampoididae with elongated body divisible in scapus and capitulum externally not distinctly separated. Cuticle developed chiefly on the scapus.

Aboral body end round or somewhat flattened. Scapus with somewhat modified *Halcampa*-papillae. No sphincter. Tentacles 14, their longitudinal muscles ectodermal. A single, weak, ventral siphonoglyph without conchula. Mesenteries 14, six pairs + one couple, the individuals of the couple with their retractors facing towards the dorsal pairs of directives. All mesenteries perfect with strong, well bounded muscle pennons. Parietal muscles strong. As a rule all mesenteries fertile.

The diagnosis of the genus given by myself (1899) and STEPHENSON (1922) are here somewhat altered. As to the *Halcampa*-papillae, which evidently are present also in *Sc. striatus*, I have already (1921, p. 118, Pl. 4, fig. 6) described their structure. In *Sc. antarcticus* they are not visible to the naked eye and form no elevations on the column.

Scytophorus antarcticus (PFEFF.) CARLGR.

Peachia antarctica n. sp. PFEFFER 1889, p. 11.
Scytophorus antarcticus (PFEFF.). CARLGREN 1899, p. 7, fig. 10, 1921, p. 118, Pl. 4, fig. 6; STEPHENSON 1922, p. 254.

Diagnosis: Proximal end rounded. Body with 14 longitudinal furrows corresponding to the insertions of mesenteries. Cuticle of the scapus not strong, easily deciduous. Muscle pennons of the mesenteries with numerous ramificated folds. Outer lamellar part of the mesenteries attached rather close to the outer end of the pennons. Parietal muscles strong with numerous close folds, not extended on the column. Numerous stomata in the mesenteries. Ciliated streaks long, but discontinuous. Reproductive region of the mesenteries situated in the under part of the ciliated tract region and in the uppermost region of the cnido-glandular tract. Dioecious. Nematocysts of the scapus 17—22 × about 2.5—well 2.5 μ, those of the capitulum 12—13 × almost 2.5 μ, those of the tentacles (22) 26—34 × 2.5—3 μ, those of the actinopharynx 31—36 × about 3 (3.5) μ. Spirocysts of the tentacles 17 × about 2—29 × about 3.5 (4) μ.

Colour in alcohol. On the scapus of the specimen there were traces of ochre-coloured parts.

Dimensions of the strongly contracted introverted specimen: length 2.5 cm, breadth 1 cm.

Occurrence: South Georgia, Cumberland bay, Grytviken, 54° 22′ S 36° 28′ W, 1—2 m. Sand and gravel. 13. 6. 1902, 1 specimen.

Further distribution: South Georgia (locality?)

The species is described by myself 1899, wherefore it is unnecessary to recapitulate the description of the whole organization. I will, however, here give some supplementary notes accompanied with the reproduction of some figures of the anatomy. The specimen collected by the Sw. South-Polar Expedition was strongly con-

tracted and its inner organs partly not as well preserved as those in the type-specimen, the outer lamellar part of the mesenteries was torn so that I cannot state the presence of numerous stomata. Also the upper part of the filaments was badly preserved.

The aboral round end was introverted. The cuticle of the scapus is, in comparison with that in *Sc. striatus*, weak. I have not observed any distinct stratification of the cuticle. The cuticle of the capitulum is very weak but — as it seems — present. As to the *Halcampa*-papillae compare above. The endodermal circular muscles of the column and the endodermal longitudinal muscles of the tentacles are rather well developed. The single siphonoglyph is provided with longer cilia than the other parts of the actinopharynx, and lacks nematocysts.

The mesenteries are arranged in 7 pairs, one pair of which forms the ventral directives. In the dorsolateral exocoels a seventh couple of mesenteries has arisen, forming new pairs with both the dorsal directive mesenteries. That it is so is evident from the lacking (or weak development) of the reproductive organs in the sixth, seventh and partly fifth couples in the type-specimen (compare below). Thus BOVERI's interpretation (1889) of the arrangement of the mesenteries holds good. The muscle pennons are very strong and form numerous ramificated folds (fig. 11 b). Also the parietal muscles are strong, in the upper part of the column (fig. 9) provided with close folds, in the lower part they are more elongated and weaker. They are not extended on the body-wall.

Fig. 9. *Scytophorus antarcticus.* Transverse section of parietal muscle.

The mesenteries in the type-specimen were perforated by several stomata, more numerous in certain mesenteries than in others. The stomata vary considerably in size. Some of these stomata are visible in the fig. 10 (the whole breadth of the mesentery is not reproduced, in the upper part the mesentery is torn in the region of the stomata).

The long filament-region is, as usually, divisible into two zones of which the ciliated tract is very long, but discontinuous. Especially in the middle part of the ciliated tract the ciliated streaks are wanting for long distances (fig. 10). In fig. 11 the filaments in the ciliated tract region are reproduced in transverse sections. Fig. 11 a shows a section through the beginning of a part of the ciliated streaks, they are not in connection here with the other part of the filament. Fig. 11 b sectioned below the section a shows the typical structure of a three-foiled filament (the intermediate streaks are distinct), in fig. 11 c the ciliated streaks have disappeared. The three sections are all from the region of the ciliated tract. In

fig. 11 d the cnidoglandular tract is sectioned, inside the filament the endoderm is here pigmented.

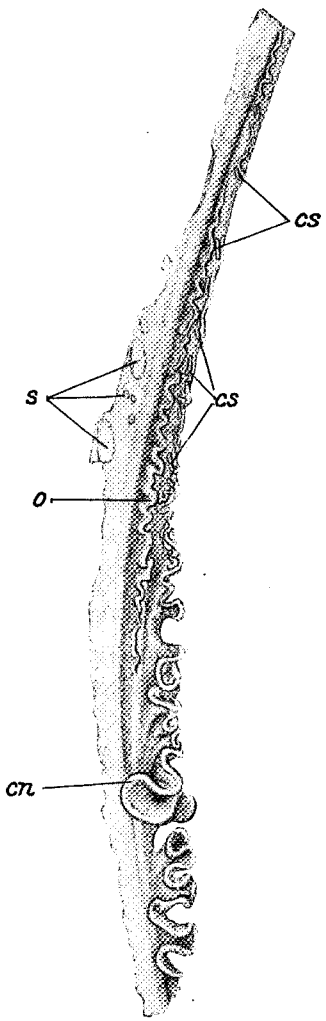


Fig. 10. *Scytophorus antarcticus.* Inner part of mesentery. *cs* ciliated streaks, *s* stomata, *o* ovarium, *cn* cnido-glandular tract.

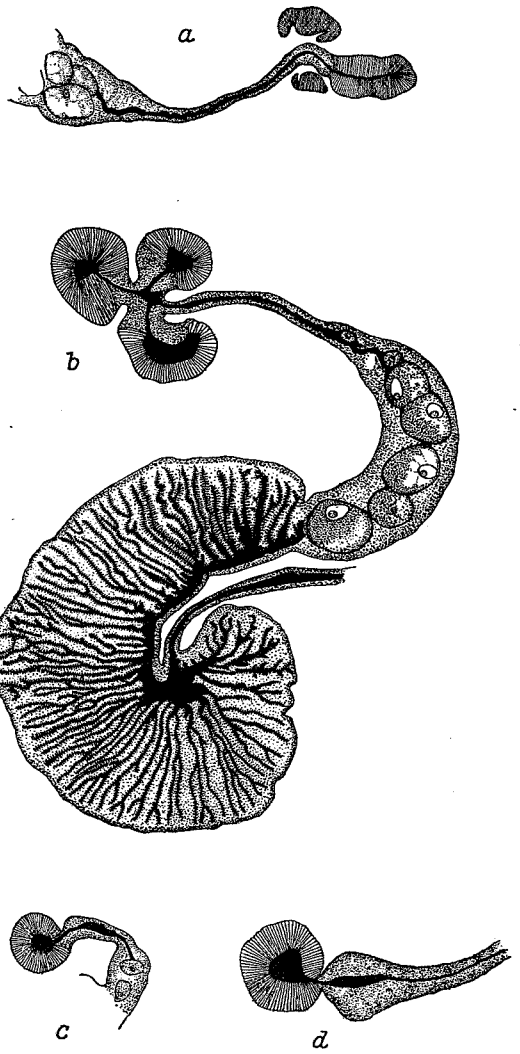


Fig. 11. *Scytophorus antarcticus.* Transverse sections of a pennon in the reproductive region (*b*) and of the inner part of a mesentery with filament (*a*, *c*, *d*). (Compare the text.)

The reproductive organs (fig. 10 *o*) are developed in the lower half of the ciliated tract and in the uppermost part of the cnido-glandular tract. In the present specimen all mesenteries were fertile, in the type-specimen I have not observed any reproductive organs in the mesenteries of the sixth and seventh couples and in one mesentery of the fifth. It is, however, to be observed that I have not sectioned these

mesenteries, wherefore it is possible that they are fertile, at any rate the reproductive organs are considerably weaker — if present — than in the other mesenteries. In contradistinction to *Sc. striatus* the species is dioecious (in the type-specimen there are ovaries, in the present specimen well developed testes). The size of the nematocysts and spirocysts is measured in the present specimen.

Fam. **Halcampidae.**

Diagnosis of the family and the genus *Halcampa* compare CARLGREN 1921, p. 117.

Halcampa octocirrata n. sp.

Diagnosis: Physa well developed, capable of complete involution. Nematocysts of the capitulum 12—14 × 1—1.5 μ, those of the tentacles 12—14 × 1 μ, those of the actinopharynx 25—30 × 3.5—4.5 μ. Spirocysts of the capitulum 17 × 1.5 μ—29 × 3 μ. Tentacles 8. Pairs of mesenteries 8, 6+2 dorsolateral pairs of second order. Only the 8 *Edwardsia*-mesenteries perfect, fertile and provided with filaments and pennons. The other mesenteries microcnemes without these organs. Muscle pennons of the macrocnemes with few, in the reproductive region 6—8, main folds, which are, however, high and richly ramificated. Outer and inner lamellar parts of the macrocnemes attached to the pennons close to each other. Parietal muscles and the microcnemes with few folds, elongated. Expansion of the parietal muscles on the column ordinary.

Colour?

Dimensions: Spec. 1, length of the introverted column 1.5 cm, breadth 0.5 cm. Spec. 2, length of the introverted column 1.2 cm, breadth 0.45 cm.

Occurrence: South Georgia, Cumberland bay, off the May bay, 54° 17′ S 36° 28′ W, 75 m. Clay with some algae. Temperature at the bottom + 1.5°. 14. 5. 1902, 2 specimens.

Exterior aspect: The exterior of the species agrees with that of other *Halcampa* species. In both specimens the distal part of the column was introverted, in one specimen also the physa. The upper part of the scapus was provided with 16 longitudinal furrows corresponding to the insertions of the mesenteries. In both specimens the number of tentacles was only 8.

Anatomical description: The anatomy recalls that in other species of *Halcampa*. The mesogloeal weak sphincter and the ectodermal longitudinal muscles in capitulum were distinct, the radial muscles of the oral disc and the longitudina muscles in the tentacles were well developed and palissade-like arranged. In both specimens the mesenteries were 16. 6 pairs of first order and two pairs of second order situated in the dorsolateral exocoels. Only the *Edwardsia*-mesenteries were

perfect and macrocnemes. The muscle pennons are strong and in the reproductive region of circumscript appearance, the main folds are few but high and richly ramificated. The ramification is often larger than in the reproduced muscle-pennon (fig. 12). In the lower part of the actinopharynx the main folds are somewhat more numerous (unto 10) and the ramification considerably larger. The parietal muscles

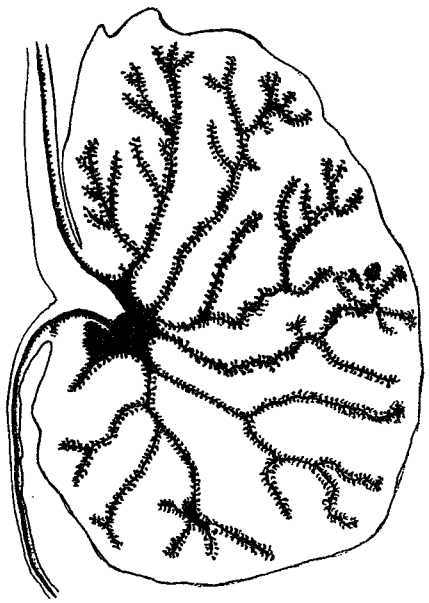


Fig. 12.

Fig. 13.

Fig. 12, 13. *Halcampa octocirrata.* Transverse sections of pennon (fig. 12) and parietal muscle (fig. 13).

are not strong with few folds and elongated (fig. 13) in the reproductive as well as in the upper region of the mesenteries. The microcnemes agree with the parietal muscles but are somewhat stronger. (Compare besides the diagnosis).

Genus **Parahalcampa** CARLGR.

Diagnosis of the genus, compare CARLGREN 1921, p. 22.

Parahalcampa antarctica n. sp.

Diagnosis: Spirocysts in the middle part of the column sparse, in the most distal part very numerous, distribution of the nematocysts reversed. Sphincter mesogloeal, very weak. Longitudinal muscles of the tentacles and radial muscles of the oral disc well developed palissade-like arranged. Muscle pennons of the macrocnemes very strong, in the reproductive region with 20—30 high folds richly ramificated and protruding in numerous small by-folds. Parietal muscles strong, rather elongated

with hardly ramificated rather high folds. Expansion of the parietal muscles on the body-wall considerable. Microcnemes recalling the region of the parietal muscles but somewhat more elongated. Ciliated streaks discontinuous. Nematocysts in the middle part of the column 13—17 × 1.5 μ, in the uppermost part 12—14 × 1—1.5 μ, those of the tentacles 12—14 × 1—1.5 μ, those of the actinopharynx 25—30 × 3—5 μ. Spirocysts in the uppermost part of the column 19 × 1 μ—31 × 2.5 μ, in the tentacles 17 × 1 μ —34 × 2.5 μ.

Colour in alcohol pale yellowish.

Dimensions of the largest specimen in introverted state: length 2.8 cm, breadth about 0.5 cm.

Occurrence: Tierra del Fuego, S. from Staten Isl, 54° 43′ S 64° 8′ W, 36 m. Boulders and gravel. 6. 1. 1902. 4 specimens.

Exterior aspect: The cylindric body shows externally no division in regions but the most distal part is of another structure than the proximal part (compare below). The column lacks perfectly *Halcampa*-papillae and a cuticle, and is mostly wrinkled because of a strong contraction (fig. 14). The proximal body-end is rounded physa-like and penetrated by several pores. The distal part of the column was introverted in all specimens. The column forms at the introversion 12 ridges, 10 of which are very high. The tentacles were 10 in three examined specimens and recall those in *Halcampa*. A single weak ventral siphonoglyph is present in the well developed actinopharynx.

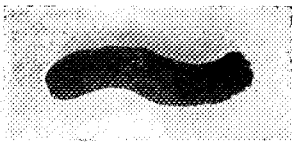


Fig. 14. *Parahalcampa antarctica* almost natural size.

Anatomical description: Concerning the pores in the proximal body-end I cannot exactly decide their number and their arrangement because no sections are good, but it seems that they are arranged in an annulus around a central pore. The ectoderm of the column is high, the mesogloea now thinner, now considerably thicker than the ectoderm according to a weaker or stronger contraction of the body. The nematocysts and spirocysts are unequally distributed in the body (compare the diagnosis). The mesogloea recalls in its structure that in *Halcampa*. The mesogloeal sphincter is situated as in *Halcampa*, but are weaker than in *H. duodecimcirrata* and *chrysanthellum*. In the sphincter region the ectoderm is provided with longitudinal muscles. The longitudinal muscles of the tentacles are well developed, especially on the inside of the tentacles, as also the radial muscles of the oral disc. The folds are palissade-like arranged and hardly ramificated. The nematocysts of the tentacles are rather numerous, the spirocysts very numerous. The ectoderm of the actinopharynx is rather high, its nematocysts numerous, the basal part of the spiral thread in the nematocysts perspicuous. The ectoderm of the siphonoglyph is somewhat higher than in the other part of the actinopharynx and its cilia longer, but the nematocysts fewer.

The mesenteries are 20 in number (2 specimens examined) of which the *Edwardsia*-mesenteries + the fifth couple, are perfect; the other mesenteries, the sixth couple and

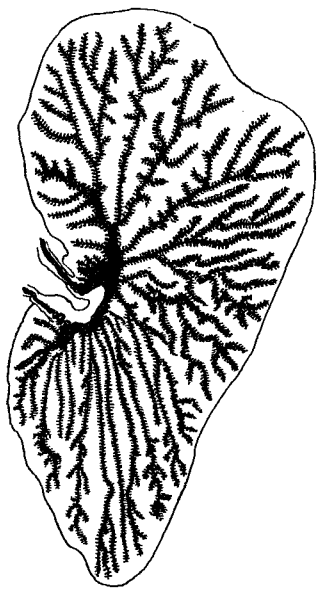


Fig. 15.

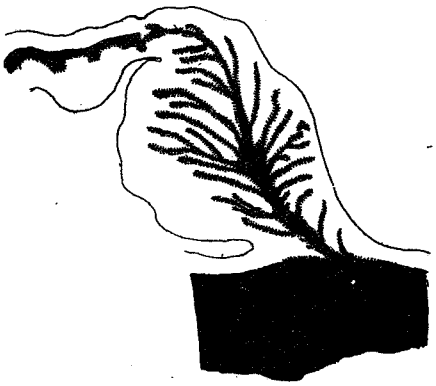


Fig. 16 a.

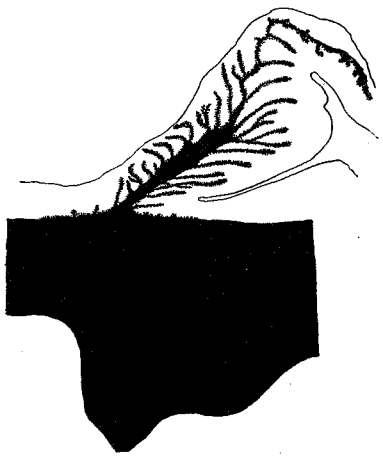


Fig. 16 b.

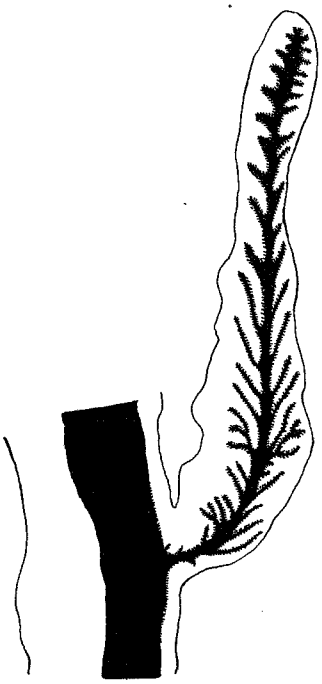


Fig. 17.

Fig. 15—17. *Parahalcampa antarctica.* Transverse sections of the pennon of the fifth couple (fig. 15), of the sixth couple (fig. 17) and of parietal muscles (fig. 16 a, b), both from the same section as the pennon (fig. 15) (compare the text!)

four pairs of second order, the latter situated in the dorsolateral and lateral exocoels, imperfect. The perfect ones are macrocnemes, fertile and provided with strong muscle-

pennons and filaments, the others are microcnemes, sterile and lack the said organs. The mesenteries of the second order are present on almost the whole body-wall but do not reach the uppermost part of the column. The muscle pennons are in the reproductive region provided with about 20—30 main folds, which are high, ramificated and running out in numerous short by-folds. I have in the fig. 15 reproduced a transverse section of one pennon of the fifth couple in the reproductive region. The pennons are here mostly weaker than in the other macrocnemes, the by-folds are namely in the latter more numerous and so are also the main folds, but the ramification is of the same type. The parietal muscles are strong, mostly rather elongated with rather high folds in the middle part (fig. 16 a, b) and considerably expanded on the column. Sometimes they form on the column short folds (fig. 16 b). The imperfect mesenteries recall the parietal muscles but are mostly more elongated. The mesenteries of the sixth couple (fig. 17) are somewhat stronger than the mesenteries of the second order. Below the filaments all mesenteries are structured as the mesenteries of the sixth couple. The ciliated streaks of the filaments are well developed but are discontinuous, recalling the filaments in *Scytophorus antarcticus*, *Limnactinia laevis* and *Isoedwardsia mediterranea*. The mesogloea of the filaments contains very sparse cells. The species is dioecious. Two examined specimens were females.

Fam. **Aliciidae.**

Diagnosis and genera compare CARLGREN 1924 b, p. 11.

Genus **Alicia.**

Diagnosis: Aliciidae with broad pedal disc. The proximal part of the column provided with thin outgrowths which are aborally short, orally pedunculate and sometimes bifurcate and in the apex furnished with more or less numerous hemispheric vesicles forming stinging batteries. Endodermal muscles in the outgrowths not differentiated in distinct longitudinal and circular muscles. Peduncles with few stinging spots. Upper part of the column, »capitulum», with stinging spots containing nematocysts but also numerous spirocysts. Siphonoglyphs weak or hardly indicated. Muscle pennons of the mesenteries weak, diffuse, not concentrated. Parietobasilar and basilar muscles weak. The first cycle of mesenteries sterile.

Alicia uruguayensis n. sp.

Diagnosis: Vesicles on the outgrowths (1) 2—6. Tentacles probably 48. Specific nematocysts (type 1 CARLGREN 1924 b, fig. 6 c) in the vesicles 65—72 × 10 μ (development stages? (ibidem fig. 6 d) 82—96 × 10—11 μ), other nematocysts partly

65—77 × about 6.5 μ, mostly opaque, partly 67—98 × about 7 μ, transparent (type 2, fig. 6 b). Nematocysts of the tentacles (type 2) 38—53 × 5.5—6 μ, those of the actinopharynx partly 34—53 × 4—about 5 μ (type 2, a part smaller 26—29 × 3 μ), partly 60—74 × 5 μ (the latter possibly developing stages to the former). Spirocysts of the capitulum up to 43 × 5.5 μ, those of the tentacles 20 × 2 μ—43 × 5.5—(6) μ.

Colour?

Dimensions of the bad preserved specimens length 1.8 up to about 2 cm. Breadth of the pedal disc up to 2 cm.

Occurrence: Off Uruguay, 33°0′ S 51°10′ W, 80 m. Dark-grey clay. 12. 12. 1901, 2 specimens.

The animals are very badly preserved and partly damaged, but the anatomy of this species seems to agree with other *Alicia*-species. Almost all tentacles were torn off at their basis; to judge from the apertures, the number of tentacles may have been about 48. The pedal disc shows the same structure as in other *Alicia*-species. Compare besides the diagnosis!

Fam. **Condylanthidae.**

Diagnosis of the family and of the genus *Condylanthus*, compare CARLGREN 1924 a, p. 191.

Condylanthus magellanicus CARLGR.

Condylanthus magellanicus n. sp. CARLGREN 1899, p. 15, fig. 7.
» » CARLGR. STEPHENSON 1922, p. 262, CARLGREN 1924 a, p. 190.

Diagnosis: Shape of body, cuticle of scapus and sphincter as in *C. aucklandicus*. Tentacles 24 up to 48. Muscles of tentacles and oral disc as in *C. aucklandicus*. Actinopharynx long with rather distinct siphonoglyphs. Pairs of mesenteries in 5 cycles hexamerously arranged, the mesenteries in the younger cycles arise irregularly, so that some primary exocoels contain fewer mesenteries than others. Only 12—24 pairs reaching the uppermost part of the body, the younger mesenteries only in the lower part. Muscle pennons very strong, richly branched in the whole length of the mesenteries. Parietal part of the longitudinal muscles of the mesenteries richly ramificated, weaker in the lower part of the body than in the upper. Parietobasilar muscles richly branched, narrower but thicker in the upper part than in the lower, where they are very broad and form a very deep fold expanded inside the pennons. Basilar muscles rather well developed, especially on the one side of the mesenteries. Mesenteries of the second order agreeing in their structure with the parietal part of the macrocnemes. Nematocysts of the scapus (10) 12—17 × almost 2—2 μ, those of the capitulum 14—22 × well 1.5—about 2 μ, those of the tentacles 18—24 × 2—2.5 μ,

those of the actinopharynx partly 17—23 × (2) 2.5 μ, partly 22—26 × 4.5—5.5 μ (the latter broader in the basal end and with perspicuous basal part to the spiral thread). Spirocysts of the capitulum very numerous 19 × about 1 μ—43 × almost 3 μ, those of the tentacles 17 × about 1 μ—43 (53) × 3 (3.5) μ.

Colour: ?

Dimensions of the two specimens: height of the column 1.8 cm, resp. 0.8 cm, breadth of the pedal disc 1.7 cm, resp. 0.9 cm, breadth of the oral disc in the largest specimen 1 cm.

Occurrence: Tierra del Fuego, S. from Staten Isl, 54° 43′ S 64° 8′ W, 36 m. Boulders and gravel. 6. 1. 1902, 2 specimens.

Further distribution: Strait of Magellan: Cap de las Virgines 32 fms. — 35° 10.5′ S 23° 2′ E 500 m. Bottomtemp. 7.8°; 35° 16.0′ S 22° 26.7′ E 155 m.; 34° 33.3′ S 18° 21.2′ E 318 m. Bottomtemp. 7.1° (German Deep-Sea Exp. St 103, 104, 113).

Exterior aspect: The exterior of the species agrees well with that of *C. aucklandicus*. The cuticle of the scapus was mostly torn off, only in one type-specimen and in the specimen from the Sw. S. Pol.-Exp. there were fragments left. The tentacles were probably 48 in the examined type-specimen because 8 tentacles were present in one sixth of the body. The tentacles were, however, very badly preserved, but as three cycles of mesenteries reach the uppermost part of the body it is very probable that the number of tentacles in this specimen was 48. The examined largest specimen from the Sw. S. Pol.-Exp. had only 24 tentacles. The oral disc is small, the siphonoglyphs not strong, but distinct.

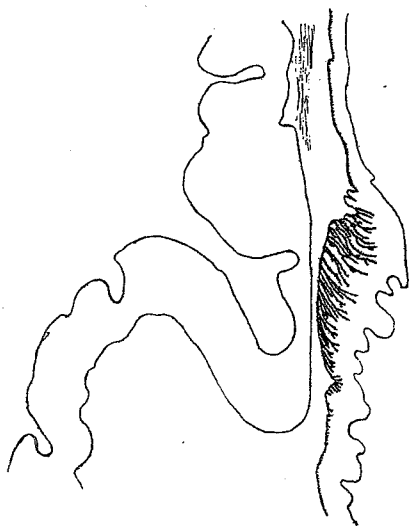


Fig. 18. *Condylanthus magellanicus*. Transverse section of sphincter.

Anatomical description: As the type-specimens were very badly preserved, I have examined one specimen from the Sw. S. Pol.-Exp. which was in a good condition. I have already (1924 a p. 191) corrected some mistake concerning the nature of the longitudinal muscles in the tentacles and of the radial muscles in the oral disc. There is indeed here also a very weak diffuse sphincter close to the tentacles (fig. 18), as in *aucklandicus*.

The mesenteries as well as the tentacles are arranged hexamerously. There are in the lower part 5 cycles of mesenteries; in the examined large type-specimen all mesenteries in the cycles seem to be developed, in the smaller specimen with 24 tentacles the development of mesenteries in certain primary exocoels was very retarded. In one primary lateral

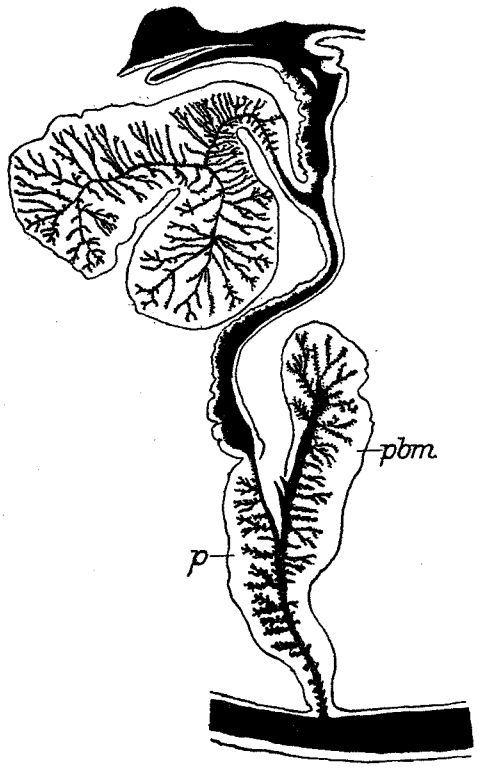


Fig. 19.

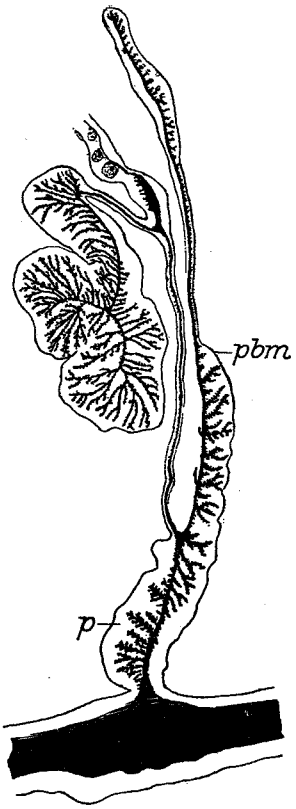


Fig. 20.

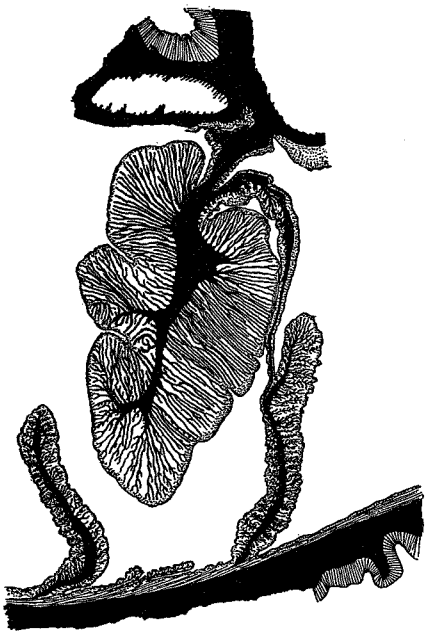


Fig. 21.

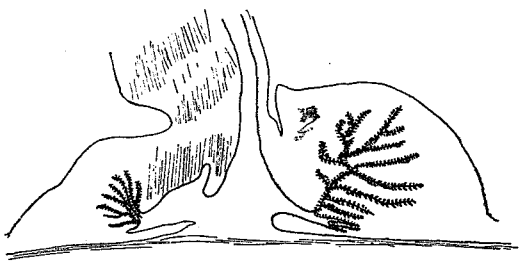


Fig. 22.

