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to which Mr. Lydekker gave the racial name *cottoni*. Whether the name *F. temmincki dominicanorum* can be used for the Foochow-Burma Bay Cat, or whether, as in the case of *cottoni*, it refers merely to a colour-phase, remains to be proved.

Mr. J. T. Cunningham, M.A., F.Z.S., read a paper entitled "The Heredity of Secondary Sexual Characters in Relation to Hormones, a Contribution to the Theory of Heredity." The paper contained an examination and criticism of the most important recent investigations and theories on the subject by evolutionists of various schools, namely, the theory which attributes such characters to constitutional causes such as male katabolism, Prof Karl Pearson's biometrical investigation of sexual selection in man, Castle's Mendelian theory of the heredity of sex, and Geoffrey Smith's views on dimorphism of males and parasitic castration in Crustacea. The author maintained that all these contributions were more or less inconsistent with the known facts concerning the connection between the development of secondary sexual characters and the functional activity of the primary gonads. He drew attention to the recent discovery and experimental proof on the part of physiologists that the development of the characters was due to the stimulus of a chemical substance or hormone produced by the testis or ovary, and passed into the blood, and suggested that conversely hormones from parts of the soma might affect the gametes in the gonads. In this way the hypertrophy of a part of the body due to external stimulation might modifiy the corresponding determinants in the gametes so as to produce some hereditary effect in succeeding generations. Mr. Cunningham added that his theory was an interpretation in terms of modern physiology of Darwin's theory of pangenesis.

The following papers were read :—

1. The Marine Fauna of Zanzibar and British East Africa, from Collections made by Cyril Crossland, M.A., in the Years 1901 & 1902.—The Calcareous Sponges. By C. F. Jenkin *.

[Received April 1, 1908.]

(Text-figures 81–104.)

The Collection, made by Mr. Cyril Crossland at Wasin and Zanzibar in 1901–2, passed through several hands and was finally entrusted to the writer in the autumn of 1907.

* Communicated by Professor Arthur Dendy, D.Sc., F.L.S., F.Z.S.

The collection consists of 25 specimens belonging to 14 species, 5 of which are new, as shown in the following list :—

Grade.	*Family.*	*Genus.*	*Species.*	*No. of Specimens.*
Homocœla ...	Clathrinidæ	Clathrina ...	primordialis (*H.*).	2
		„	darwinii (*H.*).	3
		„	contorta (*Min.*).	3
		„	blanca (*Mik.*).	1
	Leucosoleniidæ	Leucosolenia	*irregularis*, sp. n.	1
Heterocœla ...	Sycettidæ	Sycon	ciliatum *Fabr.*	2
		„	ampullum (*H.*).	1
		„	*munitum*, sp. n.	3
	Grantiidæ	Leucandra ...	ananas (*H.*).	1
	Heteropidæ	Grantessa ...	*simplex*, sp. n.	2
		„	*zanzibaris*, sp. n.	1
	Amphoriscidæ ...	Heteropegma	nodus gordii (*Pol.*).	3
		Leucilla	floridiana (*H.*).	1
		„	*wasinensis*, sp. n.	1
			Total specimens	25

The classification is that proposed by Poléjaeff (**2**) for the Homocœla, and by Dendy (**3**) for the Heterocœla, with slight modifications by Minchin (**4**).

The identification of calcareous sponges is very difficult and unsatisfactory in the present state of our knowledge. Haeckel in his great work (**1**) laid down hard and fast definitions of the different species, which if they accorded with the facts would make identification very easy, but unfortunately actual specimens very seldom fall within his definitions. This has led to a useless multiplication of species, since each specimen which did not exactly comply with Haeckel's definition has been called by a new name. Haeckel has also omitted to mention many striking features of his species, such as the subgastral quadriradiates in many of the *Sycandra*, the characteristic dermal spicules of some species, and the hair-spicules in most of the species in which they occur (*e. g.* in *Sycandra ciliata*). He has also made numerous wrong identifications (see Minchin **5**). Under these circumstances no identification can be considered as certain and nothing very satisfactory can be done till Haeckel's work has been revised.

The specimens in the Crossland Collection are unfortunately not in a good state of preservation. It therefore seemed better to place the specimens among existing species, even if the identification was doubtful, rather than to make new species based on single specimens in a poor state of preservation. This has been done as far as possible, but there remained six specimens belonging to five species which could not be classed in this way; to these new names have been given.

Description of the Specimens.

CLATHRINA PRIMORDIALIS.

Ascetta primordialis H.

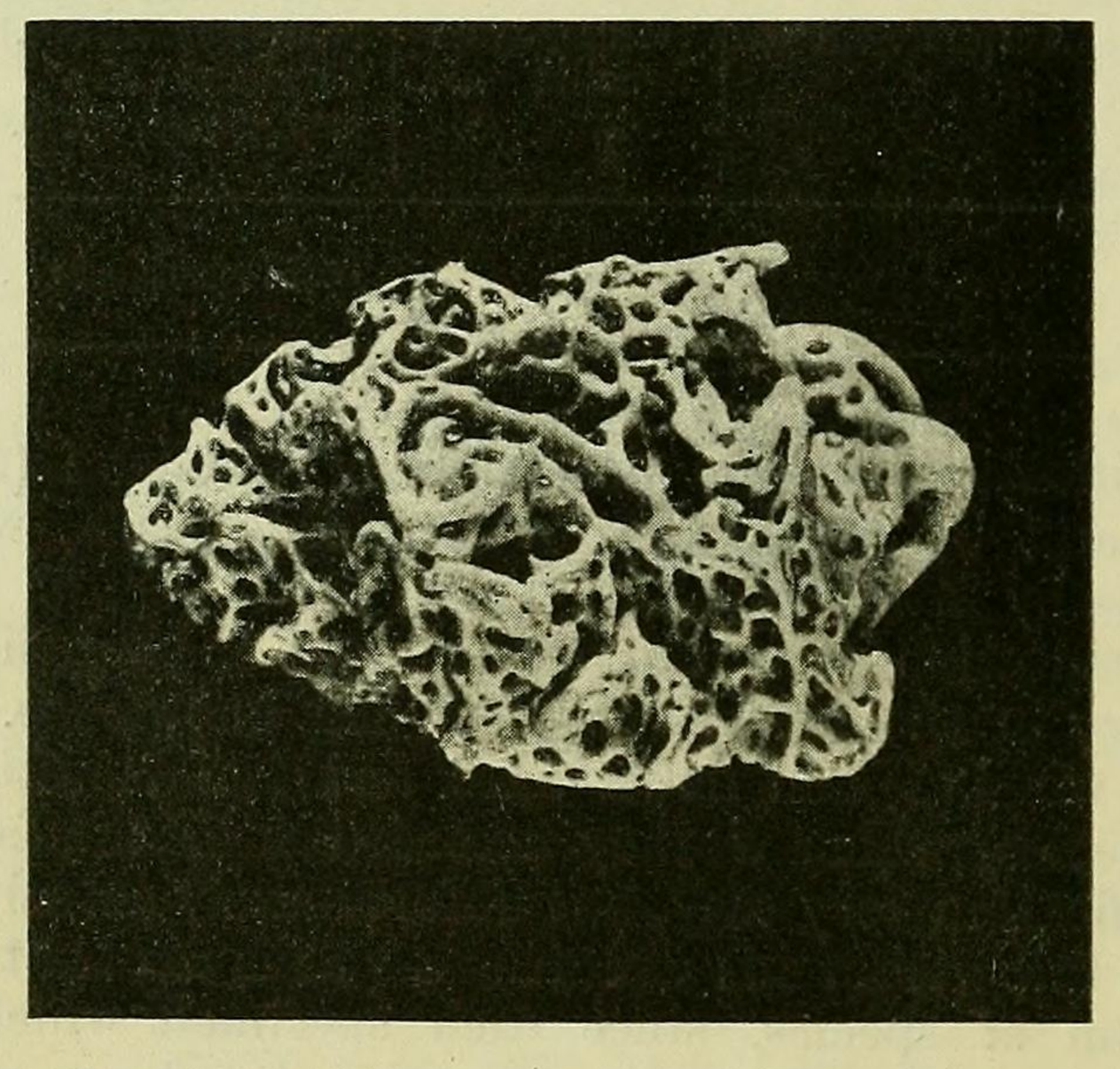
Two specimens of this sponge were dredged in 6 to 8 fathoms at Wasin. The dimensions of the spicules agree with those given by Haeckel of specimens from Australia. Most of the spicules have rays from 160–180 μ long $\times$ 16–20 μ thick.

CLATHRINA DARWINII. (Text-figs. 81, 82.)

Ascaltis darwinii H.

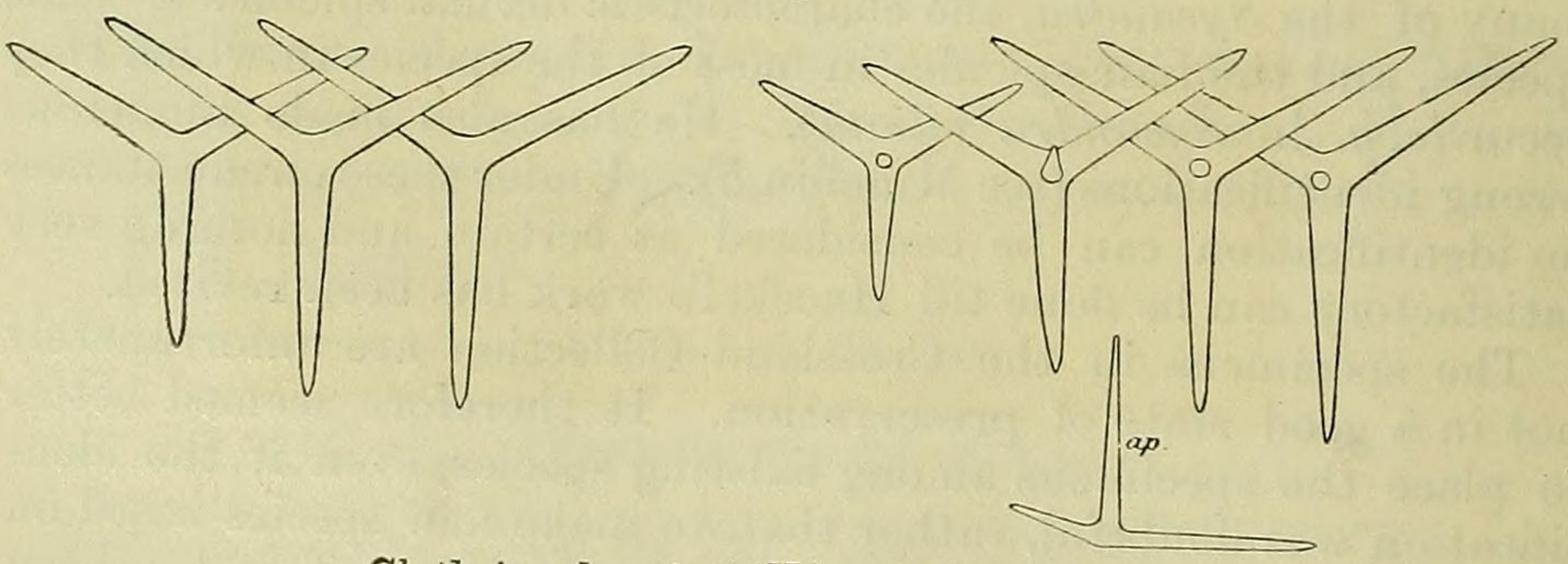
Three specimens of this sponge were dredged in 3 fathoms in Chwaka Bay, Zanzibar. The largest specimen is shown, twice

Text-fig. 81.



