AUSTRALASIAN ANTARCTIC EXPEDITION

1911-14.

UNDER THE LEADERSHIP OF SIR DOUGLAS MAWSON, O.B.E., D.Sc., B.E., F.R.S.

SCIENTIFIC REPORTS.

SERIES C.—ZOOLOGY AND BOTANY.

EDITED BY ACTING PROFESSOR E. A. BRIGGS, M.Sc.,
UNIVERSITY OF SYDNEY.

VOL. IX. PART II.

ACTINIARIA.

BY

OSKAR CARLGREN,
UNIVERSITETES ZOOLOGISKA INSTITUTION, LUND,

AND

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WITH EIGHTEEN FIGURES IN TEXT

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CONTENTS.

ACTINIARIA.

BY

Professor OSKAR CARLGREN, Universitetes Zoologiska Institution, Lund; and
T. A. STEPHENSON, D.Sc., Zoology Department, University College, London.

WITH EIGHTEEN TEXT FIGURES.

THE examination of this collection was started by my colleague, Dr. T. A. Stephenson. He made preliminary dissections of most of the species, and numerous slides, which I have somewhat completed, and also identified some species. As, however, my colleague had not time to finish the examination he made over the collection to me, together with the slides and some introductory notes on the species, dealing with both their external features and their anatomy. Although I alone am answerable for the results of the examination here published, except for the observations of Stephenson mentioned in the text, my colleague has facilitated my work so much, that both our names may properly stand as authors of this paper.

OSKAR CARLGREN.

Lund, March 1927.

The collection contained fourteen species, of which five are new :—

1. *Corallimorphus antarcticus* n.sp.
2. *Corallimorphus rigidus* Moseley.
3. *Halianthella kerguelensis* (Stud.).
4. *Parantheopsis* (*Condylactis*) *cruentata* (Couth.)
5. *Glyphoperidium bursa* Roule.
6. *Bunodactis sulcata* (Clubb).
7. *Epiactis crateriformis* n.sp.
8. *Epiactis adeliana* n.sp.
9. *Sicyonis aurora* n.sp.
10. *Hormosoma scotti* Stephenson.
11. *Stomphia selaginella* (Stephenson).
12. *Artemidactis victrix* Stephenson.
13. *Hormathia lacunifera* (Stephenson).
14. *Aurelania tricirrata* n.sp.

Genus CORALLIMORPHUS *Moseley*.

The four hitherto described *Corallimorphus*-species, *C. rigidus*, *profundus*, *obtectus* and *ingens*, agree in both their exterior and their organisation so much with each other that it is very difficult to define distinct characteristics for the different species. Stephenson (1920 *a*) has some doubt whether or no the three first species (the very imperfectly described *C. ingens* was then unknown to him) are one and the same form. "It looks," Stephenson says (1920 *a*, p. 184), "as if the differences in tentacle numbers and body-wall furrows were individual, nutritional, or other variations. It is conceivable that '*C. profundus*' is constituted by specimens which grow up quickly and attain large size before forming more than 12 disc-tentacles, and, perhaps, then cease growth, as far as tentacle-formation goes." Unfortunately, the examination of previous collections of *Corallimorphus* containing only a few specimens, and mostly dredged in different localities, gives no certain information as to the correctness of Stephenson's suggestion. Of these specimens only eight were closely examined as to the arrangement of the tentacles. I can now give some new details of the arrangement of tentacles in this genus. In all I have examined sixteen new specimens of *Corallimorphus*, eight of which are from a place in the vicinity of Cape Bojador (habitat somewhat uncertain, possibly west of Canary Islands) and five from practically one locality (E. Africa, near Somaliland). Although I cannot go into detail here, I give in the following table some information as to the size of the new specimens compared with the number and arrangement of tentacles:—

Habitat.	Size of oral disc.	Number of—		Relation between the number of disc- and marginal tentacles.	Number of tentacles in the second cycle of disc-tentacles.
		Disc-tentacles.	Marginal tentacles.		
Eight Bojador specimens	5·5 × 6–9 × 10 cm.	35–44	72–88	1 : 2–2·06	(11) 12–16
Antarktis (see below), one specimen ...	1·9 cm. on the short side.	17	56 (57)	1 : 3·3	11
Five specimens, Somaliland	2–6 cm.	23–34	54–68	1 : 2–2·7	6
One specimen off Biscay Bay ...	4·4 × 4 cm. ...	18	43	1 : 2·4	5
One specimen S.W. of Tasmania (see below).	4·3 cm.	23	48	1 : 2·09	6

Comparing this table with that given by Stephenson of the specimens examined before, it seems as if we could distinguish two types, the one with (11) 12 or more disc-tentacles of the second order, the other with (5) 6 (7) such. (In the few specimens with only 5 or only 11 disc-tentacles, one tentacle has miscarried). In the former type at least a doubling of the disc-tentacles in the second cycle has taken place, in the latter type no doubling (in a specimen of *C. profundus* with seven disc-tentacles of the second order Hertwig (1882), states that there is a doubling of these

tentacles in one sextant). To the first type, the eight Bojador specimens, the Irish specimens, and *C. antarcticus* (see below) belong; to the latter type (the *rigidus* type) all other specimens. Though the material of known *Corallimorphus*-species is comparatively poor, the specimens from each locality, as a rule, show good agreement as to the disc-tentacles of the second order; it thus seems probable that we have to do with at least two species of *Corallimorphus*. But the forms belonging to these two " species " also show differences. A retardation in the development of disc-tentacles we meet in a small specimen of *C. rigidus* and in the two specimens of *C. profundus*. Here the relations between the number of disc- and marginal tentacles is 1 : 4. A similar retardation has taken place also in *C. antarcticus*. Here the relation between the number of disc- and marginal tentacles is 1 : 3·3. Whether a richer development of disc-tentacles in a later stage arises in this specimen, so that the relation between the number of disc- and marginal tentacles approaches 1 : 2, we do not know. Finally, as to *Corallimorphus ingens*, this form is so imperfectly described (1918) that we cannot say with certainty to which type it belongs. For one specimen (oral disc 8 x 7·5 cm.) Gravier states that the 23 disc-tentacles are arranged in three cycles, but he gives no information as to the number of disc-tentacles of the second order.

Provisionally it seems best to retain Hertwig's species *rigidus* and *profundus*. The small known differences between *rigidus* and *obtectus* are probably of no systematic signification. Of the specimens in the present collection the one may be *rigidus*; the other from the Antarctic is here described as a new species.

1. *Corallimorphus antarcticus* n.sp.

Diagnosis.—Body fairly tall in proportion to width, more or less trumpet-shaped, wider above than below. Column comparatively thin-walled, but rigid and provided with longitudinal ridges. Disc conical, thin, with broad radial ridges. Disc-tentacles (in the single specimen) probably 17 (6 + 11 + 0), marginal-tentacles 56 (6 + 12 + 18 + 20). Relation between the number of disc- and marginal tentacles 1 : 3·3. Marginal tentacles comparatively long, close to the margin, so that even the innermost have their aboral side continuous with the margin. Actinopharynx neatly ridged longitudinally. Siphonoglyphs ? Stinging capsules in the nematospheres of the tentacles partly (144) 173–209 × 17–19 μ, partly 130–197 × 5·5–11 μ (the latter with distinct basal part to the spiral thread); those in the stems of the tentacles 60–79 × 7–9 μ, few in number, and of the same structure as the second type in the nematospheres; those of the actinopharynx 41–48 × 9–11 μ, those of the filaments 60–89 × 14–18 μ; there are also smaller spirocysts in all regions of the tentacles.

Colour in life. Unknown.

Dimensions.—Breadth of the shorter side of the oral disc 1·7 cm. Height of the body about 1·1 cm. Inner marginal tentacles up to 1·1 cm. long.

Occurrence.—65° 6′ S., 96° 13′ E. Temperature—1. 65·325 fms. One specimen.