Fig. 19—22. *Condylanthus magellanicus.* Transverse sections of macrocnemes in the region of the actinopharynx (fig. 19, 21, the latter from the type-specimen) and below the actinopharynx (fig. 20) *p* parietal part of the longitudinal muscles, *pbm* parietobasilar muscle. Fig. 22 Transversal section of basilar muscles.

exocoel I counted 15 pairs of mesenteries, in another only 9, in two primary exocoels on both sides of one directive pair there were 8, resp. 5 pairs developed. Often the mesenteries of the second order were somewhat unequally developed, on the side of the strongest mesentery the mesenteries of younger cycles were more richly developed. In the uppermost part only 2 cycles of mesenteries were present in the specimen with 24 tentacles, in the examined type-specimen 3 cycles. Only the mesenteries of the first order are macrocnemes and provided with filaments and reproductive organs. The muscle pennons are very strong and richly ramificated (figs. 19—21), the parietal part of the longitudinal muscles is richly ramificated and broader in the upper part (figs. 19 p) than in the lower (fig. 20 p), while it is quite the opposite with the parietobasilar muscles. In the region of the actinopharynx they are broad and the folds rather high (fig. 19 pbm), below the actinopharynx they are twice as broad as in the upper part and reach inside the pennons (fig. 20 pbm, in the middle of the parietobasilar muscles the folds in the figured section are very short, in other mesenteries the folds are of about equal height in the whole breadth of the parietobasilar muscles). The mesenteries of the second order agree in their structure with the parietal part of the macrocnemes in the different regions. The younger mesenteries are weaker. The basilar muscles (fig. 22) are rather well developed also in the stronger microcnemes. One side of the mesenteries is more regularly provided with stronger basilar muscles than the other. Oral and marginal stomata are present on the perfect mesenteries. The species is dioecious.

Fam. **Actiniidae.**

Genus **Boloceropsis** Mc Murr.

Diagnosis: *Actiniidae* with well developed pedal disc and smooth column without marginal sphaerules. Margin tentaculate. Sphincter diffuse, well developed. Tentacles in expanded state long, longitudinally sulcated, without a tentacle sphincter but at the base of the tentacles the mesogloea is strongly attenuated. Longitudinal muscles of the tentacles and radial muscles of the oral disc ectodermal. 2 distinct siphonoglyphs. Mesenteries hexamerously arranged. At least 12 pairs of mesenteries perfect. Muscle pennons weak, so are also the parietobasilar and basilar muscles. All stronger mesenteries excl. the directives fertile.

Boloceropsis platei Mc Murr.

Boloceropsis platei n. sp. Mc Murrich 1904, p. 255, figs. 34, 35.
» » Mc Murr. Stephenson 1922, p. 276.

Diagnosis: Column in contracted state low. Sphincter rather elongated, its folds of about equal height. More than half the oral disc provided with tentacles. Ten-

tacles and mesenteries up to 192. Perfect pairs of mesenteries up to 48. Nematocysts of the column partly 35—49 × 3—3.5 μ, partly 14—17 × 1.5 μ, those in the distal parts of the tentacles 50—79 × 3—3.5 μ, those of the actinopharynx 43—48 × 3—3.5 μ. Spirocysts of the tentacles about 17 × 1.5—72 × 4.5 μ.

Colour in living state rosy (teste Mc MURRICH).

Dimensions: Height of the contracted column 1.5 cm, length of the inner expanded tentacles unto 4.5 cm, breadth of the oral disc 3.5 cm.

Occurrence: S. Chile, Golfo de Corcovado, Renike fiord. 18—23 m. Sand and stones. Sw. Magell. Exp. 1907—1909, 3. 8. 1908, St. 35, 1 specimen.

Further distribution: Chile, Calbuco.

The species has been described in detail by Mc MURRICH (1904), wherefore I have not much to add. The sphincter of the present specimen is stronger and longer than in Mc MURRICH's specimens. Our specimen is also considerably larger than Mc MURRICH's. The tentacles were very much extended but also in this stage longitudinally sulcated. Mc MURRICH states that there are only 12 pairs of perfect mesenteries. In fact the perfect mesenteries are more numerous. I have examined one of Mc MURRICH's specimens (breadth of the pedal disc 2.3 cm, height of the column 0.7 cm) in the uppermost part of the actinopharynx, and here were at least 24 pairs of mesenteries perfect. I cannot determine the exact number because the animal is badly preserved in this region. In a fourth of the present specimen 24 mesenteries were perfect. Thus it is probable that the animal has 48 pairs of perfect mesenteries. The longitudinal muscles of the mesenteries are weak with low folds in their outer part, higher in the innermost and forming rather indistinct pennons. The parietobasilar muscles are weak, in the undermost part of the stronger mesenteries, however, forming a fold inwards. The reproductive organs (testes) were present in all stronger mesenteries except the directives (Mc MURRICH's specimen examined). The mesogloea in the region of the ciliated tract is provided with numerous cells.

The present specimen is badly preserved, the aboral end of the animal partly torn off.

Remarks: STEPHENSON suggests (1922, p. 276) that *Boloceropsis* and *Gyrostoma* possibly are identical. That is certainly not the case. Mc MURRICH refers *Boloceropsis* to the family Boloceridae. In fact the genus recalls *Bolocera* in many details of its structure, although it lacks a tentacle-sphincter and the reproductive organs are differently distributed on the mesenteries. STEPHENSON's suggestion that *Gyrostoma* and *Paranemonia* are synonymous I cannot accept.

Genus **Parantheopsis** Mc Murr.

Diagnosis compare Carlgren 1924 a, p. 200.

Parantheopsis cruentata (Couth) Mc Murrich.

Literature etc. compare Carlgren 1924 a, p. 201.

Diagnosis compare Carlgren 1924 a, p. 201.

Colour and dimensions compare Carlgren 1924 a, p. 202.

Occurrence: Tierra del Fuego, Puerto Laguna (Beagle Channel), littoral. 15. 5. 1896, 2 spec. — Falkland Isl. Port Louis. Greenpatch 51° 33′ S 58° 9′ W, few meters. Stones with algae just inside the *Macrocystis*-zone. 28. 7. 1902, 1 spec.; the same locality 51° 33′ S 58° 10′ W, 7 m. Mud and gravel with algae. Off outside the *Macrocystis*-zone. 28. 7. 1902, 1 spec.; Port Louis, north shore, littoral. 6. 8. 1902, 4 specimens; Port William 51° 40′ S 57° 44′ W, 17 m. Sand. 3. 9. 1902, 6 specimens. — Port Stanley, Cape Pembroke (Scot. Nat. Antarctic Exp.) — West Falkland. West Point. Rocky coast, littoral. Sw. Magell. Exp. 1907—1909, 5. 12. 1907, St. 8, 3 specimens.

Further distribution compare Carlgren 1924 a, p. 202, besides Macquarie Island (Australasian Exp. 1912—1913).

Description compare Carlgren 1924 a, p. 202.

Parantheopsis georgiana (Pfeff.).

Bunodella georgiana n. sp. Pfeffer 1889, p. 15.
Condylactis » (Pfeff.). Carlgren 1899, p. 13, fig. 15; Stephenson 1922, p. 269; Pax 1923 a, p. 26.

Diagnosis: Column with rather well developed *Urticina*-verrucae in its upper part. Margin and fossa distinct. No sphincter. Tentacles up to 40 (41), mostly octamerously (8+8+16) or decamerously (10+10+20) arranged. 2 distinct siphonoglyphs. Pairs of mesenteries up to 20 (6+6+8), mostly 16 (8+8; 6+6+4), sometimes 18 or 19. All or almost all mesenteries perfect and fertile. 2 pairs of directives. Longitudinal pennons of the mesenteries well developed, stronger than those in *P. cruentata*, with richly ramificated high folds. Parietobasilar muscles very strong, forming a deep fold inwards and reaching almost to the distal body-end. Dioecious (sometimes monoecious). Embryos developed in special brood-pouches. Nematocysts of the column partly (17)19—26 × about 2.5 μ, partly 22—36 × 3.5—4 μ, those of the tentacles 22—30 × 2.5—3 μ, those of the actinopharynx partly 24—48 × 3.5 (4) μ, partly 17—22 × almost 2.5 μ, partly 24—31 × 3.5 μ (the latter with conspicuous basal part to the spiral thread), spirocysts of the tentacles 13 × almost 1.5—24 × about 2.5 (3) μ.

Colour yellowish brown with dark-brown tentacles (PFEFFER).

Dimensions up to 2.5 cm long and 1.5 cm broad in preserved state.

Occurrence: South Georgia, Cumberland bay: off Grytviken 54° 22′ S 36° 27′ W, 30 m. Stony bottom with algae outside the *Macrocystis*-zone. 24. 5. 1902, 1 spec. The same locality, inside the kelp. 11 specimens. From old kelp. 1 spec. May bay, on a root of *Macrocystis* 1 spec. 24. 5. 1902. — S. Georgia, Bay of Isles, littoral 1 spec. 8. 5. 1902.

Distribution: South Georgia.

A description, in some respects more detailed, of this species was given by myself 1899. Of two specimens from the Grytviken one had 10 + 9 = 19 pairs of mesenteries, the other 18 pairs. The small specimen from May Bay was provided with 16 pairs. The specimen from Bay of Isles, furnished with 36 tentacles and probably 18 pairs of mesenteries, was monoecious; between the numerous testes a few ova were visible. In spite of this difference — all other closer examined specimens were namely dioecious — I think, that the specimen from Bay of Islands belongs to *P. georgiana*. I have examined the stinging capsules in two specimens. The size of the stinging capsules agrees in both specimens, only the size of the largest capsules in the actinopharynx was different, in the larger specimen (breadth of the pedal disc 1.5 cm, height 1.2 cm (36—48 × 3.5 (4) μ, in the smaller (breadth of the pedal disc 0.9 cm, height of the column 1.1 cm (24—34 × 3.5 (4) μ.

Parantheopsis ocellata (LESS.) MC MURRICH.

Actinia ocellata n. sp. LESSON 1830, p. 79, Pl. 3, fig. 5.
Parantheopsis ocellata LESS. MC MURRICH 1904, p. 235, Pl. 16, figs. 44—46, Pl. 17, fig. 47.
In this paper a more complete list of literature. STEPHENSON 1922, p. 270.

Diagnosis: Column with 48 longitudinal rows of verrucae, present in the whole column (or only in the upper part?). No sphincter. Tentacles 96 in contracted state cylindrical, in more expanded state conical. Actinopharynx with numerous longitudinal ridges and furrows, and with 2 siphonoglyphs forming well developed aboral prolongations. Mesenteries hexamerously arranged in 4 cycles (6+6+12+24 pairs), the mesenteries of the three first cycles perfect. All or almost all stronger mesenteries fertile. Muscle pennons and parietobasilar muscles well developed, the latter forming a distinct fold. Nematocysts of the column 11 × 1—18 × about 1.5 μ rather numerous, those of the tentacles 19—23 × about 2 μ very numerous, those of the actinopharynx partly 24—29 × 2.5—something more than 2.5 μ, partly 24—26 × 3.5—4.5 μ broader in the basal end, spirocysts of the tentacles 12 × 1—about 22 × almost 2 μ,

Colour variable (compare LESSON and MC MURRICH). Of the preserved specimens one was colourless, only in the endoderm some pigment rests, in two specimens

the oral disc was more or less deep black-gray, the tentacles of the same colour with irregular, uncoloured transverse bands. In the fourth specimen traces of this coloration was visible.

Dimensions: Largest, in oral—aboral direction contracted specimen: Height 1.5 cm. Diameter of the pedal and oral disc 2.5 cm. Smallest specimen: Height about 1 cm. Largest breadth of the pedal disc 1.2 cm.

Occurrence: Chile, Guaitecas Islands, Melinca 44° S, low-water. leg. DUSÉN 1897. 4 specimens.

Further distribution: Payta, Peru (teste LESSON) — Chile: Cavancha near Iquique, Tumbes near Talcahuano, Puerto Montt, Calbuco (Plate-collection teste MC MURRICH).

The specimen was before described by MC MURRICH. In the largest specimen the 48 rows of verrucae were very conspicuous and reach the aboral part of the body. In the other specimens the verrucae were in the proximal part indistinct owing to the strong contraction of the verrucae and the column. It is, however, questionable if the rows do not always reach the aboral body-end. MC MURRICH speaks of pseudo-acrorhagi in this species. In the largest specimen I can state that there are no such formations here, the uppermost parts of the stronger rows are also provided with distinct warts, somewhat more concentrated than in the other parts of the rows (compare CARLGREN 1924, p. 201). The tentacles were already in the smallest specimen 96 in number, in the largest specimen they were conical and a little longitudinally sulcated.

Genus **Bunodactis** VERR.

Diagnosis: Compare CARLGREN 1921, p. 148. To this diagnosis must be added: Mesenteries from the second order growing from the proximal towards the distal body-end. In consequence of the mesenteries sometimes being more numerous than the tentacles.

In a paper 1922 VERRILL, supposing that the type-species *Tealiopsis polaris* is provided with verrucae and an endodermal sphincter as in *Bunodactis*, places the genera before referred to *Bunodes* = *Cribrina* = *Bunodactis* to DANIELSSEN's genus *Tealiopsis*. Although VERRILL knows that I have examined the type-specimen of *Tealiopsis polaris* and have stated that this species is a *Stomphia* he supposes, on account of DANIELSSEN's description and figures, that »labels must have been interchanged» here and adds: »DANIELSSEN's figures are good. His general figure from life shows conspicuous rows of verruciform suckers as large as in *T.* (*Bunodactis*) *stella* and his sections of the wall show also verrucae. He described the verrucae and described the circular muscles as entodermal as also shown in the sections.» It is difficult to understand VERRILL's postulation that the figures are good without his

having examined the originals. VERRILL's statement that the verrucae are visible on the sections figured by DANIELSSEN shows that he has no knowledge of the structure of the verrucae in *Bunodactis* and *Urticina*. The figured verrucae are probably grains of sand. As I have observed, *Stomphia* living on sandy bottoms secerns from almost the whole column a layer of mucus, in which sand is incrusted. Besides, it is to be observed that DANIELSSEN paints longitudinal rows of suckers in *Kylindrosactis elegans* and *Sagartia repens*, both species identical with *Stomphia coccinea* (CARLGREN 1921, p. 234). Concerning the figured endodermal muscles DANIELSSEN does not indicate the place, where the column is sectioned. The muscles are certainly not sectioned in the sphincter region. Most of the anatomical details in the paper of DANIELSSEN are moreover incorrect and the figured exteriors of the animals often constructed, especially as to the presence and arrangement of the »suckers». I have examined almost all Actiniaria described by him in the report of the Norwegian North Atlantic Expedition. Any interchanging of labels concerning the enumerated species referred by myself to *Stomphia* is not to be suspected. As *Tealiopsis* is synonymous with *Stomphia* the genus *Bunodactis* may thus be kept.

Bunodactis patagoniensis (CARLGR.).

Bunodes patagoniensis n. sp. CARLGREN 1899, p. 21, fig. 16.

Diagnosis: Pedal disc broad. The whole column provided with 24—48 longitudinal rows of *Urticina*-verrucae corresponding to the endocoels. In the uppermost part also verrucae from the exocoels. Fossa well developed. Sphincter strong, without a main-lamella, often with broad basis joined with the column (sessile) or more palmate. Tentacles up to 96 hexamerously arranged. Longitudinal muscles of the tentacles and radial muscles of the oral disc ectodermal. Well developed, symmetrically situated siphonoglyphes. Actinopharynx with numerous longitudinal folds. 2 pairs of directives, 48 pairs of mesenteries, all or almost all perfect. Longitudinal pennons of the mesenteries bandlike with high, close packed folds. Parietobasilar muscles

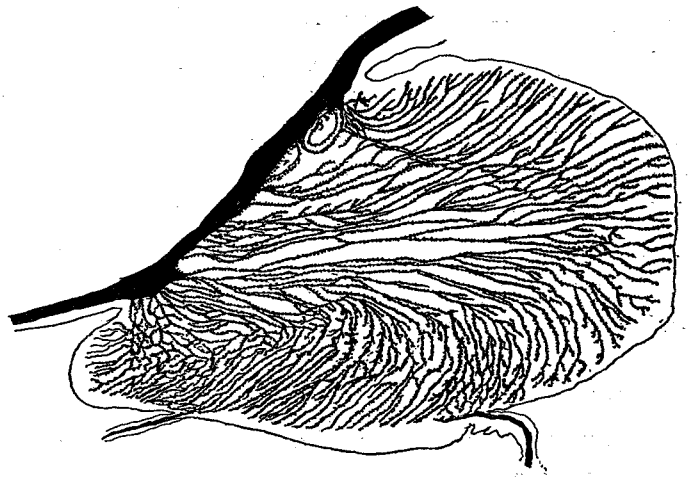


Fig. 23. *Bunodactis patagoniensis*. Transverse section of sphincter. Tentacle-side on the left.

well developed, forming a more or less distinct fold inwards, parts of the muscles enclosed in the mesogloea towards the main lamella of the mesenteries. Dioecious. Nematocysts of the column partly 17—24 × 1.5—about 2 μ, very numerous, partly 10—12 × 1 μ, those of the tentacles 16—22 × 1.5 μ, those of the actinopharynx 21—29 × almost 2.5 μ—well 2.5 μ, spirocysts of the tentacles 12 × 1—about 19 × 1.5 μ.

Colour bright gray or red with red verrucae. Tentacles bright white or gray.

Dimensions of the largest specimen in strongly contracted state: diameter of the pedal disc 2.1 cm, height of the column 1.5 cm, length of the inner tentacles 0.4 cm.

Occurrence: Puerto Madryn, low water (compare CARLGREN 1899).

The species was before described by myself 1899. The verrucae are sometimes not distinct in all regions of the column, probably because they are in these parts drawn in. The sizes of the nematocysts and spirocysts are measured in the 1899 figured type-specimen. The structure of the sphincter is shown in the figure 23.

Bunodactis aucklandica n. sp.

Cribrina hermaphroditica CARLGR. CLUBB 1908, p. 8, Pl. 3, figs. 19—21 (not *Cribrina hermaphroditica* CARLGR.).

Diagnosis: Pedal disc well developed, in the distal half arranged in 24—48 longitudinal rows. Uppermost verrucae at the margin vesicular. Fossa distinct. Sphincter well developed, palmate. Tentacles about 36—96. Longitudinal muscles of the tentacles and radial muscles of the oral disc ectodermal. 2 well marked siphonoglyphes. Pairs of mesenteries 24—28 hexamerously arranged, all except the last order perfect. Longitudinal pennons of the mesenteries strong, distinctly separated from the other parts of the mesenteries. Very strong parietobasilar muscles separated from the main-lamella of the mesenteries by a very deep fold. Zooxanthellae in the endoderm. Monoecious. Nematocysts of the column very numerous 13—17 × 2.5—3 μ, quill-like, those of the tentacles partly 12 × 1 μ, partly 17—20 × 1.5—2 μ, those of the actinopharynx partly 22—26 × about 2—2.5 μ, partly 18—19 × 3.5 μ, the latter with perspicuous basal part to the spiral thread, spirocysts of the tentacles 12 × 1—22 × 3 μ.

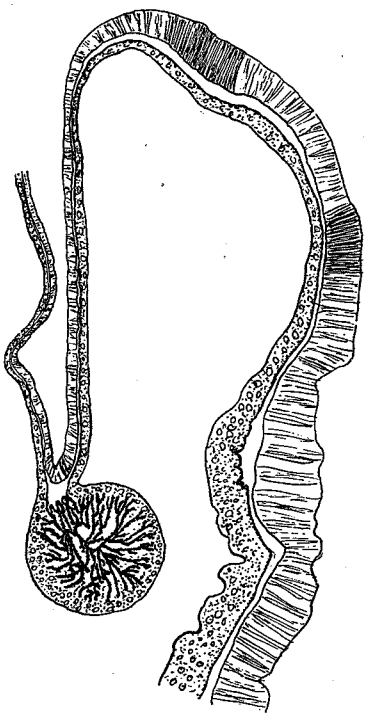
Colour?

Dimensions: height of the column up to 2 cm (teste CLUBB).

Occurrence: Enderby Island, Auckland Islands.

CLUBB has identified this species with my *Cribrina hermaphroditica* from Chile. In fact both species are wholly separated. *Cribrina hermaphroditica* is an *Anthopleura* (compare CARLGREN 1921, p. 148 and this paper p. 32), which is not the case with CLUBB's species. I have namely examined one of CLUBB's specimens and

stated that the »pseudoacrorhagi» are nothing but the uppermost *Urticina*-verrucae, which are vesicular at the margin. On sections there is namely in the middle one area or two of the same structure as in the verrucae, viz. mainly consisting of close packed supporting cells (in the figure 24 marked with closer strokes) and differing distinctly from the other ectoderm of the column. A section of one »pseudoacrorhagus» and of the palmate sphincter I have figured in fig. 24. For examination I have had a small specimen with only 27 tentacles and 24 pairs of mesenteries. The species was, however, provided with reproductive organs, although not strongly developed. Testes were mostly present, in one mesentery there was however an ovum. All specimens examined by CLUBB were also monoecious. The figure 19, Pl. 3 in CLUBB's paper gives a good idea of the structure of the pennons and the parietobasilar muscles. The diagnosis is based on CLUBB's and my own examinations of the species. The species is certainly distinct from *Bunodactis mortenseni* (CARLGREN 1924 a, p. 261).



Pig. 24. *Bunodactis auckландica*. Longitudinal section of the uppermost part of the column with sphincter.

As some authors do not separate *Bunodactis* and *Anthopleura*, I have preferred to give the species a new name in order to avoid a confounding of the species with *Anthopleura hermaphroditica*. On the other hand, if *Bunodactis* and *Anthopleura* are maintained as two separate genera, the species may be called *Bunodactis hermaphroditica* (CLUBB).

Bunodactis sulcata (CLUBB).

Urticina sulcata n. sp. CLUBB 1902, p. 295, Pl. 48, figs. 1—5, Pl. 50, fig. 13, Pl. 52, figs. 16, 17, 20, 21.
Tealia sulcata (CLUBB). STEPHENSON 1922, p. 272.
Rhodactinia sulcata (CLUBB). PAX 1923, p. 25.
Bunodactis sulcata (CLUBB). CARLGREN 1924 a, p. 196.
Urticina carlgreni n. sp. CLUBB 1902, p. 297, Pl. 49, figs. 6—10, Pl. 50, figs. 11, 12, Pl. 51, figs. 14, 15, Pl. 52, figs. 18, 19.
Tealia carlgreni (CLUBB). STEPHENSON 1922, p. 272.
Rhodactinia carlgreni (CLUBB). PAX 1923, p. 25.
Bunodactis carlgreni (CLUBB). CARLGREN 1924 a, p. 196.

Diagnosis: Pedal disc well developed. Column with 48 longitudinal rows of large *Urticina*-verrucae, which are largest in the middle of the body. Fossa distinct.

Sphincter very strong, more or less pinnate with a distinct main-lamella. Tentacles 48. Longitudinal muscles of tentacles ectodermal. Siphonoglyphs well developed. Pairs of mesenteries 24, all perfect. Sometimes all mesenteries except the 2 pairs of directives fertile. Longitudinal pennons of the mesenteries strong, forming a thick band on the faces of the mesenteries, their folds close packed and richly ramificated. Parietobasilar muscles very strong, forming a deep fold inwards. Dioecious. In the female an annular invagination round the column »about one-third of the distance below the parapet», from this invagination probably only one brood-chamber arises. Nematocysts of the column partly 19—24 × 2—3 (3.5), partly 31—46 × 6—4.5 μ, those of the tentacles 24—29 × almost 2—2.5 μ, those of the actinopharynx 30—38 × 2.5—about 3 (3.5) μ, especially the broader with perspicuous basal part to the spiral thread, spirocysts of the tentacles 24 × 1.5—41 × 2.5 μ.

Colour in life: Large specimens light red, small specimens white (*B. carlgreni*). In the preserved state the specimens are dirty brown with a distinctly green cast (*B. sulcata*), teste CLUBB.

Dimensions up to 5—6 cm in height and 5—3.4 cm in diameter (CLUBB).

Occurrence: South Victoria Land: Cape Adare, 20—28 fms. Temperature 28.8°—29.2° Fahr.; 65° 20′ S 95° 27′ E. 240 fms. (Australasian Antarct. Exp. 1913—14).

The species is well described by CLUBB 1902. I have examined 2 specimens, one of *sulcata* and one of *carlgreni*, concerning the nematocysts and spirocysts. The size of stinging capsules agrees well in the two specimens, only the larger nematocysts in the column differ a little, they were somewhat shorter in *sulcata* (31—38 × 6—5 μ) than in *carlgreni* (34—46 × (6) 5—4.5 μ), on the other hand somewhat broader in the former than in the latter. The small differences mentioned by CLUBB between the two species entitle scarcely to erect two species, therefore they are here united.

Bunodactis octoradiata (CARLGR.).

Bunodes octoradiatus n. sp. CARLGREN 1899, p. 20, figs. 11, 12.
Cribrina octoradiata (CARLGR.). CLUBB 1908, p. 7, Pl. 3, figs. 16—18.
Bunodactis octoradiata (CARLGR.). PAX 1923, p. 26.

Diagnosis: Pedal disc well developed. Column cylindrical with 32 longitudinal rows of *Urticina*-verrucae, most distinct in the distal part. Uppermost endocoel-verrucae terminating in an annulus of more vesicular appearance and exceeding the exocoel-verrucae. Fossa well developed. Sphincter strong, palmate; folds often in the outer part of the sphincter fusing together. Tentacles 32 (8 + 8 + 16). Longitudinal muscles of the tentacles and radial muscles of the oral disc ectodermal. 2 siphonoglyphes. Pairs of mesenteries 16, all perfect and fertile. Pennons on all mesenteries strong, with high and richly ramificated folds. Parietobasilar muscles very strong, reaching almost to the distal end of the body, forming a deep fold inwards and

enclosed in the mesogloea towards the main-lamella of the mesenteries. Basilar muscles strong. Ova large and rich in yolk. Embryos developing in external brood-chambers (teste CLUBB). Nematocysts of the column partly 13—17 × almost 2—2.5 μ, partly 24—29 × about 5 μ, those of the tentacles 14—17 × (1.5) almost 2—2.5 μ (24—26 × 5 μ possibly stuck to the tentacles), those of the actinopharynx partly (17) 24—26 (29) × about 2.5, partly 22—29 × 3.5—4.5 μ (partly 14—17 × 2 μ), spirocysts of the tentacles 14 × 1—26 × almost 2.5 μ.

Colour: Column blood-red (spec. from New Year Isl.), bright red, dark red, dark carmine-red, in the distal part sometimes purple-coloured. Tentacles carmine-red or purple-coloured. An annulus around the mouth mostly yellow.

Dimensions of largest specimen in extended preserved state: height of the column 2.5 cm, diameter of the pedal disc 1.8 cm, length of the tentacles up to 0.8 cm.

Occurrence: Tierra del Fuego, New Year Isl. 54° 43′ S 64° 8′ W. littoral, 6. 1. 1902, 1 spec. — W. Falkland, West Point Isl. Rocks, littoral. Sw. Magellan Exp. 1907—1909, 5. 12. 1907, St. 8, 1 spec.

Further distribution: Smyth Channel, Isthmus Bay; Magellan Strait: Port Gallant, York Bay [1]) (e. of Borja bay) littoral, Punta Arenas, Gente Grande. South Tierra del Fuego: Beagle Channel, Lapataia nueva; Navarin Isl., Puerto Toro; Lennox Isl. — Falkland Isl.: Port Harris (teste CLUBB), Cape Pembroke, Port Stanley, Stanley Harbour (Scot. Nat. Antarctic Exp.).

I have not much to add to the descriptions given before by myself (1899) and CLUBB (1908). Only some words concerning the pseudo-marginal-spherules. I have 1899 stated that these formations are provided with more numerous nematocysts than the other parts of the column. This postulation was based on studies on sections which do, however, often give anything but good result, because a great deal of the nematocysts are not visible. An examination of the nematocysts in maceration-preparations gives no distinct difference as to the number of stinging capsules in the »spherules» and in the other part of the column. Sections of the »spherules», which are imperforated, speak for the same formation as in *B. aucklandica*, viz. vesicular swellings of the endocoel-parts of the column containing also here verrucae. The sections were, however, difficult to stain, but as far I can see there are in these vesicles zones of the ectoderm with close packed supporting cells.

Genus **Anthopleura** DUCH. & MICH.

Diagnosis: Actiniidae (Bunodactidae) with well developed pedal disc. Column with *Urticina*-verrucae arranged in more or less distinct vertical lines, with true marginal spherules. Sphincter circumscript ordinarily developed or strong. Tentacles

[1]) This locality was in my paper of 1898 erroneously located to Staten Isl.

simple, hexamerously (always?) arranged. Longitudinal muscles of the tentacles and radial muscles of the oral disc ectodermal (sometimes with a tendency to be a little mesogloeal?). At least mesenteries of the two first cycles perfect, commonly more. Muscle pennons on the mesenteries distinct. Reproductive organs on the mesenteries of the first cycle and on other stronger mesenteries. Mesenteries from the second order probably growing from the proximal towards the distal body-end, and consequently sometimes somewhat more numerous than the tentacles.

Because relatively few *Anthopleura*-species are examined, the diagnosis is only tentative.

Anthopleura hermaphroditica (CARLGR.).

Bunodes hermaphroditicus n. sp. CARLGREN 1899, p. 23, fig. 18.
Anthopleura hermaphroditica (CARLGR.). CARLGREN 1921, p. 148.
Cribrina hermaphroditica (CARLGR.). MC MURRICH 1904, p. 287, Pl. 18, figs. 78—80, Pl. 19, fig. 81 (not. of CLUBB, 1908, p. 8; compare *Bunodactis aucklandica* p. 28).

Diagnosis: Pedal disc well developed. Somewhat more than the upper half of the column provided with *Urticina*-verrucae, arranged in vertical rows and corresponding to the endocoels. The compartments of the stronger mesenteries with longer rows than the other. Distally the rows end in well developed marginal spherules. Fossa distinct but inconsiderable. Sphincter circumscript more or less palmate, its folds with a tendency to fusing together in the basal parts. Tentacles hexamerously arranged in 4—5 cycles, the last cycle incomplete. Longitudinal muscles of the tentacles and radial muscles of the oral disc ectodermal. Mesenteries hexamerously arranged, in about the same number as the tentacles. At least the mesenteries of the (two) three first cycles perfect. 2 pairs of directives. Longitudinal pennons of the mesenteries strong, with high and rather richly ramificated folds. Parietobasilar muscles long, forming a distinct fold inwards. Endoderm with zooxanthellae. Monoecious. Viviparous. Nematocysts of the column $17—24 \times 1.5—3\ \mu$, partly $29—33 \times 3.5—4\ \mu$, those of the marginal spherules $38—46 \times 3.5—4\ \mu$, those of the tentacles (14) 17—22×1.5—almost $2\ \mu$, those of the actinopharynx partly $13—19\,(24) \times 1.5\ \mu$, partly $17—22 \times$ about $2.5\ \mu$. Spirocysts of the tentacles $12 \times$ about $1—22 \times 2.5\ \mu$.

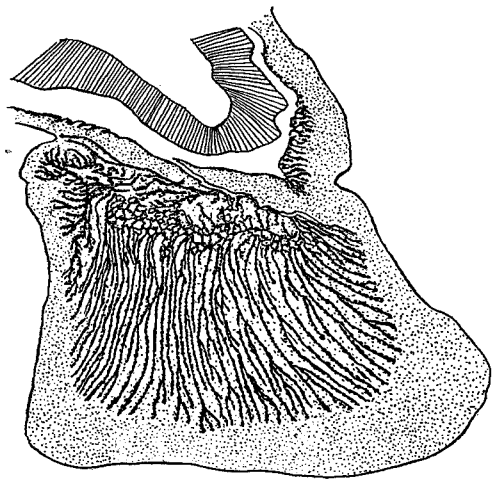


Fig. 25. *Anthopleura hermaphroditica.* Transverse section of sphincter. Tentacle-side to the right.

Colour (in formaline): Tentacles and distal part of the column green to greenish-

yellow. Verrucae and proximal part of the body paler. Insertions of the mesenteries dirty brown.

Dimensions of the largest specimen: breadth of the pedal disc 1.5 cm, height of the column 1.7 cm, breadth of the distal part of the body 1 cm, length of the inner tentacles 0.5 cm.

Occurrence: Chile, Talcahuano, low-water (compare CARLGREN 1899).