Clathrina darwinii (H.). $\times$ 2.

Text-fig. 82.



Clathrina darwinii (H.), spicules. $\times$ 130.
ap., apical ray.

natural size, in text-fig. 81. They were bright lemon-yellow colour when alive, and are buff-white in spirits. All three

specimens consist of solid lumps of the anastomosing tubes typical of the genus *Clathrina*. They are firm to the touch and similar in appearance to *C. coriacea* as it grows in the Channel Islands.

The facial rays of the tri- and quadriradiates (text-fig. 82) vary from 60–120 μ long $\times$ 12–16 μ thick, the commonest size being 110 $\times$ 15 μ. The apical rays of the quadriradiates are nearly straight, about the same length as the facial rays and about 8 μ thick.

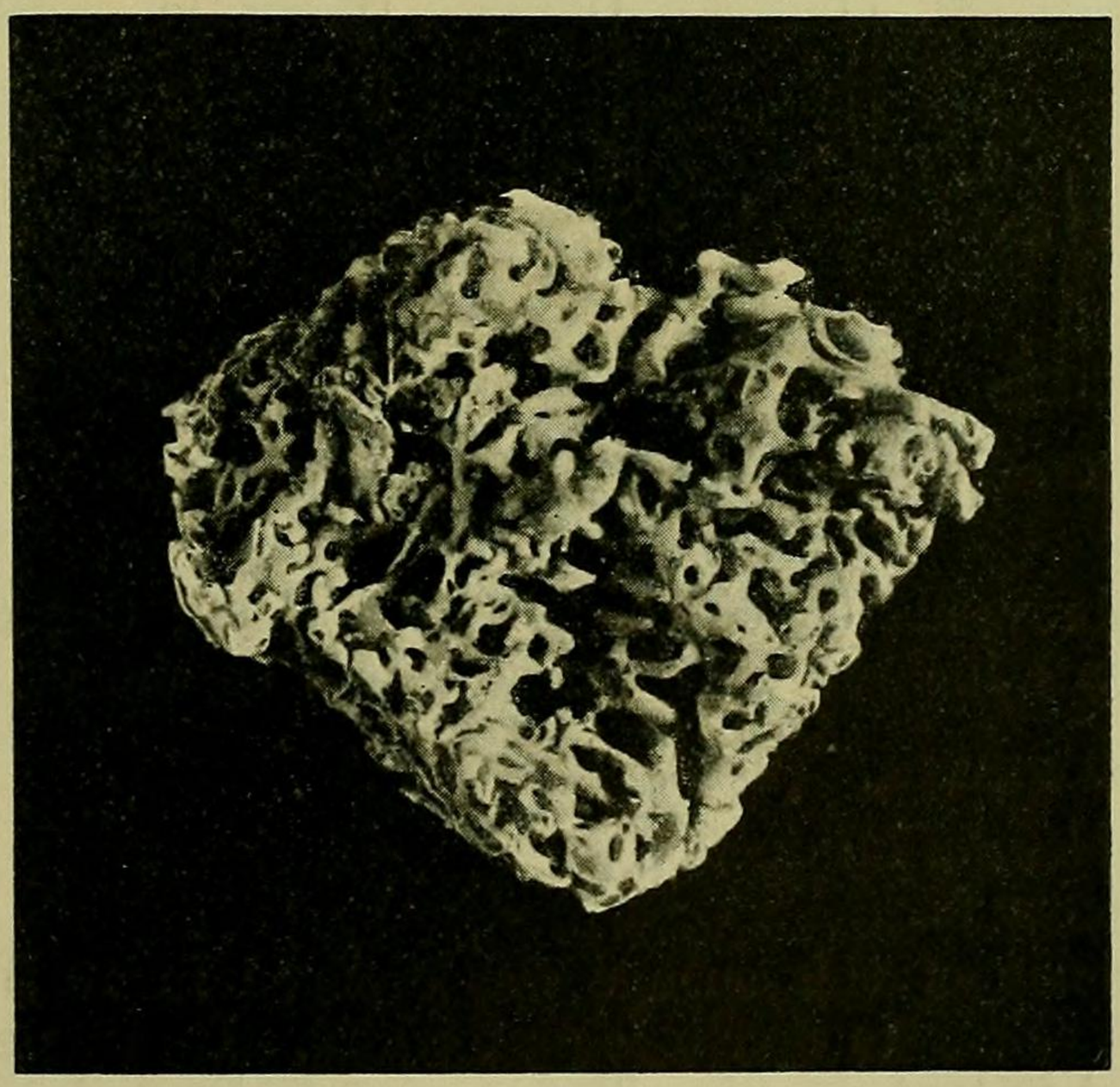
The spicules are considerably thicker than in *Clathrina contorta* var. *spinosa* (Min.), and agree better with Haeckel's *Clathrina darwinii*.

Clathrina contorta var. spinosa. (Text-figs. 83, 84.)

Clathrina contorta var. *spinosa* Minchin (**6**).

Three specimens of this sponge were dredged in 3 fathoms in Chwaka Bay, Zanzibar. They were pure white when alive and are translucent white in spirits. They are very delicate in texture, and readily fall to pieces. The largest specimen is a solid lump shown twice natural size in text-fig. 83; the others appear to be fragments only. They differ considerably in appearance from the specimens of *Clathrina darwinii* which were collected at the same time.

Text-fig. 83.



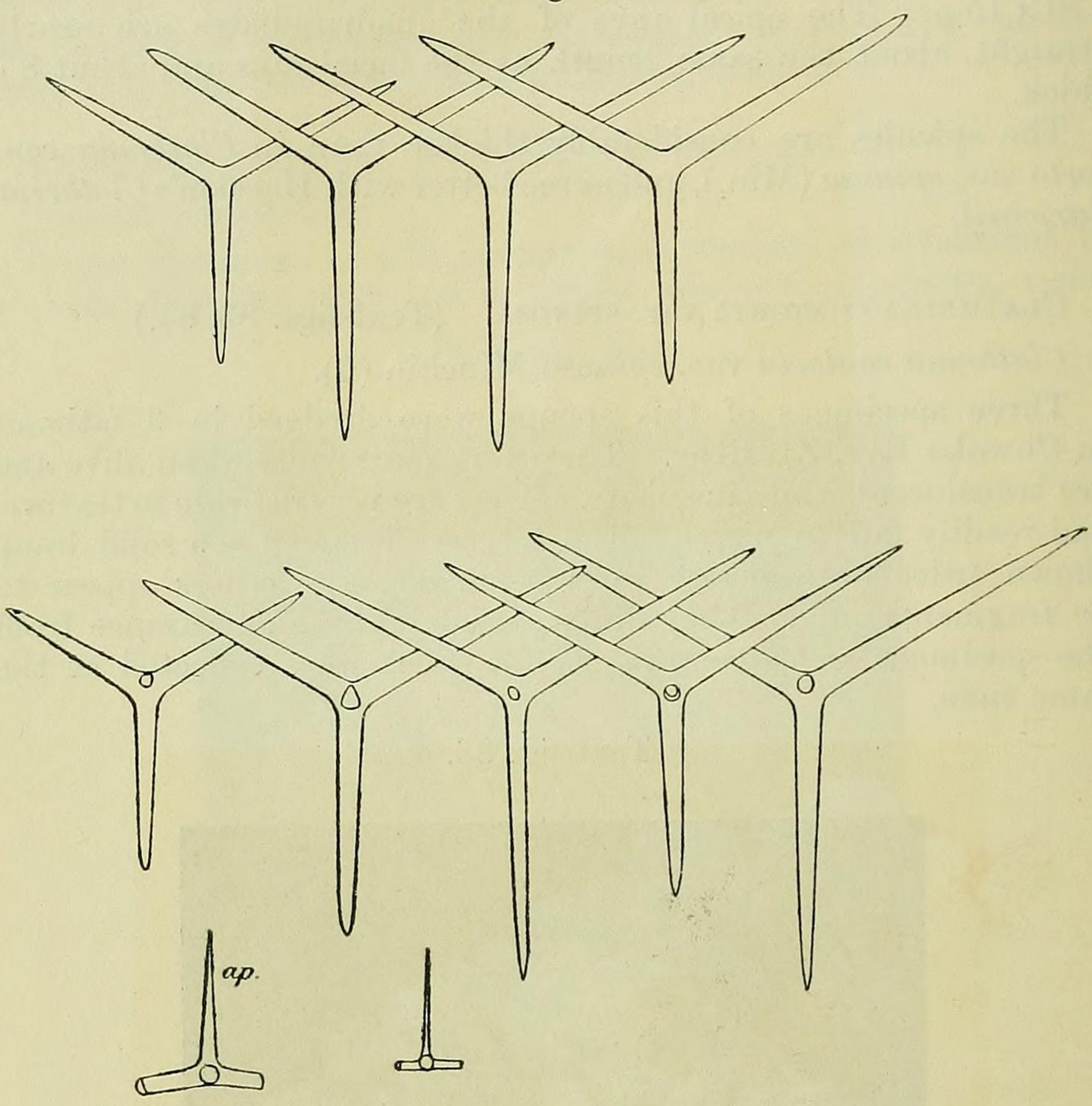
Clathrina contorta (Min.). $\times$ 2.

The spicules (text-fig. 84) agree fairly well with Minchin's (**6**) and von Lendenfeld's (**7**) descriptions of *Clathrina contorta* var. *spinosa*. No oxea were found.

The rays of the triradiates vary from 100–130 μ long $\times$ 10–12 μ thick, the commonest size being 125×11 μ.

The facial rays of the quadriradiates vary from 80–150 μ long $\times$ 10–12 μ thick, the commonest size being the same as of the triradiates 125×11 μ.

Text-fig. 84.



Clathrina contorta var. *spinosa*, spicules. × 180.
ap., apical ray.

The apical rays are 50–65 μ long $\times$ 5–7 μ thick; they are thicker than those in Minchin's or von Lendenfeld's specimens.