External Characters.—Stephenson has sectionised a part of the specimen, so that I cannot control his figure of the arrangement of the tentacles over the whole area of the oral disc. The remaining part of the specimen embraces almost two-thirds of the oral disc. The arrangement of the tentacles is shown in figure 1. In this figure I have drawn the part which was sectionised from Stephenson's sketch of this area. The

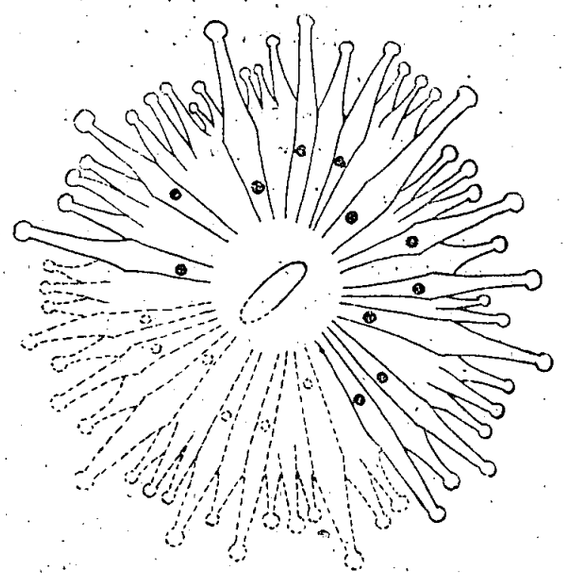

Fig. 1.

latter, however, shows half of the disc, and thus contains more tentacles than the sectionised region. The tentacles not examined by me are dotted in. I think the arrangement of the tentacles may be that indicated in the diagnosis.

Anatomical Description.—The anatomy agrees with that of other species of *Corallimorphus*, so that it is unnecessary to recapitulate it. The ectoderm of the body is high, but considerably thinner than the very high endoderm. Granular gland-cells seem to be absent from both layers; on the other hand, large homogeneous gland-cells are present. The ectodermal longitudinal muscles in the column are distinct, but weak.

2. *Corallimorphus rigidus* Moseley.

Corallimorphus rigidus, n.sp., Moseley, 1877, Pl. 45, figs. 9–10; R. Hertwig, 1882, p. 20, Pl. 2, figs. 1, 4–6; 1888, p. 9; Andres, 1883, p. 485; Stephenson, 1922, p. 302; (not *rigidus* Stephenson, 1920, p. 179).

Corallimorphus obtectus, n.sp., R. Hertwig, 1888, p. 10; Stephenson, 1922 302.

Colour.—The preserved specimen was uncoloured.

Dimensions.—Height of the column, 1·6 cm. Breadth of the pedal disc, 3·2 × 2·5 cm.; of the oral disc, about 4·4 cm.

Occurrence.—35° 55·5′ S., 134° 18′ E. 1,800 fms. 24th February, 1914. One specimen.

The preservation of the single specimen was not good, the ectoderm being mostly lost. Base less broad than disc, insertions showing through, limbus a little incurled. Low cake-like body, rigid and gelatinous, the insertions of the mesenteries show through as streaks. The disc-tentacles 6 + 6 + 11 = 23 (one tentacle of the third order is lacking at the side of one directive pair (?)).

Marginal-tentacles, 6 + 6 + 12 + 24 = 48.

Mesenteries probably 24 pairs. Because of the bad preservation of the specimen I have not given any diagnosis here. I will come back to a more detailed description in another paper based on better preserved material, and to the distribution of the species.

3. *Halianthella kerguelensis* (Stud.) Kwietn.

Edwardsia kerguelensis, n.sp., Studer, 1878, p. 546, Pl. 5, fig. 21*a*, *b*, *c*.

Edwardsiella kerguelensis (Stud.), Andres, 1883, p. 306.

Halianthella kerguelensis (Stud.), Kwietniewski, 1896, p. 588, Pl. 15, figs. 5, 6, Pl. 16, fig. 8; Carlgren, 1921, p. 185.

Marsupifer valdiviæ, n.sp., Carlgren, 1901, p. 475, figs. 11–13; Pax., 1914, p. 481, fig. 117; Stephenson, 1920, p. 526.

Halianthella valdiviæ (Carlgr.), Pax, 1925, p. 799, fig. 709.

Colour.—Scapus yellowish.

Dimensions.—Of the largest specimen—Length about 2 cm., breadth of the body, 0·9–1·1 cm. Of the smallest specimen—Length 1·1 cm., breadth at the base, 0·8–0·5 cm.; at the distal end, 0·4 cm.

Occurrence.—Macquarie Island, shore collection, seven specimens.

Further Distribution (Kerguelen Islands).

A diagnosis and a closer description of this species I will give in my paper on the Actiniaria of the German Deep-Sea Expedition. The present specimens were all strongly contracted and flattened in the proximal region, but there was no distinct limbus indicating the presence of a real pedal disc. The proximal flattened part

was also like the other parts of the scapus in structure, and the parietal muscles were continued into the flattened part. The specimens were cylindrical, one specimen conical. Six specimens examined had twenty-four tentacles. The mesogloeal sphincter is double, and agrees well with that of the specimen from the German expedition, and also with that of the co-type examined by Kwietniewski; although the muscle-meshes here, as also in the specimen from the German expedition, are more numerous. The cnidæ agree rather well in the specimens from Macquarie Island and Kerguelen.

A specimen sectionised by Stephenson was provided with embryos in different stages in the cœlenteric cavity, and other embryos were present in an ectodermal pocket. On account of the strong contraction, and the tearing of the sections (due to sand grains) I cannot be sure whether the embryos in the cœlenteric cavity are embryos which have not emigrated to the brood-pouch, or whether they have entered the cœlenteron by breaking of the brood-pouch. I think the latter is the case, because the thinner part of the brood-pouch is considerably damaged. I have not examined the co-type *H. kerguelensis*, but undoubtedly *Marsupifer valdiviæ* and *H. kerguelensis* are synonymous. Studer's figure 21 suggests also that *kerguelensis* is provided with brood-pouches. In the proximal part there is, as far as I can understand, an adherent young one.

4. *Parantheopsis cruentata* (Couth.) McMurr.

Literature, &c.—See Carlgren, 1924, p. 201; Carlgren, 1927.

Colour.—Carlgren, 1924, p. 202.

Dimensions.—Carlgren, 1924, p. 202.

The specimens were often much deformed, with the inside out. A well-preserved specimen was 3·6 cm. high, 2 cm. broad at the pedal disc, and 1·5 at the distal end. Larger specimens were also present, but so deformed that it was impossible to give exact measurements.

Occurrence.—Macquarie Island, shore collection. Several specimens. Further distribution, see Carlgren, 1924, p. 202.

I have nothing to add to the description given by me and other authors. The specimens were mostly larger than those before described. The size of the nematocysts and spirocysts agrees well with that in specimens earlier described. The nematocysts of the tentacles seem, however, to be somewhat broader.

5. *Glyphoperidium bursa* Roule.

Glyphoperidium bursa, n.sp., Roule, 1911, p. 11, Pl. 2; Pax, 1923, p. 25, 26; Carlgren, 1927, figs. 26, 27.

Glyphoperidium vas, n.sp., Roule, 1911; p. 13, Pl. 3; Pax, 1923, p. 25, 26.

Epiactis bursa Roule, Stephenson, 1922, p. 274.

Epiactis vas Roule, Stephenson, 1922, p. 275.

Epiactis (?) *stephensoni* n.sp., Pax, 1922, p. 80, fig. 3; 1923, p. 6, Pl. 1, figs. 7, 8.

Diagnosis and Colour.—See Carlgren, 1927. Column in preserved state mostly brown.

Dimensions.—The specimens from St. 11 were of the usual large size, but rather deformed; the specimens from St. 10 small, the smallest specimen was 0·5 cm. high and 0·7 cm. broad in the contracted state.

Occurrence.—65° 6′ S., 96° 13′ E. Temperature, −1·65°. 325 fms. St. 10. Fifteen specimens.

66° 44′ S., 97° 28′ E. 358 fms. St. 10. Three specimens.

I described this species in detail in 1927. Stephenson has also examined some parts of the anatomy of the specimens in the present collection. His statements agree with those given by myself in 1927. The base of the smaller specimens is usually attached to a spine, so that it is crack-like. The sphincter is comparatively better developed in young specimens than in older ones. It seems as if the sphincter increases in size more slowly than the animal itself. The tentacles of young specimens can therefore, in contrast to those in older specimens, certainly be covered completely by the body wall. In two small contracted specimens, only the tips of some of the tentacles were visible, and in one specimen only parts of the tentacles were apparent inside the imperfectly closed sphincter.

6. *Bunodactis sulcata* (Clubb).

Literature and Diagnosis.—See Carlgren, 1927.

Colour.—See Carlgren, 1927. Actinopharynx in the present specimens brownish.

Dimensions of the largest specimen.—Greatest height, 6·5 cm.; greatest breadth, about 4 cm. Another specimen—Height, 4·5 cm.; greatest breadth, 5 cm.

Occurrence.—65° 20′ S., 95° 27′ E. 240 fms. Temperature, + 1·38°. St. 9. Three specimens.