Further distribution: Chile: Antofogasta, Tumbes, Puerto Montt (teste MC MURRICH).

A sphincter of this species I have figured in fig. 25. The species was before described by myself (1899) and by MC MURRICH (1904). As far as I can see from the description of this author the species from the PLATE-collection is identical with my *hermaphroditica*, on the other hand, CLUBB's *hermaphroditica* is another species (compare p. 28). The difference between my description and that of MC MURRICH »may be due to the fact that CARLGREN's specimens were apparently about twice as large as those I examined» (MC MURRICH). That only the mesenteries of the two first cycles were perfect in the smaller specimens may be likely, on the other hand, I think that MC MURRICH's statement, that sometimes only the mesenteries of the first cycle reach the actinopharynx, is incorrect, as far as it refers to sexually ripe specimens. It is probable that MC MURRICH has not examined the mesenteries in the uppermost part of the actinopharynx. As seems from the diagnosis there are here real marginal spherules, not pseudo-marginal spherules (CARLGREN 1899, MC MURRICH 1904).

Genus **Glyphoperidium** ROULE.

Diagnosis: Actiniidae (Bunodactidae) with well developed pedal disc. Column broader in the distal part than in the proximal, without verrucae and marginal spherules. Margin distinct with fossa. Sphincter circumscript to more diffuse. Tentacles extraordinarily numerous, hexamerously arranged, in comparison to the size of the animal small and delicate, the inner tentacles longer than the outer. Oral disc wide. Actinopharynx long with 2 very broad siphonoglyphs provided with aboral prolongations. Mesenteries rather thin, more numerous in the distal than in the proximal part. Not half of the mesenteries perfect. Longitudinal muscles of the mesenteries forming no differentiated pennons. Parietobasilar muscles distinct, forming a fold inwards. Basilar muscles well developed. The two first cycles of mesenteries sterile.

According to STEPHENSON (1922, p. 274, 278) *Glyphoperidium* »seems undoubtedly identical with *Epiactis*». In fact they are certainly distinctly separated. The former is a genus characterized by a development of mesenteries which is richer in the distal part of the body than in the proximal, in the latter the mesenteries after the coupling-stage grow from the proximal end upwards and are often more numerous than the

tentacles. The extraordinarily numerous tentacles in *Glyphoperidium* are thinner and more delicate than in the ordinarily numerous tentacles in *Epiactis*. Relatively few mesenteries are perfect in *Glyphoperidium*, in opposition to *Epiactis*. The longitudinal muscles form no differentiated pennons in *G.*, while there are always pennons in *E.* Also the distribution of the reproductive organs is different in the two genera.

Glyphoperidium bursa ROULE.

Glyphoperidium bursa n. sp. ROULE 1911, p. 11, Pl. 2; PAX 1923, p. 25, 26.
» *vas* n. sp. » 1911, p. 13, Pl. 3; PAX 1923, p. 25, 26.
Epiactis bursa ROULE. STEPHENSON 1922, p. 274.
» *vas* » » 1922, p. 275.
» (?) *stephensoni* n. sp. PAX 1922, p. 80, fig. 3; 1923, p. 6, Pl. 1, figs. 7, 8.

Diagnosis: A very large species. Column in contracted state transversally and longitudinally wrinkled, in expanded state longitudinally sulcated (compare figs. 7, 8 in PAX' paper), broader in the distal part than in the proximal and in very large specimens with a tendency to lobation. Sphincter, in comparison to the size of the species, rather weak. Tentacles in large specimens up to thousand or sometimes considerably more. Longitudinal muscles of the tentacles ectodermal, radial muscles of the oral disc meso-ectodermal to ecto-mesogloeal, strong in the ridges. Mesenteries very numerous, but only 3 cycles (24 pairs) perfect. Longitudinal muscles of the mesenteries almost equally distributed on the surface of the one side of the mesenteries with low but somewhat ramificated folds. Parietobasilar muscles broad in the lower part but rapidly decreasing in breadth and terminating at half the height of the actinopharynx. Younger cycles of mesenteries without filaments. Nematocysts of the column 17—24 × almost 2—well 2.5 μ, those of the tentacles (29) 32—40 × 2—2.5 μ, those of the actinopharynx 31—38 × 2,5—well 2.5 μ, spirocysts of the tentacles 18 × 1.5—40 × about 2.5 μ.

Colour in living state red, pale red or white. According to LIOUVILLE the column is orange, the tentacles orange-yellow. Actinopharynx pale green (PAX). Column in preserved state brownish.

Dimensions of one of the largest specimens: length of the body 16 cm, breadth of the oral disc 15 cm, length of the inner tentacles up to 3 cm with a breadth of 0.5 cm at the base. Smallest specimens: height of the column 1.2 cm, breadth of the oral disc 4 cm.

Occurrence: South Georgia off the mouth of Cumberland Bay 54° 11′ S 36° 18′ W. 252—310 m. Temperature at the bottom + 1.45°. Grayish clay with some stones. 5. 6. 1902 18 specimens. — Between Falkland Isl. and South-Georgia, Shag Rock Bank, 53° 34′ S 43° 23′ W. 160 m. Bottom temperature + 2.05°. Gravel and sand. 19. 4. 1902 1 specimen.

Further distribution: Booth Wandell Isl. 25—30 m (Exp. antarctique Française). — South Shetland Isl., King George's Isl. 62° 12′ S 60° 55′ W. (Paris) 75 m. Bottom temperature + 0.2° (Pourquoi pas Exp. *Epiactis*(?) *stephensoni* PAX). — South Orkney Isl. Scotia Bay 10 fms. Salinity 2.5 % (Scot. Nat. Antarctic Exp.). — East side of Bouvet Isl. 54° 28.7′ S 3° 30′ E. 457 m. Bottom temperature + 1.1° (German Deep-Sea Exp.) — 65° 6′ S 96° 13′ E 325 fms.; 64° 44′ S 97° 28′ E 358 fms. (Australasian Antarctic Exp. 1913—14).

Exterior aspect: The pedal disc is well developed but not so broad as the oral disc. Sometimes the pedal disc is wholly invaginated. The column is mostly broader in the distal part, the form of the body varies besides with different states of contraction and is now very elongated, now short. It is transversally and irregularly wrinkled in contraction, and recalls the appearance of the column in *Antholoba reticulata*. The margin is distinct with a conspicuous, but not deep fossa. The tentacles are extraordinarily numerous, in one specimen (height of the column and breadth of the oral disc 4.5 cm) there were about 700 tentacles, in another specimen (length 12 cm, breadth of the oral disc 9 cm) the tentacles were considerably more than 200 in a sixth of the oral disc. The tentacles are conical, delicate, in contracted state often more cylindrical with their tips somewhat invaginated. In this stage they are also longitudinally sulcated. In all 19 specimens the tentacles were more or less visible. It is questionable whether the upper part of the column is capable of perfectly covering the tentacles, because the sphincter as also the longitudinal muscles of the mesenteries are rather weak in proportion to the size of the animal. The oral disc is very wide, shows in large specimens a tendency to lobation and is radially sulcated. About half of the oral disc lacks tentacles. The actinopharynx is long, with numerous longitudinal ridges and provided with 2 very broad siphonoglyphs with well developed aboral prolongations.

Anatomical description: The ectoderm of the column is high and contains numerous granulous gland cells and rather numerous nematocysts (as to size compare the diagnosis). In the maceration preparations I have also observed some nematocysts of the same size as those in the tentacles but probably they have stuck to the column. The sphincter varies in its appearance and is mostly circumscript, sometimes more diffuse (figs. 26, 27). The nematocysts in the distal part of the tentacles are numerous. The longitudinal muscles of the tentacles are ectodermal with rather high folds. The radial and circular muscles of the oral disc are well developed, the former mesoectodermal or especially in the furrows ecto-mesogloeal. The siphonoglyphs are provided with distinct longitudinal muscles, in the other parts of the actinopharynx the longitudinal muscles are very weak.

In the above named specimens with about 700 tentacles there were 96 pairs of mesenteries in the greater part of the body, in the uppermost region two cycles of

the sixth and seventh order are added, so that in all 384 pairs should be present if all mesenteries of the last cycle were developed. This is probably not the case as the specimens had only about 700 tentacles. The mesenteries of the first, second and at least part of the third order were perfect, those of the sixth and seventh orders lacked filaments as did also part of those of the fifth order. In the most proximal part mesenteries of the sixth order begin to appear. The specimen was not sexually ripe. In the large specimen with more than one thousand tentacles 24 pairs of mesenteries were perfect and the mesenteries of the third, fourth and fifth order fertile. Also another large specimen had the same mesenteries provided with reproductive organs (testes). In both specimens the first and second cycles of mesenteries were sterile. ROULE's statement that the first 5 cycles of mesenteries are fertile is not correct. At superficial aspect on a transverse section it seems that also the mesenteries of the first and second order should be fertile, but a closer examination shows that the reproductive organs do not belong to these mesenteries but are sticking to them. The longitudinal muscles of the mesenteries are weak and form no pennons, the folds are short but somewhat ramificated, PAX' statement (p. 7) that the retractors are circumscript is false. The parietobasilar muscles are well limited and form a fold inwards; they are broad at the basis but decrease rapidly in breadth and terminate at about the middle of the actinopharynx-region. The basilar muscles are rather well developed in the stronger mesenteries. Oral and marginal stomata are present in the perfect mesenteries. The mesogloea in the region of the ciliated streaks is provided with numerous cells. The species is dioecious.

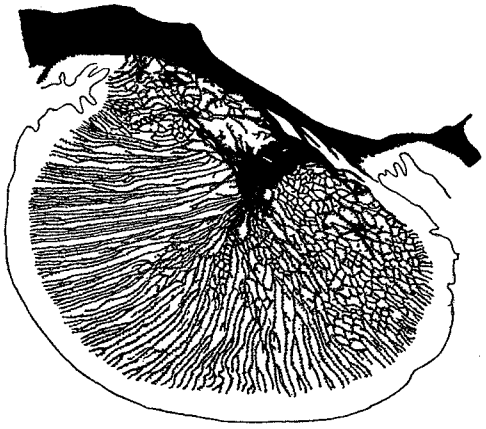


Fig. 26.

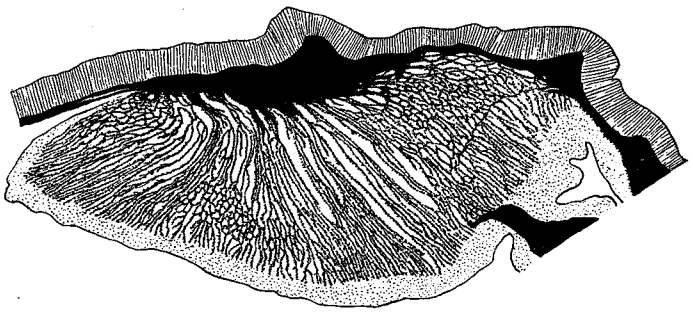


Fig. 27.

Figs. 26, 27. *Glyphoperidium bursa*. Transverse sections of sphincters. Tentacle-side to the right (fig. 26), on the left (fig. 27).

Remarks. I cannot find any real distinction between ROULE's *G. bursa* and *vas* and think that the two species are identical. I have examined the type-specimens of

PAX' *Epiactis* (?) *stephensoni*. There is no doubt that they belong to *Glyphoperidium bursa*. I cannot confirm PAX' statement that the pennons (retractors) are circumscript. Probably he has not examined them.

Genus **Isotealia** CARLGREN.

Diagnosis: Actiniidae (Bunodactidae) with well developed pedal disc. Column not elongated, probably divisible into scapus and capitulum. Scapus with a cuticle easily deciduous, without verrucae. Margin with perforated pseudo-marginal spherules. Sphincter well developed, circumscript. Tentacles short, as the mesenteries hexamerously arranged, the inner larger than the outer. Number of tentacles almost agreeing with that of the mesenteries. Actinopharynx with 2 siphonoglyphs, aborally prolongated. Numerous perfect mesenteries. Muscle pennons of the mesenteries ordinary. Parietobasilar and basilar muscles distinct. The mesenteries of the first and second order sterile.

Isotealia antarctica CARLGR.

Isotealia antarctica n. sp. CARLGREN 1899, p. 25, figs. 8, 9.
» » CARLGR. STEPHENSON 1918, p. 27, 1922, p. 275.

Diagnosis: Pseudo-marginal spherules 48. Sphincter pinnate, circumscript (always?). Tentacles arranged in 6 cycles, up to 192. Longitudinal muscles of the tentacles and radial muscles of the oral disc ectodermal. Actinopharynx with numerous ridges. Pairs of mesenteries up to 96, 48 pairs perfect. Mesenteries of the fifth cycle very weak in the greater part of the body. Dioecious. Nematocysts of the column 19—22 × 2 μ, those of the pseudo-marginal spherules 17—22 × 1.5—2 μ, those of the tentacles 22—29 × 1.5—(2) μ, those of the actinopharynx 33—37 × 2.5 μ, spirocysts of the tentacles 19 × 1.5—31 × 3.5—4.5 μ.

Colour in living state?

Dimensions: Breadth of the pedal disc 2.1—2.5 cm. Height of the body 2.2 cm, its breadth 3.1—3.8 cm. Inner tentacles 0.4—0.45 cm long.

Occurrence: off South Argentina, 40° 32′ S 61° 25′ W (type-specimen).

The species was before described by myself so that it is unnecessary to recapitulate the description. I will, however, give figures of the sphincter (fig. 28) and of one pseudo-marginal spherule (fig. 29).

As to the relations between the number of tentacles and mesenteries it is possible that the latter are more numerous than the former. Owing to the strong contraction of the specimen I have not been able to count the tentacles, but in a sixth of the animal there were 28 tentacles instead of the typically 32. A renewed examination of the number of mesenteries in five-sixths of the animal, and this time at the pedal disc, shows 155 mesenteries to be present, i. e. in the whole animal 187 mesenteries,

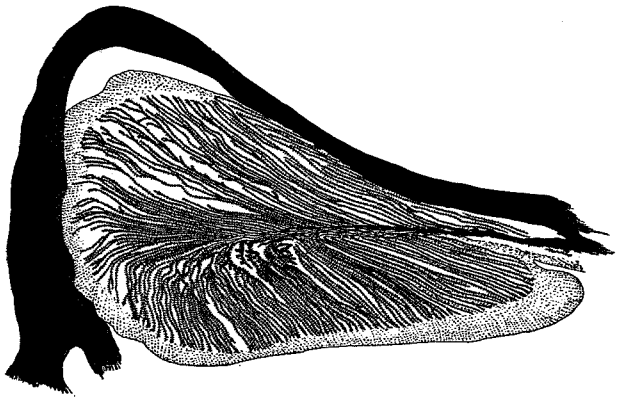


Fig. 28.

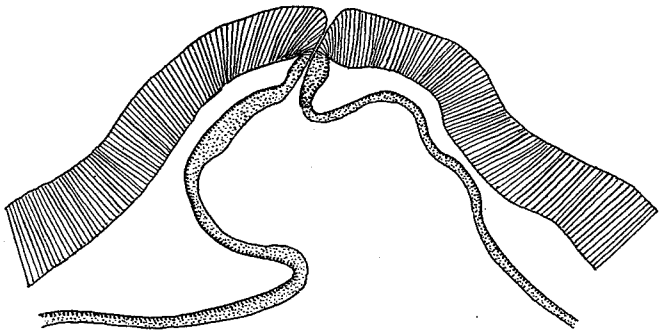


Fig. 29.

Figs. 28, 29. *Isotealia antarctica*. Transverse sections of sphincter (fig. 28) and of pseudomarginal spherule (fig. 29).

provided that the before sectioned sixth contained 32 mesenteries. At any rate there is no considerable difference in the number of tentacles and mesenteries. The parietobasilar muscles on the stronger mesenteries are extended over almost the whole length of the mesenteries and enclosed in the mesogloea at the main lamella of the mesenteries.

Genus **Tealianthus** n. gen.

Diagnosis: Actiniidae with wide pedal disc. Column smooth, not elongated, divided in scapus and capitulum? Margin with perforated (?) pseudomarginal-spherules. Sphincter diffuse (or onesidedly) circumscript. Tentacles short, hexamerously arranged, the inner longer than the outer, probably about as numerous as the mesenteries. More than 6 pairs of mesenteries perfect. Pennons diffuse. Parietobasilar muscles very strong. Mesenteries of the first cycle sterile, those of the second and following cycles fertile.

I propose with some hesitation a new genus for the specimen described by PAX 1923 as *Isotealia antarctica* CARLGR. The genus forms a transition between *Myonanthus* and *Isotealia* and is undoubtedly related to both these genera. Possibly the species could be referred to *Isotealia*, but in such a case the characters of this genus must be altered.

Tealianthus incertus n. sp.

Isotealia antarctica CARLGR. PAX 1923, p. 5.

Diagnosis: Pedal disc very broad and thin. Pseudomarginal spherules 24 (teste PAX). Sphincter diffuse or onesidedly circumscript. Tentacles and mesenteries probably 48. Pennons diffuse, rather well developed, somewhat concentrated. Parietobasilar

muscles very strong, forming a deep fold inwards. Nematocysts of the column and spherules 22—29 × 2.5—something more than 2.5 μ, those of the tentacles partly 17—19 × (1.5) 2—2.5 μ (few), partly 31—43 × (3) 3.5 μ, those of the actinopharynx 31—41 × (3) 3.5 μ, those of the filaments 38—50 × 4.3—5 μ.

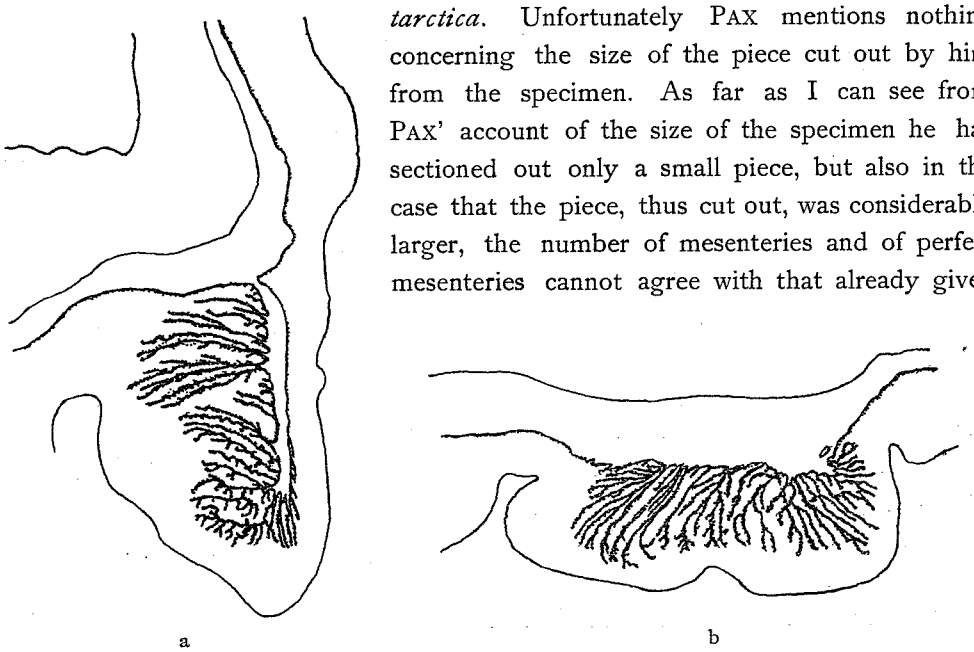
Colour?

Dimensions: Pedal disc unto 2.4 cm, height of the body 0.7 cm (PAX).

Occurrence: South Shetland Isls., King George's Isl., 62° 12′ S 60° 55′ W (Paris). 420 m. Bottomtemperature +0.3°. 1 spec. on *Cominella*. Pourquoi pas Exp.

PAX states that the anatomy of the specimen agrees completely with that given in my description of *Isotealia antarctica* 1899. Already the sphincters show, however, differences in both specimens. *I. antarctica* has a circumscript sphincter (compare fig. 28), as already pointed out by myself 1899, while the sphincter of PAX' specimen is diffuse or of a peculiar appearance (fig. 30). In one sectioned part the sphincter was typically diffuse, in another part the mesogloea is protruded as a thin lamella with the musclefolds concentrated almost on one side, so that we may speak of a onesidedly circumscript sphincter. Evidently this lamella in other parts fuses with the main-lamella of the mesogloea in the column.

Also the number of mesenteries in PAX' specimen is another than in my *I. antarctica*. Unfortunately PAX mentions nothing concerning the size of the piece cut out by him from the specimen. As far as I can see from PAX' account of the size of the specimen he has sectioned out only a small piece, but also in the case that the piece, thus cut out, was considerably larger, the number of mesenteries and of perfect mesenteries cannot agree with that already given



a b

Fig. 30. *Tealianthus incertus*. Transverse section of sphincter in different parts of the column.

1899 in my description of *I. antarctica*. I for my part think that PAX' specimen had only 24 pairs of mesenteries — I counted 22 in the rest of the specimen. Of those

only the mesenteries of the first and second cycles are perfect. The mesenteries of the first cycle are sterile (I have sectioned one not directive mesentery in the whole filament-region and examined two others in glycerine-preparations, but no traces of reproductive organs were present), while those of the second and third order had well developed reproductive organs (testes). Concerning the pennons and parietobasilar muscles compare the diagnosis. The filaments are broad and provided with very large nematocysts.

I have sectioned pseudomarginal-spherules but the sections are not good, so that I cannot confirm whether they are perforated or not. In one spherule the ectoderm was lost, there was, however, a small impression with remains of epithelium indicating a perforation.

The species is certainly not identical with my *I. antarctica*. Besides the differences named above the size of the nematocysts is quite another in both species. PAX mentions that *I. antarctica* has been dredged also at Emperor Wilhelm's land. Possibly an examination of this form may clear up and perhaps correct some details as to Pax' »*antarctica*» from the Pourquoi-pas-Expedition.

Genus **Epiactis** VERR.

Diagnosis compare CARLGREN 1921, p. 174. Besides, the following ought to be added: Mesenteries of the same number as the tentacles or some more.

Epiactis georgiana n. sp.

Diagnosis: A rather large species. Sphincter strong, pinnate-palmate with a distinct main lamella. Fossa deep. Tentacles unto 96 hexamerously arranged, in contraction longitudinally sulcated. The ectodermal muscles of the tentacles and oral disc well developed, palissade-like arranged. Actinopharynx with numerous longitudinal ridges and two well developed siphonoglyphs aborally elongated. Mesenteries in 4 cycles, the fourth cycle sometimes incomplete, all or almost all mesenteries perfect and fertile. Muscle pennons very strong with very high close folds extended over almost the whole breadth of the mesenteries. Parietobasilar muscles strong. Tentacles and mesenteries in about equal numbers. Nematocysts of the column 19—22 × 1.5—2 μ, those of the tentacles 30—36 × about 2.5 μ, those of the actinopharynx 31—41 × 2.5—3 μ, spirocysts of the tentacles 26 × 2.5—about 48 × 4.5 μ.

Colour in living state white.

Dimensions: Spec. 1: breadth of the pedal disc 5.5 cm, that of the oral disc 3.5 cm, height of the contracted column 2.8 cm. Spec. 2: breadth of the pedal disc about 5 cm, height of the column about 4.5 cm.

Occurrence: South Georgia, off the May Bay, 54° 17′ S 36° 28′ W, 75 m. Bottom-temperature + 1,5°. Clay with algae. 14. 5. 1922. 2 specimens.

Exterior aspect: The pedal disc is very wide, the column very contracted and not well preserved. The tentacles were in one specimen 96, in another 84. Compare besides the diagnosis.

Anatomical description: The ectoderm of the column probably lacks a cuticle. The sphincter is round in transverse section and provided with a rather thick main lamella more or less strongly thickened in the inner part, from this lamella numerous close and high folds issue (fig. 31). There are rather well developed longitudinal muscles in the furrows of the actinopharynx in its upper part. In the specimen with 84 tentacles the pairs of mesenteries were 43 (directive pair—19—directive pair—22) in the lower part of the body, in the specimen with 96 tentacles 54 pairs at the pedal disc. All or almost all mesenteries were perfect. The muscle pennons are broad, the folds of the muscle lamella are very high and close packed, mostly palissade-like arranged and little or not ramificated. The parietobasilar muscles are very strong and form a deep fold inwards, between this and the main lamella of the mesenteries muscles are enclosed in the mesogloea. All or almost all mesenteries incl. the directives are fertile. Both specimens were males.

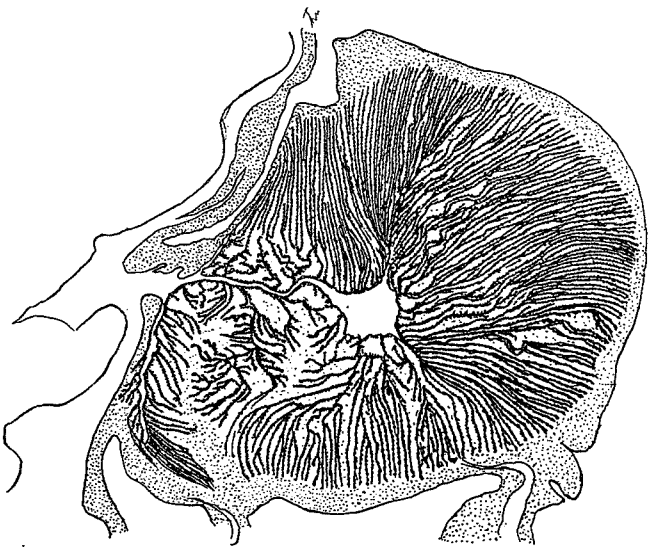


Fig. 31. *Epiactis georgiana.* Transverse section of sphincter. Tentacle side to the right.

Genus. **Urticinopsis** n. gen.

Diagnosis: Pedal disc well developed. Column without *Urticina*-verrucae, marginal spherules and pseudomarginal spherules. Sphincter strong, circumscript. Tentacles short but thick, hexamerously arranged, about half as numerous as the mesenteries, the inner longer than the outer. Longitudinal muscles of the tentacles and radial muscles of the oral disc ectodermal or meso-ectodermal. Actinopharynx well developed. Siphonoglyphs strong. Mesenteries hexamerously arranged, more numerous in the proximal than in the distal part. At least 2 cycles of mesenteries perfect. Muscle pennons of the mesenteries diffuse, not strong. Parietobasilar muscles forming a distinct fold towards the transversal muscles. The first 2 cycles of me-

senteries sterile. Nematocysts of the tentacles and actinopharynx of about the same size.

In some respects this new genus recalls *Urticina* (*Tealia*), the only known species of which, *U. felina* (L), shows a great variation in its organization (compare CARLGREN 1921, p. 162). *Urticinopsis* is, however, separated from *Urticina* by the hexamerous arrangement of the tentacles and mesenteries, and by the considerably richer development of mesenteries in the proximal part of the body than in the distal. Also the relation between the size of the nematocysts in the tentacles and in the actinopharynx is considerably different in the two genera. Thus I have preferred to erect a new genus for the species, referred by CLUBB to *Rhodactinia crassicornis*.

Urticinopsis antarctica (VERR.)

Rhodactinia crassicornis. CLUBB 1908, p. 9. Pl. 3, fig. 23.
Urticina antarctica n. nom. VERRILL 1922, p. 109.
Rhodactinia clubbi n. nom. PAX 1923, p. 25.

Diagnosis: Body cylindrical. Muscle lamellae of the sphincter bipinnate or projecting from a thick lamella of the mesogloea. Tentacles about 200, in contraction longitudinally sulcated. Longitudinal muscles of the tentacles palissade-like arranged, ordinarily developed, almost wholly ectodermal. Radial muscles of the oral disc like the longitudinal muscles of the tentacles, between the insertions of the mesenteries much stronger. Actinopharynx with numerous longitudinal ridges and furrows. Mesenteries about twice as numerous as the tentacles. Pairs of mesenteries in 6 cycles with traces of a seventh in the proximal part. Three cycles of mesenteries perfect. Muscle pennons of the mesenteries extended over a great part of the mesenteries. On the stronger mesenteries a band-like strong thickening of the mesogloea on the inside of the pennons. Parietobasilar muscles rather well developed, enclosed in the mesogloea towards the main lamella of the mesenteries. Dioecious. Nematocysts of the column 18—22 × about 2.5 μ (partly 38—43 × 2.5—3 μ?), those of the tentacles 35—46 × 2.5—3 μ, those of the actinopharynx 35—43 × 2.5—3 μ, spirocysts of the tentacles 26 × 1.5—50 × 3.5 (43 × 4) μ.

Colour in alcohol yellowish.

Dimensions of the examined specimen: heigth of the column 4.5—5 cm, breadth of the expanded oral disc about 6 cm.

Occurrence: Mc Murdo Bay. 10—20 fms. (National Antarctic expedition. 1902—1904.)

Exterior aspect: The examined specimen — one of the specimens examined by CLUBB — recalls the appearance of an *Epiactis*. The body is cylindrical, the oral disc is expanded and all tentacles clearly visible. The column is irregularly wrinkled, owing to the contraction of the body. There are no traces of verrucae,

marginal spherules or pseudomarginal spherules. The fossa is inconsiderable. The number of tentacles was something more than 200. The oral disc is radially sulcated, the siphonoglyphs are aborally prolongated.

Anatomical description: The ectoderm of the column is thick and contains numerous gland cells and nematocysts. Whether the large nematocysts (compare diagnosis) are normal components of the column or not I cannot confirm. Probably they have stuck to the ectoderm and belong to the tentacles. The sphincter is in the main of the same appearance as in the somewhat schematic figure given by CLUBB. Now the thickened mesogloea-lamella is attenuated at the base, now some stronger folds of the mesogloea issue from the main lamella of the sphincter. The nematocysts in the tentacles and actinopharynx are very numerous. The longitudinal muscles of the tentacles are mainly ectodermal, ordinarily developed and palissade-like arranged, here and there isolated folds are enclosed in the mesogloea. The radial muscles of the oral disc show the same appearance as the longitudinal muscles in the tentacles, but are surpassing them many times in height.

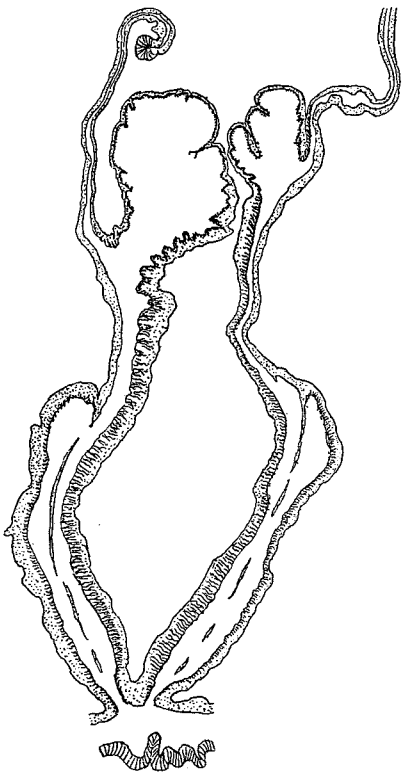


Fig. 32. *Urticinopsis antarctica.* Transverse section of two stronger mesenteries below the actinopharynx.

The pairs of mesenteries were in the proximal part of the body more than 192; in some exocoels very weak mesenteries of a seventh cycle had namely arisen (stated on sections of a twelfth part of the body); in the uppermost part only about the half was present. Three cycles of mesenteries were perfect, the two first cycles were sterile, well developed testes are visible on the mesenteries of the third to fifth orders. The muscle pennons on the rather thick mesenteries are diffuse, their folds rather low and extended over a great part of the mesenteries. At the inner edge of the pennons the mesogloea forms a thick band-like process on the stronger mesenteries (fig. 32), recalling the circumscript pennons in the same place in *Hormosoma*, but with the difference that here the folds of the muscle lamella are few and low, in comparison with those in *Hormosoma.* The parietobasilar muscles are well developed (compare the diagnosis and the fig. 32). The mesogloea in the ciliated tract region of the filament is provided with numerous cells.