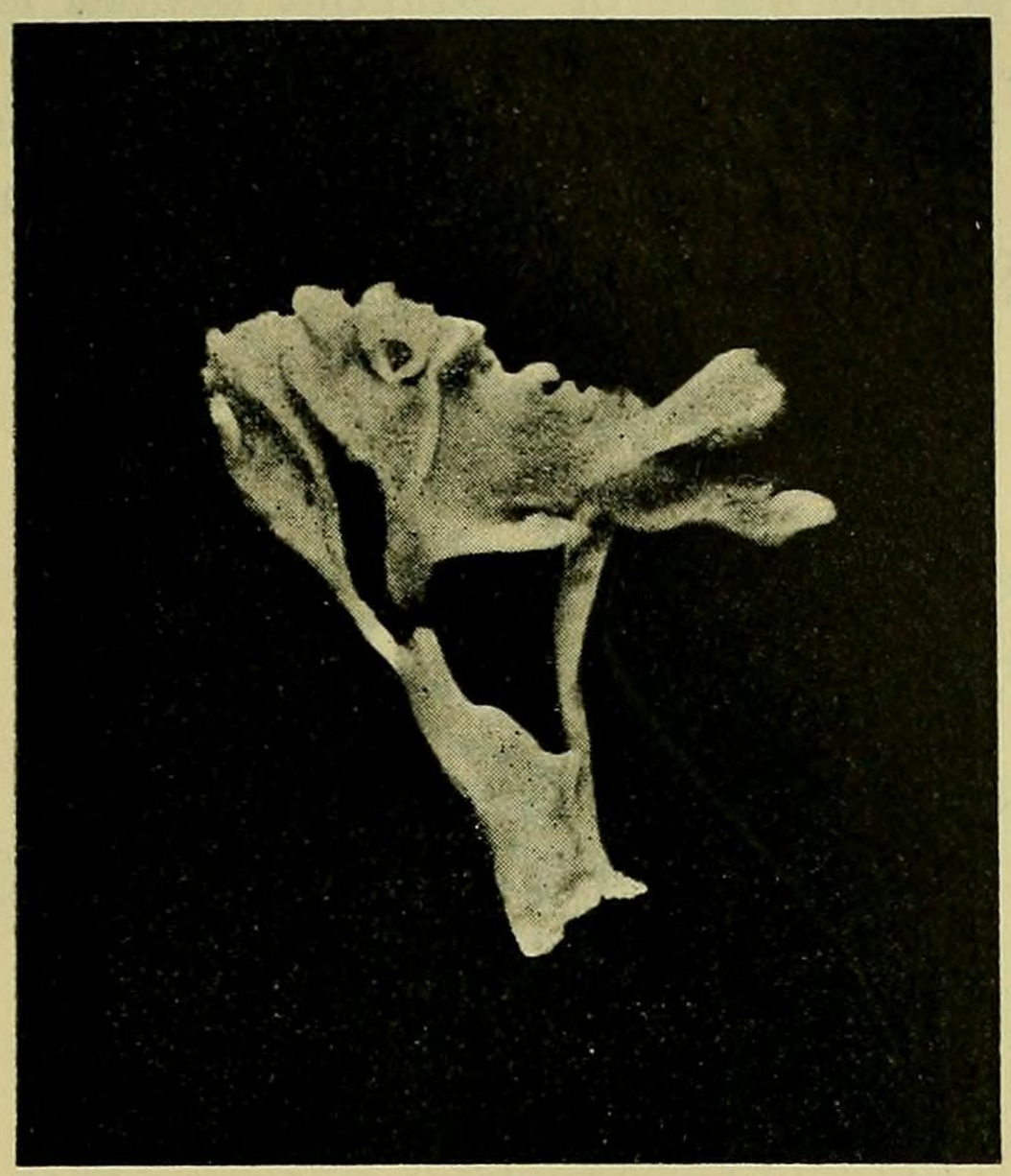
CLATHRINA BLANCA. (Text-figs. 85–87.)

Guancha blancha Miklucho.

Ascetta blanca H.

One specimen of this sponge was dredged in 10 fathoms at Wasin. Its colour in spirits is pure white. Its shape is shown (natural size) in text-fig. 85. The sponge is formed of flat fan-shaped heads on the ends of a branching stalk. The largest head is shown ($\times 5$) in text-fig. 86. It consists of a flat mass of anastomosing tubes with several oscules on the outer edge; sections show that the head is about three tubes thick, and that the tubes are so arranged that the spaces in the meshwork never extend right through it. The stalk is somewhat flattened and

Text-fig. 85.



Clathrina blanca (Mik.). Nat. size.

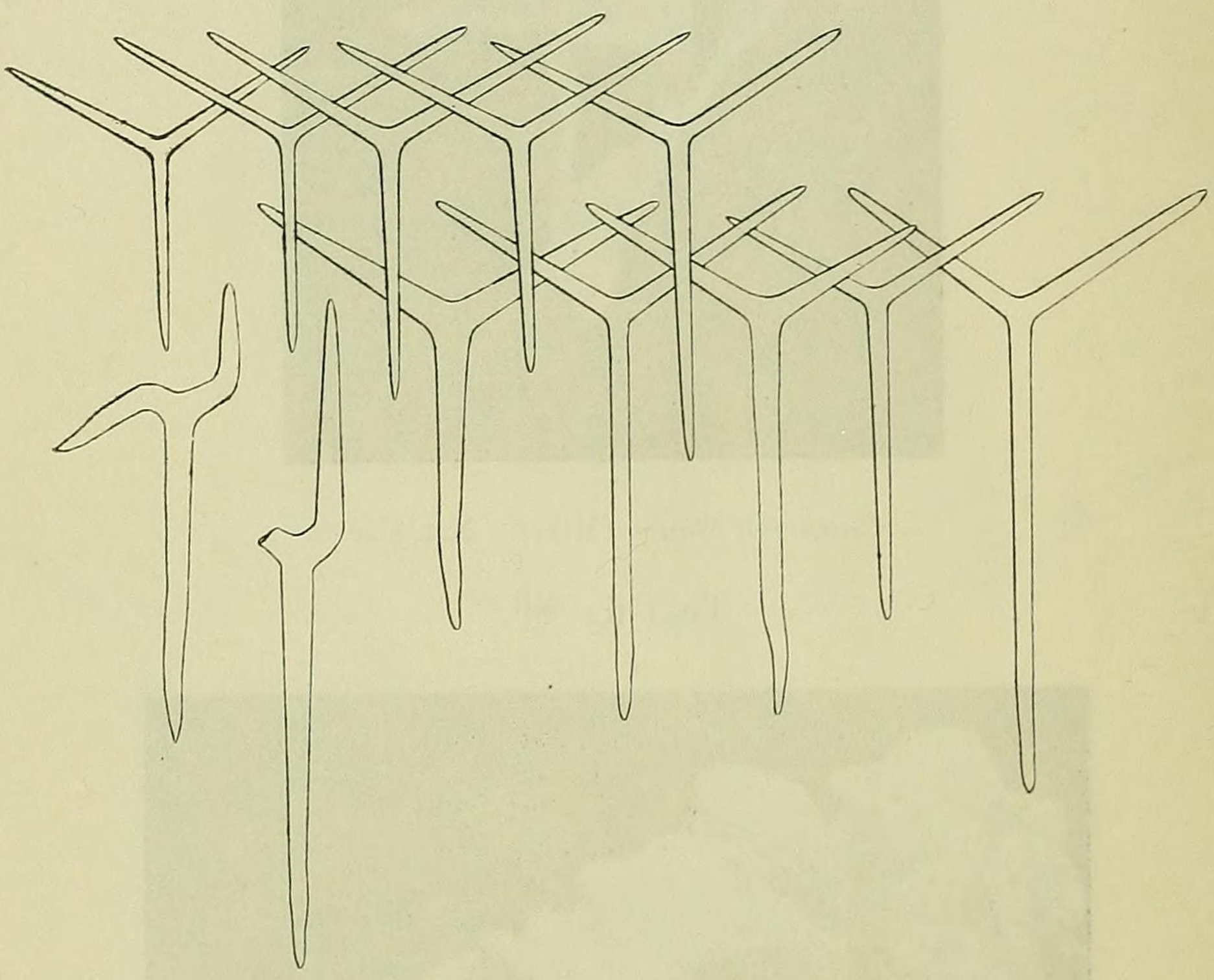
Text-fig. 86.

Clathrina blanca (Mik.). × 5.

is solid. The flat shape of the specimen is remarkable; the ordinary shape of the heads of *Clathrina blanca* is more or less spherical.

The skeleton consists of regular and sagittal triradiates (text-fig. 87). The spicules agree fairly well with the descriptions given by Haeckel (**1**) and von Lendenfeld (**7**).

Text-fig. 87.



Clathrina blanca, spicules. × 220.

The body-spicules are mostly regular, but some have the basal rays slightly the longest. Paired rays 65–70 $\mu \times 4$–6 μ. Basal ray 70–110 $\mu \times 4$–6·5 μ.

The stalk-spicules are almost all sagittal, the smaller ones on the outside and the larger ones inside, all arranged with the basal ray downwards. Paired rays 60–80 $\mu \times 5$–9 μ. Basal ray 100–160 $\mu \times 70$–110 μ.

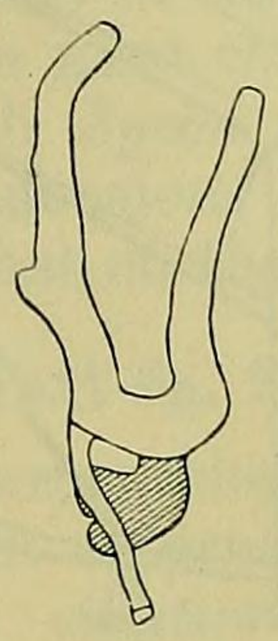
LEUCOSOLENIA IRREGULARIS, sp. n. (Text-figs. 88–90.)

One small specimen of this new species was found among the *Clathrina primordialis* dredged in 6–8 fathoms at Wasin. It consists of two erect tubes with a short rooting tube (text-fig. 88).

The skeleton (text-fig. 89) is rather remarkable. It contains no triradiates but is made up of two types of equiangular quadriradiates, lying without orientation, together with a few large oxea which project in all directions.

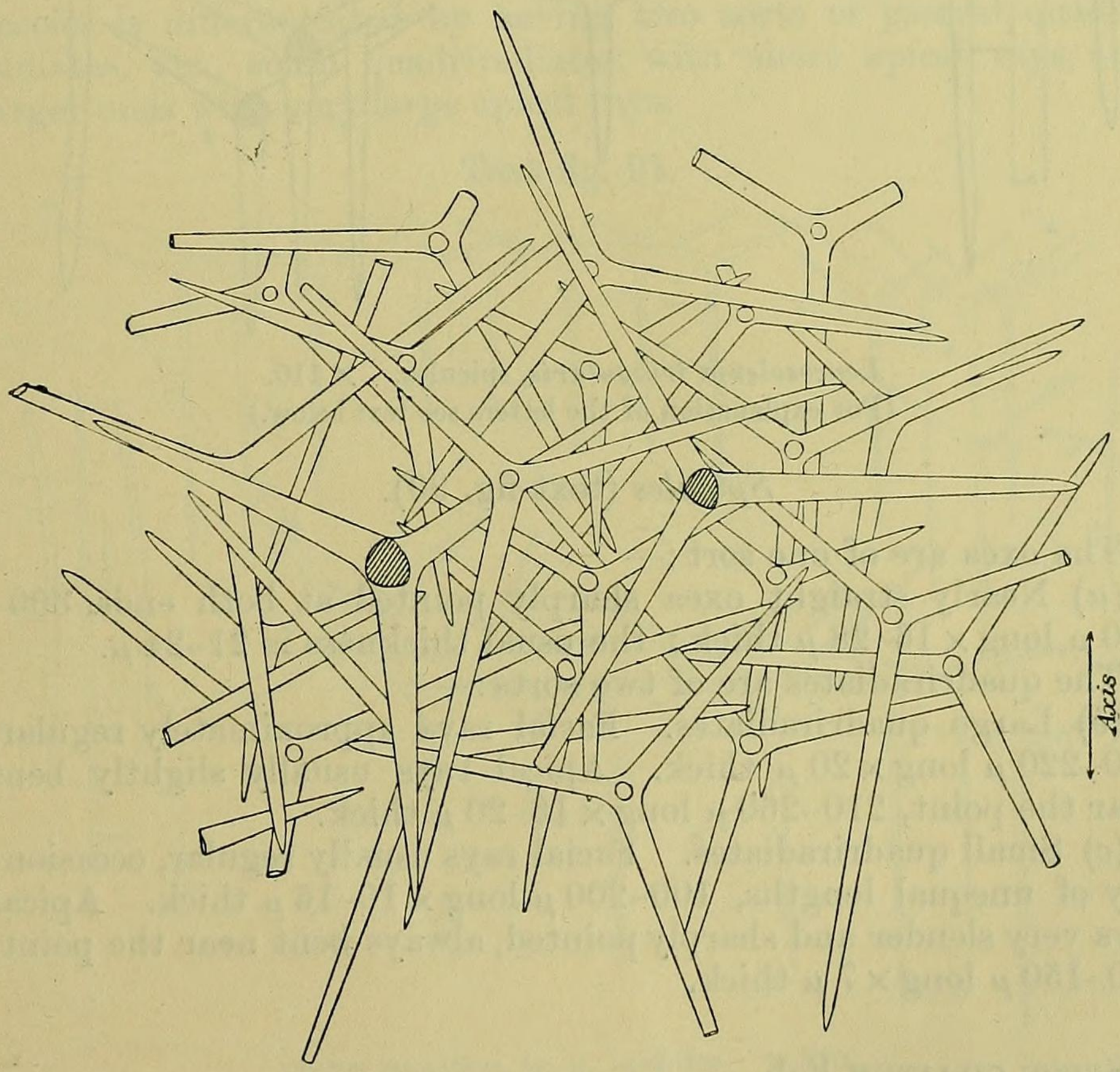
Most species of *Leucosolenia* contain triradiates as well as quadriradiates, and the facial rays of both sorts of spicule are usually alate and regularly placed with the basal ray downwards.