As I have stated before (Carlgren, 1924, p. 196) this species is a *Bunodactis*. After an examination of "*Urticina*" *sulcata* and *carlgreni* (Carlgren, 1927) from the collection described by Clubb (1902), I cannot find any differences between these two species. To the description of Clubb I have not much to add. The radial muscles of the oral disc were ectodermal, very weak at the insertions of the mesenteries. The aboral prolongations of the siphonoglyphs were well developed. There were numerous cells in the mesoglœa of the ciliated tracts of the filaments. Clubb states that all mesenteries are fertile except the directives. In the specimen with brood-pouches (see below) the directives also were fertile. In another specimen examined by Stephenson he says that apparently all mesenteries are fertile save one pair of directives.

According to Clubb the embryos develop in special brood-chambers, invaginations from the body wall. He states that in the upper part of the females there is a groove running completely round the animal, and from this groove usually 4–6 brood-chambers have become invaginated into the spaces between the mesenteries. He adds (1902, p. 301) " horizontal sections, however, show that the partition walls between adjacent invaginations have broken down and the cavities are more or less continuous, but extend deeper in the mesenteric spaces." I have not sectionised transversely the two specimens of Clubb's (one of *sulcata* and one of *carlgreni*) the externals and nematocysts of which I examined, so that I cannot confirm Clubb's statement on his own specimens, but judging from the examination of one of the specimens in the present collection I think that Clubb's supposition that the walls between the brood-pouches have broken down, is incorrect. It is true that the first examination of a transverse section of the brood-pouches in this specimen showed an appearance suggesting the correctness of Clubb's statement. The brood-pouches, containing here twelve large embryos, formed more or less deep cavities between the mesenteries, which communicated with each other by more or less large rounded openings. A closer examination revealed, however, that at one single place there was no opening between the brood-chambers, but the mesenteries were continuous. This made me look for the openings of the brood-chambers on the column wall. To my astonishment it became evident that there was only a single but very distinct opening about 0·7 cm. broad, almost on the opposite side to the continuous mesenteries. Thus it is clear that we have to do not with several brood-chambers, but with a single brood-pouch, and that the walls between the independent brood-chambers have not broken down. From the circular groove a single invagination has taken place, dividing into two branches, the one longer than the other. These increase at the same time as the embryos grow, squeeze through the mesenteries, and finally form an almost circular pocket, the two branches only separated from each other by a few mesenteries. In this pocket the embryos make more or less deep projections. Several points in Clubb's description tend to confirm my explanation.

The embryos in the brood-pouch were large, the largest 1·1 cm. high, and about 1·3 cm. broad, in the contracted state. The pedal disc was thin and often drawn out in its centre into a cone, caused by a large clump of food-yolk. A closer examination

of this yolk, which is sometimes present in other regions of the cœlenteric cavity, shows that it consists of fat-globules. The column was provided with longitudinal furrows corresponding to the insertions of mesenteries, and with twelve longitudinal rows of

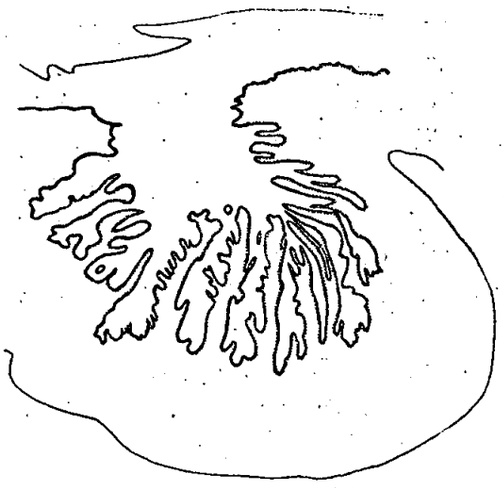

Fig. 2.

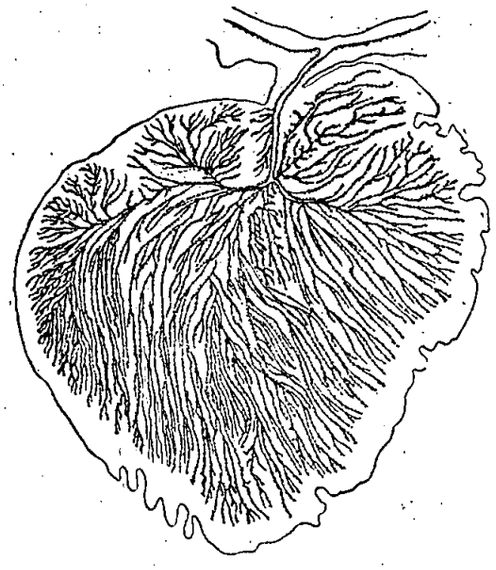

Fig. 3.

verrucæ most distinct in the upper part. The sphincter (fig. 2) shows a more robust appearance than in the ripe specimen (fig. 3), and forms only a few coarse folds. There were 24 tentacles, 24 mesenteries in the uppermost part, 48 in the lower. The nematocysts in the young were somewhat shorter than in the older specimens, those of the column partly 17–23 × 2–2·5 μ, partly 29–38 × about 5 μ; those of the tentacles 17–25 × (2) 2·5 μ; those of the actinopharynx 26–38 × 2·5–3·5 μ.

7. *Epiactis crateriformis* n.sp.

Diagnosis.—Pedal disc very broad. Upper part of the column, in an introverted state, crateriform. Fossa very deep. Sphincter very strong, circumscript, with a single main lamella and very close folds. Tentacles about 68–82, not hexamerously arranged, stout and blunt, longitudinally sulcated in a contracted state. Tentacles the same in number as the mesenteries. Longitudinal muscles of the tentacles and radial muscles of the oral disc ectodermal. Actinopharynx with numerous longitudinal ridges and two deep siphonoglyphs aborally prolonged. Arrangement of the mesenteries irregular, sometimes decamerous. Two pairs of directives symmetrically or almost symmetrically arranged. All mesenteries perfect. Pennons of the mesenteries diffuse, with high, often branched folds. Parietobasilar muscles strong, forming a distinct elevation on the mesenteries. Mesoglœa of the ciliated tract in the filaments with numerous cells. All mesenteries fertile, the directives, however, with or without reproductive organs. Nematocysts of the column 19–22 × 2μ; those of the tentacles 34–39 × about 2·5μ; those of the actinopharynx partly 35–39 × 2·5–3μ, partly 29–33 × 4·5–5μ (the latter broader at the basal end and with a conspicuous basal part to the spiral thread). Spirocysts of the tentacles 26 × 2·5 – 60 × about 5μ.

Colour.—Unknown.

Dimensions of the two largest specimens in the contracted state.—Breadth of the pedal disc, 3–3·5 cm.; height of the column, 2·5–3·3 cm.; inner tentacles about 0·8–0·9 cm. long and 0·4 cm. wide at the base.

Occurrence.—66° 32′ S., 141° 39′ E. 157 fms. St. 3. 31st December, 1913. Two specimens.

65° 48′ S., 137° 32′ E. 230 fms. St. 4. 2nd January, 1914. Two specimens.

External Characters.—The pedal disc is very broad and irregularly wrinkled. The column is provided with longitudinal furrows corresponding to the insertions of the mesenteries. These furrows are, however, not always distinct because of the strong contraction of the body in the longitudinal direction. There are no verrucæ. The

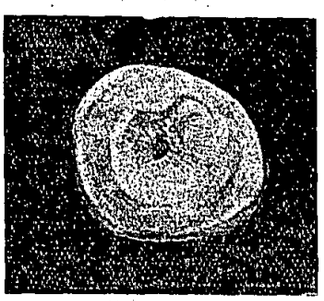

Fig. 4.

uppermost part of the column shows, in the contracted state of the body, a characteristic appearance, recalling a little that of *Asteractis* inasmuch as the part situated below the sphincter, the fossa-region, has a ruff-like appearance. This ruff is most distinct in the

specimen figured (fig. 4), but in the other specimens also, which are more compressed in their upper part, it is clearly visible. Regarded from the distal end the upper part is crateriform, and the sphincter is situated around the pit in the centre. The fossa is extraordinarily deep. The tentacles are stout and blunt, and longitudinally sulcated in contraction. Their number agrees with that of the mesenteries. In one specimen, examined by Stephenson, the tentacles may be 80; in another specimen the number was 68, and in a third specimen probably 82 as there were 82 mesenteries. The oral disc is smooth. The actinopharynx is well developed with numerous longitudinal ridges and furrows. The two siphonoglyphs are deep, with long aboral prolongations.