Fam. **Paractidae.**

Genus **Paranthus.**

Diagnosis: *Paractidae* with the pedal disc not enlarged. Column smooth, elongated. Margin indistinct. Sphincter rather well developed. Tentacles rather short, the inner longer than the outer, hexamerously arranged. Longitudinal muscles of the tentacles and radial muscles of the oral disc ectodermal. 2 distinct siphonoglyphs. Mesenteries more numerous in the uppermost part of the body than in the proximal, At least 12 pairs of mesenteries perfect. 2 pairs of directives. Muscle pennons strong, diffuse. Parietal part of the longitudinal muscles of the mesenteries recalling the muscles of the weaker mesenteries. Reproductive organs on all stronger mesenteries.

As I before have pointed out (CARLGREN 1921, p. 186) the genera *Paranthus* and *Parantheoides* are synonymous. The »geno-type» of *Paranthus*, *P. chromatoderus*, has namely in accordance with *Parantheoides* more than 6 perfect pairs of mesenteries, and the reproductive organs appear already on the mesenteries of the first cycle.

Paranthus crassa (CARLGR.)

Parantheoides crassa n. sp. CARLGREN 1899, p. 27, fig. 17.
» » CARLGR. STEPHENSON 1920, p. 555.
(*Paranthus crassa* (CARLGR.)). CARLGREN 1921, p. 187.
? *Paractis nivea* (LESS.) VERRILL. MC MURRICH 1904, p. 239, Pl. 15, figs. 16—19. (Here literature and synonyms).
? *Paranthus nivea* LESS. STEPHENSON 1920, p. 542.

Diagnosis: Sphincter ordinarily developed, closer to the ectoderm than to the endoderm, in the uppermost part reticular, in other places alveolar with few small meshes. Tentacles about 170—180. Actinopharynx about half as long as the body. Siphonoglyphs with aboral prolongations. Mesenteries most numerous in the distal part, fewer at the base and fewest in the middle of the body. Muscle pennons of the stronger mesenteries very well developed, elongated with very numerous, high and ramificated folds. Folds of the parietobasilar muscles recalling the parietal part of the longitudinal. Nematocysts of the column 10—19 × 1.5—3.5 μ, those of the tentacles partly 17—26 × 1.5—2 μ, partly 13—23 × 2.5—3 (3.5) μ, those of the actinopharynx partly 23—33 × 2—2.5 μ, partly 17 × 3—25 × 4.5 μ, spirocysts of the tentacles 13 × 1.5—about 24 × 2.5 μ.

Colour?

Dimensions of the type-specimen in rather strongly contracted state: largest breadth of the body 1.5 cm, length of the column 1.6 cm, length of the inner tentacles

0.3—0.35 cm, — of the largest specimen from Chile: length of the column 4.5 cm, breadth of the pedal disc 2.3 cm, largest breadth of the column 2.3 cm.

Occurrence: off S. Argentina, 43° S 60° W. 60 fms. (type-specimen). Chile, Talcahuano, leg. DUSÉN 1896, 4 specimens.

The exterior and the organization of the very badly preserved type-specimen was before described by myself in my paper of 1899. Here I will only add some supplementary notes accompanied by some figures. The sphincter is ordinarily developed and situated closer to the ectoderm than to the endoderm. In its upper reticular part it occupies the greater part of the mesogloea, in the other parts it is composed of small scattered meshes. Below the reticular part the mesogloea is attenuated and further below strongly thickened. Probably these differences are connected with the strong contraction of the column. The actinopharynx is about half as long as the column. (In my description (1899, p. 28) the word »halben» before »Länge» has been omitted by the printing). The pairs of mesenteries in the type-specimen were 48 or some more at the pedal disc. Owing to the bad preservation it is possible that some small pairs have been overlooked, the number of mesenteries is, however, certainly smaller at the pedal disc than at the oral, in the greater part of the body only 36, arranged as follows:

dm dm

1 3 2 4 3 4 1 3 2 4 3 4 1 3 2 4 3 4 1 4 3 4 2 3 1 4 3 4 2 3 1 4 3 4 2 3

(dm: directives, the spaced out figures are fertile and contain testes). In the uppermost part the mesenteries are most numerous. Because of the bad preservation of the mesenteries I cannot here fix their number, but as the number of tentacles is about 170 the pairs of mesenteries are probably about 84. In a specimen from Talcahuano I counted about 150 mesenteries at the base, in the middle of the column there were only three cycles and possibly also here and there traces of a fourth cycle present, at the distal end probably about 180 in agreement with the number of tentacles. The mesenteries of the first and second order and the strongest of the third are perfect, the last ones being, however, at-

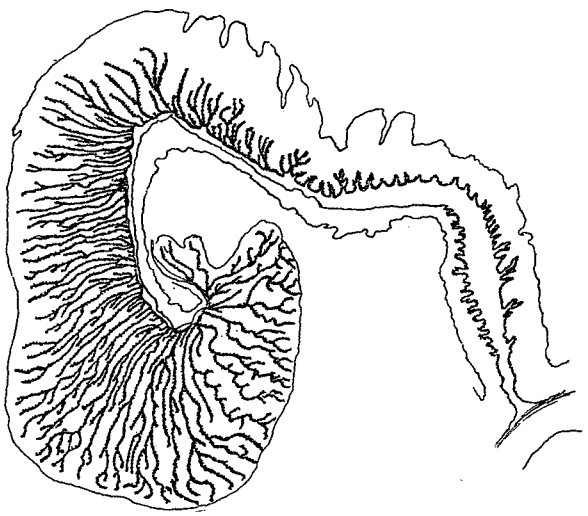


Fig. 33. *Paranthus crassa.* Transverse section of one stronger mesentery of the type-specimen.

tached to the actinopharynx only by a small flap. The muscle pennons on the mesenteries of the first and second order are very strongly elongated and provided with very numerous high and richly ramificated folds (fig. 33). The folds of the parietobasilar muscles are rather few and not high and agree with the parietal part of the longitudinal muscles (fig. 33). The nematocysts of the column are numerous, those of the tentacles very numerous, between the different kinds of the nematocysts of the tentacles there are possibly transitional stages. The nematocysts of the column are often (always?) broader in one end and somewhat curved. The nematocysts of the type-specimen and of a specimen from Talcuhuano (length 4.5 cm, largest breadth of the body 1.2 cm) show good agreement.

Remarks. Whether *Paranthus nivea* (LESS.) is synonymous with *crassa* is questionable. It is not impossible. I have not seen MC MURRICH's *nivea* but this species is certainly a *Paranthus*.

Genus **Hormosoma** STEPH.

Diagnosis: Paractidae (Paractinae) with well developed basal disc. Column thick without tubercles and capitular ridges. Sphincter strong. Tentacles short but thick, arranged in several cycles, the inner longer than the outer. Outermost cycle of tentacles on the exterior side at the base with a more or less distinct stinging battery containing large particular nematocysts. Longitudinal muscles of the tentacles and radial muscles of the oral disc mesogloeal. Oral disc wide. 2 very broad siphonoglyphs with aboral prolongations. Tentacles and mesenteries regularly hexamerously arranged with 2 pairs of directives. Mesenteries and tentacles of about the same number. Perfect pairs of mesenteries rather numerous. Longitudinal muscles of the mesenteries with rough folds, forming a small pennon close to the reproductive organs. Parietobasilar muscles very broad forming a deep fold inwards. Basilar muscles strong. All mesenteries (sometimes except the directives) fertile.

In opposition to STEPHENSON (1918, p. 29) I have excluded the presence of a collar from the diagnosis, because I am persuaded that the collar has arisen by a certain stage of contraction of the body (compare below). An essential addition to the diagnosis is the presence of the stinging battery at the base of the outermost tentacles. In this regard the genus agrees with the genera *Anthosactis* and *Tealidium* (compare CARLGREN 1921, p. 190, 196). As the nematocysts in these batteries are of a special kind and show the same structure in all three genera I think that the three genera in question are nearly related to each other, although they are in several respects separated.

Hormosoma scotti STEPH.

Hormosoma scotti n. sp. STEPHENSON 1918, p. 29. Pl. 2, figs. 2, 17, 18, Pl. 3, figs. 17, 19, 21, Pl. 4, figs. 4, 7, 8, 9, Pl. 6, fig. 10; STEPHENSON 1920, p. 554, textfig. 32.
» *violaceum* n. sp. PAX 1922, p. 83, fig. 6; PAX 1923, Pl. 1, fig. 9, Pl. 2, fig. 2.
Paractis papaver DRAYTON in DANA. CLUBB 1908, p. 3, Pl. 2, figs. 7—11.
Actinostola rufostriata n. sp. PAX 1922, p. 86; 1923 p. 17, Pl. 1, fig. 4, Pl. 2, fig. 4.

Diagnosis: A rather large specimen. Sphincter very strong, almost reticular, forming very small meshes and showing a tendency to longitudinal stratification. Tentacles about 96 or some more, in contraction longitudinally and transversally sulcated. Large particular nematocysts, present in the stinging battery, absent or scarce in other parts of tentacles. Actinopharynx with numerous longitudinal ridges. No stomata. Pairs of mesenteries about 48, the (two?) three first order perfect. All mesenteries, sometimes except the directives, fertile. Embryos developing in the coelenteric cavity. Nematocysts of the column sparse (with visible basal part to the spiral thread) 19—24 × 2.5—3 μ, those of the tentacles in the stinging batteries (53) 57—67 (74) × 7—8 μ, other nematocysts very sparse 26—33 × 3.5—4 μ, those of the actinopharynx 29—36 × 5—6 μ. Spirocysts in the tentacles extraordinarily numerous 22 × almost 2—65 × 4.5 μ.

Colour in life: whitish-gray with red dots close to one another (specimen from May Bay). Column coral-red with oblique stripes of orange. Tentacles orange (*Actinostola rufostriata*). — Column pale red, outer tentacles dark violet-blue. Other tentacles malva-coloured (*H. violaceum* teste PAX). — In alcohol: column reddish brown, tentacles and oral disc pinkish-buff (STEPHENSON), grayish-brown (*violaceum* teste PAX).

Occurrence: South Georgia, Cumberland bay: South fiord, in front of Nordenskjöld's glacier, 54° 24′ S 36° 22′ W, 195 m. Clay with stones. Temperature at the bottom + 1.45°. 29. 5. 1902, 2 specimens; off the May Bay 54° 17′ S 36° 28′ W, 75 m. Clay with some algae. Temperature at the bottom + 1.5°. 14. 5. 1902, 1 spec.

Further distribution: Entrance Mc Murdo Sound 207 fms. (Terra Nova Exp.), Mc Murdo Bay, winter quarters, 20 fms. (Nat. Antarctic Exp., *Paractis pavaver*). Commonwealth Bay 66° 50′ S 142° 6′ E 354 fms. (Australasian Antarctic Exp. 1913—14). South Shetland Isls. 75 m. St. 18 (Pourquoi-pas-Exp., *H. violaceum*, *Actinostola rufostriata*).

Dimensions: Sp. 1. Breadth of pedal disc 5.9 cm, height of column 3 cm.
» 2. » » » » 6 » » » » 4.8 »
» 3. » » » » 8.5 » » » » 4.5 »

I have not much to add to STEPHENSON's description. As above said the collar-like formation on the uppermost part of the column is certainly caused by a certain stage of contraction. In one specimen, the tentacles of which were partly covered,

there is no trace of a collar, the sphincter was not elongated and showed no thickening (fig. 35). In the second specimen, the tentacles of which were for the greater part extended, a more or less distinct collar was mostly present, sometimes accompanied with a thickening of the uppermost part of the sphincter. In the third specimen, with the tentacles perfectly drawn in, a distinct collar formed by the strongly thickened upper part of the sphincter was present (fig. 34). Thus there is a great

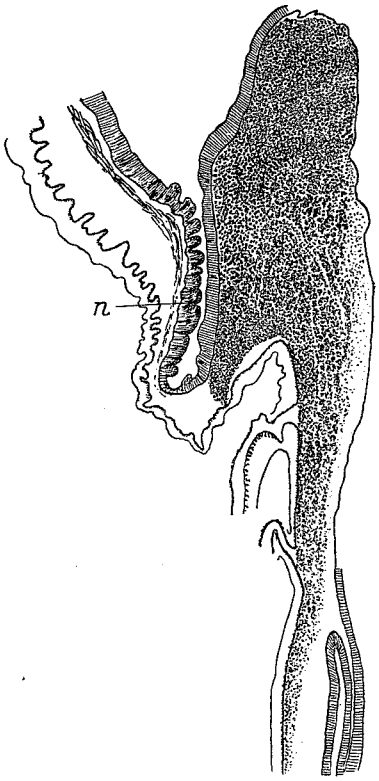


Fig. 34.

Fig. 35.

Figs. 34, 35. *Hormosoma scotti.* Longitudinal sections of the uppermost part of the column and the base of one tentacle showing the different appearance of the sphincter. — *n:* nematocyst-batteries on the base of the outer side of the outermost tentacles.

variation in the appearance of the uppermost part of the column. In the same way the uppermost part of *Actinostola spetsbergensis* varies as also in *Korenia* and others. If we put up the presence of a collar in the diagnosis we must add »during a certain stage of contraction». In our specimen I counted 91 tentacles, and in half of the body 24 pairs of mesenteries. The nematocyst-batteries were most distinct, and the nematocysts most numerous in the specimen, the sphincter of which is figured (fig. 34), probably because the tentacles in this specimen were the best guarded against damage

during the dredging. The strong parietobasilar muscles are extended unto the sphincter. The basilar muscles are very distinct. I have not observed any mesenterial stomata. In the coelenteric cavity of a specimen I have observed embryos. In one dissected specimen the directives were sterile as in *H. violaceum*. STEPHENSON states that all mesenteries are fertile, perhaps he has not examined the directives.

Remarks: The small differences between *scotti* and *violaceum* pointed out by PAX (1923, p. 16) are, to my mind, to be referred to individual variations of one and the same species. Therefore I regard *violaceum* as synonymous with *scotti*. The nematocysts in *violaceum* agree well with those in the specimens from South Georgia. Also *Actinostola rufostriata* (PAX 1922, 1923) is synonymous with *Hormosoma*. Already PAX' statement, that the mesenteries of the second order are fertile, does not agree with the distribution of the reproductive organs in *Actinostola*. The sphincter agrees perfectly with that reproduced in fig. 34. Sections of the mesenteries show no different development of the mesenteries in one and the same pair. The mesenteries of the three first cycles are perfect. I have namely examined the mesenteries of half the body in the uppermost part of the actinopharynx and here were 24 perfect mesenteries. At the base there were some more than 48 mesenteries in about half of the animal. Also the colour of *rufostriata* recalls that in the specimen from May Bay (compare above). At the base of the outer tentacles the large nematocysts were 55—62 × 7—7.5 μ in one specimen, in the other (53) 62—74 × 7—7.5 μ. The small nematocysts in the tentacles and the nematocysts in the actinopharynx agree with those from the South Georgia-specimens.

In his paper of 1920 STEPHENSON has adopted *Paractis papaver* DRAYTON as the »genotype» for the genus *Paractis* and drawn up the diagnosis of this genus to fit *P. papaver*, more recently described by CLUBB 1908. It ought to be taken up for discussion whether CLUBB's specimen is referable to DRAYTON's species. I think it is impossible to solve this problem without an examination of the type, if present. Besides the habitat of DRAYTON's species gives no support for such a supposition. On the other hand, CLUBB's *P. papaver* is identical with STEPHENSON's *Hormosoma scotti*. From the description of CLUBB I already suggested that his species was identical with STEPHENSON's, and a nearer examination of the nematocysts from the tentacles of a little piece of the distal body of CLUBB's specimen has now shown the correctness of this suggestion. There are namely a stinging battery also in »*P. papaver*» at the outer side of the basis of the outermost tentacles. The size and structure of the stinging capsules in CLUBB's specimen show good agreement with those of our specimens.

I have already pointed out (1912, p. 43; 1921, p. 191) that *Paractis excavata* R. HERTWIG probably is an *Anthosactis*. It remained, however, to be stated that the outermost tentacles were provided with stinging batteries as in this genus. I

have now examined two tentacles of HERTWIG's specimen. Unfortunately the ectoderm on the outside of the tentacles was torn off, but the presence of one large nematocyst, 107 × about 13 μ, of the same structure as in the other *Anthosactis*-species in small rests of the ectoderm clearly shows that *P. excavata* is an *Anthosactis*. The sparse other nematocysts in the tentacles were 31—37 × about 6 μ, the spirocysts 22 × almost 2—about 48 × 4.5 μ.

Genus **Cnidanthus** n. gen.

Diagnosis: Well developed, broad pedal disc. Column smooth, rather thin. Margin distinct. Sphincter mesogloeal, rather well developed. Tentacles short and thick, the inner longer than the outer. Tentacles with scattered, particular, large nematocysts. Longitudinal muscles of tentacles and radial muscles of oral disc mesogloeal. 2 well developed siphonoglyphs. Mesenteries and tentacles present in equal number? At least the mesenteries of the two first cycles perfect. Pennons of the mesenteries diffuse, rather weak. Parietobasilar muscles distinct. All other mesenteries, including the directives fertile.

As to the genus compare the species.

Cnidanthus polaris (CLUBB).

Paractis polaris n. sp. CLUBB 1908, p. 3, Pl. 1, figs. 2—6.
Cymbactis polaris CLUBB. STEPHENSON 1920, p. 563, not of PAX 1923, p. 12.

Diagnosis: Sphincter rather long, in the upper portion broad, reticular with tendency to longitudinal stratification, wholly separated from the endodermal circular muscles of the column but not from the mesogloeal muscles of the tentacles. Tentacles 96. Actinopharynx longitudinally(?) plicated. Pairs of mesenteries 48 of which 2 directives. Mesenteries of the two (three?) first cycles perfect and fertile. Pennons diffuse, bandlike with rather low but ramificated folds. Parietobasilar muscles not forming a deep fold towards the transversal muscles. Dioecious. Embryos developing in the coelenteric cavity. Nematocysts of the column 17—19 × about 2 μ, very sparse, large particular nematocysts in the tentacles 35—47 × (5.5) 6 μ, other nematocysts of the tentacles sparse 22—26 × 2 μ. Spirocysts of the tentacles 29 × 2—about 53 × 4 μ, very numerous.

Colour in life?

Dimensions: up to 2.3 cm high and 3.5 cm broad at the pedal disc, breadth of the oral disc 2.5 cm (CLUBB).

Occurrence: Mc Murdo Bay, winter quarters, 25—30 fms. (Discovery Exp.).

Unfortunately I have had for examination only a little piece of the distal body-end of the type-specimen wherefore most of the details in the diagnosis are com-

pilated from CLUBB's description. In several maceration preparations from different parts of the outer and inner tentacles as also in sections, I have found large particular nematocysts, perhaps they are most numerous in the distal part of the tentacles. Between two mesenteries close to the tentacles I have observed a small elongated embryo. In the diagnosis I have with a query indicated that a re-examination of the basal part of the body is necessary in order to state, whether the number of mesenteries in this part agrees with that of the tentacles. The base is namely (according to CLUBB) considerably wider than the oral disc. It is possible that in the proximal part the mesenteries are more numerous than in the distal.

I have proposed a new genus, *Cnidanthus*, for CLUBB's species. CLUBB (1908) refers the species to the genus *Paractis*, STEPHENSON (1920) to *Cymbactis*. Unfortunately it is impossible at present to give a diagnosis of the certainly very heterogenous genus *Paractis*. Of MILNE-EDWARDS' 5 *Paractis*-species — I disregard the species marked with a query — the first named species *impatiens* is a Sagartiidae (compare p. 77), the third is *lineolatus*[1] referred by MC MURRICH incorrectly to *Pycnanthus*, the other three species are not identified, for CLUBB's *papaver* is certainly not identical with DRAYTON's species (compare p. 49). CLUBB's *polaris* has nothing to do with *lineolatus* and *impatiens*. Under such circumstances we can not place *polaris* in the genus *Paractis*, a genus which it was perhaps best to abolish. It belongs neither to the genus *Cymbactis*, having probably more mesenteries in the distal than in the proximal part (compare CARLGREN 1921, p. 185), nor to any other genus of the »Paractidae».

Although CLUBB's statements as to the organization of *polaris* in some respects require confirmation and enlargement I think it necessary to put up a new genus for this species. At first, when I found rather large, particular nematocysts at the outside of the base of the outermost tentacles, I suggested that the species were a *Hormosoma*. An examination of the inner as well as the outer tentacles showed, however, these nematocysts to be present everywhere in the tentacles, probably mostly in the apex. This circumstance as also the structure of the mesenteries make it difficult to refer the species to *Hormosoma*. As to the large nematocysts the species agrees, as it seems, well with those of *Actinostola* and *Stomphia* (I have, however, not compared them in details), but both these genera are on other points of another structure, for instance as to the distribution of the reproductive organs.

PAX (1923, p. 12) identifies a specimen dredged at 68° S 70° 20′ W (Paris), (227 m, bottomtemperature + 0.5°, Pourquoi pas Exp.) with CLUBB's *polaris*. Unfortunately, the specimen was not well preserved in the interior and also the tentacles were very macerated, the dissection made by PAX does not facilitate the examination either.

[1] MC MURRICH (1904, p. 247) feels dubious, however, as to the identification of his species with COUTHOUY's *lineolata*.

The pedal disc is broader than the oral, the mesogloea of the column very thick especially in consideration of the small size of the specimen. Besides, the column is provided with deeper and shallower irregular furrows, by which the column gets a nodular appearance recalling the column in *Actinostola callosa*. The sphincter is weaker than in CLUBB's species and occupies at most half the breadth of the mesogloea. Under the magnifying glass the sphincter seems to be longitudinally stratified. On the one half of the animal I counted at the base 110 mesenteries, the exact number of the tentacles was impossible to calculate but it is certainly less than that of the mesenteries. The size of the stinging capsules agrees, however, rather well with CLUBB's species. The nematocysts of the tentacles were partly 21—24 × 2 (2.5) μ (not numerous), partly 38—48 × 6—7 μ, those of the actinopharynx 24—26 × 4—4.5 μ, the spirocysts of the tentacles unto 46 × 4—5 μ. I think that the specimen is an *Actinostola*.

Genus **Isosicyonis** n. gen.

Diagnosis: Pedal disc very broad. Column rather thick, broader than high. Sphincter ento-mesogloeal, ordinarily developed. Margin distinct. Tentacles rather short, situated close to the margin, fewer than the mesenteries. Longitudinal muscles of tentacles and radial muscles of oral disc ectodermal. Oral disc very wide. Siphonoglyphs, if present, weak. Mesenteries decamerously arranged (always?). More than 10 pairs perfect. No difference in the size of the mesenteries in one and the same pair. Only the mesenteries of the last order fertile and probably without filaments, which are present in the sterile mesenteries. The longitudinal muscles of the mesenteries as well as the parietobasilar muscles weak. Extraordinarily large nematocysts in all parts of the ectoderm.

The examination of STUDER's »*Paractis*» *alba* has shown that this species cannot be referred to any already proposed genus.

Isosicyonis alba (STUD.).

Paractis alba n. sp. STUDER 1879, p. 545, Pl. 5, figs. 19 a, b.
» *studerii* n. n. ANDRES 1883 p. 479.

Diagnosis: Pedal disc very wide. Column rather low, rather thick with strong stinging batteries. Fossa deep. Sphincter rather strong, almost half as broad as the mesogloea, transversally stratified. Tentacles about 80 in at least three cycles, conical. Ectodermal longitudinal muscles of tentacles and radial muscles of oral disc very strong with close, high folds. Oral disc radially furrowed. Possibly one, but not distinct, siphonoglyph. Pairs of mesenteries 80 (10 + 10 + 20 + 40), of which 20 perfect. Only one pair of directives(?). Longitudinal muscles of the mesenteries weak,

only in the innermost part of mesenteries forming weak pennons. Parietobasilar muscles weak, not folded. Dioecious. Nematocysts of the column 70—84 × 5—4.5 μ, those of the tentacles 58—65 × 3—well 3.5 μ, those of the actinopharynx 43—55 × 5—4.5 μ (all very numerous), those of the filaments partly 55—67 × 5—6.5 μ (partly 17—19 × 2.5 μ). Spirocysts of the tentacles 14 × 1.5—about 38 × well 2.5 μ.

Colour in life yellowish-white (STUDER). The column is in preserved state partly dirty grayish.

Dimensions in preserved state: Largest diameter 4.5 cm, largest height 2.5 cm. Length of the inner tentacles about 1 cm. Length of the contracted actinopharynx 1.7 cm.

Occurrence: off East Patagonia, 60 fms. (Gazelle exp.).

Exterior aspect: The exterior of this species is well described and figured by STUDER. The pedal disc is very wide and totally covers the outer parts of the shell of a *Fusus*-species. The rather thick column is somewhat conical, broader than high and, owing to the contraction, longitudinally and transversally sulcated. The margin is distinct, sometimes a little crenulated, the fossa deep. The tentacles are rather short but broad at the base, conical, sometimes a little longitudinally furrowed, the inner somewhat longer than the outer. Their number is about 80 (I counted 78 tentacles) and, as far as I can see, decamerously arranged in at least three close cycles (according to STUDER only two). All tentacles stand closer to the margin, so that the largest part of the wide oral disc lacks tentacles. The oral disc is radially sulcated. The long actinopharynx, in oral-aboral direction strongly contracted, is provided with numerous longitudinal ridges and furrows. Whether a single siphonoglyph is really present at the single pair of directives I cannot with certainty decide, at any rate it is not well developed.

Anatomical description: The ectoderm of the column is rather high and seems to have secerned a mucus-membrane to which foreign particles are attached, but there is no cuticle. The very large nematocysts (size compare diagnosis) are arranged in groups containing close packed nematocysts but also some spirocysts, between these stinging batteries only isolated nematocysts seem to be present. Also in the fossa there are very numerous nematocysts (55—77 × 4.5—5 μ) and rather numerous spirocysts (48—60 × almost 3—almost 4 μ). The nerve-layer is well developed. The mesogloea is rather thick and provided with numerous protoplasma-poor cells. The circular muscles of the column are weak, the sphincter rather strong and of special interest.

In the textfigure 36 I have reproduced a schematic figure of the sphincter, and in fig. 37 a part of the sphincter as correct as possible. In the first figure we find the sphincter rather strong, although not occupying half the thickness of the mesogloea, in the second we see the greater part of the sphincter enclosed in the mesogloea with the muscles transversally arranged. Towards the endoderm the sphincter

is entodermal. On closer examination of the section we state that the rows of mesogloeal muscle-meshes are in direct continuation with the bays of the endodermal muscle-folds and arisen through by-folds of the stronger muscle-folds joining together. Thus *the antecessor of the for the main part mesogloeal sphincter of this species seems to be an already well developed endodermal sphincter*. We know many although not so evident examples of the fact that an already differentiated endodermal sphincter shows a tendency to be enclosed in the mesogloea by anasthomoses of the muscle processes. I call to mind f. inst. the so-called aggregate sphincter and the anasthomoses often present in the circumscript sphincter between the muscle-folds outside the insertions of the mesenteries. Thus it is clear that an antecessor of the mesogloeal sphincter can be an already

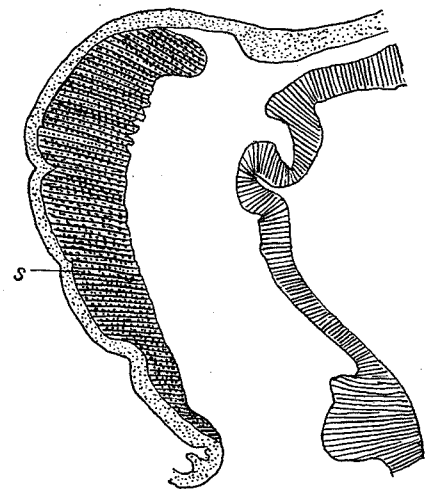


Fig. 36.

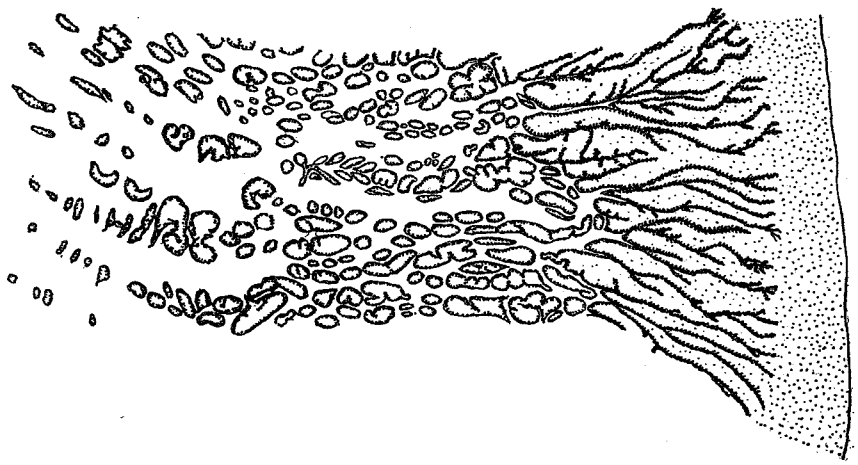


Fig. 37.

Figs. 36, 37. *Isosicyonis alba.* Fig. 6. Longitudinal section of the uppermost part of the column showing a schematic figure of the sphincter (*s*). Fig. 37. Transverse section of part of the sphincter.

well developed endodermal sphincter and it is a question if not several, but not all transversally stratified mesogloeal sphincters have such an origin. On the other hand, we must suppose that the antecessor of many mesogloeal sphincters are the endodermal *circular muscles of the column* (that is an *undifferentiated* endodermal sphincter). It is namely impossible to derive the weak mesogloeal sphincters in *Aiptasia couchi*

and other Aiptasiidae from a differentiated endodermal sphincter as also the longitudinal stratified mesogloeal sphincters, increasing from repeated foldings of the circular muscles or perhaps also by augmentation of the muscle-cells already enclosed in the mesogloea. Thus the conclusion is that the origin of the mesogloeal sphincters is not homogeneous. The mesogloeal sphincters have arisen in at least two, probably in several different periods during the evolution of the Thenaria. Thus a common ancestor for all forms having a mesogloeal sphincter is invalid as also, I think, the erection of the groups Endomyaria and Mesomyaria (STEPHENSON 1920—22, PAX 1925). I will come back to this question in another paper.

The longitudinal muscles of the tentacles are ectodermal, the folds very high and close, palissade-like arranged. The radial muscles in the outer part of the oral disc recall the former muscles but are somewhat ramificated, at the insertions of the mesenteries they are weaker.

As far as I can see, the mesenteries are decamerously arranged which also agrees with the number of tentacles. There are probably 80 pairs of mesenteries (10+10+20+40), of which the 20 first pairs perfect. I have observed only one pair of directives (stated also on sections), but on the side opposite this pair I cannot after careful examination find any directives. The three first cycles of mesenteries are sterile, the last cycle fertile. The longitudinal muscles of the mesenteries of the three first orders are weak, only in the innermost part of the mesenteries the folds are higher, so that here we can speak of weak pennons. The parietobasilar muscles are very weak and not folded. The fertile mesenteries of the fourth cycle recall those in *Sicyonis* and probably lack filaments. The muscular part of these mesenteries is inconsiderable, on the other hand, the reproductive organs — in the single specimen testes — are extraordinarily strong and very folded. The mesenteries of the fourth cycle grow from the basal part of the body and reach almost the upper part of the column. The oral stomata are large. The cnido-glandular streak of the filaments in the stronger mesenteries is broad, the small capsules (compare the diagnosis) few.