Text-fig. 88



Leucosolenia irregularis. × ½.

Text-fig. 89.

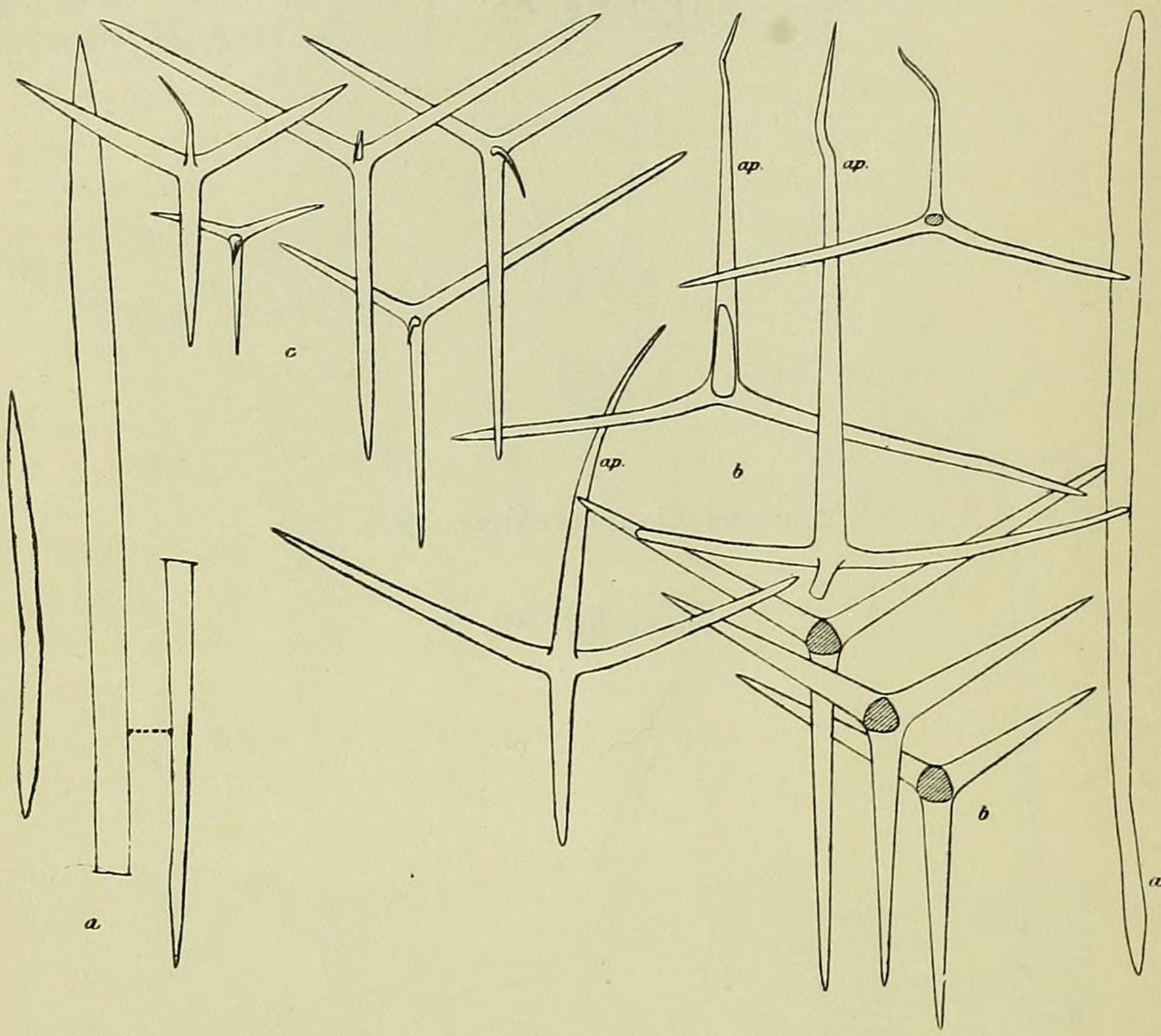


Leucosolenia irregularis, skeleton of dermis. × 150.

All the spicules in the new species are large, two or three times the size of those in the British species of *Leucosolenia*. The facial rays of the larger quadriradiates are usually of the

same length, but those of the smaller quadriradiates are often of unequal lengths. The oscules of both tubes are too much damaged to furnish any indication of their structure.

Text-fig. 90.



Leucosolenia irregularis, spicules. × 110.
(For explanation of the letters see text below.)

Spicules (text-fig. 90).

The oxea are of one sort:—

(*a*) Nearly straight oxea sharply pointed at both ends, 300–800 μ long × 16–28 μ thick; the usual thickness is 21–24 μ.

The quadriradiates are of two sorts:—

(*b*) Large quadriradiates. Facial rays approximately regular, 150–220 μ long × 20 μ thick. Apical rays usually slightly bent near the point, 210–260 μ long × 16–20 μ thick.

(*c*) Small quadriradiates. Facial rays usually regular, occasionally of unequal lengths, 100–200 μ long × 10–16 μ thick. Apical rays very slender and sharply pointed, always bent near the point, 120–150 μ long × 7 μ thick.

Sycon ciliatum Fab.

Sycandra ciliata H.

Two small specimens of this species were dredged in 7 fathoms in the Zanzibar Channel. Their dimensions are 8 × 2 mm. and 5 × 1¼ mm.

SYCON AMPULLUM.

Sycandra ampulla H.

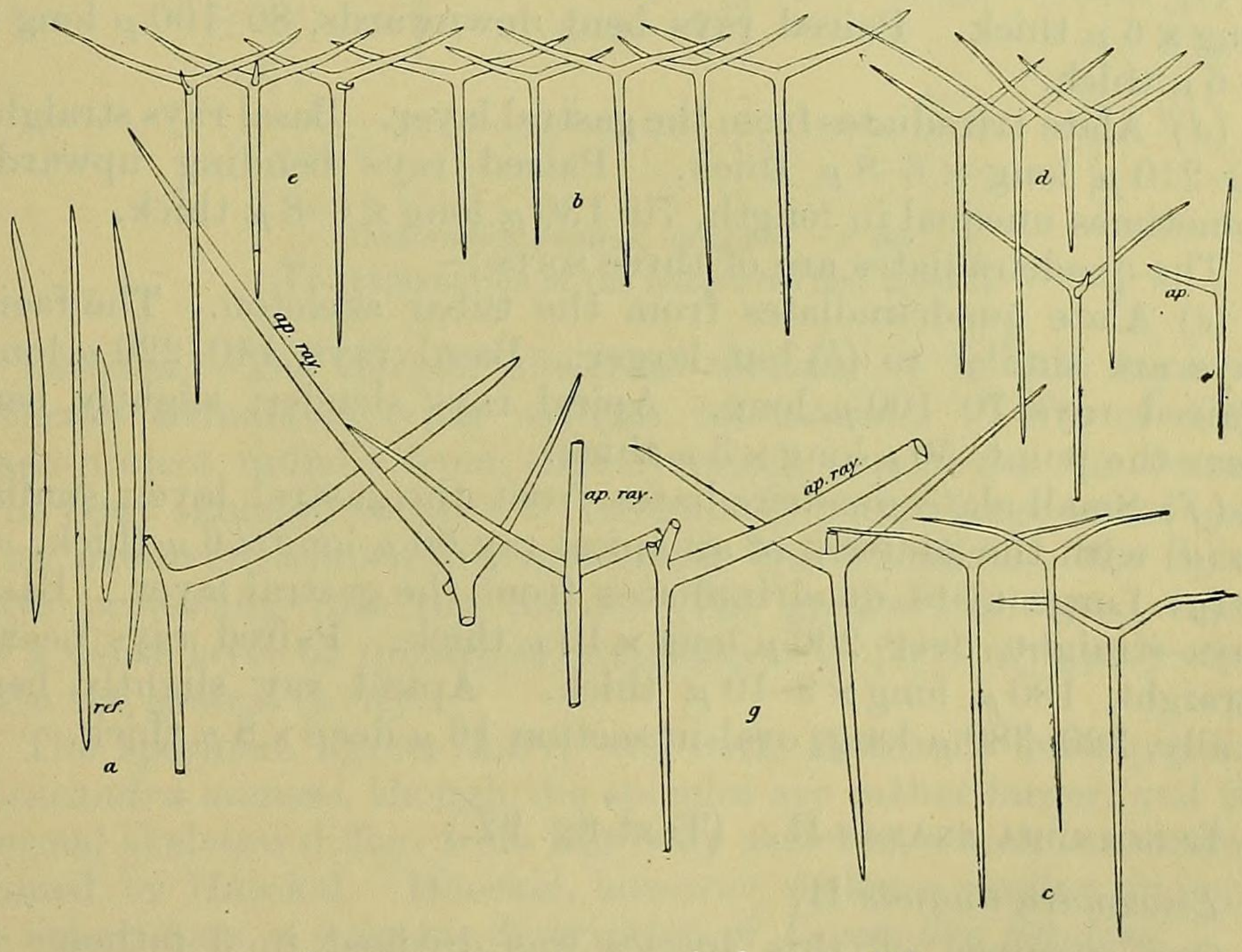
One small specimen of this species was dredged in 6–8 fathoms at Wasin. It is 11 mm. long × 5 mm. diameter. Its structure is typical of the genus. The spicules are too small for *Sycon raphanus*, and there are none of the thin subgastral tri- and quadriradiates which are the most characteristic features of that species. Comparing it with *Sycon ampullum* the spicules are rather thicker than the dimensions given by Haeckel and the oxea are also rather longer, but on the whole it agrees fairly well.

SYCON MUNITUM, sp. n. (Text-fig. 91.)