Anatomical Description.—The mesoglœa of the column contains numerous cells, poor in cytoplasm; also, in the mesoglœa of other parts of the body the cells are numerous, especially in the ciliated tracts of the filaments, where they are closely packed. In the tentacles they are more sparse. The endodermal muscles of the column are rather weak, the sphincter, however, very strong. It is circumscript, with a single, thin, main lamella distally divided into a few branches. The folds issuing from the main lamella are high and closely packed (fig. 5). The longitudinal muscles

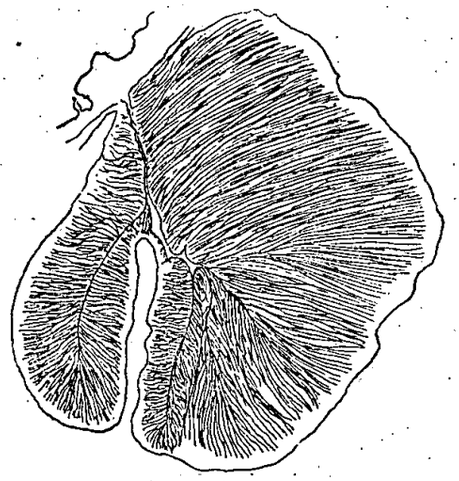

Fig. 5.

of the tentacles and the radial muscles of the oral disc are ectodermal, well developed, and palisade-like. The folds are sometimes a little branched and commonly weaker in the furrows, on the tentacles, and at the insertions of the mesenteries on the oral disc. The ectoderm of the actinopharynx is high and contains numerous mucus-cells and sparse granular gland-cells.

The mesenteries are somewhat irregularly arranged. In one specimen there are thirty-four pairs, sixteen on each side of the two directive pairs; another specimen was provided with forty-one pairs, nineteen on one side of the directive pairs, twenty

on the other; in a third specimen the number of pairs was probably forty, eighteen pairs on one side of the directives. All mesenteries were perfect. The pennons of the mesenteries are well developed and diffuse. The high and often ramified folds are often of about the same height (fig. 6). The parietobasilar muscles are strong and form a

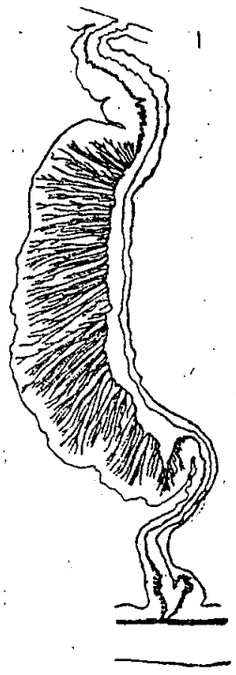

Fig. 6.

distinct elevation on the mesenteries. Between the main lamellæ of the mesenteries and the lamellæ of the parietobasilar muscles there are muscle-meshes enclosed in the mesoglœa. The basilar muscles are distinct. In the ciliated tract of the filaments the mesoglœa is very strong. All mesenteries are fertile, sometimes with the exception of the directives. As I have observed reproductive organs on one directive mesentery, there is no doubt that even these mesenteries can produce such organs. The species is dicœcious.

8. *Epiactis adeliana* n. sp.

Diagnosis.—Pedal disc and fossa well developed. Sphincter strong, pinnate, circumscript. Tentacles short, seventy-eight in number, not so numerous as the mesenteries. Longitudinal muscles of the tentacles and radial muscles of the oral disc ectodermal, strong, with close palisade-like folds. Two siphonoglyphs symmetrically arranged. Pairs of mesenteries hexamerously arranged, forty-eight (or forty-nine) with two pairs of directives. At least twenty-four pairs perfect. Pennons of the mesenteries strong, diffuse, with high folds branched in the distal parts. The pennons of the younger mesenteries often more concentrated. Region of the parietobasilar muscles in the lower part of the stronger mesenteries often almost completely separated from the main lamella. Reproductive organs (?). Nematocysts of the column about

24 × 2·5 μ; those of the tentacles partly 34–49 × about 2·5μ (numerous), partly 22–24 × 2μ (few); those of the actinopharynx partly 35–41 × 3–3·5μ, partly 30–34 × 5μ (visible basal part to the spiral thread); spirocysts of the tentacles 19 × 1·5μ–about 38 × 2·5μ (?).

Colour.—Unknown.

Dimensions in a strongly contracted state.—Height 1 cm., breadth about 2 cm.

Occurrence.—Commonwealth Bay, Adelie Land, 45–50 fms. 14th December, 1911. One specimen.

External Characters.—The single specimen, which is not sexually ripe, is very strongly contracted and deformed; probably it has been preserved in very strong alcohol. The pedal disc is well developed. The ectoderm of the column is mostly lost, being retained only in the uppermost and lowest parts. As far as I can see there are no verrucæ or other differentiations on the column. The fossa is well developed, the tentacles strongly contracted and almost wart-like. They are fewer in number than the mesenteries, and very probably seventy-eight. In order to examine the sphincter Stephenson cut out a piece of the distal part of the body without counting the tentacles, but judging from the well developed mesenteries in the distal part, which are seventy-eight in number, the tentacles should also be seventy-eight. The actinopharynx is well developed, with two distinct siphonoglyphs symmetrically situated.

Anatomical Description.—The ectoderm of the column is high, but considerably thinner than the mesogloea. The sphincter is strong, pinnate, circumscript. From a

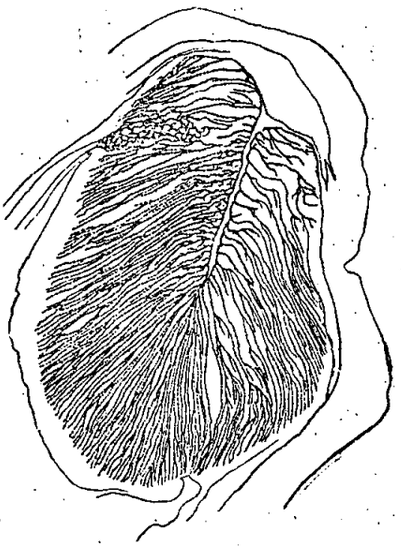

Fig. 7.

moderately thick main lamella numerous high and branched folds issue (fig. 7). The longitudinal muscles of the tentacles are ectodermal, and form high palisade-like folds sometimes a little branched. At the base of the tentacles the muscles are stronger

on the oral face than on the aboral. The radial muscles of the oral disc are ectodermal, and recall the longitudinal muscles of the tentacles, but are weaker at the insertions of the mesenteries. The pairs of mesenteries are forty-eight, or possibly forty-nine, hexamerously arranged. Some of these do not reach the distal end, wherefore the number of tentacles is fewer than that of the mesenteries. There are two pairs of directives. At least twenty-four pairs are perfect, probably more. The pennons are strong and extended—diffuse on the older mesenteries, often more concentrated on the younger. The close folds are high and branched in their distal part. The parietobasilar muscles are characteristic in as much as the mesoglœal lamellæ supporting these muscles, in the lower parts of the stronger mesenteries, are often wholly separated

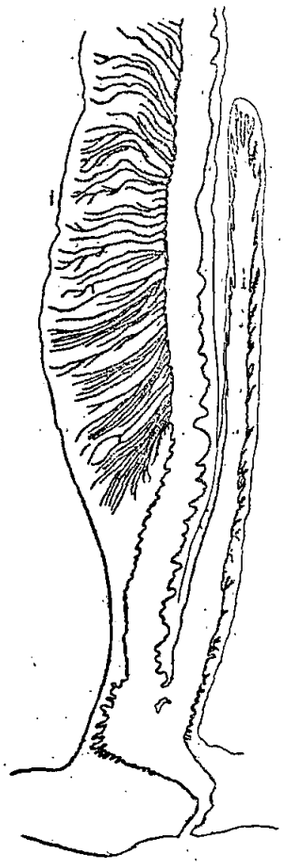

Fig. 8.

from the main lamella (fig. 8). Here and there both lamellæ grow together, so that muscle-meshes are enclosed in the mesoglœa. These points show distinctly the origin of the mesoglœal meshes, sometimes formed both by transversal and parietobasilar muscles (see Carlgren, *Zool. Anzieger*, 28, 1905, p. 519). The ciliated streaks are well developed; their mesoglœa contains rather numerous cells. The specimen has no reproductive organs.

Although the specimen is sterile there is hardly any doubt that it is an *Epiactis*. It is closely related to *E: crateriformis*, but the arrangement of the tentacles and mesenteries is hexamerous here.

9: *Sicyonis aurora* n.sp.