Genus **Antholoba** R. HERTW.

Diagnosis: Paractidae. Pedal disc well developed. Column without differentiations. No distinct margin. Sphincter very long. Tentacles short but very numerous, hexamerously arranged. Longitudinal muscles of tentacles, ectodermal to meso-ectodermal. Radial muscles of oral disc ecto-mesogloeal. 2 well developed siphonoglyphs with aboral prolongations. Mesenteries very numerous but fewer in the proximal part than in the distal. Perfect pairs of mesenteries at least 24. Slight muscle pennons. Parietobasilar muscles weak. Basilar muscles rather well developed. The three first cycles of mesenteries sterile.

As I before have pointed out (1921, p. 184), the genus *Archactis* is synonymous with *Antholoba*. STEPHENSON (1922, p. 309) is of the same opinion.

Antholoba achates (DRAYTON).

Actinia achates n. sp. DRAYTON in DANA 1846, p. 142, Pl. 3, fig. 28.
Sagartia achates DR. GOSSE 1855, p. 274.
Metridium achates DR. MILNE-EDWARDS 1857—60, p. 254.
Actinoloba achates DR. GOSSE 1860, p. 24. ANDRES 1883, p. 389.
Antholoba achates (DR.). MC MURRICH 1904, p. 250.
Actinia reticulata n. sp. COUTHOUY in DANA 1846, p. 144, Pl. 4, fig. 31.
Metridium reticulatum COUTH. MILNE-EDWARDS 1857—60, p. 255, VERRILL 1869, p. 479.
Actinoloba reticulata COUTH. GOSSE 1860, p. 24, ANDRES 1883, p. 348.
Antholoba reticulata COUTH. R. HERTWIG 1882, p. 53, Pl. 1, fig. 9, Pl. 10, figs. 11, 12, Pl. 13, fig. 9; MC MURRICH 1893, p. 164; CARLGREN 1899, p. 29, fig. 3, 1921, p. 184; STEPHENSON 1920, p. 554.
Actinolobopsis reticulata COUTH. VERRILL 1899, p. 144.
Actinostola crassicornis (R. HERTW.). REES 1913, p. 382, figs. 1—3.

Diagnosis: Column in contracted state reticulated. Sphincter extraordinarily long, extended over almost the whole column, reticular, not distinctly separated from the circular muscles of the column, not occupying the whole breadth of the mesogloea. Margin more or less distinctly lobated. Tentacles very numerous, arranged in up to about 10 cycles. Longitudinal muscles of the tentacles ectodermal, at the base meso-ectodermal. Radial muscles of the oral disc strong. Mesenteries very numerous. Probably protandrous hermafrodite. Nematocysts of the column (14) 17—22×(1.5) about 2 μ, those of the tentacles partly 22—31×almost 2.5—3 μ, partly (11) 14—22×1—1.5 μ, those of the actinopharynx 23—30 (31)×2.5—something more than 3 μ, partly 22—26×(3) 3.5—4 μ, the latter with perspicuous basal part to the spiral thread, spirocysts of the tentacles 14×1—36×about 3 (3.5) μ.

Colour compare DANA and VERRILL (1869).

Dimensions of some specimens in the present collection. Largest specimen: breadth of the pedal disc 2.8 cm, height of the column 2 cm, smallest specimen in extended state, breadth of the pedal disc 1 cm, that of the oral disc 1.5 cm, heigth of the column 1 cm.

Occurrence: Falkland Isls.: Port William 51° 40′ S 57° 47′ W. 12 m. Sand and gravel. 3. 9. 1902, 1 spec.; Stanley Harbour 51° 42′ S 57° 50′ W. 10 m. Mud and stones. 3. 9. 1902, 1 spec.; W. Falkland, West Point Isl. Littoral, rocks. Sw. Mag-Exp. 1907—1909, 5. 12. 1907, 3 specimens; E. Falkland, Cape Pembroke, littoral, rocks. Sw. Mag-Exp. 1907—1909, 8. 11. 1907, 1 spec.

Further distribution: Galapagos Isls., Coasts of Peru, Bolivia, Chile, Tierra del Fuego, Patagonia 0—55 fms.

The exterior and the anatomy of this species was before described by R. HERTWIG, MC MURRICH and myself. The size of the nematocysts and spirocysts agrees rather well in three examined specimens. The smallest specimen (compare above) had the smallest stinging capsules. Possibly the stinging capsules are somewhat larger in larger specimens. I have only examined them in specimens from the present collection.

Whether *Antholoba epizoica* (PAX 1922) is identical with *A. achates* or not, is impossible to decide, on account of PAX' short description. Probably it is not the case.

Sicyonis erythrocephala (PAX).

Cymbactis erythrocephala n. sp. PAX 1922, p. 82, fig. 5, 1923, p. 11, Pl. 1, fig. 6, Pl. 2, figs. 3, 6.

Diagnosis: Pedal disc wide. Column in expanded state cylindrical. Mesogloea of the column thick. Sphincter reticular with small meshes occupying one third or less of the thickness of the mesogloea, by and by diminishing aborally. Tentacles between 60 and 70 with extraordinarily swollen mesogloea at the base of the outside. Longitudinal muscles of the tentacles at the base considerably stronger on the inside than on the outside, where they are more scattered. Actinopharynx with 2 deep siphonoglyphs. Pairs of mesenteries up to about 70, half of which stronger, sterile and with filaments, the other half alternating with the former, only present in the aboral part, without filaments but fertile. Mesenteries somewhat irregularly arranged (in the one half 8 perfect pairs and one pair consisting of one perfect and one imperfect mesentery). In certain exocoels a duplication of the sterile imperfect mesenteries. Pennons diffuse. Nematocysts of the tentacles 24—29×2—something more than 2.5 μ, those of the actinopharynx partly 25—31×well 2.5—3 μ, partly 26—29×5 μ. Spirocysts of the tentacles 22×2—53×4—5 μ.

Colour in life: Column bright white. Tentacles cherry-red (teste PAX). Actinopharynx in preserved state red-brown, oral disc and siphonoglyphs reddish-yellow.

Dimensions in life unto 2.6 cm high, pedal disc unto 2.3 cm (teste PAX).

Occurrence: 70° 10′ S 80° 50′ W (Paris), 460 m. Pourquoi pas Exp, 2 specimens.

PAX refers this species to *Cymbactis*. There is however no doubt that it is a *Sicyonis*. PAX' description of several important characters is besides incorrect. There are no capitular furrows here. What PAX calls capitular furrows are nothing but the spaces between the very swollen basal parts of the outermost tentacles! All tentacles — not only the inner tentacles, as PAX states (»an einem Exemplar sind die innersten Tentakel an ihrer Basis blasig aufgetrieben») — are, however, provided with very large mesogloea-thickenings at the outside of the base. In the fig. 38 I have figured a transverse section through the base of a tentacle of the outermost cycle. The longitudinal muscles are relatively well developed on the outer side, and scattered but considerably

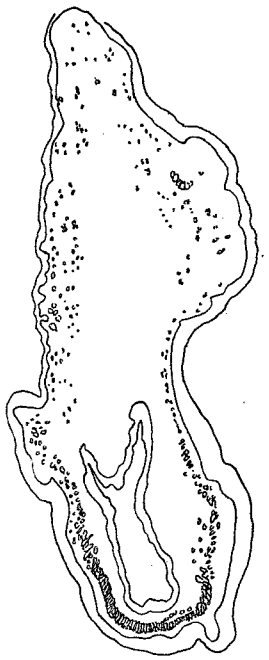


Fig. 38. *Sicyonis erythrocephala*. Transverse section of a tentacle of the outermost cycle at the base.

weaker than in the not thickened inner side. The number of »capitular furrows» is certainly more than 24 (PAX). The outermost cycle of tentacles in the not dissected specimen contained 33 tentacles. Thus the total number of tentacles was probably 66. On about one half of the other specimen I counted 32 tentacles. PAX states that there is probably a single siphonoglyph, both siphonoglyphs are, however, clearly visible and deep down in the specimen sectioned by PAX, one siphonoglyph is situated in each of the two sectioned halves of the specimen. Also the arrangement and number of the mesenteries are otherwise than stated by PAX. I have examined one half of the animal in the middle of the column. The arrangement was as follows (p: perfect pairs, i: imperfect pairs, pi: pair consisting of one perfect and one imperfect mesentery, d: directive pairs):

d d

p, i, p, i, i, p, i, p, i, i, p, i, p, i, p, i, i, pi, p, i (p) = 20 pairs ($8^1/_2$ pairs of perfect and $11^1/_2$ pairs of imperfect mesenteries).

Alternating with these sterile mesenteries a cycle of mesenteries not observed by PAX, is developed in the proximal part of the body. In the whole animal 140 mesenteries (70 pairs) were present at the base. As on the described side 40 pairs were present, the number of pairs on the other side may be 30. Because of an irregular contraction of the oral disc in the other half I cannot state the definite number of the perfect mesenteries in this half without cutting this part to pieces. The mesenteries of the last cycle, only present in the proximal part, lack filaments and show in their exterior distinct indications of fertility. The sections show groups of cells enclosed in the mesogloea, which may be spermatogonia.

Actinostola intermedia CARLGR.

Actinostola intermedia n. sp. CARLGREN 1899, p. 31.
Catadiomene intermedia (CARLGR.). STEPHENSON 1920, p. 558.
Actinostola chilensis n. sp. MC MURRICH 1904, p. 247, Pl. 15. figs. 30, 31, Pl. 16, figs. 32, 33; STEPHENSON 1920, p. 557.

Diagnosis: Pedal disc well developed. Column cylindrical, irregularly wrinkled (in preserved state) , rather thick. Sphincter reticular or somewhat alveolar with tendency to stratification, divisible in small meshes and occupying, upon the whole, not half the breadth of the mesogloea. Tentacles up to about 236, hexamerously arranged

in 7 cycles, of the last cycle only one part developed, considerably fewer than the mesenteries at the pedal disc (in relative proportion as about 1 : 1.64—1.83), on the outside of the base a little thickened. Longitudinal muscles of the tentacles reticular, divided in small meshes, at the base of the outside the muscles are alveolar and considerably weaker than on the inside. Radial muscles in the inner part of oral disc weak and alveolar but increasing towards the tentacles and here reticular. Actinopharynx about half as long as the column. Pairs of mesenteries 192. Mesenteries of the three first cycles, and at least one part of the fourth, perfect. Both mesenteries in the pairs of the third cycle about equally developed. Longitudinal muscles in the inner part of the mesenteries sometimes enclosed in the mesogloea. Parietobasilar muscles strong, reaching the sphincter. Typical nematocysts of the column 19—24 (29) × 2 μ, those of the distal part of the tentacles 25—35 × about 2—2.5 μ those of the actinopharynx 24—31 × (2) about 2.5 μ. Large stinging capsules in the apex of the tentacles 48—60 × about 7 μ, nematocysts with discernible basal part to the spiral thread in the actinopharynx 22—26 × about 5 μ. Spirocysts of the tentacles 19 × about 2 μ—70 × about 5 μ.

Colour: ?

Dimensions: Length and breadth of the body about 6.5 cm, length of the inner tentacles 2—2.5 cm (type-specimen).

Occurrence: Strait of Magellan. Cape St. Vincent 150 fms (type-specimen) Chile. Calbuco 16—20 fms (*A. chilensis*).

Concerning the exterior aspect and the anatomy compare further CARLGREN 1899, p. 31. The typical nematocysts were common in the tentacles of the type-specimen, fewer in the column and in the actinopharynx, the large stinging capsules sparse, the broad nematocysts in the actinopharynx numerous. In fig. 39 I have reproduced a section of the uppermost part of the sphincter. Concerning the number of the tentacles it is impossible to confirm it because part of the margin was damaged and in regeneration without any traces of tentacles. In 3/6 I counted 117 tentacles, supposing that the other sixths are equally developed there would be in all

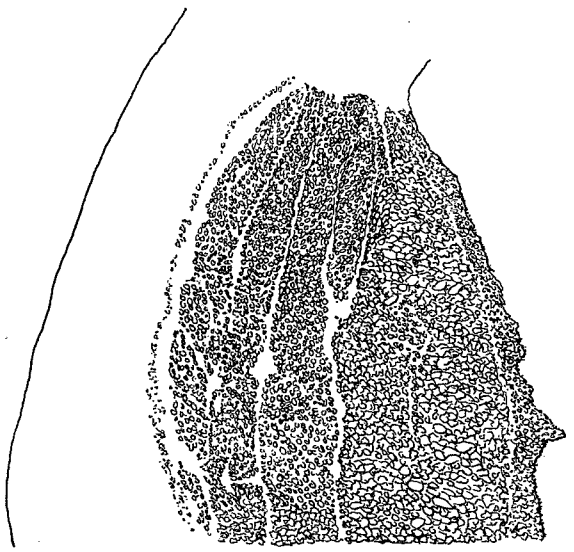


Fig. 39. *Actinostola intermedia.* Transverse section of the uppermost part of the sphincter from the type-specimen.

234 tentacles. At the pedal disc — this part was not previously examined — there are about 192 pairs of mesenteries, judging from an examination of $^5/_6$ of the pedal disc. Thus the relation between the number of tentacles and that of the mesenteries is about 1 : 1,64. The small thickenings of the tentacles on the outside of their base are only conspicuous on sections. In my description (1899) of the longitudinal muscles of the tentacles I have been guilty of a lapse, it is evident because of the small mesogloea-thickenings on the outside, that these muscles are weaker in this part than on the inside, not the contrary.

I have examined the type-specimen of *Actinostola chilensis* Mc MURR. There is no doubt that this species is identical with *A. intermedia*. The examination of the specimen shows that some of Mc MURRICH's statements as to the organization are incorrect. This author speaks of »two rather feebly developed siphonoglyphs» in *chilensis*, in fact the siphonoglyphs are very broad as in other *Actinostola*-species. Further the sphincter should »present no indication of layering». In another section of the body-wall than that made by Mc MURRICH the sphincter is considerably broader than shown in Mc MURRICH's figure and exhibits a distinct tendency to stratification. At last Mc MURRICH notes that only the mesenteries of the two first cycles are perfect. I have examined half of the animal in the uppermost part of the actinopharynx — Mc MURRICH has not examined this part — and found the mesenteries of the three first cycles and at least a part of the fourth cycle reaching the actinopharynx. *A. chilensis* thus agrees in all these states of organization with *intermedia*. Also the number of tentacles and its relation to that of the mesenteries at the pedal disc seem rather well corresponding with *intermedia* as far as I can confirm from the present stage of the specimen. Mc MURRICH says that the number of tentacles »would make 192, if all tentacles in the cycles were fully developed, a condition which, however, does not seem to be fulfilled, since an enumeration of the outer cycle failed to give 96 tentacles». In fact, when there are here 4 cycles of tentacles, the innermost cycle consisting of 24 tentacles — as Mc MURRICH states — the number of tentacles would be 192 (24—24—48—96). There were, however, 198 tentacles in the specimen in its present stage. To these must be added about 12 tentacles in an already sectioned piece. The total number of the tentacles would then be 210 or some more. The mesenteries at the pedal disc were 369 at the present stage of the specimen, the mesenteries of a piece sectioned, at the pedal disc, I estimate to 15, thus in all 384 mesenteries (192 pairs). The relation between the number of tentacles and that of the mesenteries is about 1 : 1.83.

The tentacles of *chilensis* were shorter than in *intermedia*, but that is due to the very strong contraction of the former. The stinging capsules show good agreement with those in *intermedia*, the large capsules in the tentacles were, however, here very rare. In the mesenteries of the specimen I have observed the same parasitic Crusta-

cean (probably an *Antheacheres* or related to this genus) which I have found in *intermedia* (CARLGREN 1899, p. 82). MC MURRICH states that *chilensis* is monoecious. In a sectioned piece containing ovaries in three and a half pairs, of which two large, I could not find any testes, in another sectioned mesentery, unfortunately badly preserved, it seemed on the sections as if there were testes present but slightly developed. MC MURRICH's statement may then be correct, although I have not been able to confirm it with certainty. At any rate the testes are not numerous. In *intermedia* I have observed only testes. This difference between the two »species» is, however, of small consequence.

Whether *A. excelsa* MC MURR is synonymous with *intermedia* remains to confirm. A renewed, careful examination of the former species is desirable.

Actinostola georgiana n. sp.

Diagnosis: Pedal disc wide. Body at least in older specimens not higher than broad, longitudinally and transversally irregularly wrinkled. Mesogloea of the column thick. Sphincter comparatively weak, occupying in its uppermost part hardly one third of the mesogloea, reticular. Tentacles up to 192, hexamerously arranged, the inner comparatively large, in expansion longitudinally sulcated, in contraction irregularly transversally and longitudinally wrinkled, not swollen at the outside of the base. Number of the tentacles and that of the mesenteries at the pedal disc in relation as 1 : 1.06—1.39. Muscle meshes of the longitudinal muscles in the tentacles ordinarily large, situated in about the middle of the mesogloea. Radial muscles of the oral disc as the muscles in the tentacles closer to the ectoderm than to the endoderm, on the insertions of the stronger mesenteries weaker than in other parts. Mesenteries at the pedal disc mostly only somewhat more numerous than the tentacles, arranged in 5 or 6 cycles, the sixth of which is always incomplete, often also the fifth. The two oldest cycles sterile, the strongest mesentery in each pair of the third cycle as a rule turning towards the mesenteries of the second order. Pennons and parietobasilar muscles as in other *Actinostola*-species. Development of the embryos in the coelenteric cavity. Dioecious. Nematocysts of the column 22—29 × about 2 μ, those of the tentacles partly 24—31 × 2 — something more than 2.5 μ, partly (36) 41—43 × 4.5—5 μ, the latter very sparse, those of the actinopharynx partly 26—31 × 2.5 μ (not numerous), partly 17—26 × about 3.5 μ (very sparse and with visible basal part to the spiral thread), spirocysts of the tentacles 24 × 2—62 × about 4.5—5 μ.

Colour in life white.

Dimensions in preserved state: Height of the column up to 5.5 cm, breadth of the pedal and oral disc up to 6 cm. Inner tentacles in more extended state about 2 cm long, in more contracted state 1.4—0.9 cm long, in the latter case considerably

broader than in the former. Smallest specimen: breadth of the pedal disc 1.7 cm, that of the oral 3 cm, height of the column 1.7 cm.

Occurrence: South Georgia off the mouth of Cumberland Bay, 54° 11′ S 36° 18′ W. Gray clay with few stones 253—310 m. Bottomtemperature +1.45°. 5. 6. 1902. 19 specimens. — Cumberland bay, mouth of the West fiord, 54° 15′ S 36° 25′ W. Loose clay, 250 m. Bottomtemperature +1.2°. 22. 4. 1902. 4 specimens.

Exterior aspect: The exterior of this species (fig. 40) much recalls that of *Actinostola spetsbergensis*. In large specimens the column is not higher than broad, only in small specimens the height somewhat exceeds the breadth. The form of the body is cylindrical or cuplike, according to the different state of contraction, the oral disc is mostly somewhat wider than the pedal, probably because the latter is more strongly contracted. The rather thick column is irregularly longitudinally and transversally furrowed. The tentacles are comparatively large and much larger than in *Actinostola crassicornis*, in more extended state they are conical and longitudinally sulcated, in more contracted more cylindrical and irregularly wrinkled. They are hexamerously arranged in numbers up to about 192, also in large specimens the last cycle of tentacles is incomplete. The number of mesenteries at the pedal disc is mostly inconsiderably larger than that of the tentacles, sometimes the difference is a little greater as it seems from the result of the examination of 6 specimens.

	Size of the specimens			Number of tentacles	Number of mesenteries at the pedal disc	Relation of the number of tentacles to that of the mesenteries at the pedal disc
	height	breadth at the pedal disc	breadth at the oral disc			
1)	5 cm	5 cm	5.5 cm	175	186	1 : 1.06
2)	4.5	4.5	6	188	208	1 : 1.11
3)	3.5	2.5	3	162	172	1 : 1.06
4)	3.5	5	5.5	177	188	1 : 1.06
5)	5.5	6 × 5.5	5	175	244	1 : 1.39
6)	3.5	3.7	5	166	186	1 : 1.11

Taking the number of tentacles to be 1, the number of mesenteries at the pedal disc is at most (in spec. 5) 1.39. The oral disc is radially furrowed. The siphonoglyphs are broad with aboral prolongations.

Anatomical description: The ectoderm of the column is rather high, the mesogloea thick. The circular muscles of the column are well developed, the sphincter, on the other hand, comparatively weak, short and in structure reticular with small muscle-meshes. In its uppermost part it occupies not a third of the thickness of the mesogloea, only in the furrows of the column, where the mesogloea is thinner, the difference between the breadth of the mesogloea and of the sphincter is smaller. In young specimens the sphincter is alveolar-reticular (textfig. 41). It is questionable whether the upper part of the column can wholly cover the tentacles, in fact the ten-

tacles were visible in all specimens. The mesogloeal muscles of the tentacles were at the base stronger on the inside than on the outside. The radial muscles of the oral disc were strong. The number of mesenteries varies (compare above). 24 pairs were perfect, the 2 first cycles sterile. The strongest mesentery in the pairs of the third cycle is turned towards the mesenteries of the second cycle, with some exceptions. The *Actinostola*-rule is clearly visible in the mesenteries of the fourth and fifth cycles.

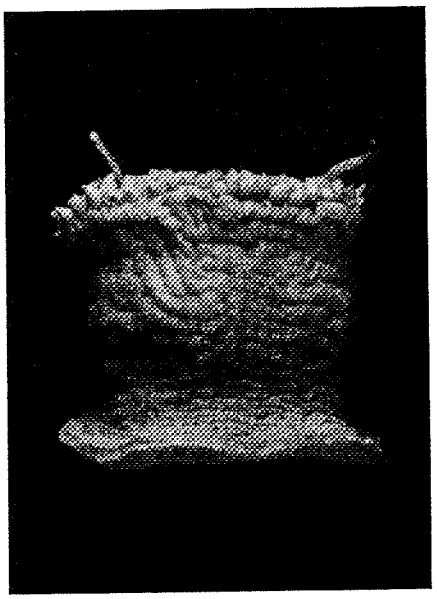


Fig. 40. *Actinostola georgiana.* Almost natural size.

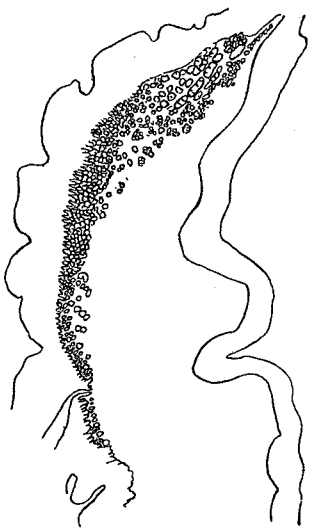


Fig. 41. *Actinostola georgiana.* Transverse section of sphincter in a young specimen.

The species recalls an *Actinostola* from Kerguelen and CLUBB's *Actinostola »chilensis»*, but the relation between the number of tentacles and mesenteries is there quite another, in both these species the development of tentacles is, in comparison with that of the mesenteries, considerably retarded.

Actinostola crassicornis (R. HERTW.).

Dysactis crassicornis n. sp. R. HERTWIG 1882, p. 39, Pl. 7, figs. 6—12; 1888, p. 17, Pl. 2, figs. 6—7.

? *Actinostola callosa* VERR. MC MURRICH 1893, p. 167, Pl. 24, fig. 46; Pl. 25, figs. 47—52.

Actinostola callosa VERR. (pro parte). MC MURRICH 1893, p. 209.

Actinostola crassicornis (R. HERTW.). CARLGREN 1899, p. 31, 44; 1921, p. 229. STEPHENSON 1920, p. 557. PAX 1923, p. 26.

Diagnosis: Pedal disc wide. Height of the column and diameter of the pedal disc about the same. Column thick and smooth. Sphincter stronger than in *Actino-*

stola callosa and occupying about half the thickness of the mesogloea, reticulo-alveolar, at least with a tendency to stratification. Tentacles very numerous, up to more than 300, hexamerously arranged in 6—7 cycles, small (the inner tentacles in rather extended state do not reach 1 cm in length), irregularly wrinkled or in more expanded state longitudinally sulcated. They are most often not swollen at the outside of the base, sometimes the inner tentacles show a little tendency to form weak thickenings in these parts. Number of tentacles and that of mesenteries at the pedal disc in relation as 1 : 1.05—1.59. Longitudinal muscle-meshes of the tentacles small. Radial muscles weaker at the insertions of the mesenteries. Mesenteries at the pedal disc somewhat more numerous, to about $1^1/_2$ times as numerous as the tentacles. Mesenteries of the pedal disc up to 400 or some more. At least 3 cycles perfect, the first two (three?) cycles sterile. Muscles of the mesenteries as in other *Actinostola*-species. Embryos developing in the coelenteric cavity. Dioecious. Nematocysts of the column 17—19 (25) × about 2 μ, those of the tentacles partly 22—29 (31) × 2—2.5 μ, partly 36—48 (53) × (5.5) 6—7 μ (rarely), partly (15) 19—24 × almost 3—4 μ, those of the actinopharynx partly 24—31 × 2.5—well 2.5 μ, partly 20—24 × about 3.5 μ, spirocysts of the tentacles 24 × 2—60 × 4.5 (5) μ.

Colour in life?

Dimensions of our specimens: Height of the column up to 7.5 cm, breadth of the pedal disc up to 7 cm, length of the inner tentacles in rather expanded state 0.8—0.9 cm.

Occurrence: S of West Falkland Isl. Burdwood Bank. 53° 45′ S 61° 10′ W, 137—150 m. Broken shells and stones. 12. 9. 1902. 5 specimens.

Further distribution: 53° 38′ S 70° 56′ W. 10—15 fms.; 52° 20′ S 68° 0′ W. 55 fms. (Challenger-Exp.). — ?? 0°.37′ S 81° W. 401 fms., 0°.24′ S 87° 06′ W. 812 fms., 0°.29′ S 89° 54′ 30″ W. 392 fms. (Albatross-Exp.).

I have compared the species from the Burdwood Bank with HERTWIG's *Dysactis crassicornis*, a species, to my mind, not identical with *Actinostola callosa*, from which it is separated by the exterior of the column being in *crassicornis* smooth without any tendency to be wrinkled and tuberculated. Also the sphincter is in *crassicornis* considerably stronger than in *callosa* and the tentacles smaller than in this species. I have examined one specimen from the Challenger expedition which, judging from the number of tentacles and the size of the expanded column, was younger than our specimens. In the specimens from the Burdwood Bank the mesogloea was thick and compact, in three specimens the sphincter region overlaps the other part of the column, and the oral disc was very expanded, the two other specimens were elongated and the upper part of the column drawn in, so that only one part of the tentacles was visible. The inner tentacles do not in rather expanded state reach 1 cm in length (0.8—0.9 cm in one specimen the tentacles of which were distinctly longitudinally

furrowed). In the other specimens the tentacles were smaller and irregularly wrinkled. The number of tentacles was in the smallest specimen (from the Challenger-Exp.) 176, in three of our specimens 279, 290 and 337. HERTWIG states in his larger specimens about 284 tentacles. The relation between the number of tentacles and that of the mesenteries at the pedal disc varies a little as it seems from the following comparison. It is, however, to be observed that there are possibly some more mesenteries than those stated in the specimens 2 and 3, in fact it was difficult to observe the smallest mesenteries in these specimens without making sections.

	Size of the specimens			Number of tentacles	Number of mesenteries at the pedal disc	Relation between the number of tentacles and that of the mesenteries
	height	breadth of pedal disc	breadth of oral disc			
1) (Challenger Exp.)	about 5 cm	5 cm	—	about 176	280	1 : 1.59
2)	5	6.5 × 5	5	337	354	1 : 1.05
3)	4.5	4.5	5	279	302	1 : 1.08
4)	5.5	5 (concave)	6.5	290	408	1 : 1.41

The anatomy of this species is described by R. HERTWIG (1882, 1888). Possibly MC MURRICH's description of *Actinostola callosa* (1893) partly refers to HERTWIG's species. The sphincter occupies in the upper part at least half the thickness of the mesogloea, it was in two examined specimens somewhat more divided into smaller meshes than in the specimens of HERTWIG, and in the upper part more reticular than alveolar. The longitudinal stratification of the sphincter was also not so distinct here as in the type specimen. The muscle meshes of the tentacles were small, in the tentacles with somewhat thickened mesogloea at the outside weaker in this part. The perfect mesenteries were in one examined specimen 52 (the three first cycles and 4 mesenteries of the fourth), the latter was, however, attached only with a small lap to the actinopharynx. The mesenteries of the fourth and fifth order were fertile (one specimen examined); as, however, of some examined mesenteries of the third order one mesentery was fertile, it is very probable that also the mesenteries of the third order develop reproductive organs, as in HERTWIG's specimens. The size of the nematocysts and spirocysts in 4 examined specimens was as follows. (The three first specimens were the same of which the tentacles and mesenteries were counted.)

Tentacles

	Nematocysts		Spirocysts	
1)	25—29 (31) × 2—2.5 μ	39—48 (53) × 5.5—7 μ	19—22 × 3,5—4 μ	—53 × (4.5) 5 μ
2)	22—26 (29) × about 2	?	19—24 × (2.5) 3—3.5	—53 × 45
3)	24—29 × 2—about 2.5	36—46 × (5.5) 6—7	22—24 × 3—3.5	—
5)	24—29 × (2) about 2.5	36—48 × 6—7	15—22 × well 2.5—3.5	24 × 2—60 × 4.5

	Actinopharynx (nematocysts)	
1)	26—31 × 2.5—well 2.5 μ	—
2)	24—26 × well 2—2.5	20—24 × about 3.5 μ
3)	24—29 × about 2.5	22—24 × about 3.5
5)	—	—

The largest nematocysts in the tentacles were very sparse, in the specimen 2 they seem to be lacking. In the smaller, broad nematocysts in the tentacles and actinopharynx the basal part to the spiral thread was visible. The species develops its embryos in the coelenteric cavity (observed in the specimens from Burdwood Bank).

Actinostola clubbi n. sp.

Actinostola chilensis Mc Murr. Clubb 1908, p. 4; Stephenson 1920, p. 557.

Diagnosis: Pedal disc well developed. Column in contracted state of about equal height and breadth, smooth, with irregular shallow furrows, rather thick. Sphincter ordinarily developed, in the uppermost part occupying about half the thickness of the mesogloea, reticular. Tentacles not half as numerous as the mesenteries at the pedal disc (in relation as $1 : 2.15$), hexamerously arranged in 6 cycles, the last of which is incomplete, comparatively large (the inner tentacles up to 2 cm long), in contraction irregularly wrinkled and not thickened at their outside. Longitudinal muscles of the tentacles and radial muscles of the oral disc strong, reticular, the latter interrupted at the insertions of the mesenteries. Mesenteries probably up to 288, the three first cycles perfect; the two first cycles and possibly the third sterile. Parietobasilar muscles well developed, with numerous meshes enclosed in the mesogloea towards the main lamella of the mesenteries. Nematocysts of the column 22—26 × about 2.5 μ, those of the tentacles partly 36—41 × 2.5—3 μ, partly 24—31 × (3.5) 4—4.5 μ, those of the actinopharynx partly 24—29 (31) × 2—about 2.5 μ, partly about 24 × 3.5—4.5 μ. Spirocysts of the tentacles 26 × almost 2 μ—70 × about 4.5 μ. Dioecious.

Colour in alcohol: the examined specimen had on the column, tentacles, oral disc and actinopharynx traces of a dirty, redbrown colour. Sections show that the ectoderm is pigmented.