Three specimens of this new species were dredged in 7 fathoms in the Zanzibar Channel. In external appearance they resemble small specimens of *Sycon ciliatum*. Their dimensions are 7 × 3 mm., 5 × 3 mm., and 3 × 1 mm.

The peculiarity of the species is the presence of quadriradiates in the articulated tubar skeleton. Only a few species of *Sycon* are known with quadriradiates in this position; from these the new species is differentiated by having two sorts of gastral quadriradiates, viz., small quadriradiates with short apical rays and larger ones with very large apical rays.

Text-fig. 91.



Sycon munitum, sp. n., spicules. × 110.
(For explanation of the letters see text p. 444.)

Skeleton.—The *gastral skeleton* is a dense felt of small tri- and quadriradiates, fairly regularly arranged round the apopyles, with the basal rays aborally directed and the small apical rays pro-

jecting into the gastral cavity. The apical rays being short, many of them hardly reach further than just through the thick gastral layer. Among these spicules, every here and there, lies one of the large quadriradiates, with its large apical ray projecting far into the gastral cavity.

The articulated *tubar skeleton* is built up of tri- and quadriradiates. The short apical rays of the quadriradiates project into the flagellated chambers. The tops of the chambers are crowned with tufts of small oxea.

The oscule has a thick fringe of thin straight oxea. The flagellated chambers get shorter near the oscule and there is no collar. There are remains of a diaphragm across the oscule.

Spicules (text-fig. 91).

The oxea are of one sort:—

(*a*) Oxea from the ends of the flagellated chambers, nearly straight, pointed at both ends, 170–400 μ long $\times$ 8 μ thick. Some of these are more refringent than others. The refringent spicules are quite straight.

The triradiates are of three sorts:—

(*b*) Alate triradiates from the tubar skeleton. Basal rays straight, 110–170 μ long $\times$ 5–6 μ thick. Paired rays bent upwards, 60–100 μ long $\times$ 5–7 μ thick. Oral angle about 140°.

(*c*) Alate subgastral triradiates. Basal rays straight, 180–230 μ long $\times$ 6 μ thick. Paired rays bent downwards, 80–100 μ long $\times$ 4–6 μ thick.

(*d*) Alate triradiates from the gastral layer. Basal rays straight, 80–210 μ long $\times$ 6–8 μ thick. Paired rays bending upwards, sometimes unequal in length, 70–130 μ long $\times$ 6–8 μ thick.

The quadriradiates are of three sorts:—

(*e*) Alate quadriradiates from the tubar skeleton. The facial rays are similar to (*b*) but larger. Basal rays 140–220 μ long. Paired rays 70–100 μ long. Apical rays slender, slightly bent near the point, 50 μ long $\times$ 3 μ thick.

(*f*) Small alate quadriradiates from the gastral layer, similar to (*d*) with the addition of an apical ray 60 μ long $\times$ 6 μ thick.

(*g*) Large alate quadriradiates from the gastral layer. Basal rays straight, over 200 μ long $\times$ 10 μ thick. Paired rays nearly straight, 180 μ long $\times$ 9–10 μ thick. Apical ray slightly bent orally, 320–380 μ long, oval in section 16 μ deep $\times$ 8 μ thick.

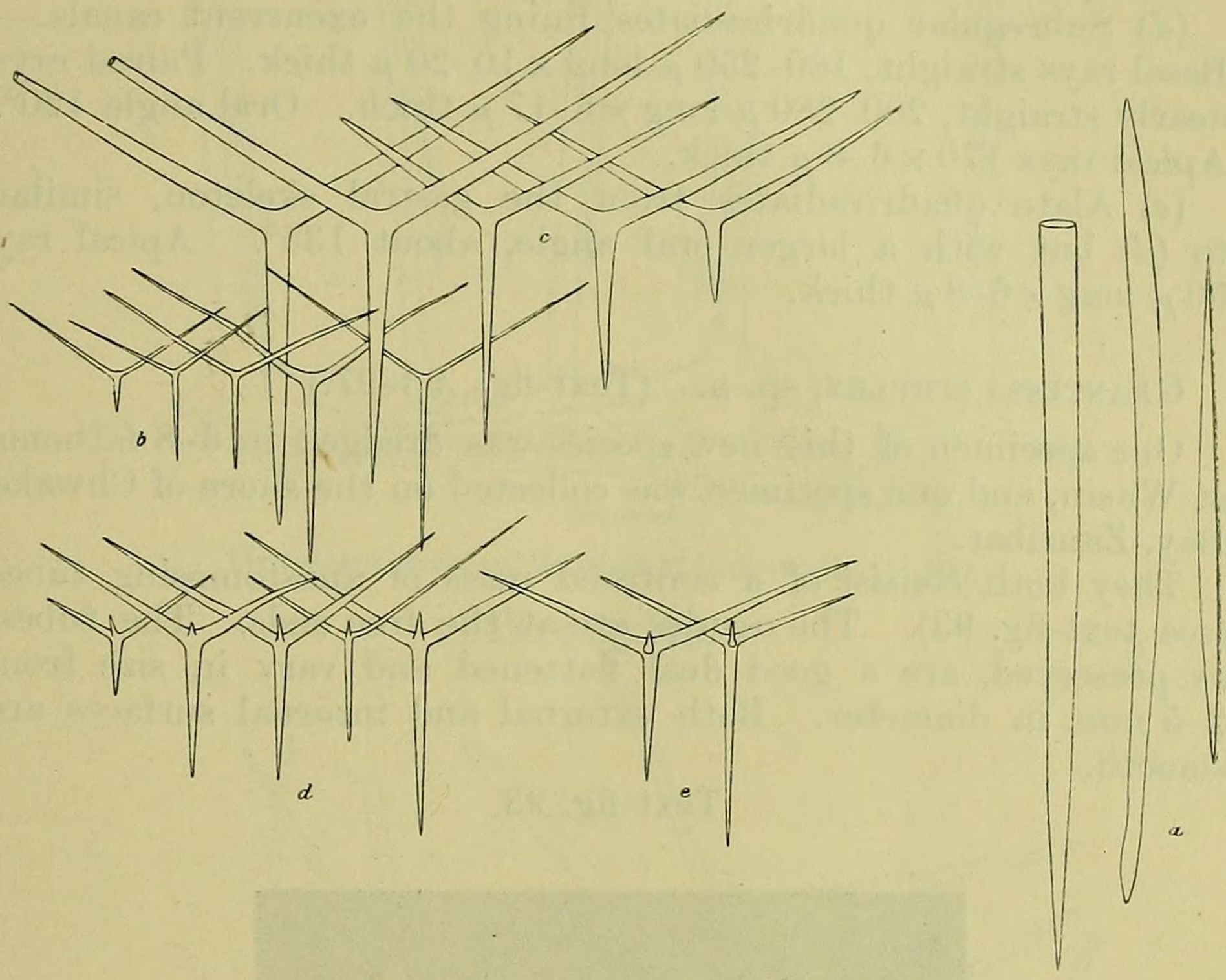
Leucandra ananas H. (Text-fig. 92.)

Leucandra ananas H.

One specimen of this species was dredged in 3 fathoms in Chwaka Bay, Zanzibar. It is flask-shaped, 20 mm. long $\times$ 13 mm. diameter, with an oscule 5 mm. diameter. It was dirty white in colour when alive. The body-wall is about 3 mm. thick near the middle and surrounds a gastral cavity about 7 mm. diameter.

Canal-system.—There are large incurrent chambers under the dermis from which the large incurrent canals run radially inwards. The excurrent canals are also large and run radially between the others; they communicate with the gastral cavity through large ports.

Text-fig. 92.



Leucandra ananas, spicules. × 56.
(For explanation of the letters see text below.)

Skeleton.—The dermal skeleton consists of a thin layer of delicate triradiates lying without orientation. Tufts of large oxea project radially from slightly raised papillæ on the dermis. The body skeleton consists of irregularly placed large triradiates. The excurrent canals are lined with quadriradiates, the apical rays projecting into the canals. The gastral skeleton consists of a dense layer of quadriradiates with the apical rays projecting into the gastral cavity.

The specimen agrees fairly well with Haeckel's description of *Leucandra ananas*, though the spicules are rather larger, and the dermal skeleton differs from the body skeleton, which is not mentioned by Haeckel. Haeckel, however, makes a similar omission in other cases, *e. g.* in his description of *Leucandra fistulosa*.

Spicules (text-fig. 92).

The oxea are of one sort:—

(*a*) Nearly straight sharply-pointed oxea, 700–3000 μ long × 28–46 μ thick.

The triradiates are of two sorts :—

(*b*) Slender dermal triradiates, subregular. Rays 160–280 μ long $\times$ 5–10 μ thick.

(*c*) Subregular triradiates from the body. Basal ray straight, 120–400 μ long $\times$ 20–32 μ thick. Paired rays almost straight, 140–550 μ long $\times$ 16–26 μ thick.

The quadriradiates are of two sorts :—

(*d*) Subregular quadriradiates lining the excurrent canals.—Basal rays straight, 180–250 μ long $\times$ 10–20 μ thick. Paired rays nearly straight, 200–280 μ long $\times$ 6–17 μ thick. Oral angle 120°. Apical rays 170 $\times$ 6–8 μ thick.

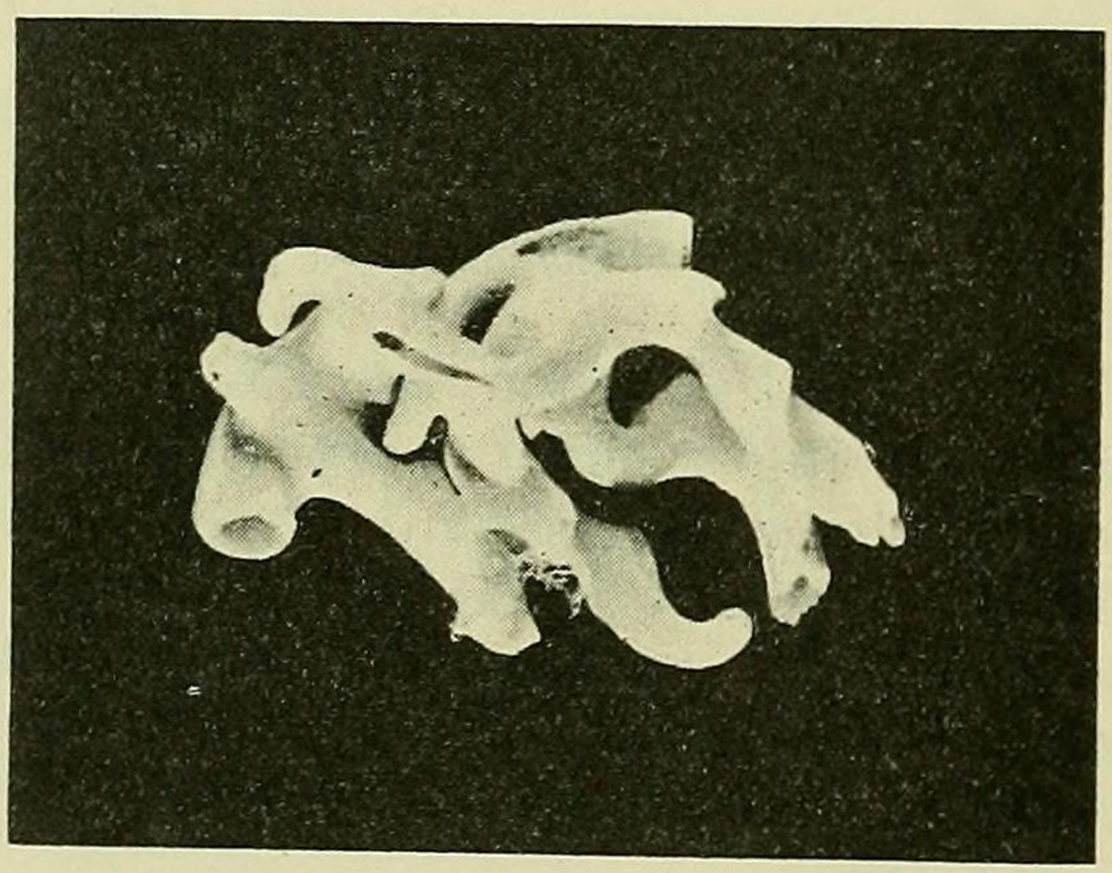
(*e*) Alate quadriradiates from the gastral skeleton, similar to (*d*) but with a larger oral angle, about 135°. Apical ray 50 μ long $\times$ 6–8 μ thick.