Diagnosis.—Column rather low, very thick. Sphincter elongated but weak in its Uppermost part about a third of the breadth of the mesoglœa, reticular-alveolar, with a slight tendency to stratification. Tentacles about ninety-four, short, in contracted state wrinkled, with a very strong bulbous thickening on the aboral side at the base. Longitudinal muscles of the tentacles reticular, strong on the oral side, weak and alveolar in the basal thickenings. Oral disc with a tendency to form lobes. Radial muscles of the oral disc reticular, sometimes with a tendency to stratification, not interrupted at the insertions of the mesenteries. Actinopharynx deeply sulcated longitudinally, with two deep siphonoglyphs. Pairs of mesenteries almost regularly hexamerously arranged, probably ninety-four. Two pairs of directives. Probably twenty-four pairs and a few single mesenteries perfect. Only a slight tendency towards unequal development of mesenteries in one and the same pair. Pennons diffuse, with low but richly branched folds. Parietobasilar muscles weak, but partly enclosed in the mesoglœa in the lower parts of the mesenteries. The older mesenteries strongly thickened in their uppermost parts. Nematocysts of the tentacles very numerous (26) 29–36 (40) × 2·5–almost 3μ; those of the actinopharynx partly 29–36 × about 3μ (very numerous), partly 29–31 × 4·5–5μ, the latter with visible basal part to the spiral thread; spirocysts of the tentacles about 24 × 2·5–58 × 4·5μ.

Colour.—Unknown. In the ectoderm of the actinopharynx there is brownish pigment.

Dimensions.—Height of the column about 3·3 cm. Breadth in the upper part about 4·5 cm.

Occurrence.—Off Maria Island, Tasmania, 1,300 fms. S.Y. "Aurora," 13th December, 1911. One specimen.

External Characters.—The preservation of the specimen was not good; the well developed pedal disc was contracted, as also was the very thick cartilaginous column. The upper part of the column and the disc are somewhat roughly four-lobed, but one of the lobes is more or less subdivided, so that the total number of indistinct lobes is six. Probably the arising of lobes is due to the strong thickening of the older mesenteries in their uppermost part, or possibly it may be a result of the strong contraction of the body. According to Stephenson the tentacles are ninety-four (24 + 24 + 46) in number. They are short, and provided with very thick swellings at the aboral side of the base. The distal inner parts of the tentacles are very wrinkled. The oral disc is radially sulcated, most of the disc being occupied by tentacles. The actinopharynx is rather short, and provided with deep longitudinal furrows. The two symmetrically situated siphonoglyphs are deep.

Anatomical Description.—The ectoderm of the column was lost. The stout mesoglœa reaches at certain places a thickness of 0·7 cm. The sphincter is weak but elongated, in its uppermost part occupying about a third of the thickness of the

Fig. 9.

mesoglœa; from here downwards it gradually diminishes. A part of the sphincter is figured (fig. 9). It is not distinctly separated from the weak endodermal circular muscles of the column. Its structure is alveolar, here and there more reticular; in the upper part it shows a slight tendency towards stratification. The ectoderm of the tentacles is high, and provided with very numerous nematocysts and spirocysts. The mesoglœa is very thick in the swellings. The longitudinal muscles of the tentacles are mesoglœal. In the oral side they occupy a considerable part of the mesoglœa, and show a reticular appearance in transverse sections; at the edges of the swellings they are more alveolar. In the swellings there are only scattered meshes situated in the outer part of the mesoglœa. The radial muscles of the oral disc are mesoglœal and well developed, on some places they show a tendency to stratification (fig. 10); they are not interrupted at the insertions of the mesenteries.

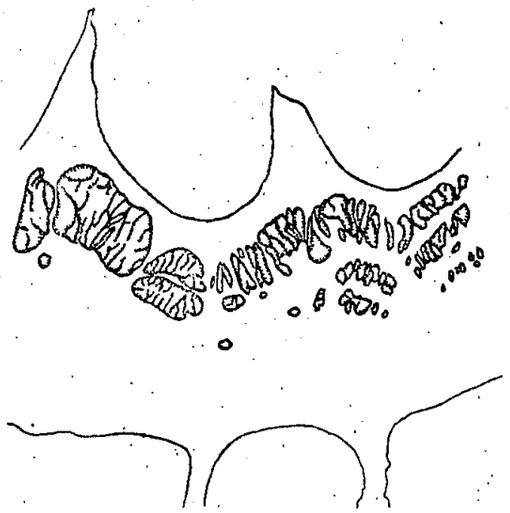

Fig. 10.

The number of mesenteries I cannot exactly fix, as my colleague has sectionised a part of the column. Since in half the specimen there were twenty-four pairs in the upper part, and since the number of tentacles (ninety-four) agrees with that of the mesenteries in this region, the pairs of mesenteries in the distal part may be forty-seven,

all of which are sterile. Alternating with these pairs there are fertile pairs in the lowest part of the body, as in other *Sicyonis*-species. Two pairs of directives are present. Probably the twenty-four older pairs are perfect. A few pairs of the following cycle may consist of one perfect and one imperfect mesentery; I have observed at least one such pair. In the most distal parts of the older mesenteries the mesoglœa is extraordinarily thickened; sometimes one mesentery in a pair is strongly thickened, the other only slightly, probably an indication that in this specimen a different development of the mesenteries in one and the same pair has taken place. The arrangement of the mesenteries seems, however, to be more regular here than in other *Sicyonis*-species. The pennons are diffuse and show a coarse folding to the naked eye. A closer examination of these coarse folds shows a rich ramification of the muscle-lamella. The endodermal parts of the parietobasilar muscles are very weak and form no folds, but in the lower parts of the mesenteries rows of meshes are enclosed in the mesoglœa. The basilar muscles are distinct, but weak. The sterile mesenteries are provided with filaments. As far as I can judge from an examination of the very compressed fertile mesenteries, they lack filaments.

10. *Hormosoma scotti* Stephenson.

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; 1920, p. 554, fig. 32; Pax, 1923, p. 25; Carlgren 1927, figs. 34, 35.

Hormosoma violaceum n.sp., Pax, 1922, p. 83, fig. 6; 1923, Pl. 1, fig. 9, Pl. 2, fig. 2.

Paractis papaver Drayton, Clubb, 1908, p. 3, Pl. 2, figs. 7–11.

Actinostola rufostriata Pax, 1922, p. 86; 1923, p. 17, Pl. 1, fig. 4, Pl. 2, fig. 4.

Diagnosis and Colour.—See Carlgren, 1927.

Dimensions of the single specimen.—Breadth of pedal disc about 6 cm.; height of body about 4 cm.

Occurrence.—66° 50′ S., 142° 6′ E. 354 fms. Temperature, —1·85°. St. 1. One specimen.

The species was well described by Stephenson in 1918. To his description I have given some supplementary notes (1927), and at the same time discussed the synonyms of the species. The single specimen has the usual facies of *Hormosoma*, and its anatomy agrees well with Stephenson's description.

11. *Stomphia selaginella* (Stephenson).

Cymbactis selaginella n.sp., Stephenson, 1918, p. 36, Pl. 1, figs. 7, 11, Pl. 4, figs. 14, 15, Pl. 5, figs. 1, 2, 4, Pl. 6, fig. 14.

Stomphia selaginella (Steph.), Stephenson, 1920, p. 559; Carlgren, 1921, p. 211, 213.

Diagnosis.—Pedal disc wide, sometimes conical in the middle. Mesoglœa of the column thicker or thinner, according to state of contraction. Sphincter in the younger specimens alveolar, in older ones alveolo-reticular to almost reticular, sometimes with a slight tendency to be stratified (especially in young specimens). Tentacles commonly about sixty-four (seldom up to over seventy). Number of tentacles in relation to that of the mesenteries at the pedal disc as 1 : about 3. Actinopharynx with numerous longitudinal ridges. Siphonoglyphs with aboral prolongations. As a rule sixteen pairs of perfect and sterile mesenteries. Pennons diffuse; in the distal part the folds are highest a little distance from the column; in the proximal part they are more uniformly distributed. Parietobasilar muscles broad, but with short folds; enclosures of these muscles in the mesoglœa very numerous. Young ones developing in the cœlenteric cavity. Nematocysts of the column 17–19 × about 1·5μ; those of the tentacles partly (17) 22–26 × 1·5 to almost 2μ, partly 36–49 × 5·5–6 (6·5)μ; those of the actinopharynx partly 24–31 × 2–2·5μ, partly 24–26 × 5μ (the latter with visible basal part to the spiral thread). Spirocysts of the tentacles 18 × 1·5 to about 50 × 5μ.