Dimensions up to 5.5 cm high, 4 cm broad; 4 cm high, 6 cm broad (Clubb). The specimen — one of Clubb's —, examined by myself, was about 4.5 cm high and 7 cm broad at the oral disc.

Occurrence: Oates Land, 67° 21′ 46″ S 155° 21′ 10″ E. 254 fms. Mud and stones. (Nat. Antarctic (Discovery) Exp.)

I have had one, in the interior badly preserved specimen for examination. The tentacles were 121 in number and more or less contracted, but not so strongly wrinkled as in *crassicornis*. The oral disc is of the same appearance as in other *Actinostola-*

species. CLUBB states that the siphonoglyphs are »in no case well marked». In the examined specimen the siphonoglyphs are clearly visible, although the strong contraction and the bad preservation make it difficult to observe them without closer examination. As far as I can see, they are developed as much as in other *Actinostola*-species.

The longitudinal muscles of the tentacles and radial muscles of the oral disc are well developed and reticular, the meshes occupy a good part of the mesogloea, especially in the outer part of the oral disc (fig. 42). The mesenteries were about 260 at the pedal disc, at the upper part of the actinopharynx the three first cycles of mesenteries were perfect. Owing to the bad preservation of the mesenteries, pressed together and partly macerated, it was very difficult to state, if the mesenteries were arranged in accordance with the *Actinostola*-rule. CLUBB states that his specimens were dioecious, I have also found only ova in the specimen examined by myself. Concerning the distribution of the reproductive organs, it is possible that also the mesenteries of the third order are sterile.

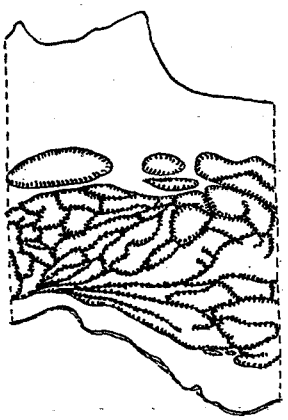


Fig. 42. *Actinostola clubbi.* Transverse section of the radial muscles of oral disc.

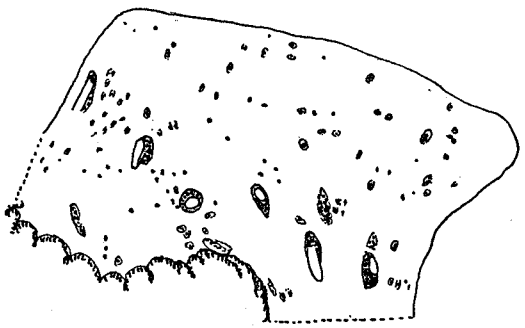


Fig. 43. *Actinostola clubbi.* Outer part of tentacle-mesogloea with enclosements of foreign nematocysts. The mesogloeal muscles downwards.

In the broader nematocysts of the tentacles and actinopharynx the basal part to the spiral thread was clearly perspicuous. These nematocysts were somewhat broader in the basal end than in the distal. Both forms of nematocysts in the tentacles were sparse. In the maceration-preparations of the tentacles, actinopharynx and parts of the mesenteries in the region of the filaments, I observed to my astonishment nematocysts recalling those of the Protostichodactylinae and those of the Hydrozoa. A nearer examination showed, however, that these nematocysts do not belong to the animal but had stuck to it or were enclosed in its tissues. Inside the filaments these nematocysts were namely situated in the endoderm, in the tentacles mostly enclosed in the

ectoderm as well as, peculiarly enough, in the mesogloea, which is here rich in cells recalling those in *Bolocera*. These cells are probably amoeboid and especially aggregated around the enclosed nematocysts (Phagocytose?) (fig. 43). Thus we have here for the first time, as I believe, become acquainted with an Actiniarian being capable of taking in foreign bodies in its mesogloea, an phenomenon so common in the Zoanthids. It is, however, possible that the concrements recalling starch-grains, described by R. HERTWIG (1882, p. 73) in the mesogloea of the column in »*Phellia*» *pectinata* are also foreign bodies.

Fam. **Phelliidae.**

Genus **Phelliogeton** nov. gen.

Diagnosis: Phelliidae with enlarged pedal disc. Column indistinctly divisible in scapus and capitulum, the former with very numerous gland cells but without cuticle. Cinclides absent. Sphincter well developed. Tentacles few, short, not so numerous as the mesenteries, outer tentacles shorter than the inner ones. Longitudinal muscles of the tentacles and radial muscles of the oral disc ectodermal. Mesenteries divided into macrocnemes and microcnemes. 6 pairs of fertile macrocnemes with very strong pennons, with filaments and acontia, microcnemes sterile, without pennons, filaments and acontia. The last cycle of microcnemes only in the proximal part of the body. Basilar muscles present but not strong. Acontia rather thick with small nematocysts.

Phelliogeton falklandicus n. sp.

Diagnosis: Body conical. Sphincter rather elongated reticular-alveolar, wholly separated from the circular muscles, situated in the middle of the mesogloea, mostly of an equal breadth but proximally diminishing. Tentacles 24 or some more. Siphonoglyphs rather distinct. Pennons of the macrocnemes reniform with rather few but richly ramificated folds. Parietobasilar muscles forming a distinct fold in their inner parts. Muscle folds of the microcnemes partly numerous but not high. Nematocysts of the scapus 15—22 × about 2.5 (3) μ, often somewhat curved, numerous, those of the tentacles 18—22 × 2 (2.5) μ, those of the actinopharynx 25—29 × about 3 μ, those of the acontia 22—29 × about 2—almost 2.5 μ (very numerous). Spirocysts of the tentacles 12 × 1.5—26 × 2.5 (3) μ.

Colour?

Dimensions in strongly contracted state: breadth of the pedal disc 0.6 cm, heigth of the column 0.55 cm.

Occurrence: Falkland Isls., Port William, 51° 40′ S 57° 44′ W. 17 m. Sand. 3. 9. 1902. 1 spec.

Exterior aspect: The wide pedal disc is provided with a cuticle. The column is strongly contracted and irregularly wrinkled, in the upper part considerably narrower than in the proximal. There is no distinct division in scapus and capitulum, but as the gland cells are rather few in the uppermost part of the column, in comparison with those in the greater part of the body, we can speak of a scapus and capitulum. I have not observed any cuticle on the scapus, but the very numerous gland cells can certainly secern a membrane of mucus to which sand grains may be attached. Some grains were also loosely fastened to the scapus. In each case there are no *Halcampa*-papillae in this species. The tentacles are short, hexamerously arranged, their number 24 or somewhat more. The actinopharynx is longitudinally sulcated but because of its strong contraction and the smallness of the animal I cannot give any further information of it.

Anatomical description: The ectoderm of the column is mostly thicker than the mesogloea, only in the region of the sphincter the mesogloea is thicker. There are no traces of *Halcampa*-papillae in the column. The sphincter is strong, reticular-alveolar, not stratified and situated in the middle of the mesogloea at equal distance from the ectoderm and the endoderm. The muscle meshes are rather large (fig. 44) but vary in size. The sphincter is in almost its whole extension of equal breadth, only in the aboral part it is narrower. The ectodermal longitudinal muscles of the tentacles and the radial muscles of the oral disc are ordinarily developed. The pairs of mesenteries are hexamerously arranged $6 + 6 + 12 = 24$. The last cycle is de-

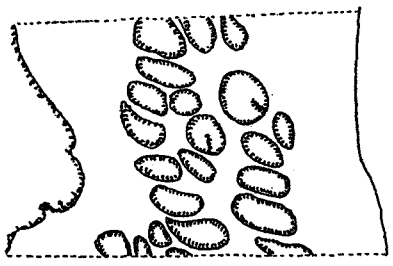


Fig. 44.

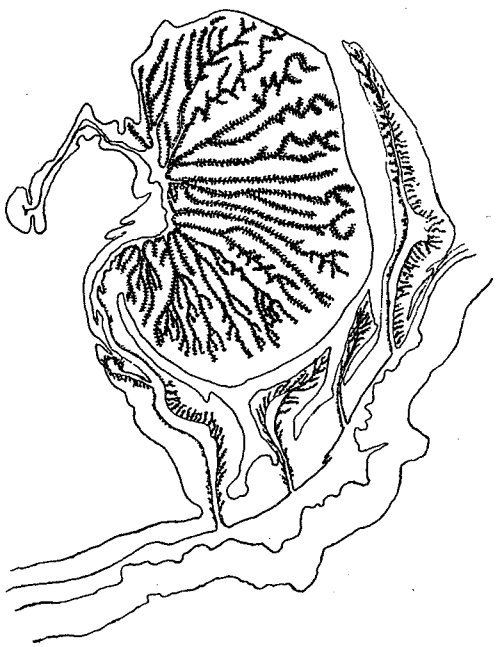


Fig. 45.

Figs. 44, 45. *Phelliogeton falklandicus*. Fig. 44. Transverse section of part of the sphincter. Fig. 45. Transverse section of one directive mesentery and of one mesentery of the second and two of the third orders.

veloped especially in the proximal part of the body, and does not reach the distal end of the column. The six first pairs are macrocnemes, the other typical microcnemes. The muscle pennons are very strong and reniform with very high folds, richly ramificated in their distal parts. The parietobasilar muscles are ordinarily developed, their folds low, the inner parts of the muscles are situated on a distinct fold of the mesogloea, separated from the main lamella of the mesenteries (fig. 45). The basilar muscles are distinct but not strong. The microcnemes recall the parietal part of the macrocnemes (fig. 45). Though the reproductive organs are not developed in the specimen, it is very probable that the perfect mesenteries, the macrocnemes, develop the genital organs. A *Phelliogeton* from Kerguelen nearly allied to *falklandicus* is namely provided with fertile macrocnemes. The microcnemes are weak and lack filaments as well as acontia. The acontia are rather thick and of usual structure. Concerning the stinging capsules compare the diagnosis. In the coelenteric cavity I have observed a great infusorian.

Remarks: I have proposed a new genus, *Phelliogeton*, for this species. In certain characters it recalls *Paraphellia*, as in the presence of small nematocysts in the acontia, a richer development of mesenteries in the proximal part than in the distal, but the structure of the mesenteries is different as also the distribution of the reproductive organs. The species cannot be a *Synphellia* (CARLGREN 1924 a, p. 230) because this genus is provided with *Halcampa*-papillae, not an *Isophellia* or *Acraspedanthus* (CARLGREN 1924 a, p. 224), the mesenteries of which are more numerous in the distal than in the proximal part, and which are also in other respects separated from *Phelliogeton.* Probably the genus comes the nearest to *Phellia*, in as much as the structure of the mesenteries and their arrangement agree, except that the mesenteries are more numerous in the proximal part than in the distal in *Phelliogeton*, which is probably not the case in the real *Phellia.* Also the size of the nematocysts in the acontia seems to be different. Unfortunately the type of *Phellia* is not examined concerning its anatomy.

Genus **Synphellia** CARLGR.

Diagnosis: Pedal disc wide, in expanded state probably always broader than the column. Column divisible into scapus and capitulum, the former with longitudinal rows of strong *Halcampa*-papillae. Cuticle present on the scapus, absent on the capitulum. Sphincter strong and long, mesogloeal, wholly separated from the circular muscles of the endoderm. Tentacles rather short, the inner longer than the outer, fewer than the mesenteries. Longitudinal muscles of the tentacles ectodermal, radial muscles of the oral disc ectodermal to meso-ectodermal. 2—4 siphonoglyphs. Mesenteries more numerous in the proximal than in the distal part. Arrangement of

mesenteries often irregular, 6 to 8 pairs perfect, 2 or 4 pairs of directives. Perfect mesenteries with strongly concentrated, diffuse to almost circumscript pennons and well developed parietobasilar muscles forming a distinct fold. Imperfect mesenteries without pennons, as to the muscles distinct microcnemes. Filaments, acontia and reproductive organs on all stronger mesenteries incl. the directives. Acontia long with nematocysts of ordinary length.

I enclose, but provisionally as before, the genus in the Phelliidae, although it is an aberrant genus. The diagnosis of the genus given by myself 1924, is here somewhat altered, on account of my examination of the species below. Compare besides remarks under the species.

Synphellia exlex (Mc Murr.).

Hormathia exlex n. sp. Mc Murrich 1904, p. 279, Pl. 18, figs. 70—71; Stephenson 1920, p. 535.

Diagnosis: Scapus with distinct longitudinal rows of strong papillae, covered with a thick cuticle. Sphincter reticular, long, reaching almost the middle of the scapus. Tentacles about 96, rather short, obtuse. Radial muscles of oral disc sometimes mesoectodermal. Actinopharynx longitudinally sulcated. 2—4 rather well developed siphonoglyphs. Mesenteries heptamerously or octomerously arranged (always?) in 4 cycles. 2 or 4 pairs of directives. Muscle pennons of the 7 or 8 pairs of mesenteries of the first cycle very strong with high folds partly of circumscript appearance. Parietal part of the longitudinal muscles rather well developed. Parietobasilar muscles forming distinct folds inwards, with the strongest muscle-folds in their innermost part. Dioecious. Nematocysts of the capitulum $12—14 \times 3—3.5$ μ, those of the tentacles partly $19—29 \times 2$—almost 3 μ, partly $12—14 \times 2.5—3$ μ, those of the actinopharynx partly $23—24 \times 2—2.5$ μ, partly $19—25 \times 3—3.5$ μ, those of the acontia $31 \times$ about $3.5—43 \times 4.5$ μ, spirocysts of the tentacles $17 \times 1—36 \times 4$ μ.

Colour in preserved state: scapus chestnut, capitulum and tentacles paler.

Dimensions up to 2.7 cm high and 1.2 cm broad.

Occurrence: Chile, Calbuco (Collection Plate's).

I have examined one, the contracted, of the two type-specimens. About one fourth of the upper half of the specimen has been sectioned out by Mc Murrich. The exterior of the species is well described by this author. In the rest of the specimen I counted 73 tentacles, thus the total number of tentacles was about 90 or some more, probably 96 (compare the mesenteries). Mc Murrich says that there are two siphonoglyphs. This statement refers apparently to the expanded specimen, in the contracted there are 4 siphonoglyphs corresponding to the four pairs of directives.

As to the anatomy I have not examined the sphincter, the tentacles and oral disc, but refer to Mc MURRICH's paper. In some points his description needs complement and correction. The ectoderm of the scapus is principally structured as in *Halcampa*, but the papillae are here much more marked. The cuticle of the scapus is between the papillae thin and easily deciduous, in the apex of the papillae strong and more intimately connected with the ectoderm. Chitinized cells join the cuticle with the mesogloea, in the spaces between the fibrillae common ectoderm-cells are situated. Between the papillae the chitinized cells are absent. The nematocysts of the capitulum are very numerous, pin-shaped, often curved and with perspicuous basal part to the spiral thread. Probably there are also sparse spirocysts in the capitulum, I cannot decide this with certainty because the tentacles are sticking to the capitulum. The thinner nematocysts in the tentacles were rather sparse to somewhat common, in some maceration preparations I have found them to be fewer, in others more numerous. The broader nematocysts in the tentacles are sparse, and the basal part to the spiral thread is here perspicuous, as also in the broader nematocysts in the actinopharynx. Mc MURRICH states that there were 8 perfect pairs of mesenteries, and of these each alternate pair was a pair of directives. This statement is correct, on the other hand, Mc MURRICH's statement that the perfect pairs of mesenteries were sterile does not agree with my observations. In fact, this autor has not carefully examined the directives. Already on the transverse hand-section, made by him through the middle part of the body, it can be seen that the perfect pairs are fertile. For security I have made some longitudinal hand-sections in the proximal part of the body. There is no doubt after this examination that the perfect mesenteries, inclusive the directives, are fertile. Also Mc MURRICH's statement of three cycles of mesenteries requires correction. There is namely also a fourth cycle present mostly distinct in the proximal part of the body. The arrangement of the mesenteries is thus $8+8+16+32=64$ pairs. The pairs of mesenteries of the fourth cycle are unequally developed, those bordering on the second cycle are at the base considerably weaker than the others, as stated in 6 examined compartments. At least the strongest mesenteries of the fourth cycle are provided with filaments and reproductive organs. Already in the middle of the body the mesenteries of the fourth cycle are very weak, but the stronger of them probably reach the distal part (to judge from the number of tentacles, estimated to some and 90, compare the above).

The 8 perfect pairs are strongly marked macrocnemes with concentrated strong muscle-pennons and the parietobasilar muscles forming a distinct fold. Mc MURRICH's figure 71 of a transverse section of a primary mesentery is not instructive, probably this figure refers to a very expanded mesentery of the largest specimen, the pennons are namely in the more contracted specimen considerably stronger and concentrated (fig. 46). The folds of the parietobasilar muscles are highest inwards (fig. 47 b). The

basilar muscles are comparatively well developed. Concerning the muscles the imperfect mesenteries are microcnemes, in as much as the muscles on both sides of the mesentery are longitudinal and form no pennons (fig. 47 a), in other respects, as to the filaments, reproductive organs and acontia, they look like macrocnemes. The mesenteries of the second cycle agree in structure with those of the third but are stronger. Those of the fourth order do not extend in the middle of the body over the endoderm of the body. The specimen was a male. Rather well developed oral stomata and very large marginal stomata are present in the perfect mesenteries. The acontia are long and well developed.

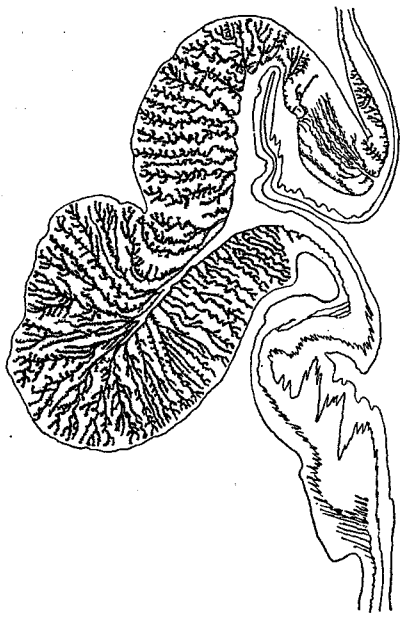


Fig. 46.

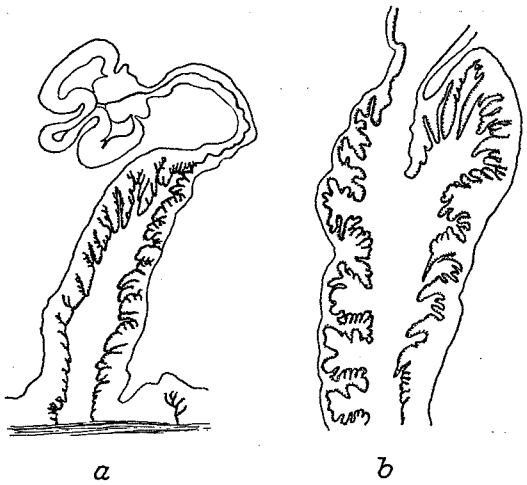


Fig. 47.

Figs. 46, 47. *Synphellia exlex*. Fig. 46. Transverse section of a perfect mesentery showing the pennons. Because of the folding of the mesentery the muscles in the upper and under part are obliquely sectioned. Fig. 47 *a*. Transverse section of mesenteries of the third and fourth order. *b* Part of the mesentery figured in fig. 46, showing the inner part of the parietal part of the longitudinal muscle and the parietobasilar muscle.

Remarks: I have referred this species to the genus *Synphellia* CARLGR., the type of which is *S. aucklandica* from the Auckland Islands. The whole organization of *exlex* agrees very well with this species, as also the exterior. The small differences are due to the specimens of *aucklandica* being small and not sexually ripe. Already the description given by MC MURRICH indicates that *exlex* cannot be a *Hormathia* what is now still more confirmed by my examination of the species. Very interesting is the variation in the presence of the directives and siphonoglyphs, especially the appearance of 4 pairs of directives and 4 siphonoglyphs, perfectly symmetrically arranged. How this peculiarity may be explained is till now hardly to understand.

Fam. **Sagartiidae.**

Genus **Thoe.**

Diagnosis of the genus compare CARLGREN 1924 a, p. 245.

Thoe patagonicha (CARLGR.).

Sagartia patagonicha n. sp. CARLGREN 1899, p. 34.

Diagnosis: Pedal disc not broader than oral. Column with cinclides in the distal half (arrangement?). Sphincter well developed, rather elongated, occupying almost the whole mesogloea and completely separated from it, in structure principally reticular, not stratified. Tentacles up to 180 (196?). Radial muscles of the oral disc with tendency to be mesogloeal. Siphonoglyphs well developed. Mesenteries arranged hexamerously or irregularly? One or two pairs of directives. At least the mesenteries of the first three cycles perfect. Muscle pennons diffuse, not particularly strong but varying in size with the more or less contracted state of the animal. Parietobasilar muscles very weak, not folded. Basilar muscles distinct. Acontia well developed. Nematocysts of the column 12—17 × 2.5—3 μ, those of the tentacles partly 19—24 × about 2 μ, partly 19—25 × about 3 (4) μ, those of the actinopharynx partly 26—33 × 2—2.5 μ, partly 19—25 × (3) 3.5 μ, those of the acontia partly 60—84 × 5.5—7 μ (partly 26—34 × 1.5 μ), spirocysts of the tentacles 10 × 1 μ—25 × about 3 μ.

Colour: ?

Dimensions of the largest contracted specimen: breadth of the pedal disc and height of the column 1 cm. Largest breadth of the column in its middle 1.2 cm.

Occurrence: North Argentina, 37° 50′ S 56° 11′ W. Gravel mixed with sand. 100 m. Together with *Corynactis*. 23. 12. 1901, 3 specimens.

Further distribution: Patagonia, Puerto Madryn. Littoral (type-specimens).

Exterior aspect: Owing to the bad preservation of the type-specimens my description (1899) of the species was rather imperfect, wherefore I here give some complementary notes. The pedal disc is provided with a weak cuticle. The column is cylindrical or in contracted state largest in its middle part. It is smooth without »suckers», in the distal part provided with cinclides (also stated in one of the type-specimens). The margin is distinct. The tentacles are in more expanded state ordinarily long, in contracted short, especially the outermost. They are arranged hexamerously (or irregularly?), in two of the present specimens I counted about 180 tentacles. The inner half of the oral disc lacks tentacles. Sometimes only a small part of the disc

seems to be without tentacles, certainly in connection with a strong contraction of the disc (the radial muscles of the oral disc are very strong). The actinopharynx is provided with numerous longitudinal furrows and ridges and two (2 spec. examined) distinct siphonoglyphs or only one (1 spec.).

Anatomical description: The ectoderm of the column is rather high and of about the same thickness as the mesogloea, which contains numerous small cells. The cinclides are evaginations from the endoderm. The sphincter is strong, broad and rather long, and occupies almost the whole mesogloea. It is chiefly reticular with ordinarily large muscle-meshes. The radial muscles in the outer part of the oral disc are very strong and show a tendency to become mesogloeal. The actinopharynx lacks ectodermal muscles, the siphonoglyphs are normally structured. The pairs of mesenteries were also in one of the examined present specimens arranged hexamerously in five cycles, the last of which was incomplete. The mesenteries of the three first cycles and at least some of the fourth cycle were perfect. The arrangement of the mesenteries in the specimen with only one pair of directives (CARLGREN 1899) was probably irregular, but because of the bad preservation of this specimen it was impossible to confirm this suggestion. The muscle pennons are diffuse, in the more expanded specimens from North Argentina (fig. 48) rather weak, in the previously described specimens considerably stronger. The parietobasilar muscles are very weak and not folded, the basilar muscles distinct. The species is dioecious. The stronger mesenteries are fertile. The size of the stinging capsules in the type-specimens and in the present specimens shows good agreement.

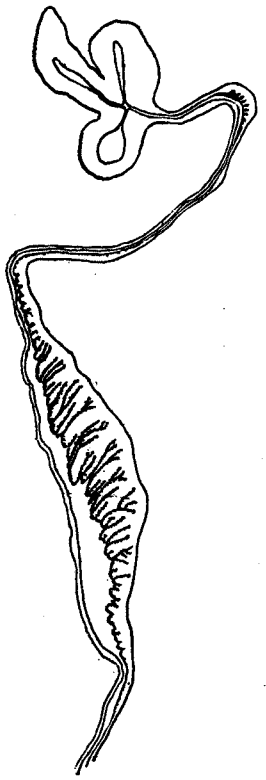


Fig. 48. *Thoë patagonicha.* Transverse section of inner half of a perfect mesentery.

Thoe chilensis (Lesson).

Actinia chilensis n. sp. LESSON 1830, p. 76, Pl. 2, fig. 5.
Dysactis chilensis (LESS.). MILNE-EDWARDS 1857, p. 262.
Nemactis(?) chilensis (LESS.). VERRILL 1869, p. 488.
Sagartia chilensis (LESS.). ANDRES 1883, .p. 384; MC MURRICH 1904, p. 265, Pl. 17, figs. 48—52.
? Actinia primula DRAYTON in DANA 1849, p. 134, Pl. 2, fig. 12, 16.

Diagnosis: Pedal disc well developed. Column smooth, in contracted state longitudinally folded, with scattered cinclides in the middle and the upper part. Margin

distinct, without fossa. Sphincter strong, occupying in its upper part almost the whole mesogloea, wholly separated from the endodermal muscles, reticular-alveolar with rather large meshes. Tentacles conical, in number up to 158 (Mc MURRICH), the inner longer than the outer. Longitudinal muscles of tentacles and radial muscles of oral disc weak, ectodermal. Siphonoglyphs 2—3. Mesenteries hexamerously, octomerously or irregularly arranged. Up to 24 pairs of mesenteries perfect. 2—3 pairs of directives. Mesenteries in the proximal part probably more numerous than the tentacles? Pennons rather weak to rather strong. Parietobasilar muscles not folded, weak are also the basilar muscles. Reproduction by longitudinal fission? Nematocysts of the column often curved 14—16 × almost 3 μ, those of the tentacles partly 20—24 × almost 2 μ, partly 12 × 2.5—26 × 4 μ, those of the actinopharynx partly 22—26 × (2) 2.5 μ, partly 18—24 × 3.5—4 μ, those of the acontia partly (34 × 4.5) 36—62 × 5—6 μ, partly 22—25 × about 1.5 μ. Spirocysts of the tentacles 12 × 1.5—about 24 × well 2.5 μ.

Colour compare Mc MURRICH. The colour of the column in our specimens was greenish.

Dimensions of the largest specimen from Melinca. Column 0.6 cm high, pedal disc 0.6 × 0.4 cm.

Occurrence: Chile, Guaitecas Isls., Melinca In cavities of the rocks, low-water. leg. DUSÉN 1897, 4 specimens.

Further distribution: Chile. In the vicinity of Talcahuano (teste LESSON, VERRILL and Mc MURRICH), Coquimbo, Calbuco (teste Mc MURRICH).

The exterior of our specimens agrees very well with the description of Mc MURRICH. In one specimen the one, the shorter side seems to be regenerated, the pedal disc shows also a deep excavation on this side. Also in two other specimens one side was somewhat shorter than the other. It is therefore probable that an asexual reproduction, either by longitudinal fission or by laceration, takes place in this species. Also the presence of three pairs of directives and irregularities in the arrangement of the mesenteries in the region of the extra-directives in another specimen speak for such a suggestion. In the only sectioned specimen, being not sexually ripe, the two well developed siphonoglyphs with their directives were namely asymmetrically arranged: 38 mesenteries on one side, 61 on the other in the undermost part of the actinopharynx-region. On the better developed side one more siphonoglyph, considerably weaker and more indistinct, was present in connection with one pair of directives. The mesenteries were more numerous in the proximal part than in the distal. As the specimen has probably originated by asexual reproduction this statement is, however, of little consequence, as we do not know the way of asexual reproduction.

The sphincter is of the same structure as that figured by Mc MURRICH. The

pennons are, however, considerably stronger than MC MURRICH's figure shows. In one specimen MC MURRICH has yet observed stronger pennons.

The thinner nematocysts of the tentacles and actinopharynx were staff-like, the broader nematocysts sometimes a little curved and with perspicuous basal part to the spiral thread. The smaller nematocysts in the long acontia were needle-like and, together with the large nematocysts, numerous.

Genus **Choriactis** MC MURR.

Diagnosis: Sagartiidae with wide pedal disc. Column thick, longitudinally sulcated, in young specimens smooth, in older sometimes with flat tubercles in more or less distinct longitudinal rows. Cinclides small and few or absent. Sphincter strong, mesogloeal. Tentacles rather short, the outer considerably smaller than the inner. Longitudinal muscles of tentacles and radial muscles of oral disc ectodermal. Mesenteries and tentacles present in equal number or the former are somewhat more numerous. At least the mesenteries of the two first cycles perfect. Pennons ordinarily developed or weak. Reproductive organs developing from the mesenteries of the first cycle. Acontia well developed with large nematocysts.

Based upon the description of the type-species, *C. impatiens*, STEPHENSON (1920) has proposed a new family Choriactidae. As, however, MC MURRICH's description of the species is on some important points incorrect — the mesenteries of the first and second cycles are namely fertile and not sterile, and cinclides are present — this family must be dropped. In fact I call in question, if the genus itself can be retained. It agrees in almost all characters with *Thoe*, only the thicker mesogloea in the column and the flat tubercles, present on the column in older individuals, separates *Choriactis* from *Thoe*. The thickness of the mesogloea is of little importance as genus-character as the thickness varies with the different state of contraction of the column and the flat tubercles of the column may possibly also be due to contraction. The cinclides seem, however, to be considerably fewer here than in *Thoe*, and probably in certain specimens absent. Besides, it ought to be called in question, whether *Artemidactis* and *Choriactis* are not synonyms, at any rate they are nearly related to each other.

Choriactis impatiens (COUTH.) MC MURRICH.

Actinia impatiens n. sp. COUTHOUY in DANA 1849, Pl. 3, fig. 18.
Paractis impatiens (COUTH.). MILNE-EDWARDS & HAIME 1851, p. 8; MILNE-EDWARDS 1857, p. 248.
Sagartia impatiens (COUTH.). GOSSE 1860, p. 38; VERRILL 1869, p. 483.
Cylista impatiens (COUTH.). ANDRES 1883, p. 390.
Choriactis impatiens (COUTH.). MC MURRICH 1904, p. 272, Pl. 17, figs. 59—61; STEPHENSON 1920, p. 548.

Diagnosis: Pedal and oral disc broad. Column longitudinally sulcated, rather thick, in older individuals with more or less distinct flat tubercles, in younger smooth. Small cinclides present in the lower part of the column, probably few. Sphincter strong, reticular-alveolar, in its greater part occupying almost the whole breadth of the mesogloea, wholly separated from the endodermal muscles of the column. Tentacles up to some more than 200, moderate in size, covering the greater part of the disc, the inner at least four times larger than the outer. Actinopharynx with 2 distinct siphonoglyphs with well developed aboral prolongations, with numerous longitudinal ridges. Mesenteries hexamerously arranged, growing from the proximal as well as the distal part of the body, fewer in the middle part of the column than in the upper and under end. Mesenteries of the three first cycles perfect. Mesenteries in the proximal part rather thick. Muscle pennons ordinarily developed or somewhat weaker, diffuse; parietobasilar muscles hardly folded, in the proximal part of the mesenteries broad and here forming a distinct protuberance inwards. All stronger mesenteries incl. the directives fertile. Nematocysts of the column 19—24 × 2.5—2 μ sparse, those of the tentacles partly 26—39 × about 4.5 μ, partly 23—27 × 2.5 μ, those of the actinopharynx partly 34—38 × about 4.5 μ, partly 29—34 × about 2 μ, those of the acontia partly 46—53 × about 3.5 μ, partly 55—65 × 5.5—6 (6.5) μ, spirocysts of the tentacles up to 34 × 3.5—4 μ.