Grantessa simplex, sp. n. (Text-figs. 93–97.)

One specimen of this new species was dredged in 6–8 fathoms at Wasin, and one specimen was collected on the shore of Chwaka Bay, Zanzibar.

They both consist of a confused mass of anastomosing tubes (see text-fig. 93). The oscules are at the free ends. The tubes, as preserved, are a good deal flattened and vary in size from 2–5 mm. in diameter. Both external and internal surfaces are smooth.

Text-fig. 93.



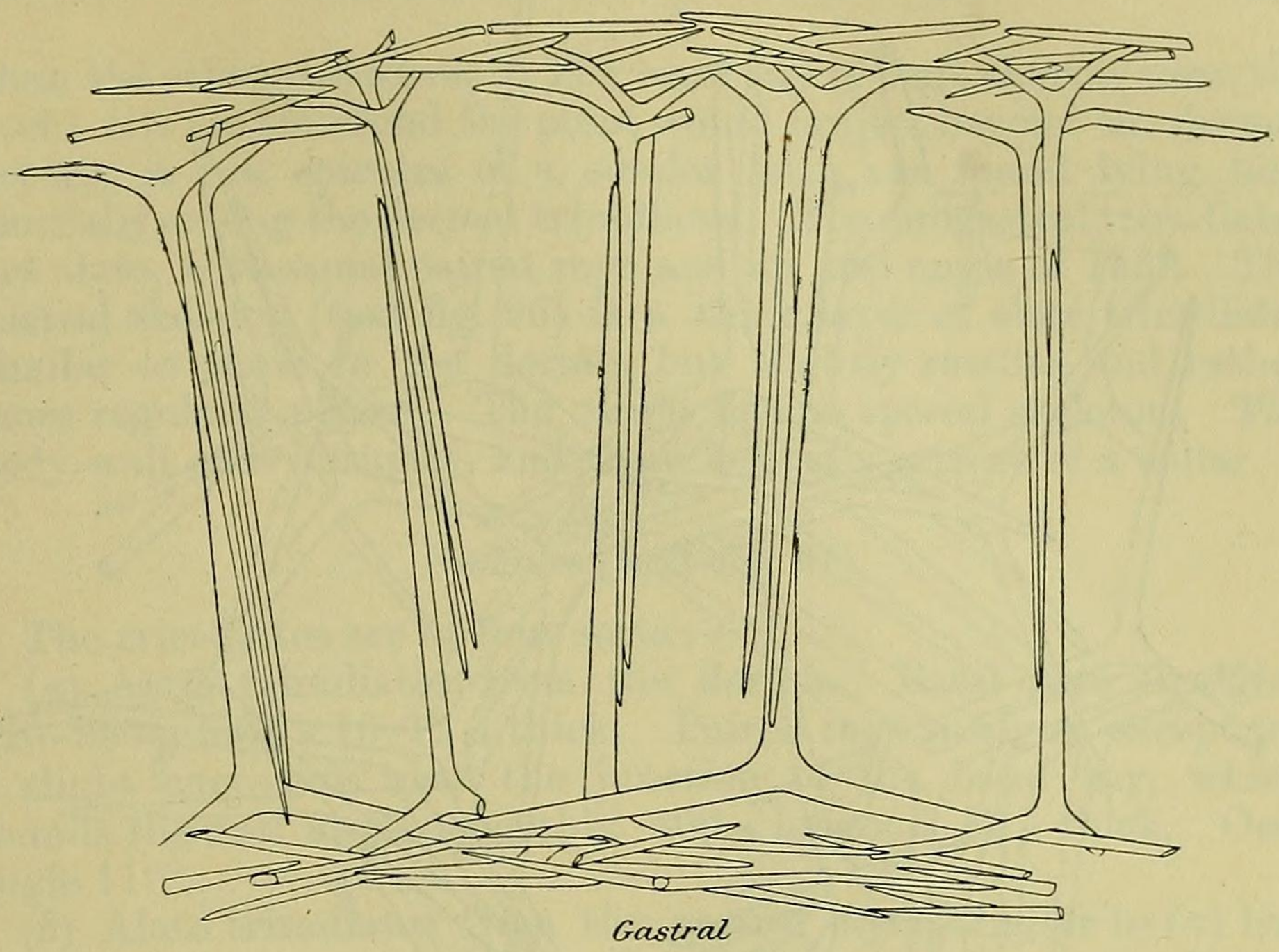
Grantessa simplex, sp. n. Nat. size.

The structure of the body-wall is very regular and typical of the genus *Grantessa* (see text-fig. 94).

The *skeleton* is formed entirely of triradiates. The dermal skeleton (text-fig. 95) consists of alate triradiates lying tangentially, without orientation. The subdermal triradiates (*c*, text-fig. 97) are modified dermal spicules; the centripetal ray is one of the paired rays, not the basal ray*; it is considerably longer

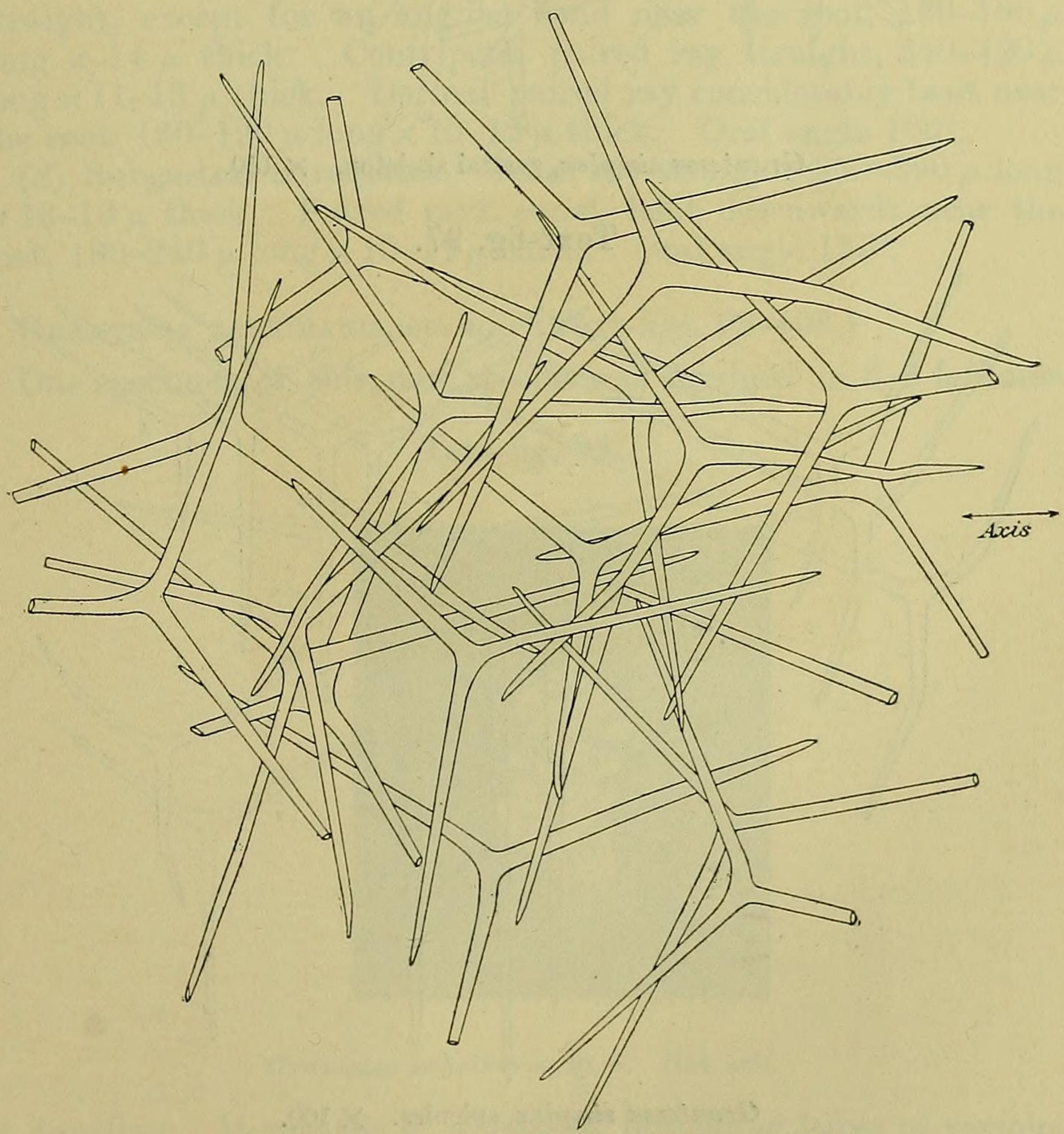
* *Cf.* Poléjaeff (**2**).

Text-fig. 94.