Colour.—In the preserved state, tentacles, actinopharynx and filaments are purplish, gonads pale orange (one specimen from St. 2). Tentacles in other specimens white or with traces of purplish. Actinopharynx, in all specimens examined, purplish. See also Stephenson, 1918.

Dimensions in the preserved state.—Height and breadth with the tentacles drawn in, 3·2 cm. (St. 9); largest specimen from St. 2 (column contracted), height and breadth about 2 cm.; smallest specimen (St. 10), height 0·7 cm.; breadth, 0·9 cm. Stephenson has examined larger specimens.

Occurrence.—

65° 55′ S,	145° 21′ E.	318 fms.	Temperature,	— 1·84°.	St. 2. Six specimens.
66° 44′ S,	97° 28′ E.	358 fms.	,,	(?)	St. 11. One specimen.
65° 6′ S,	96° 13′ E.	325 fms.	,,	— 1·65°.	St. 10. Three specimens.
65° 20′ S,	95° 27′ E.	240 fms.	,,	+ 1·38°.	St. 9. One specimen.
65° 42′ S,	92° 10′ E.	60 fms.	,,	(?)	St. 7. One specimen.

Further Distribution.—Ross Sea, 158 fms.; entrance to McMurdo Sound, 207, 140 fms. (*teste* Stephenson); South Orkney Islands, 9–10 fms. (Scotia Exp.).

The externals and anatomy of this species are well described by Stephenson. The pedal disc was conically drawn out in the specimen from South Orkney Islands. The mesoglœa of the column in this specimen was rather thin; in the specimen from St. 9 it was thin, smooth, and parchment-like below, thick at the margin, where the column is ridged. The mesoglœa in the other specimen was tough, irregularly wrinkled, and considerably thicker, differences due, to my mind, to different states of contraction of the body. The tentacles vary in number; in the smallest specimen (not sexually ripe) from St. 10 there were forty-eight tentacles, in another specimen from St. 10 and in that from St. 7 (both fairly young specimens) sixty, in two specimens from St. 2, as also, probably, in that from St. 9, sixty-four (16 + 16 + 32). In the specimen from the South Orkney Islands there were over seventy tentacles. A parallelism to this will be met with in *Stomphia coccinea*, where the number of tentacles sometimes reaches eighty, although generally it does not exceed seventy-odd.

As to the sphincter, Stephenson (1918) stated that it is alveolar in small specimens, alveolo-reticular in large ones; and that it is longitudinally stratified in its upper part and in smaller specimens especially it shows also a tendency towards transverse stratification. In a small specimen from St. 10, the vertical stratification was rather

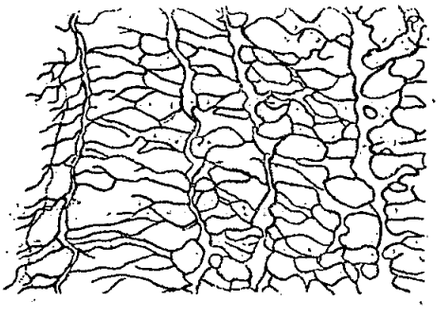

Fig. 11.

distinct (fig. 11); in two larger specimens from St. 9 and 2 a slight tendency to such stratification is also visible in the upper part of the sphincter; and also, especially in the specimen from St. 9, a tendency to elongation of the muscle-meshes in a transverse direction. In general, the sphincters seem to be more reticular here than in the type-specimens. The radial muscles of the oral disc are mesoglœal and reticular, weaker or sometimes discontinuous at the insertions of the mesenteries. The size of the stinging capsules shows good agreement in different specimens. I have measured the capsules in three specimens (from South Orkney Islands and from St. 2 and St. 9).

The pairs of mesenteries in the specimens examined seem to run 16 + 16 + 32, &c.; the first sixteen are perfect and sterile. Stephenson has examined the specimen from St. 9, and stated that the first sixteen pairs were sterile, but for one mesentery. The second cycle contained seventeen pairs. I have examined the mesenteries at the basal disc, there were about 190. In three other specimens

(two from St. 2, and one from St. 11) there were 194–199 mesenteries at the base. The relation between the number of tenacles and the number of mesenteries seems thus to be 1 : about 3. The *Actinostola*-rule for the arrangement of the youngest mesenteries is clearly visible in the older specimens. The structure of the mesenteries agrees well with that in *Stomphia selaginella*, so that I have no hesitation in referring the specimens to this species. The only doubt as to the justness of this identification may be that Stephenson (1918) stated that there are only four cycles of mesenteries in the proximal part of *selaginella*. I think, however, that Stephenson has not examined his specimens at the basal disc. In the specimen from the Orkney Islands there were several young in the cœlenteric cavity. The proximal end of these was conically elongated.

12. *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.

Artemidactis victrix Steph., Stephenson, 1920, p. 546; Pax, 1923, p. 25; Carlgren, 1927.

Diagnosis.—See Carlgren, 1927.

Colour of the single specimen in alcohol.—Ectoderm of the actinopharynx purplish, that of the siphonoglyphs uncoloured.

Dimensions of the specimen with retracted tentacles.—Greatest length, 2·8 cm.; breadth of the pedal disc, 2·2 × 1·5 cm.; that of the uppermost part, 1·2 cm.

Occurrence.—65° 20′ S, 95° 27′ E. 240 fms. Temperature, + 1·38°. 28th January, 1914. St. 9. One specimen. The careful description of this species given by Stephenson (1918) I completed in 1927, and at the same time set down a diagnosis of the species. The size and the form of the stinging capsules in this specimen agree very well with those before examined in the species. The tentacles were 142, the mesenteries at the base about 210. Cinclides were present in the slides. At least a part of the mesenteries of the third cycle was perfect.

13. *Hormathia lacunifera* (Stephenson).

Liliella lacunifera n.sp., Stephenson, 1918, p. 33, Pl. 1, fig. 13, Pl. 2, figs. 12–14, Pl. 3, fig. 5, Pl. 4, figs. 10–13; Stephenson, 1920, p. 543; Pax, 1923, p. 25.

Diagnosis.—Pedal disc well developed. Body-wall thick, sometimes with lacunæ (artefacts (?)). Scapus long, rugged and corrugated like bark, but without distinct tubercles. Capitulum short, with fine wrinkles, but not distinctly ridged.

Sphincter very strong, separated from the endodermal muscles by a thick band of mesoglœa; alveolar, or in some parts more reticular. Muscle-meshes very numerous, with a tendency towards horizontal (and in some parts) indistinct vertical stratification. Tentacles, ninety-six, stout and moderately short. Longitudinal muscles of the tentacles ectodermal, forming short but close folds. Radial muscles of the oral disc almost exclusively ectodermal. Pairs of mesenteries forty-eight, two pairs of directives, six perfect sterile pairs. Mesoglœa of the mesenteries rather thick, no sharply differentiated pennons in the lower parts. Parietobasilar muscles on the stronger mesenteries not placed on a distinct lamella, rather weak. Mesenteries of the last order with parietal muscles only. Acontia well developed, but possibly only present on the strongest mesenteries. Nematocysts of the capitulum about 19–24 × 2·5 to almost 3μ; those of the tentacles (22) 24 – 34 (36) × 2·5 – 3 (3·5)μ; those of the actinopharynx partly 26–36 × 3–3·5μ, partly (22) 26–34 × 4·5μ (the latter with a conspicuous basal part to the spiral thread).

Spirocysts of the tentacles, 22 × 2·5 to 53 × about 5μ.

Colour in alcohol.—Scapus dirty yellowish brown.

Dimensions of the largest specimen.—Length 6·8 cm.; greatest breadth in the upper part, 3·3 cm. Of the smallest specimen, length 3·4 cm.; breadth at the pedal disc, 2·3 cm.; smallest breadth about 1 cm.

Occurrence.—

65° 48′ S, 137° 32′ E. 230 fms. Temperature, — 1·4°. St. 4. 2nd January, 1914. One specimen.

64° 44′ S, 97° 28′ E. 358 fms. St. 11. 31st January, 1914. One specimen

65° 6′ S, 96° 13′ E. 325 fms. Temperature, — 1·65°. St. 10. 29th January, 1914. Two specimens.

65° 20′ S, 95° 27′ E. 240 fms. Temperature, + 1·38°. 28th January, 1914. One specimen.

Further Distribution.—Off Barne Glacier, McMurdo Sound, 200 fms. (*teste* Stephenson).