Colour: Column rose or flesh-coloured, near the summit chequered with green. Tentacles rose or crimson, oral disc crimson (COUTHOUY, MC MURRICH.)

Dimensions unto 4.3 cm in height, breadth at the distal part unto 2.5 cm (MC MURRICH).

Occurrence: Tierra del Fuego, Orange Harbour, littoral (U. S. Expl. Exp.), Punta Arenas, 10—11 fms. (PLATE-collection).

I have examined »the largest expanded specimen» (MC MURRICH, p. 273) as also a small specimen from the PLATE-collection. The exterior is well described by MC MURRICH. The number of tentacles was in the largest specimen 212, the ridges of the actinopharynx were 19 on each side of the siphonoglyphs, a part of the ridges were, however, short (MC MURRICH states a smaller number of tentacles and ridges). I have sectioned out one sixth of the body except the most distal and proximal part, in order to control, if there are cinclides (not observed by MC MURRICH) and if the mesenteries of the first and second order are sterile (in conformity with MC MURRICH's statement).

Concerning the cinclides I have undoubtedly found a cinclis issuing from the endocoel of the one pair of directives in the proximal part of the body. This species is thus provided with cinclides but probably in a small number.

As to the distribution of the reproductive organs there is no doubt that also the mesenteries of the first and second order, incl. the directives, are fertile. In the

»largest expanded specimen» they were ovaries. In fig. 49 I have reproduced a section of a directive mesentery showing a few ova. At the basal disc I counted about 208 mesenteries. To judge from the number of tentacles the number of mesenteries at the oral disc may be about the same. In the middle part of the body there were, however, only 96 mesenteries clearly visible, the rest is inconspicuous or only indicated. The mesenteries thus grow from the distal as well as from the basal part of the body. MC MURRICH's figure of a mesentery of the first order shows a very weak pennon. In the sectioned specimen the pennons are considerably stronger (figs. 49, 50), especially in the upper part of the mesenteries. As to the parietobasilar muscles compare the diagnosis.

The sphincter recalls that of *Choriactis laevis*. It is strong, in its upper part reticular, in its under part more alveolar and wholly separated from the endodermal muscles of the column.

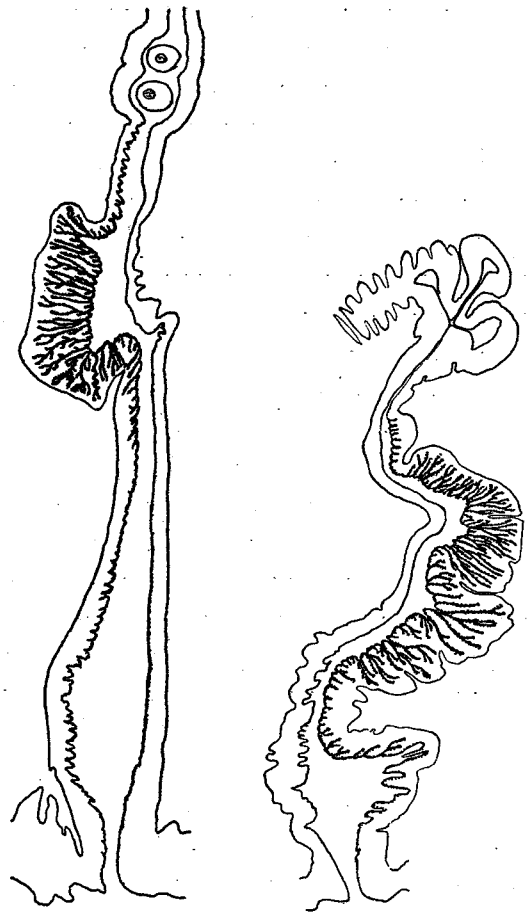


Fig. 49. Fig. 50.

Figs. 49, 50. *Choriactis impatiens*. Transverse sections of mesenteries of the first cycle. Fig. 49 of a directive. Fig. 50 of a non-directive.

Choriactis laevis (CARLGR.).

Sagartia laevis n. sp. CARLGREN 1899, p. 35.
Choriactis crassa n. sp. MC MURRICH 1904. p. 274, Pl. 17, figs. 62—64, Pl. 18, fig. 65; STEPHENSON 1920, p. 548.
Choriactis crassoides n. sp. PAX 1922, p. 91; 1923, p. 21, Pl. 2, fig. 5.
Choriactis opalescens n. sp. PAX 1922, p. 92; 1923, p. 23, Pl. 1, fig. 5.

Diagnosis: Pedal disc well developed. Cinclides probably absent. Margin rather distinct. Sphincter strong, broad in the distal part and here occupying almost the whole breadth of the mesogloea, reticular or in the outer (and under) part more alveolar. Tentacles hexamerously arranged, 130 unto considerably more than 200, of or-

dinary length, the inner considerably longer than the outer. Longitudinal muscles of tentacles and radial muscles of oral disc ectodermal. 2 well developed siphonoglyphs. Pairs of mesenteries hexamerously arranged, up to 96 in the middle part of the column, in the upper and especially in the under part more numerous. Longitudinal pennons of the mesenteries well developed, especially those of the directives with high ramificated folds. Other parts of the mesenteries thin. Parietobasilar muscles in the proximal part weak. Reproductive organs on all stronger mesenteries (on the directives?). Acontia long and thick. Nematocysts of the column very sparse 17—19 × 2 μ, those of the tentacles partly 19—29 × 2—2.5 (3) μ, partly 26—39 × (4) 4.5—5 μ, those of the actinopharynx partly 31—43 × 4.5—5.5 μ, partly 24—36 × 2—2.5 (3) μ, partly 25—32 × 3.5—4.5 μ, partly 12—19 × 1—1.5 μ, those of the acontia partly 55—73 (77) × 5—6 μ, partly 38—55 × (2.5) 3—3.5 μ.

Colour in life white, orange, yellow or red (*Choriactis crassa*). Column pale rosa, tentacles opalescent (*Choriactis opalescens*, PAX).

Dimensions of the type-specimen in introverted state: height of the column 2 cm, largest breadth of the pedal disc 3.1 cm — of a specimen from Scotia expedition: breadth of the pedal disc 1.9 × 1.5 cm, height of the column about 1 cm. — The largest specimens of *Choriactis crassoides* and *opalescens* are considerably larger: breadth of the pedal disc 2.8 resp. 2.7 cm, height of the column 2.8 resp. 3.5 cm.

Occurrence: Burdwood bank 53° 45′ S 61° 10′ W. Shells shattered in pieces with stones, 137—150 m. Bottomtemp. + 3.20°. 12. 9. 1902, 5 specimens.

Further distribution: Strait of Magellan, Punta Arenas 13 fms (leg. MICHAELSEN). — Cabo Espiritu Santo, East coast of Tierra del Fuego (leg. PLATE, *Ch. crassa*). — South Orkney Isl.. Scotia Bay, shore pool. Temperature 30—32° Fahr. (Scott. Nat. Antarctic (Scotia) Exp.). — South Shetland Isls., King George's Isl. 62° 12′ S 60° 55′ W (Paris) 420 m. Bottomtemperature + 0.3° (*Ch. opalescens*); 75 m Bottomtemperature + 0.2° (*Ch. crassoides*), (Pourquoi pas Exp.)

I have compared the specimens from Burdwood bank and from Scotia bay with the type-specimen and there is no hesitation that they belong to *laevis*. I have not observed any cinclides in the sections, but as I have sectioned only parts of the column, it is possible that cinclides may be present although at any rate few in number. In one specimen one acontium was ejected through the body-wall, but the perforation was probably not due to a cinclis because the canal in the mesogloea containing the acontium was not invested by an epithelium. The tentacles were in one examined specimen about 192, in the other examined 130—160. Some of the outermost tentacles were sometimes very small. In the figs. 51 and 52 I have reproduced a transverse section of the sphincter and of a perfect mesentery. The folds of the directives are twice as high as in the figured mesentery but the pennons shorter.

I have examined specimens of MC MURRICH's *Choriactis crassa*. There is no

doubt that this species is synonymous with *laevis*. The capitular ridges are due to the very strong contraction of the specimens.

I have further examined *all* specimens of PAX' *Choriactis crassoides* and *opalescens*. Both species are certainly identical and to my mind probably synonymous with *laevis*, although the nematocysts in certain parts of the body are a little larger than in the other specimens referred to this species. I have examined one specimen of *opalescens* as to the number of tentacles and mesenteries. At the base this specimen had about 316 mesenteries, the tentacles, however, were fewer, but more than 200 (it was difficult to give the exact number because several tentacles were damaged).

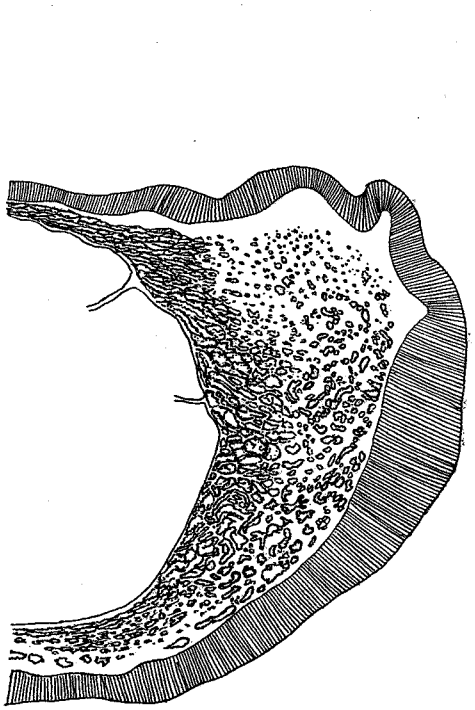


Fig. 51.

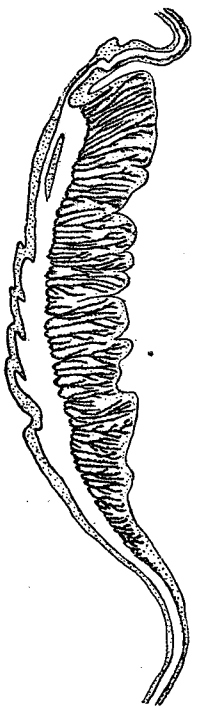


Fig. 52.

Fig. 51, 52. *Choriactis laevis*. Fig. 51. Transverse section of sphincter. Fig. 52. Transverse section of pennon from a perfect mesentery in the undermost part of the actinopharynx. Both sections of a specimen from Burdwood Bank.

PAX says that the acontia in *opalescens* »treten nur in geringer Zahl auf». PAX' statement gives reason for astonishment as he has not examined the proximal part of the body. There cannot either be any doubt that he has not examined the reproductive organs, although he states that the ovaries in the specimen examined by him »treten von den Mesenterien dritter Ordnung auf». Now it is so fatal that the examined specimen had testes, and they are developed also on the mesenteries of the first and second order. I have carefully cut out one fourth of the body, counted from the one direc-

tive in the region of the aboral prolongations of the siphonoglyphs, and there are also testes on the mesenteries of the first and second order. If also the directives develop testes I cannot confirm, as I have not sectioned the part of the directives where the reproductive organs eventually may be present. There is also a similar unreliableness in some of PAX' statements concerning *Ch. crassoides*. Here he states that the ovaries appear also from the mesenteries of the third cycle. In fact he has examined the mesenteries in the under part of the actinopharynx, where reproductive organs are never developed in Actinians in *perfect* mesenteries of the first and seldom in those of the second order. Further he says that »zwei deutlich entwickelte Schlundrohrzipfel» are present. The specimen examined by PAX has been sectioned by him in two halves transversally to the directive plane, under such circumstances the aboral prolongations of the siphonoglyphs cannot possibly be seen. Further he states »Cincliden habe ich bei genauester Untersuchung nicht feststellen können.» In reality he has sectioned only the upper part of the body.

The size of the nematocysts and spirocysts in several specimens is shown in the following table.

	Tentacles	
	Nematocysts	Spirocysts
1) Scotia Bay	19—24 × well 2—2.5 μ; 28—31 (36) × 4.5—5 μ	—34 × about 5 μ
2) Burdwood bank	19—23 × 2—2.5 ; 29—31 × 4.5—5	17 × 2—31 × 4.5
3) Punta Arenas	19—24 × 2—2.5 ; 29—34 × 4.5—5	22 × 2—34 × 4.5—5
4) *Ch. crassa*	19—24 × 2—2.5 ; 26—31 × 4.5—5	17 × 2—32 × 4.5
5) *Ch. opalescens*	26—29 × about 2.5 (3) ; 31—38 × 4.5	—43 × 5
6) *Ch. crassoides*	26 × 2.5 ; 31—36 × about 4.5	—48 × 5

	Acontia	
1) Scotia Bay	55—70 × about 5—5.5 μ;	44—52 × 3—3.5 μ
2) Burdwood bank	60—72 × about 5.5 ;	43—49 × about 2.5
3) Punta Arenas	(49) 55—64 × 5—5.5 ;	41—46 × (2.5) 3—3.5
4) *Ch. crassa*	55—65 × 5—5.5 ;	38—48 × 3
5) *Ch. opalescens*	60—73 × 5—5.5 :	48—55 × 3.5
6) *Ch. crassoides*	62—77 × 5.5—6 ;	47—53 × 3.5

	Actinopharynx			
1) Scotia Bay	34—43 × about 5 μ;	24—29 × about 2 μ;	12—17 × 1—1.5 μ;	26—32 × (3.5) 4 (5) μ
2) Burdwood bank	34—41 × » 5 ;	26—34 × almost 2.5 ;	13—17 × 1 ;	26—29 × (3.5) 4—5
3) Punta Arenas	34—43 × » 5 ;	26—31 × » 2.5 ;	17—19 × 1 ;	25—31 × 3.5—4.5
4) *Ch. crassa*	31—36 × » 5 ;	29—31 × » 2.5 ;	17—18 × 1 ;	24—31 × 3.5—4.5
5) *Ch. opalescens*	—	31—36 × about 2.5	—	—
6) *Ch. crassoides*	34—41 × 5.5—6 ;	29—34 × .25	—	—

Genus **Artemidactis** STEPHENSON.

Diagnosis: Sagartiidae with the basal disc well developed. Wall of the column thin in proportion to the size of the species. Cinclides in the column scattered (teste STEPHENSON). Sphincter well developed. Margin distinct. Tentacles numerous, in proportion to the size of the animal small, arranged hexamerously, the inner longer than the outer, in number fewer than the mesenteries. Longitudinal muscles of the tentacles and radial muscles of the oral disc ectodermal. Actinopharynx well developed with 2 broad siphonoglyphs. Mesenteries hexamerously arranged, in the lower part of the body more numerous than in the upper. Muscles in the mesenteries weak, the longitudinal as well as the parietobasilar muscles. Basilar muscles rather well developed. The filaments on the different cycles of mesenteries confined to a certain definite area. Several perfect pairs of mesenteries. All mesenteries fertile. Acontia well developed with large nematocysts.

STEPHENSON says in the diagnosis of *Artemidactis* (1918, p. 40): »Body cylindrical below but expanded above so that the disc greatly exceeds the column, although it is not lobed.» This statement induces us to think that the lower part of the column is less developed than the oral disc, which is still more confirmed, as STEPHENSON in comparing *Artemidactis* with *Cereus*, finds out that both genera have an expanded oral disc. There is, in fact, no such conformity between the two genera. *Cereus* is a genus with an enlarged distal part of the body and with more numerous mesenteries in the distal region than in the proximal, in contradistinction to *Artemidactis*, a form with richer development of mesenteries in the proximal part than in the distal. Already from STEPHENSON's statement of the number of tentacles and mesenteries in the only known species of *Artemidactis* (1918, p. 42) we may conclude that it may be so. I have examined half of one specimen between the two directive pairs: there were about 150 tentacles and therefore the same number of mesenteries in the distal part, at the pedal disc on the contrary 192 mesenteries. Thus it is clear that STEPHENSON's diagnosis must be altered in that respect. I will, however, once for all point out that after the couples-stage the mesenteries in the *Actiniaria* originate and increase in three different ways. In the first type the mesenteries arise at the proximal body-end and increase from here upwards, in the second type the mesenteries grow from the distal body-end towards the proximal end, and in the third type there is an almost simultaneous origin of mesenteries at the proximal and the distal body-end. In the first case the mesenteries become more numerous in the proximal part than in the distal, if not the increase of the mesenteries is continued to the oral disc, in the second case the opposite takes place and in the third the number of mesenteries in the distal and proximal part is about equal. Almost all authors have overlooked these differences and their systematic signification wherefore species have often been placed into wrong genera (compare *Glyphoperidium*).

Artemidactis victrix STEPHENSON.

Artemidactis victrix n. sp. STEPHENSON 1918, p. 41, Pl. 2, figs. 1, 3, 7, 15; Pl. 3, figs. 6—10, Pl. 5, figs. 3, 5—8. Pl. 6, figs. 5—9, 12.
» » STEPH. STEPHENSON 1920, p. 546.

Diagnosis: Column in preserved state mostly elongated. Tentacles in large specimens unto about 300. Longitudinal muscles of the tentacles and radial muscles of the oral disc with high, very close and ramificated folds. Sphincter strong with tendency to stratification, its muscle-meshes arranged in irregular groups. Pairs of mesenteries unto 192, those of the last cycle partly only in the proximal part. Perfect pairs of mesenteries 24. Longitudinal muscles of the mesenteries forming no pennons. Nematocysts of the column partly 19—26 × 2.5—3 μ, partly 12—14 × 1 μ, those of the tentacles partly 31—36 × 2.5— something more than 2.5 (3) μ, partly 34—38 × 3.5—4 μ, those of the actinopharynx partly 31—36 × about (3) 3.5 μ, partly 17—19 × almost 2 μ, partly 26—35 × 4—about 5 μ, those of the acontia partly (55) 58—70 × 5.5—6 μ, partly 46—53 × 3.5 (4) μ, partly 19—22 × almost 2 μ, spirocysts of the tentacles about 29 × 2.5—48 × 5 μ.

Colour in living state white, yellowish-white or red.

Dimensions of one of the largest preserved specimens: length of the body 13 cm, breadth of the pedal disc 6.5 cm, of the smallest specimen length 3 cm, breadth of pedal disc 2 cm.

Occurrence: South Georgia. Antarctic Bay 54° 12′ S 36° 50′ W 250 m. Pebbles. 6. 5. 1902, 27 specimens. — South Georgia, off Cumberland Bay 54° 11′ S 36° 18′ W. 252—310 m. Grayish clay with few stones. Bottomtemperature + 1.45°. 5. 6. 1902, 7 specimens. — South Georgia, off May Bay 54° 17′ S 36° 28′ W. 75 m. Clay with some alges. Bottomtemperature + 1.45°. 14. 5. 1902, 3 specimens. — South of W. Falkland, Burdwood Bank 53° 45′ S 61° 10′ W. 137—150 m. Bottomtemp. + 3.20°. Shattered shells with stones. 12. 9. 1902, 1 specimen.

Further distribution: Ross Sea 74° 25′ S 179° 3′ E. 158 fms. — Entrance Mac Murdo Sound 77° 13′ S 164° 18′ E. 207 fms (teste STEPHENSON). — 65° 20′ S 95° 27′ E. 240 fms. (Australasian Antarctic Exp. 1913—14).

The species is carefully described by STEPHENSON. On some points we are of different opinion. Under the genus I have discussed the oral disc. STEPHENSON (1918, p. 42) suggests that »the species is unable to shorten its body at all». Of the 38 specimens in the present collection the greater part is very elongated, but several show a strong contraction of the body, so that the height of the body and the breadth of the pedal disc are about equal. One very contracted specimen was about 3.5 cm high and 4.5 cm broad at the pedal disc. Thus there is no reason for denying its power to contract the body in oral-aboral direction.

I have controlled STEPHENSON's examination concerning the anatomy, except that of the cinclides. In none of my specimens the acontia were ejected and there were no marked cinclides. The radial muscles of the oral disc, not examined by STEPHENSON, agree in their appearance with the longitudinal muscles of the tentacles. The basilar muscles were rather well developed, forming folds issuing more from the pedal disc than from the mesenteries. In the broader nematocysts of the tentacles and actinopharynx the basal part to the spiral thread was perspicuous, the small nematocysts in the tentacles, actinopharynx and column were few as also all nematocysts in the tentacles. In the actinopharynx I have also observed some large nematocysts (not set down in the diagnosis) 36—60 × about 5 μ. Possibly these nematocysts belong to the acontia. The size of the nematocysts in the acontia agrees very well in three examined large specimens. In a fourth, not fertile and small specimen (length 3 cm, breadth of the pedal disc 2 cm) the size of the nematocysts was smaller, in the acontia partly 48—65 × 5.5—6 μ, partly 36—43 (48) × about 3 μ, in the tentacles partly 24—26 × about 2.5 μ, partly 29—34 × about 4 μ, in the actinopharynx partly 30—36 × almost 3—3.5 μ, partly 29—34 × about 4—4.5 μ. Concerning the cnidae compare for the rest the diagnosis.

Hormathia (Chondractinia) georgiana n. sp.

Diagnosis: Pedal disc well developed. Scapus with numerous larger and smaller tubercles showing distinct tendency to be arranged in longitudinal rows, often 12 rows of larger tubercles. Ectoderm of the scapus with a rather strong cuticle and with extraordinarily numerous grain-cells. Sphincter strong, long, transversally stratified, wholly separated from the circular muscles of the column and mostly situated in the middle of the mesogloea. Tentacles 96, hexamerously arranged, not thickened at their outside, their longitudinal muscles weak, ectodermal, rather short. Radial muscles of oral disc meso-ectodermal, in the outer part of the disc rather strong. Actinopharynx very long with few longitudinal furrows and two very broad siphonoglyphs, prolonged aborally. Mesenteries rather thick, especially the directives. Muscle pennons diffuse, not strong. Parietobasilar muscles not distinctly separated from the transversal muscles. Basilar muscles weak. Dioecious. Nematocysts of the column 18—22 × 2.5 μ, those of the tentacles 24—31 × 2—2.5 μ numerous, those of the actinopharynx partly 26—36 × about 2.5 μ numerous, partly 26—29 × 3.5—4 (4.5 μ, the latter with perspicuous basal part to the spiral thread and broader in the basal end), those of the acontia 34—46 × (3.5) 4—4.5 μ very numerous, spirocysts of the tentacles 22 × 2 —about 43 × 5 μ.

Colour in living state: column gray-yellow, tentacles dark-brown, oral disc white. In formol-alcohol: scapus yellowish- or dark brown.

Dimensions of the largest specimen in contracted state 6×6 cm, those of the smallest: height 4 cm, breadth 3.5 cm.

Occurrence: South Georgia. Off Cumberland Bay 54° 11′ S 36° 18′ W. 252—310 m. Temperature at the bottom 1.45°. Gray clay with few stones. 5. 6. 1902, 2 specimens. — Between Falkland Isl. and S. Georgia. Shag Rock Bank 54° 34′ S 43° 23′ W. 160 m. Bottomtemperature 2.05°. Gravel and sand. 19. 4. 1902, 2 specimens.

Exterior aspect (fig. 53): The pedal disc is well developed but in all specimens drawn in. The scapus is provided with a rather strong cuticle and tuberculated. The tubercles are of varying size and show a distinct tendency to be arranged in longitudinal rows. In two specimens 12 rows of larger tubercles are clearly visible, in the two other these rows are not so conspicuous. Owing to the different state of contraction the tubercles are flattened in two specimens, in the other they are rounded

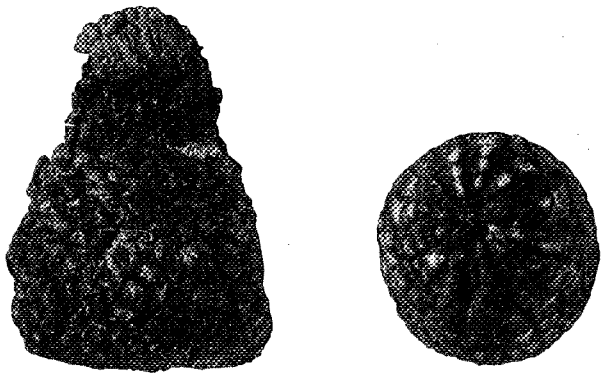


Fig. 53. *Hormathia georgiana.*

or somewhat acuminated. In contracted state the capitulum is longitudinally furrowed. The margin is distinct, the tentacles hexamerously arranged, 96 in number and longitudinally or weakly transversally furrowed, according to the different state of contraction. The actinopharynx is very long with few longitudinal furrows and two very broad siphonoglyphs, drawn out in distinct aboral prolongations.

Anatomical description: The ectoderm of the column is ordinarily high and contains grain-cells, being so extraordinarily numerous that almost the whole ectoderm seems to consist of such cells; besides those there are comparatively few elongated mucus-cells present. The cuticle of the scapus is rather strong and divisible in a thinner outer part and a mostly thicker restitution-cuticle. Here and there thin chords of cuticularised ectoderm-cells unite the restitution-cuticle with the mesogloea, lending the ectoderm a somewhat discontinuous appearance. The mesogloea of the column is thick, especially in the under and upper parts of the column, and provided with numerous cells. The circular muscles of the column are weak, the sphincter is strong and long and for the greater part situated in the middle of the mesogloea, only

in its undermost part when diminishing in breadth it approaches the endoderm but is in no communication with the circular muscles. The muscle-meshes are small and show a distinct tendency to transverse stratification. The longitudinal muscles of the tentacles are weak and ectodermal, the radial muscles of the outer parts of the oral disc strong, meso-ectodermal. Also the ectoderm of the tentacles and oral disc is richly provided with grain-cells although not so numerous as in the column.

The pairs of mesenteries are 48, of which 6 perfect and sterile. The pennons are not strong, diffuse and show coarse folds. The mesogloea of the mesenteries is on the directive mesenteries strongly thickened (fig. 54). The parietobasilar muscles are, as in other species of the genus, not distinctly differentiated from the transversal muscles. The basilar muscles are weak. The ectoderm of the middle-streak of the filaments is of typical structure: the unpaired cnido-

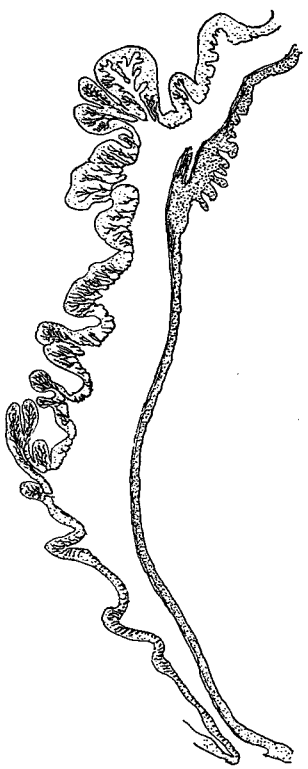


Fig. 54.

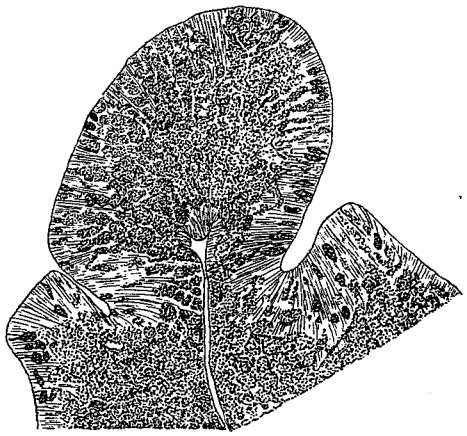


Fig. 55.

Figs. 54, 55. *Hormathia georgiana.* Fig. 54. Transverse section of one directive mesentery on the height of the under part of the sphincter. Column-side downwards. Fig. 55. Transverse section of cuido-glandular streak with part of the bounding-streak.

glandular streak and the boundary streak contain extraordinarily numerous and close packed grain-cells, not stained with haematoxyline, and occupying the whole epithelium; only in the circumference scattered mucus-cells, deeply stained with haematoxyline, are present (fig. 55). The outer part of the intermediate streaks shows folds corresponding to those of the ciliated streaks; whether the latter are continued in the furrows of the former I cannot decide, because of the bad preservation of these parts. The acontia are well developed but not long. I have dissected the largest specimen, from which also the stinging capsules are examined.

Remarks: The species in its exterior rather strongly recalls *Hormathia* (*Chondractinia*) *nodosa* (FABR.) from the arctic and boreo-arctic regions.

Hormathia erythrosoma (PAX).

Paranthus erythrosoma n. sp. PAX 1922, p. 81, fig. 4; 1923, p. 8, Pl. 1, figs. 2, 3, Pl. 2. fig. 1.

Diagnosis: Pedal disc well developed. Scapus smooth or with flat tubercles arranged in longitudinal rows. No coronial tubercles in the uppermost part of the scapus. Cuticula of the scapus seemingly weak. Sphincter well developed, transversally stratified with the smaller muscle-meshes arranged in rectangular compartments, separated from each other by broad transversal mesogloea-balks. Tentacles and mesenteries 96. Longitudinal muscles of the tentacles and radial muscles of oral disc ectodermal (teste PAX). Nematocysts of the tentacles 26—31 × about 3 μ, those of the actinopharynx 31—34 × about 4 μ, those of the acontia 38—48 × 4.5 (5) μ.

Colour in life: Column dark orange. Tentacles canary-yellow. Actinopharynx straw-yellow (PAX).

Dimensions: Breadth of the pedal disc unto 4.5 cm, length of the column unto 4.3 cm (PAX).

Occurrence: South Shetland Isl., King George's Isl. 62° 12′ S 60° 55′ W. (Paris) 75 m., (Pourquoi pas Exp.) 5 specimens.

PAX refers this species to the genus *Paranthus!* It has nothing to do with this genus but is, as the following species, a *Chondractiniid.* The pedal disc is provided with a well developed cuticle. The scapus is almost smooth (in one specimen) or tuberculated. The tubercles are low and arranged in longitudinal rows. They are most distinct in the proximal part of the scapus, the smallest tubercles are present distally. There are no coronial tubercles. Traces of a thin cuticle on the scapus are present in the proximal part of a specimen.

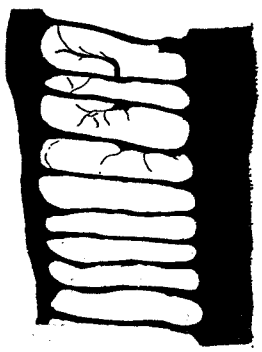


Fig. 56. *Hormathia erythrosoma.* Transverse section of part of the sphincter.

The sphincter is, as also stated by PAX, transversally stratified. The smaller muscle-meshes are collected in rectangular groups separated from each other by strong mesogloea-balks (fig. 56). The thinner mesogloea-balks are only indicated in some compartments on the figure.

It is questionable if this species is really separated from the following species (*rhododactyla*). Compare this species!

Hormathia rhododactyla (PAX).

Parantheoides rhododactyla n. sp. PAX 1922, p. 84, fig. 7; 1923, p. 20, Pl. 1, fig. 1.

Diagnosis: Pedal disc well developed. Scapus with a well developed cuticle and provided with low tubercles. No differentiated coronial tubercles in the uppermost part of the scapus. Sphincter strong, transversally stratified but not so distinct as in *erythrosoma*, with thinner and not so regularly arranged mesogloea-balks. Longitudinal muscles of the tentacles and radial muscles of the oral disc ectodermal (teste PAX). Tentacles and mesenteries about 96. Pennons diffuse. Nematocysts of the tentacles (22) 24—31 × something more than 2.5—3 μ, those of the actinopharynx 29—34 × about 4 μ, those of the acontia 37—45 × 4.5 (5) μ.

Colour in life: Column pale orange, tentacles vivid red (teste PAX).