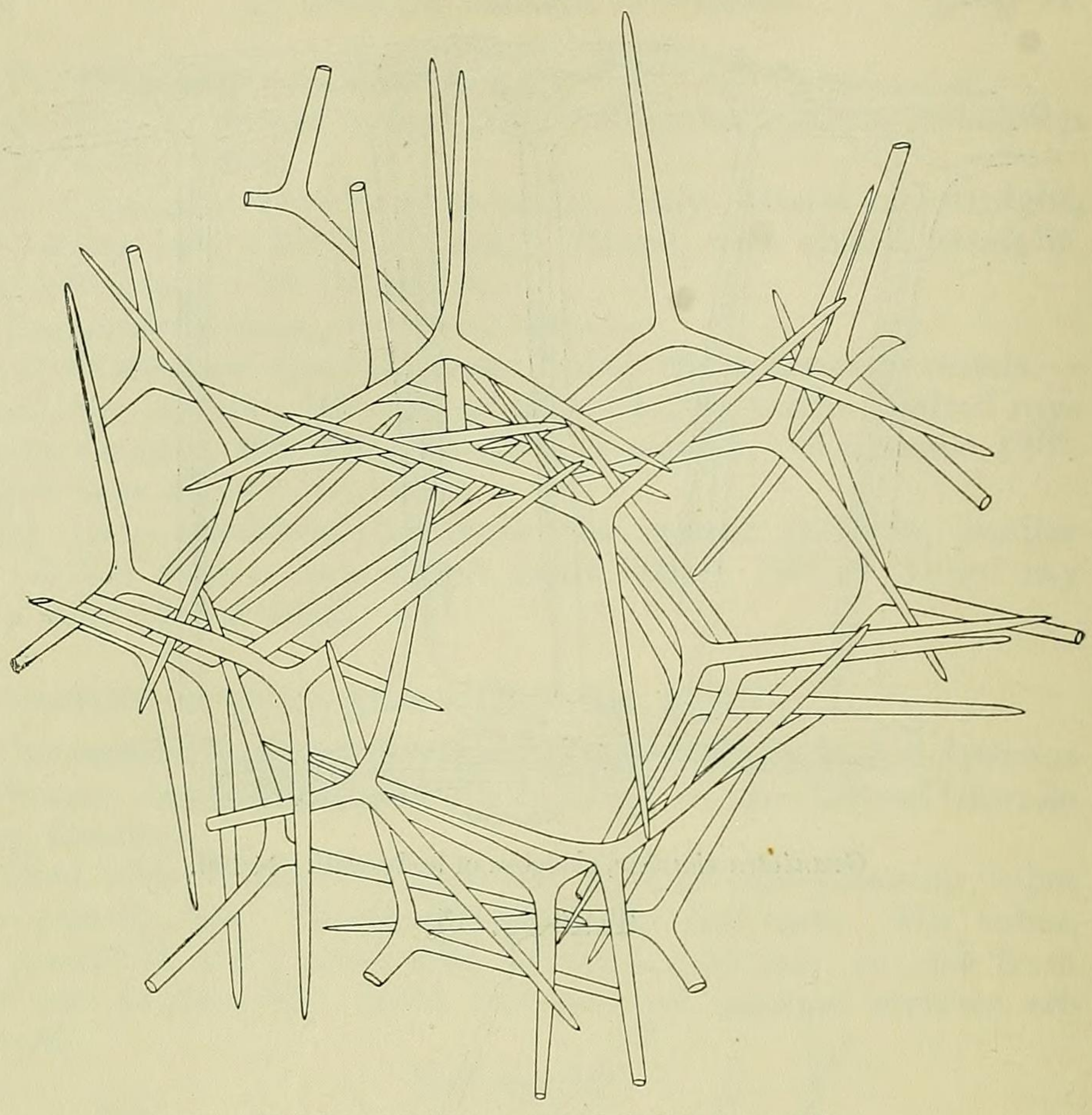
Grantessa simplex, skeleton of body-wall. × 100.

Text-fig. 95.



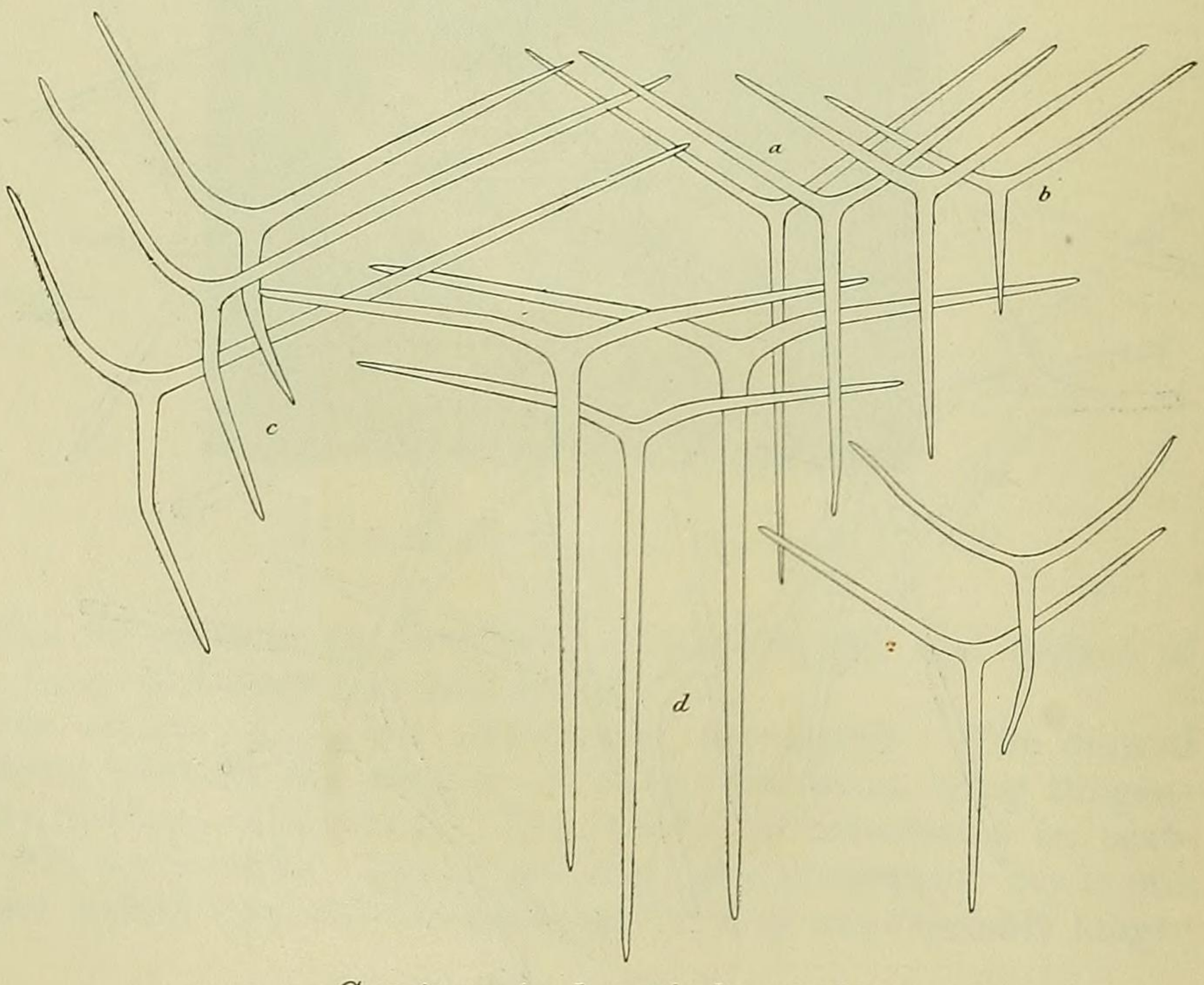
Grantessa simplex, skeleton of dermis. × 150.

Text-fig. 96.



Grantessa simplex, gastral skeleton. × 150.

Text-fig. 97.



Grantessa simplex, spicules. × 100.

(For explanation of the letters see text p. 449).

than the other paired ray. The basal ray is bent sharply near the root; but for this bend the point would project beyond the dermal layer. A few spicules of a similar form are found lying tangentially among the dermal triradiates. The subgastral triradiates are alate, with equal paired rays and an oral angle of 155°. The gastral skeleton (text-fig. 96) is a thick layer of alate triradiates similar to those in the dermis, but slightly smaller and rather more regularly placed. The oscule has no special skeleton. The body-wall ends abruptly, and there is hardly a trace of a collar.

Spicules (text-fig. 97).

The triradiates are of four sorts :—

(*a*) Alate triradiates from the dermis. Basal rays straight, 210–250 μ long × 10–12 μ thick. Paired rays straight, except for a slight curvature near the junction of the basal ray, which rounds the oral angle smoothly, 200 μ long × 8–10 μ thick. Oral angle 110°.

(*b*) Alate triradiates from the gastral layer, similar to (*a*) but smaller. Basal ray 180 μ (occasionally much shorter). Paired rays 140–150 μ long. Oral angle 115°–120°.

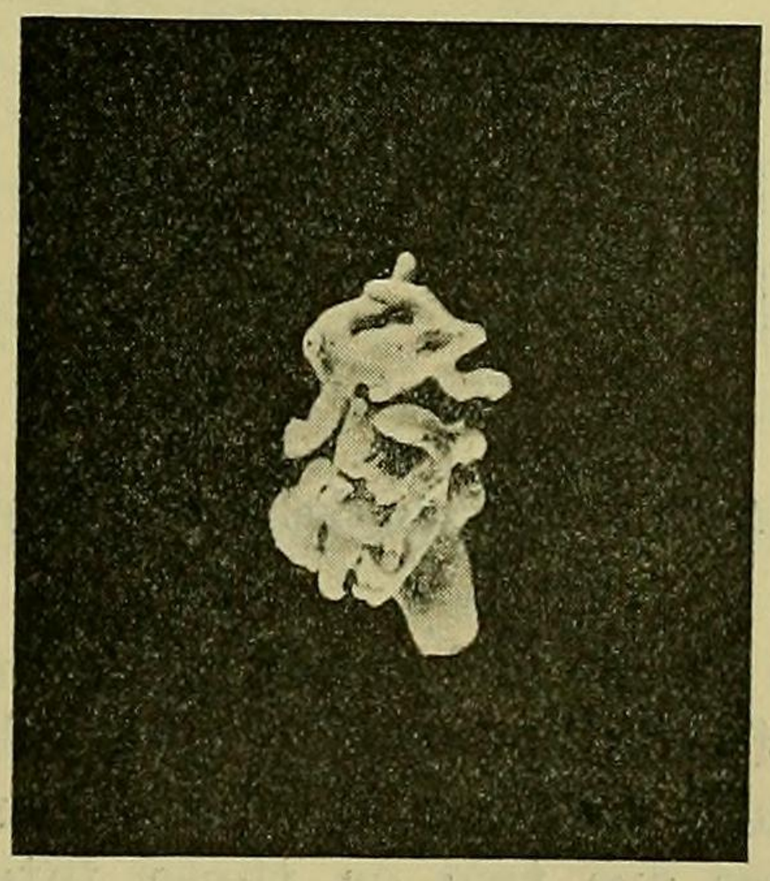
(*c*) Subdermal triradiates. Basal ray (lying in the dermis) straight, except for an angular bend near the root, 130–190 μ long × 14 μ thick. Centripetal paired ray straight, 240–420 μ long × 11–13 μ thick. Dermal paired ray considerably bent near the root, 160–190 μ long × 10–12 μ thick. Oral angle 100°.

(*d*) Subgastral triradiates. Basal ray straight, 360–390 μ long × 13–16 μ thick. Paired rays, equal, bent downwards near the root, 180–240 μ long × 10–12 μ thick. Oral angle 155°.

Grantessa zanzibaris, sp. n. (Text-figs. 98–102.)

One specimen of this new species was dredged in 6–8 fathoms

Text-fig. 98.