Stephenson (1918) placed this species in a new genus *Liliella*, belonging to the Paractidæ, but in the slides of the present specimens he observed acontia. I have closely examined the slides and hand-sections made by Stephenson from all specimens, and have confirmed the presence of these organs. They were rather long, and most numerous in the small specimens; in the larger, fewer and mostly broken

away from the mesenteries and probably packed together with the filaments. On some of the larger mesenteries I have, however, observed acontia. It is possible that the acontia are present only on the strongest mesenteries. The genus *Liliella*, based partly on the lacunæ in the body wall (probably artefacts or degenerations) must, I think, be abolished, and the species referred to the genus *Hormathia*, which sometimes has no tubercles on the scapus. In the poorly preserved co-type Stephenson found no cuticle on the scapus. Such a one is distinct in the present specimens.

Stephenson (1918) has described the anatomy of this species, but on account of the bad preservation of the single specimen not all the organs could be examined. In

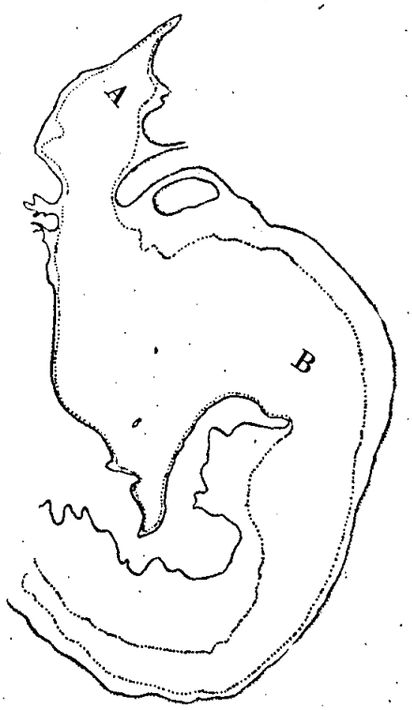

Fig. 12.

a sectionised specimen of the present collection the sphincter was very strong and long, and placed for the most part of its length nearer to the ectoderm than to the endoderm, and separated from the latter in the upper part by a usually strong band of mesoglœa (fig. 12). In the upper part it is close to the ectoderm. The muscle-meshes are very numerous, close to each other in the upper and inner parts of the sphincter, separated by stronger bridges of mesoglœa in the outer. They are extended in a horizontal direction, and show a slight tendency to stratification. Part of the sphincter is shown in figs. 13 and 14. The longitudinal muscles of the tentacles are ectodermal, their folds mostly low, but often close to each other. The radial muscles of the oral disc

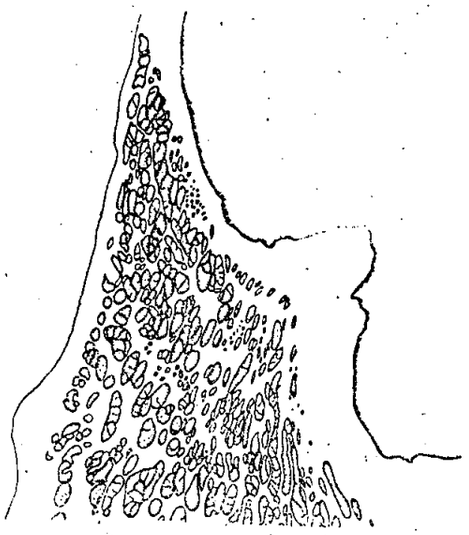

Fig. 13.

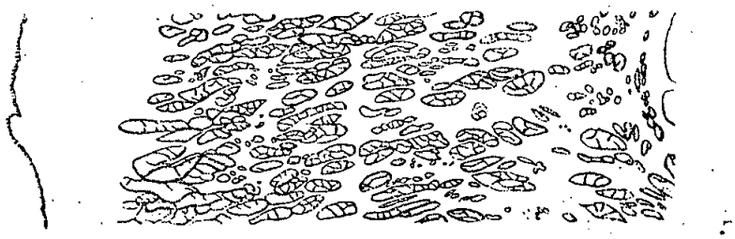

Fig. 14.

are ectodermal and weaker in the parts corresponding to the endocœls; in those situated over the exocœls they are higher, and here the folds fuse together here and there.

The arrangement and number of the mesenteries agree with Stephenson's description. The mesenteries of the last cycle are, however, better developed in the larger specimens than in the co-type, and provided with filaments. As in *Calliactis parasitica*, the ciliated streaks are very long on the mesenteries of the last cycle, but the filaments do not form a continuous layer, being interrupted here and there (see Carlgren, Ceriantharia, The Danish Ingolf-Expedition, 5, 3, 1912, p. 74). The mesoglœa in the filaments is well developed. The longitudinal muscles are rather weak in the lower parts of the mesenteries and form no distinct pennons; in the uppermost part they are considerably stronger. The parietobasilar muscles are rather weak, and not raised on a distinct lamella. The mesenteries of the last order have only parietal muscles. The six perfect pairs are sterile; the mesenteries of the second, third and at least a part of the fourth orders are fertile. The nematocysts of the tentacles and actinopharynx were, in the smallest specimen, shorter than in the larger specimens.

Remarks.—The species is closely related to *Hormathia georgiana* Carlgr., *H. rhododactyla* (Pax), and *H. erythrosoma* (Pax) (see Carlgren, 1927). Possibly *rhododactyla* and *lacunifera* are identical. Both have a very strong sphincter, but the bad preservation in *rhododactyla* makes it difficult to confirm their identity.

14. *Aureliania tricirrata* n.sp.

Diagnosis.—Pedal disc very wide. Sphincter distinctly pinnate, circumscript as a deep fold projecting into the cœlenteric cavity, but not so lamella-like as in *Aureliania georgiana*. Inner part of the sphincter with numerous high and very close folds. Tentacles in about thirty-four rows and in five alternating cycles, with the inner cycle incomplete. Two tentacles issuing from each exocœl, two or *three* tentacles from each endocœl. Exterior of tentacles as in other *Aurelianias*. Longitudinal muscles of the bases of the tentacles mesoglœal, especially well developed on the oral side of the outer tentacles, and here forming a reticular layer. Radial muscles of the oral disc mesoglœal, weak, in the inner part of the disc absent or almost so. Pairs of mesenteries in the upper part probably thirty-four, at the base 136. Only the first thirty-four pairs fertile and provided with pennons and filaments. Pennons extraordinarily strong, distinctly pinnate, circumscript. Parietobasilar muscles, especially on certain of the thirty-four first pairs, very strong. Basilar muscles strong. Nematocysts of the scapus partly 24–26 × about 3μ, partly 34–43 × 4–4·5μ, the latter often curved; those of the capitulum 22–25 × 2·5–almost 3μ; those of the tentacles 22–29 × 2–2·5μ; those of the actinopharynx partly 18–23 × about 2·5μ, partly 36–43 × 4·5–5μ (often curved), partly (31) 36–43 × 7–9μ (broader at the basal end). Spirocysts of the capitulum about 36 × 2 to 55 × 2·5μ; those of the tentacles 24 × 1·5 to 53 × almost 3μ.

Colour.—Unknown.

Dimensions.—Breadth of the pedal disc about 4 cm.; of the uppermost part about 2·5 cm.

Occurrence.—65° 48′ S, 137° 32′ E. 230 fms. Temperature, — 1·4°. St. 4. 2nd January, 1914. One specimen.

External Characters.—The single specimen has a very wide base and low pyramidal form which is certainly augmented by the strong contraction of the upper part of the body. The oral disc is much less wide than the base. There is a deep constriction around the body and a rim below the sphincter. A fossa is present, and above it a bare zone below the tentacles. The lower part of the body is rather puffed

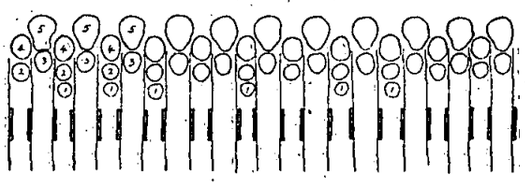

Fig. 15.

out, so that it is practically smooth in places, not corrugated, as is more usual. The tentacles show the usual appearance for this genus. They are arranged in five alternating cycles, with the inner cycle incomplete; or, in other words, in short radial rows, with two tentacles in each row on exocœls, and 2–3 in each row on endocœls.

Stephenson has figured (fig. 15) the arrangement of the tentacles in a sector. The outermost tentacles, as a whole, are the largest. There are thirty-four of the large outer exocœlic tentacles, therefore sixty-eight radial rows altogether. The species differs from all the European *Aurelianias*, from *Aureliania georgiana* Carlgr., and from an undescribed *Aureliania*-species from Japan, by having three tentacles on some of the endocœls. The mouth was puffed out.