Dimensions in preserved state: Height of the column unto 4.6 cm, breadth of the pedal disc unto 2.2 cm, length of the inner tentacles unto 1.2 cm (teste PAX).

Occurrence: South Shetland Isl., King George's Isl. 62° 12′ S 60° 55′ W. (Paris), 75 m. Bottomtemperature +0.2°. (Pourquoi pas Exp.), 3 specimens.

PAX has described this species as a *Parantheoides!* A glance at the exterior of the specimens at once indicates that we have to do with a *Chondractiniid.* The examination of the inner organization has confirmed this supposition. PAX' statement of 24 pairs of perfect mesenteries is false. Among the specimens there is a piece of the uppermost part of the body evidently cut off and examined as to the mesenteries by PAX. PAX's statement of 24 perfect pairs of mesenteries is certainly based on this examination. A nearer investigation of the piece shows, however, that the section has hit not the actinopharynx but the inner part of the oral disc. In fact only 6 pairs of perfect mesenteries are present. Further PAX says that the reproductive organs were not developed in the specimens. How superficial PAX' examination has been, is shown by the fact that on the hand-sections, made by him, large ova are clearly visible without microscopical research. The distribution of the reproductive organs agrees with that in other *Hormathia*. The sphincter is also here transversally stratified, although not so distinctly as in *erythrosoma*. The mesogloea-balks are thinner than in this species, the compartments more irregular (fig. 57). PAX says that the sphincter is reticular.

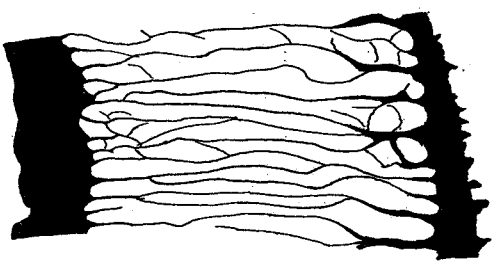


Fig. 57. *Hormathia rhododactyla.* Transverse section of part of the sphincter.

Remarks: I am inclined to regard both the species *erythrosoma* and *rhododactyla* as identical. They are taken in the same locality. The differences between the

species are inconsiderable. The different colours of the species are of little importance as the colours in antarctic and subantarctic actinians often vary (for inst. in *Hormosoma*, *Bunodactis octoradiata*, *Parantheopsis cruentata*). Also the difference in the thickness of the scapus-cuticle is not so considerable that we may for this reason separate the species; the cuticle in *erythrosoma* may have been torn off during the dredging. The different structure of the sphincters can also be due to individual variation. Only provisionally I retain them as two different species. It is a question, if not *Lilliella* (= *Hormathia*) *lacunifera* is identical with PAX' species. I come back to this question in another paper.

Hormathia castanea (MC MURR.) STEPHENSON.

Chitonanthus castaneus n. sp. MC MURRICH 1904, p. 282, Pl. 18, figs. 72—74.
Hormathia castanea MC MURR. STEPHENSON 1920, p. 535.

Diagnosis: Pedal disc very broad. Scapus with more or less numerous tubercles, arranged in more or less distinct longitudinal rows (48 in number, MC MURRICH) sometimes only indicated or present in the uppermost part of the scapus (24 tubercles, MC MURRICH). Sphincter triangular, wholly separated from the endodermal circular muscles and confined to the capitulum, reticular in the upper part, alveolar in the under, muscle meshes in the upper part transversely elongated. Tentacles about 96, not swollen at the base, short, pointed. Radial muscles of oral disc ectodermal. Pairs of mesenteries in 4 cycles. Longitudinal muscle pennons of the mesenteries weak' parietobasilar muscles weak forming no folds. Nematocysts of the tentacles 14—17 × 2 μ, rather numerous, those of the actinopharynx 19—24 × about 2.5 μ numerous, those of the filaments 15—18 × 2.5—3 μ spindle-like, those of the acontia 30—34 × about 3.5 μ (acuminated in the distal end as a pin), spirocysts of the tentacles up to 24 × something more than 3.5 μ.

Colour in life redbrown. Tentacles probably of the same colour (MC MURRICH).

Dimensions up to 1 cm high. Pedal disc up to 2 cm broad.

Occurrence: Juan Fernandez 20—40 fms (PLATE-collection).

I have made only hand-sections of this species for examination of the mesenteries. The other anatomical details except the stinging capsules as also several of the exterior are compilated from MC MURRICH's paper. The specimens are certainly not full-grown as there were no reproductive organs present.

Fam. **Aurelianidae.**

Genus **Aureliana.**

Diagnosis: Aurelianidae with very wide pedal disc. Column without verrucae, smooth, divided into scapus and capitulum, the former provided with a more or less distinct periderm (always?), the latter containing spirocysts which are absent or almost so in the scapus. Fossa distinct. Sphincter fairly to very strongly pinnate-circumscript with a distinct central axis of the mesogloea. Tentacles short, simple or somewhat lobed, comparatively few arranged in cycles, two tentacles communicating with each main exocoel, two or three with each main endocoel. Longitudinal muscles of tentacles and radial muscles of oral disc weak, (chiefly) mesogloeal. One siphonoglyph. Mesenteries more numerous in the proximal than in the distal part of the body. All stronger mesenteries perfect, fertile with strong pinnate circumscript pennons, parietobasilar and basilar muscles well developed. The weaker mesenteries in the proximal part without filaments.

STEPHENSON (1922, p. 292) states that the »radial muscles of oral disc and tentacles where present curious, chiefly mesogloeal». I have reexamined *A. regalis* in this respect, but the tentacles and the oral disc in the specimens which I had for examination were not well preserved. The strongly fibrillar structure of the mesogloea in these regions also makes it difficult to obtain a definite answer to this question. In spaces between the transversal fibrils in the tentacles there were in *regalis* as also in the following species here and there longitudinal fibrils, but whether they are muscle fibrils or not I cannot decide on the present material. It is, however, probable that STEPHENSON is right in his opinion.[1] In the following species the outer tentacles namely present a different appearance, some are expanded and smooth, some very contracted and wrinkled, the latter state presupposes a longitudinal muscle layer.

Aureliana georgiana n. sp.

Diagnosis: Mesogloea of the scapus thick. Sphincter forming a broad but very thin membrane extended rather deeply in the coelenteric cavity. Tentacles simple, 2 in each main-exocoel and each main-endocoel. Rows of tentacles in large specimens about 66. Pennons often with a by-fold inwards. Nematocysts of the scapus

[1] Since this was written I have examined two species of *Aureliana*, one from Antarctis and one from Japan. There is no doubt that as well the longitudinal muscles of the tentacles as the radial muscles of the oral disc are mesogloeal although they are very weak or wholly absent in certain regions of the tentacles and oral disc. In another paper I come back to the distribution of these muscles.

partly about 24 × 2.5 μ, partly 36—41 × 2 μ, those of the capitulum partly 22—25 × 2.5 μ, partly 34—38 × 4.5—5 μ, those of the tentacles 17—22 × 1.5—about 2 μ (partly 36 × 2 μ), those of the actinopharynx partly 38—43 × about 7 μ, partly 34—39 × about 4.5 (5) μ. Spirocysts of the capitulum 29 × almost 2—43 × 2.5 μ, those of the tentacles 29 × almost 2—46 × 2.5 μ.

Colour in life pale red.

Dimensions in preserved state, largest specimen: Breadth and height 3 cm, smallest specimen: height 1.1 cm, breadth in the distal part 1 cm.

Occurrence: South Georgia. Off the mouth of Cumberland Bay 54° 11′ S 36° 18′ W. Gray clay with few stones, 252—310 m. Bottomtemperature + 1.45°. 5. 6. 1902, 2 specimens.

Exterior aspect: Of the two specimens in the collection one was young (size compare dimensions), the other large and sexually ripe. The wide and thick pedal disc was in both specimens concave. The almost cylindrical body was indistinctly divided into a very thick scapus and a thin capitulum, in which latter the insertions of mesenteries were visible, especially in the small specimen. The periderm of the scapus was lost. The rows of tentacles in the larger specimen was 66, in the smaller specimen probably only 38, judging from the number of mesenteries in the distal part. In each main-endocoel and each main-exocoel there were 2 tentacles present, the outer tentacles in each row were larger than the inner and often very wrinkled. As several of the outer tentacles are smooth and show no traces of lobation, the wrinkled appearance is due to contraction. The oral disc was thin, the actinopharynx longitudinally furrowed, the siphonoglyph rather indistinct without aboral prolongation.

Anatomical description: The sphincter shows a characteristic appearance (fig. 58) and is in both specimens bandlike, very thin, very broad, distinctly pinnate with very close but not high folds. In this respect it is separated from *A. regalis* as well as from *A. nymphaea* HERTW., a species which I think in concordance with STEPHENSON (1922) may be an *Aureliana*. Concerning the muscles in tentacles and oral disc compare above.

In the distal part of the larger species 33 pairs of mesenteries were present, further below the mesenteries there were some more numerous, and at the pedal disc somewhat more than twice those at the oral disc. A part of the mesenteries at the pedal disc was very small. The stronger mesenteries were fertile, perfect and provided with filaments, the smaller sterile and without pennons and filaments. The strong pennons of the larger mesenteries show the typical structure in this genus. Often a small by-fold, directed inwards, was perspicuous (fig. 59). The parietobasilar (fig. 59) and basilar muscles were very strong. The nematocysts in the scapus were sparse, those in the capitulum common, the smaller in the tentacles rather sparse, the larger very rare, in the actinopharynx common. The spirocysts were very sparse in the

scapus, common in the capitulum and very numerous in the tentacles (size compare the diagnosis). Only the large specimen was examined concerning the stinging capsules. The large species was a female.

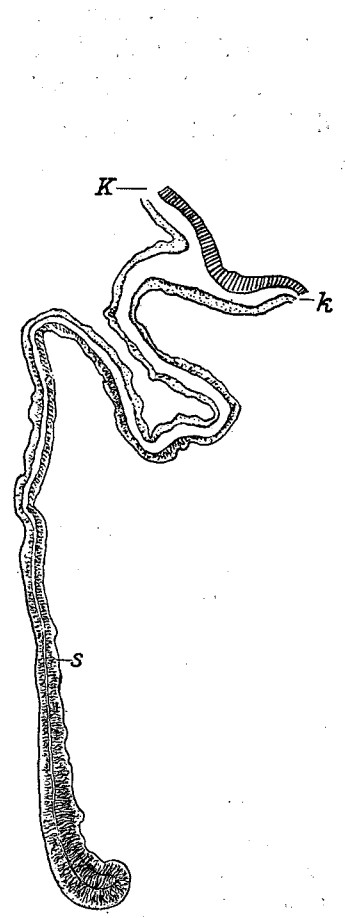


Fig. 58.

Fig. 59.

Figs. 58, 59. *Aureliana georgiana*. Fig. 58. Transverse section of sphincter *K*; *k* column, *s* sphincter. Fig. 59. Transverse section of one directive mesentery below the actinopharynx.

Zoantharia.

Parazoanthus antarcticus n. sp.

Diagnosis: Free colonies (always?) of rather long polyps connected with inconsiderable tube-shaped coenenchyme. Body incrusted with sand-grains situated in the ectoderm and only in the outer part of the mesogloea. Polyps cylindrical, in half contracted state swollen in the distal part. Capitular-ridges very distinct, broad, in

number 16—18. Tentacles rather thick. Sphincter rather weak with coarse folds. Ectoderm of the column very thick. A well developed encircling sinus in the mesogloea. Lacunae rare, probably only excavations from the sinus. Cell-islets absent, but few and scattered, irregular cells in the mesogloea. Actinopharynx with one distinct siphonoglyph, the mesogloea of which is thickened. Mesenteries about 36. Micromesenteries weak. Filaments with very well developed ciliated streaks. In the capitular-region nematocysts with very coiled thread 34—38 × 14—(16) μ, rather common, nematocysts of the filaments with visible basal part to the spiral thread 17—19 × 5.5—6 μ.

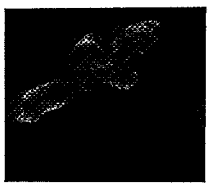


Fig. 60.

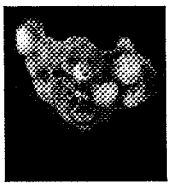


Fig. 62.

Figs. 60, 62. Fig. 60. *Parazoanthus antarcticus.* Fig. 62. *Epizoanthus patagonichus.* Almost natural size.

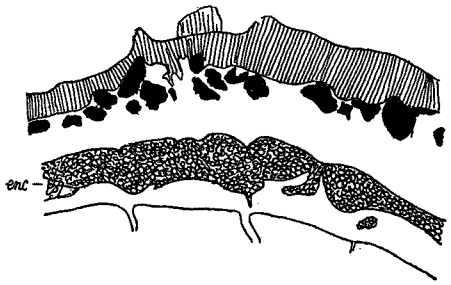


Fig. 61. *Parazoanthus antarcticus.* Transverse section of the column. Endoderm not figured. Incrustations black, *enc* encircling sinus.

Colour in alcohol dirty gray.

Dimensions: Length of the colony 2.4 cm. Breadth of the largest polyps in the distal part 0.45—0.5 cm.

Occurrence: Graham region 63° 50′ S 61° 6′ W. Clay mixed with sand, 290 m. Bottomtemperature — 1.05°. 3. 12. 1902, 1 colony.

The single colony is composed of 4 polyps (fig. 60). They are rather long and irregularly wrinkled on the surface. The incrustation is not very strong. A transversal section of the column is figured in fig. 61

I have sectioned a single polyp. The preservation was not so good as desirable. In one half I counted 18 mesenteries, in the other there are probably 17. The mesenteries were regularly arranged after the macrotypus. The macro-mesenteries contain ovaries.

Epizoanthus patagonichus CARLGR.

Epizoanthus patagonichus n. sp. CARLGREN 1899, p. 38, fig. 1.
» » CARLGR. MC MURRICH 1904, p. 296, Pl. 19. figs. 85, 86.

Diagnosis: Polyps connected with each other by thin, flat coenenchyme or situated close to each other, cylindrical, often somewhat swollen in the distal part

Body wall of the coenenchyme and polyps heavily incrusted with sand-grains filling up almost the whole mesogloea. Capitular-ridges rather indistinct about 18. Ectoderm of the column high with a distinct continuous cuticle. Mesogloea of the column with rather numerous cell islands. Sphincter rather strong, forming in its upper part a network with rather coarse meshes. Siphonoglyph very distinct with thickened mesogloea. Mesenteries about 32—36, micromesenteries weak. Ciliated streaks of the filaments well developed. Capitular region with nematocysts 29—31 × 10—12 μ, filaments (and other part of the mesenteries?) with nematocysts partly 17—19 × 4.5—5 μ, partly 27—31 × 10—12 μ.

Colour in alcohol gray; previously described specimens brownish-yellow. Tentacles in life rust-red (Mc MURRICH).

Dimensions: Length and breadth of the polyps up to 0.4 cm (0.45—0.5 cm, Mc MURRICH).

Occurrence: S of W Falkland Isl. 52° 29′ S 60° 36′ W. Sand and gravel, 197 m. Bottomtemperature +4.1°. 11. 9. 1902, 8 colonies.

Further distribution: Chile Calbuco 20 fms (leg. PLATE, teste Mc MURRICH). East Patagonia 44° 14′ S 61° 23′ W 60 fms (leg. KOPHAMEL).

All eight colonies form a flat thin coenenchyme (fig. 62). Some polyps were strongly contracted and only a little higher than the coenenchyme. No traces of capitular furrows were here to be seen, in the more expanded polyps they were visible as thin spaces. The sectioned polyps were sterile.

II. Some zoogeographical results.

The species of Actiniaria and Zoantharia, of which I here have given diagnosis and more or less complete descriptions, are 48 in number (46 Actiniaria and 2 Zoantharia). To these must be added a species, determined by PAX as *Cymbactis polaris* (CLUBB) but which is probably an *Actinostola*. Before discussing the geographical distribution of the described Actinians I here give a list of the species and also a short survey of the papers treating the antarctic and subantarctic Actinians after the publication of my paper on the Zoantharia in »Hamburger Magelhaensische Sammelreise» 1899, in which the older literature of Actinians from the Magellan and other districts of South America up to 30° S. L. is mentioned. The described Actinians are the following (* species taken below as well as above 200 m; ** species taken only below 200 m; no marks: species taken above 200 m)

**Dactylanthus antarcticus* (CLUBB) p. 2
Corynactis carnea (STUD.) p. 2
**Edwardsia intermedia* Mc MURR. p. 4
Limnactinia nuda n. sp. p. 7
**Halcampoides purpurea* (STUD.) p. 10
Scytophorus antarcticus (PFEFF.) p. 11

Halcampa octocirrata n. sp. p. 14
Parahalcampa (n. gen.) *antarctica* n. sp. p. 15
Alicia uruguayensis n. sp. p. 18
**Condylanthus magellanicus* CARLGR. p. 19
Boloceropsis platei MC MURR. p. 22
Parantheopsis cruentata (COUTH.) p. 24
» *georgiana* (PFEFF.) p. 24
» *ocellata* (LESS.) p. 25
Bunodactis patagoniensis CARLGR. p. 27
» *aucklandica* n. sp. p. 28
» *sulcata* (CLUBB) p. 29
» *octoradiata* (CARLGR.) p. 30
Anthopleura hermaphroditica (CARLGR.) p. 32
**Glyphoperidium bursa* ROULE p. 34
Isotealia antarctica CARLGR. p. 37
***Tealianthus* (n. gen.) *incertus* n. sp. p. 38
Epiactis georgiana n. sp. p. 40
Urticinopsis (n. gen.) *antarctica* (VERR.) p. 42
Paranthus crassa (CARLGR.) p. 44
**Hormosoma scotti* (STEPH.) p. 47
Cnidanthus (n. gen.) *polaris* (CLUBB) p. 50
Isosicyonis (n. gen.) *alba* (STUD.) p. 52
Antholoba achates (DRAYT.) p. 56
***Sicyonis erythrocephala* (PAX) p. 57
**Actinostola intermedia* CARLGR. p. 58
** » *georgiana* n. sp. p. 61
*? » *crassicornis* (HERTW.) p. 63
** *clubbi* n. sp. p. 66
Phelliogeton (n. gen.) *falklandicus* n. sp. p. 68
Synphellia exlex (MC MURR.) p. 71
Thoe patagonicha (CARLGR.) p. 74
» *chilensis* (LESS.) p. 75
Choriactis impatiens (COUTH.) p. 77
* » *laevis* (CARLGR.) p. 79
**Artemidactis victrix* STEPH. p. 84
**Hormathia georgiana* n. sp. p. 85
» *erythrosoma* (PAX) p. 88
» *rhododactyla* (PAX) p. 89
» *castanea* (MC MURR.) p. 90
***Aureliana georgiana* n. sp. p. 91
***Parazoanthus antarcticus* n. sp. p. 93
Epizoanthus patagonichus CARLGR. p. 94
***Actinostola* sp.? p. 52

Let us now turn to the literature after 1899.

In 1902 CLUBB describes two new antarctic species. *Urticina sulcata* and *carlgreni*, from South Victoria Land. The species are, to my mind, identical and belong to the genus *Bunodactis*. In 1903 I mentioned *Condylactis cruentata* and some larvae taken during the Belgica-expedition.

MC MURRICH gives 1904 a survey of the Actinians collected by PLATE at the coast of Chile and Tierra del Fuego. Of the 27 described species only 4, *Parantheopsis cruentata*, *Antholoba achates*, *Choriactis impatiens* and *crassa*, are dredged at Tierra del Fuego, all others are from Chile proper. 10 species of the 27 are described in the present paper namely *Parantheopsis cruentata*, *ocellata*, *Boloceropsis platei*, *Actinostola chilensis* = *intermedia*, *Antholoba achates*, *Choriactis impatiens*, *C. crassa* = *laevis*, *Hormathia* = *Synphellia exlex*, *Chitonanthus* = *Hormathia castanea* and *Epizoanthus patagonichus*. Of the other specimens not examined by myself *Halianthus chilensis* is certainly a *Cactosoma* and *Paractis nivea* a *Paranthus*.

In 1908 CLUBB describes 8 Actiniaria from the National Antarctic (Discovery)

Expedition, of which 2 species, *Parantheopsis cruentata* and *Cribrina* = *Bunodactis octoradiata* from Falkland Islands, and 1 species, *Cribrina hermaphroditica* = *Bunodactis aucklandica* from Auckland Islands and 5 from the Antarctis (South Victoria Land) namely *Paractis* = *Cnidanthus polaris*, *Paractis papaver* = *Hormosoma scotti*, *Actinostola chilensis* = *clubbi*, *Cystiactis* = *Dactylanthus antarcticus* and *Rhodactinia crassicornis* = *Urticinopsis antarctica*. I have examined the species except those from Falkland Islands, which are certainly correctly determined.

In 1911 ROULE mentions 3 antarctic species, *Glyphostylum calyx*, *Glyphoperidium bursa* and *vas* from the French Antarctic Expedition. I have not seen the type-species and cannot say anything as to *Glyphostylum* (possibly identical with *Glyphoperidium*). Specimens which undoubtedly belong to *Glyphoperidium bursa* and *vas* I have examined from several localities. To my mind both species are identical.

The present author gives 1911 a more complete description of *Dactylanthus* (*Cystiactis*) *antarcticus* from the Graham region and points out its systematic place and in 1914 (Scottish Nat. Antarctic Exp.) and 1918 he describes *Actinernus* (*Porponia*) *antarcticus* from Coats land.

In 1913 REES describes »*Actinostola callosa* = *Dysactis crassicornis*» from Kings George's Bay, W. Falkland. This species is probably nothing but *Antholoba achates* (compare the colour).

In 1918 STEPHENSON gives a report of the Actiniaria collected during the British Antarctic (Terra nova) Expedition. Of the 15 species mentioned here 7 species are from Antarctic (South Victoria land and Ross sea) namely *Halcampoides* (probably *Cactosoma*) *aspera*, *Dactylanthus antarcticus*, *Hormosoma scotti*, *Lilliella* = *Hormathia lacunifera*, *Cymbactis* = *Stomphia selaginella*, *Artemidactis victrix* and *Leptoteichus insignis*, and one species *Bolocera longicornis* possibly = *kerguelensis* from Falkland Islands. I have not examined these specimens.

In 1922 PAX gives diagnoses of new Actiniaria collected during the French South-Polar (Pourquoi pas) expedition and the German South-Polar expedition. Of the 26 species 17 are from the latter expedition and of those 5 from Antarctis (Emperor Wilhelm's land), namely *Isotealia pachyderma*, *Cymbactis frigida*, *Antholoba epizoica*, *Sagartia antarctica* and *minima*, and 6 from Kerguelen: *Halcampoides kerguelensis* = probably *purpurea*, *Condylactis crassa* = *Parantheoides cruentata*, *Bunodactis vanhöffeni*, *Rhytidactis antarctica*, *Dimyactis duplicata* and *Sagartia kerguelensis*. I have not examined these specimens. On the other hand, I have revised the whole collection from Pourquoi pas expedition, of which PAX 1923 gives a nearer report. Unfortunately, the interior of the collected specimens is badly preserved, inasmuch as the mesenteries are strongly compressed and the filaments mostly strongly sticking to each other. Also PAX' description of the species is a splendid example of how not to do it. It is astonishing to read such a paper by an author who wants

to pass for a specialist in Actinians. Most of the species are incorrectly determined to the genus, and there are many incorrect observations. Two species *Cymbactis* = *Sicyonis erythrocephala* and *Cymbactis polaris*, probably an *Actinostola*, are from Alexander land, the other, *Halcampoides macrodactyla* = *purpurea*, *Epiactis stephensoni* = *Glyphoperidium bursa*, *Isotealia antarctica* = *Tealianthus incertus*, *Hormosoma violaceum* = *scotti*, *Actinostola rufostriata* = *Hormosoma scotti*, *Paranthus* = *Hormathia erythrosoma*, *Parantheoides* = *Hormathia rhododactyla*, *Choriactis opalescens* and *crassoides* = *laevis*, from South Shetland Islands.

Finally the present author gives (1924) a report of MORTENSEN's collection of Actinians from New Zealand and its subantarctic islands. Although is is questionable, if the Campbell and Auckland islands are to be referred to the purely subantarctic regions, I have mentioned this paper here. The described species from these islands are: *Edwardsia tricolor*, *Condylanthus aucklandicus*, *Actinia tenebrosa*, *Parantheopsis cruentata*, *Bunodactis mortenseni*, *Synphellia aucklandica*. To these *Sagartia alboviridis* KIRK and STUCKEY, not examined by me, is to add (compare literature CARLGREN 1924 a).

It is not my intention to discuss the antarctic and subantarctic Actinians in general here. I hope ere long to take up this question in connection with the working out of another paper from these regions. It may, however, be suitable to make a comparison between the subantarctic and the antarctic regions south of the Atlantic Ocean. I give first a list of the Actinians found in the different regions with additions and corrections to that by PAX (1923, p. 25).

Alexander land.

***Sicyonis erythrocephala* (PAX)
***Actinostola* sp?

Westantarctis.

**Dactylanthus antarcticus* (CLUBB)
**Edwardsia intermedia* MC MURR.
***Halcampoides purpurea* (STUD.)
Glyphoperidium bursa ROULE
Glyphostylum calyx ROULE
***Parazoanthus antarcticus* CARLGR.

South Shetland Islands.

***Halcampoides purpurea* (STUD.)
Glyphoperidium bursa ROULE
***Tealianthus incertus* CARLGR.
Hormosoma scotti STEPH.
Hormathia erythrosoma (PAX)
Hormathia rhododactyla (PAX)
**Choriactis laevis* (CARLGR.)

Shagrock bank.

Glyphoperidium bursa ROULE
Hormathia georgiana CARLGR.

Falkland Islands.

(*Actinia? macloviana* LES.)
Parantheopsis cruentata (COUTH.)
***Bolocera longicornis* CARLGR.?
Bunodactis octoradiata (CARLGR.)
Antholoba achates (DRAY.)
Phelliogeton falklandicus (CARLGR.)
Epizoanthus patagonichus CARLGR.

Burdwood bank.

Artemidactis victrix STEPH.

Actinostola crassicornis (HERTW.)
Choriactis laevis (CARLGR.)

South Orkney Islands.

Glyphoperidium bursa ROULE
Stomphia selaginella (STEPH.)
Choriactis laevis CARLGR.
Artemidactis victrix STEPH.

Off Coats land.

***Actinernus antarcticus* (CARLGR.)
***Epiactis* sp.?, ***Sicyonis* sp.?

South Georgia.

Edwardsia intermedia MC MURR.
Limnactinia nuda CARLGR.
**Halcampoides purpurea* (STUD.)
Scytophorus antarcticus (PFEFF.)
Halcampa octocirrata CARLGR.
Parantheopsis georgiana (PFEFF.)
***Glyphoperidium bursa* ROULE
Epiactis georgiana CARLGR.
Hormosoma scotti STEPH.
***Actinostola georgiana* CARLGR.
Sagartia georgiana CARLGR.
**Artemidactis victrix* STEPH.
***Hormathia georgiana* CARLGR.
***Aureliana georgiana* CARLGR.

Tierra del Fuego and Magellan Strait.

Edwardsia intermedia MC MURR.
Parahalcampa antarctica CARLGR.
Condylanthus magellanicus CARLGR.
Bolocera occidua MC MURR.
Parantheopsis cruentata (COUTH.)
Bunodactis octoradiata (CARLGR.)
Leiotealia! badia MC MURR.
Antiparactis lineolata (MC MURR.)
Antholoba achates (DRAYT.)
Dysactis! rhodora HERTW.
**Actinostola intermedia* CARLGR.
Actinostola crassicornis (HERTW.)
Choriactis impatiens (COUTH.)
Choriactis laevis (CARLGR.)
***Hormathia pectinata* (HERTW.)
Stoichactis?[1] *fuegiensis* (DANA)
Parazoanthus fuegiensis CARLGR.

Comparing the Actinians from South Georgia with those from the other regions we find no identical species at South Georgia and Falkland islands, one species, *Edwardsia intermedia*, is common to S. Georgia and the Fuegal region, one species, *Artemidactis victrix*, is dredged at S. Georgia as well as at Burdwood bank and South Orkney Islands, two species, *Glyphoperidium bursa* and *Edwardsia intermedia*, are common to S. Georgia and Westantarctis, three species, the mentioned *Glyphoperidium*, *Hormosoma* and *Halcampoides purpurea* are taken at S. Georgia as well as at South Shetland islands and two species, *Glyphoperidium* and *Artemidactis* are common to S. Georgia and South Orkney islands. The 2 species, *Glyphoperidium* and *Hormathia georgiana*, found at Shag Rock bank, are present also at S. Georgia. Of these species *Edwardsia intermedia* is taken also in S. Chile. *Glyphoperidium bursa* also at Bouvet Island and at Queen Mary Land, this species as also *Hormosoma* and *Artemidactis*, the latter occurring also at South Victoria Land, besides *Hormosoma*

[1] According to the description of MC MURRICH (1893) this species cannot be a *Discosoma* but rather a *Stoichactis*. I very much doubt, however, that this species is a Stichodactylin Actinian, if not a *Corynactis*.

at Queen Mary Land and *Artemidactis* at Adelie Land, are probably circumpolar. *Halcampoides* seems to be a cosmopolite although it is most numerous in the arctic and antarctic regions (compare CARLGREN (1921, p. 84—85). *Hormathia georgiana* is known only from S. Georgia and Shag Rock bank. More than half of all the S. Georgia-species are not found in another region, of the other species the greater part belongs to the antarctic fauna. Thus as to the Actinians there are strong reasons to regard South Georgia as a transition-region between the subantarctic (Fuegal) and the pure antarctic regions. A similar conclusion EKMAN (Holothurien in Further zool. results of the Swedish Antarctic expedition, I: 6, Stockholm 1925, p. 166—167), as before him KOEHLER (compare EKMAN), has drawn from his examination of the Holothurians, a paper I did not read until I had taken my position with regard to the zoogeographical character of the marine fauna of S. Georgia.

The Actinian fauna of the Fuegal region (incl. Magellan Strait) is nearly related to that of the Falkland Islands. The tree littoral forms, *Parantheopsis cruentata*, *Bunodactis octoradiata* and *Antholoba achates* seem to be common in both these regions. *P. cruentata* has a large subantarctic distribution, occurring also at Kerguelen, Campbell and Aucklands and Macquarie islands and, according to MC MURRICH, also at South Chile. Also *A. achates* has a wide distribution, appearing also along the west-coast of South America and at Patagonia. Another of the Magellan-species, *Condylanthus magellanicus*, is found also south of Africa and a nearly related species, *aucklandicus* at Auckland islands.

Only a single species, *Edwardsia intermedia*, is common to Tierra del Fuego and Westantarctis. Two species, *Actinostola crassicornis* and *Choriactis laevis*, from Burdwood bank occur also in the Fuegal region, the latter also at South Shetland Islands. Besides it is remarkable, that one specimen of *Artemidactis victrix*, certainly an antarctic form, so common at South Georgia, was also found on Burdwood bank. Is there perhaps an unknown submarine ridge between South Georgia and Burdwood bank (compare NORDENSKJÖLD, Wiss. Ergebn. Schwed. Südpolar Exp. I: 2, 1917, p. 6) facilitating the distribution of the fauna?

Also with the Actinian fauna of Chile and Patagonia the Fuegal fauna shows relations. I will, however, not discuss this question at present, especially as the Actinian fauna of Patagonia is imperfectly known.

Further examinations of the subantarctic and antarctic forms may probably bring forth other circumpolar species. To these is probably to be added, besides the before mentioned, also *Stomphia selaginella*, dredged at South Orkney Islands, Queen Mary Land, Adelie Land, South Victoria Land and in Ross sea and *Dactylanthus antarcticus*.

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