Anatomical Description.—The ectoderm of the column is ordinarily developed, the mesoglœa thick, with few cells. The sphincter forms a deep fold in the cœlenteric cavity, and is strong, but not so lamella-like as in *A. georgiana*. It is distinctly pinnate, circumscript. and shows in its inner part high and close folds (fig. 16). The circular

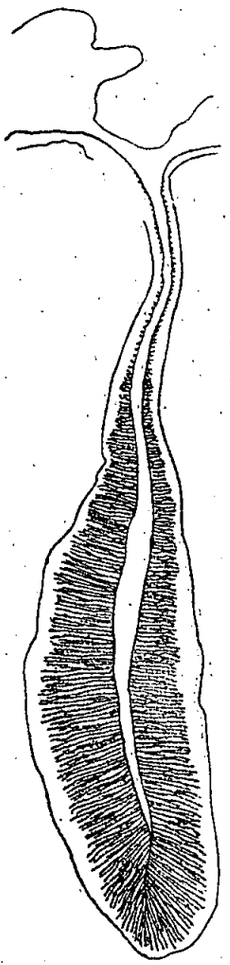

Fig. 16.

muscles are weak in the sphincter-region, stronger below. The ectoderm of the tentacles is high. the longitudinal muscles are at least mainly enclosed in the mesoglœa and show a different appearance in different regions. The muscle-layer is strongest at the bases of the tentacles, especially well developed on the oral side of the outermost tentacles, where the muscles form a reticular layer (fig. 17). Towards the outer side

the muscles gradually diminish, so that the meshes on the outer side are very sparse and at the same time they are close to the circular muscles of the endoderm. In the

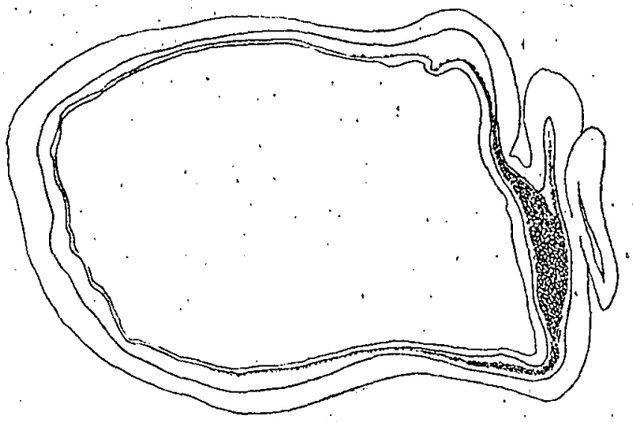

Fig. 17.

upper parts of the tentacles the muscles are very sparse, even on the oral side, or wholly reduced. Sometimes it seems as if there were here and there very weak ectodermal muscles, but probably these are only the somewhat swollen basal parts of the ectoderm cells. The muscles of the oral disc are weak mesoglœal; centripetal to the tentacles these muscles are reduced, or as it seems, sometimes wholly lacking.

The mesenteries are arranged in four cycles, only two of which are present in the uppermost part of the body, and consist of thirty-four pairs. At the base 136

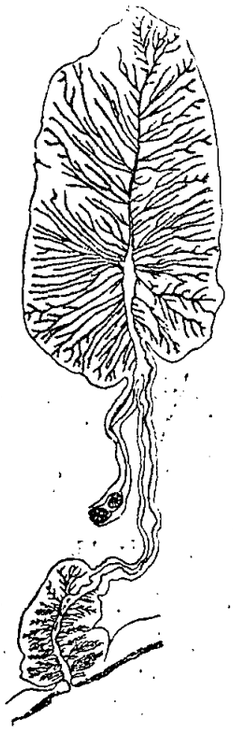

Fig. 18.

pairs are present. The first thirty-four pairs are perfect and provided with gonads, filaments and very strong retractors, the other pairs lack these organs. As in other *Aurelianias* the retractors form very strong pinnate circumscript pennons. From a single mesoglœal lamella there issue high, somewhat branched folds, which are often provided with shorter secondary folds at their tips (fig. 18). The parietal part of the longitudinal muscles, and the parietobasilar muscles, are very strong and furnished with numerous short secondary folds on the rather long primary folds. Both are sharply marked off from the other muscles of the mesenteries. Between the main lamellæ of the mesenteries and the parietobasilar muscles there are muscles enclosed in the mesoglœa. The basilar muscles are very strong and are visible to the naked eye. The gonads in the single specimen are ovaries, containing rather large ova.

LITERATURE.

Andres.—Le Attinie. R. Acad. dei Lincei, 14, Roma, 1883.

Carlgren.—Die Brutpflege der Actiniarien. Biol. Centralblatt, 21, 1901, p. 468.

Actiniaria. The Danish Ingolf-Exped., 5, 9, 1921.

Actiniaria from New Zealand and its Subantarctic Islands. Vid. Medd. fra Dansk Naturh. Foren., 77, 1924.

Further Zoological Results of the Swedish Antarctic Expedition, 1901–03, 2, 3, Stockholm, 1927.

Clubb.—Actiniæ. Report of the "Southern Cross" Antarctic Expedition. London, 1902.

Actiniæ. Report. Nat. Antarctic Exp., 1901–04 Nat. Hist., 4, 1908.

Gravier.—Note Préliminaire sur les Hexactiniares, &c. Bull. Inst. Oceanogr., 346, 1918.

Hertwig, R.—Die Actinien der Challengerexpedition. Jena, 1882.

Supplementary Report on the Actiniaria. Challenger Exped., Zool., 73, 1888.

Kwietniewski.—Revision der Actinien Welche von Studer ... gesammelt wurden. Jena, Zeits., 30, 1896, p. 583.

Pax.—Die Actinien. Ergebn. Fortsch. der Zoologie (Spengel), 4, 1914, p. 339.

Diagnosen neuer Actiniaren. Zool. Anzieger, 54, 1922, p. 75.

Antarktische Actinien, "Pourquoi Pas." Zool. Jahrb., 47, System., 1923.

Hexacorallia. Handbuch der Zoologie (Kükenthal), p. 770.

Roule.—Hexactinides. Expedition antarctique française, 1903–1905. Paris, 1911.

Stephenson.—Actiniaria. British Antarctic ("Terra Nova") Exp., Zool., 5, 1, 1918.

On the Classification of Actiniaria, 1. Quart. Journ. Micros. Sci., 64, 4, 1920, p. 425.

The Genus Corallimorphus. Proc. R. Irish Acad., 355, B, p. 178, 1920 (1920 *a*).

On the Classification of Actiniaria, 3. Quart. Journ. Micros. Sci., 66, 2, 1922, p. 247.

Studer.—Zweite Abteil. der Anthozoa Polyactinia (Gazelle Exp.). Monatsb. K. Akad. Wissens., Berlin, 1878, p. 524.

EXPLANATION OF TEXT-FIGURES.

FIG. 1.—*Corallimorphus antarcticus.* Diagram showing the arrangement of the tentacles. (See text).

FIGS. 2 and 3.—*Bunodactis sulcata.* Transverse sections of sphincter; fig. 2 from an embryo, fig. 3 from the mother.

FIG. 4.—*Epiactis crateriformis.* Seen from the distal end. Natural size.

FIG. 5.—*Epiactis crateriformis.* Transverse section of sphincter (somewhat diagrammatic).

FIG. 6.—*Epiactis crateriformis.* Transverse section of a directive mesentery in the lower part of the actinopharynx-region.

FIG. 7.—*Epiactis adeliana.* Transverse section of sphincter.

FIG. 8.—*Epiactis adeliana.* Transverse section of the outer part of a stronger mesentery in the proximal region.

FIG. 9.—*Sicyonis aurora.* Transverse section of a portion of the sphincter in its upper part.

FIG. 10.—*Sicyonis aurora.* Transverse section of a part of the oral disc.

FIG. 11.—*Stomphia selaginella.* Transverse section of a part of the sphincter in the lower part of the upper third.

FIG. 12.—*Hormathia lacunifera.* Diagram to show the shape of the sphincter (enclosed by dotted lines). Endodermal side to the right.

FIGS. 13 and 14.—*Hormathia lacunifera.* Parts of the sphincter from the regions A (fig. 13) and B (fig. 14) in fig. 12.

FIG. 15.—*Aureliania tricirrata.* Arrangement of tentacles in a sector. 1–5: tentacles of the first to fifth cycles.

FIG. 16.—*Aureliania tricirrata.* Transverse section of sphincter.

FIG. 17.—*Aureliania tricirrata.* Transverse section of one tentacle of the outermost cycle, at the base. Inner side on the right.

FIG. 18.—*Aureliania tricirrata.* Transverse section of a stronger mesentery in the reproductive region.

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