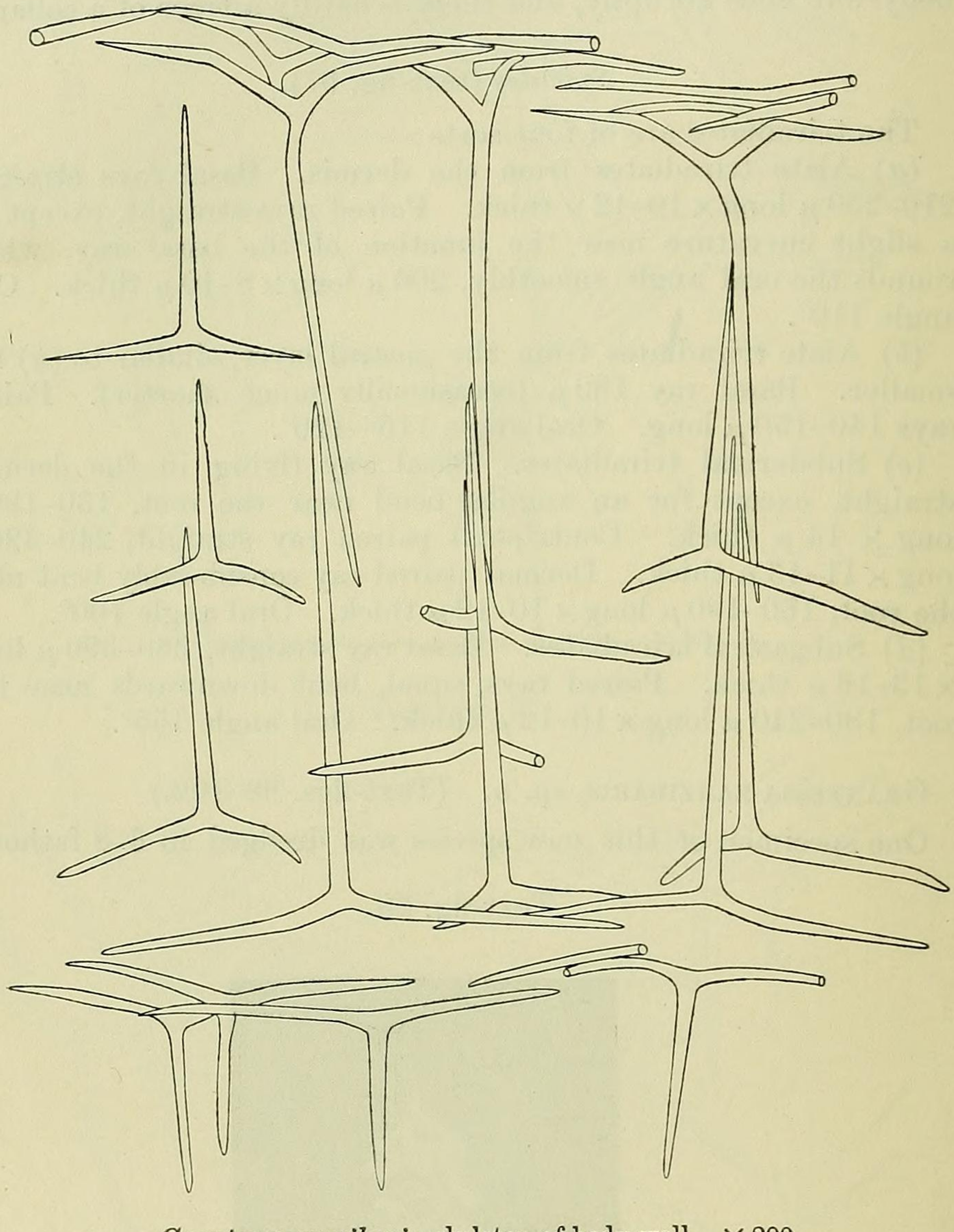


Grantessa zanzibaris, sp. n. Nat. size.

at Zanzibar. It consists of a mass of branching tubes of various

sizes; there is no anastomosis between the branches (see text-fig. 98). The tubes, as preserved, are flattened so that the opposite sides touch; they vary in size from 1–3 mm. wide. The external surface is smooth; the internal surface is lined with quadriradiates with the apical rays projecting inwards.

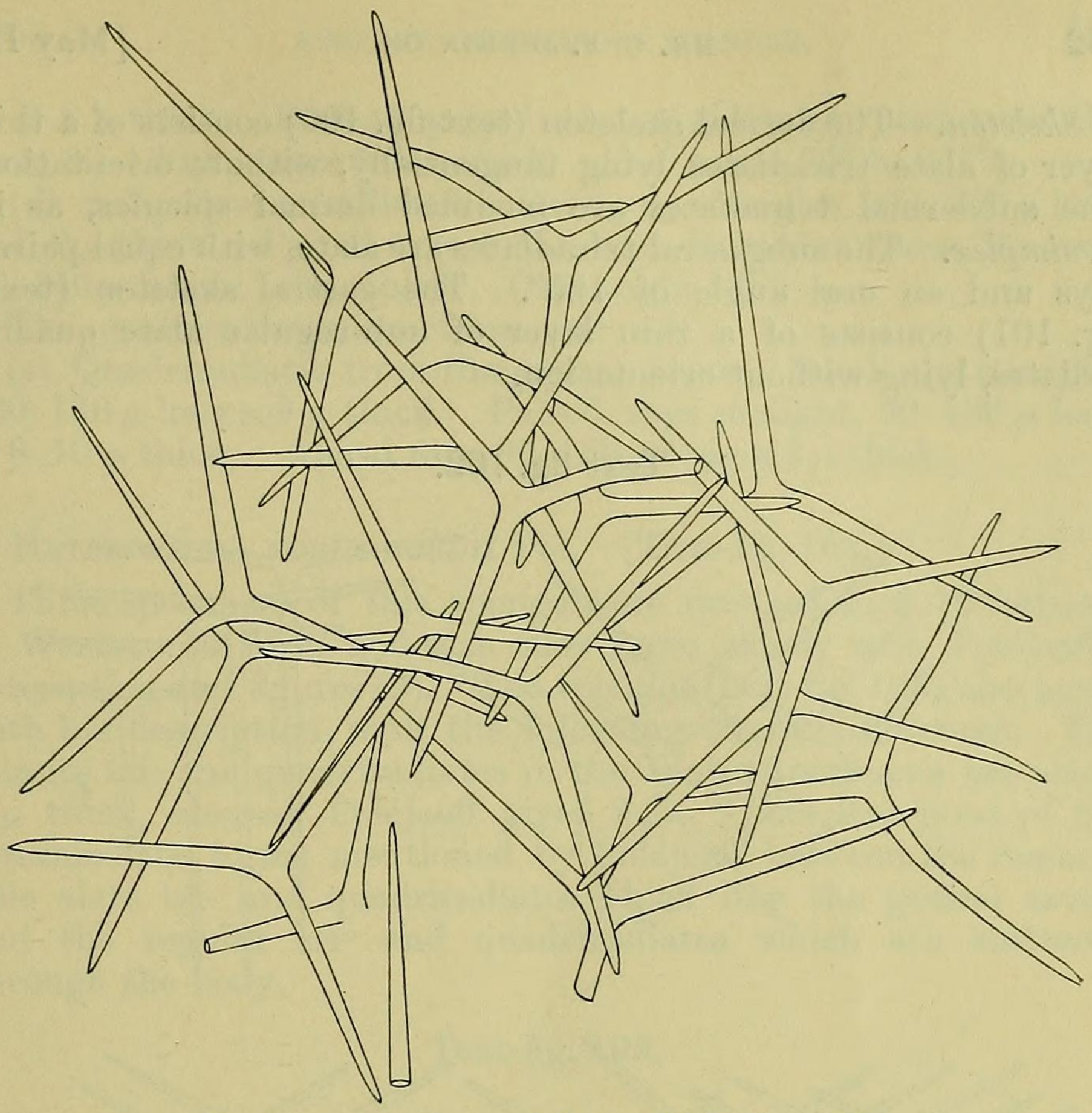
Text-fig. 99.



Grantessa zanzibaris, skeleton of body-wall. × 200.

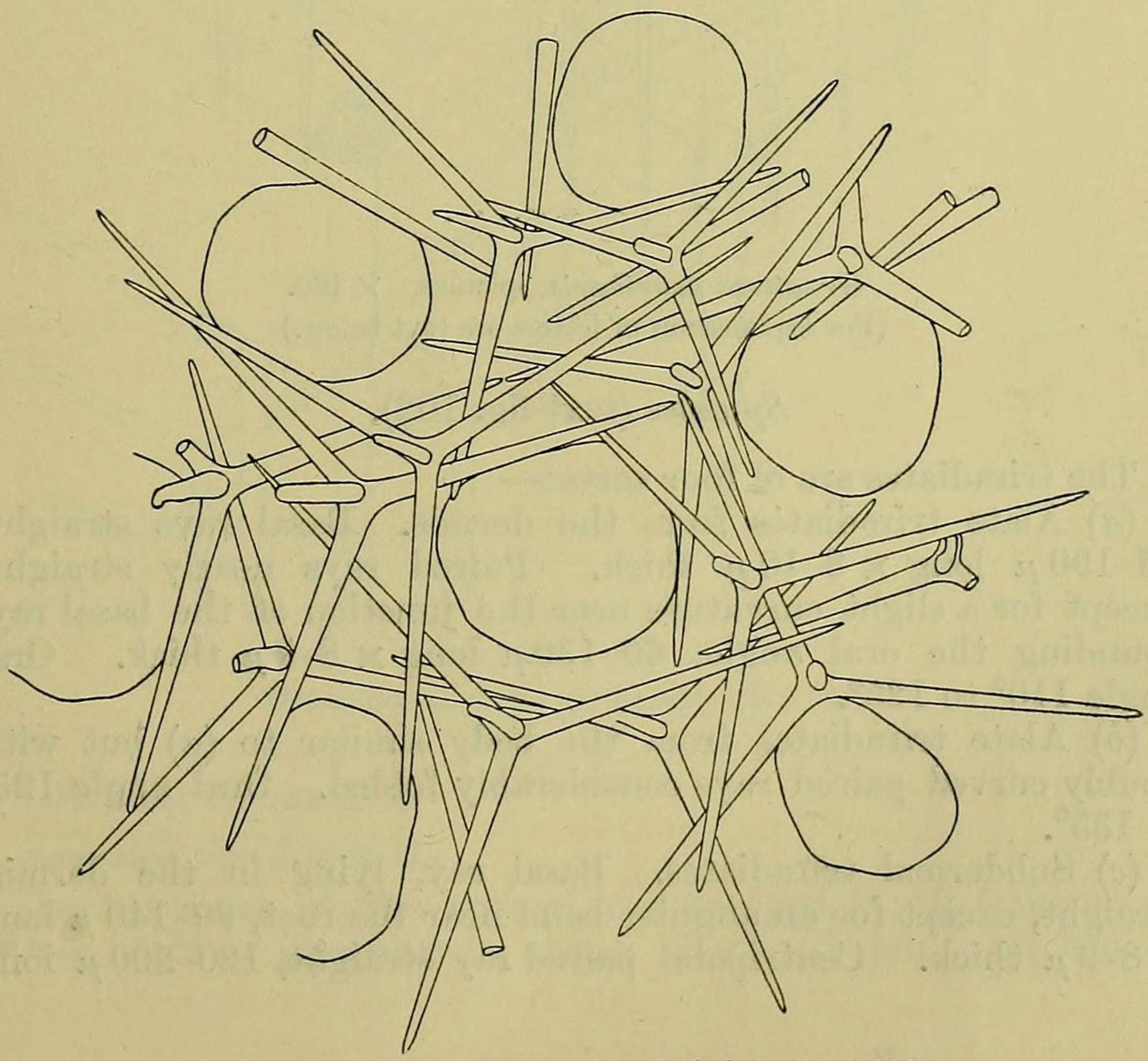
The structure of the body-wall is shown in text-fig. 99. The opposite rays of the subdermal and subgastral triradiates lie beside each other, forming a typical non-articulated skeleton; in addition there are two or three intermediate rows of triradiates, apparently the remains of an articulated skeleton. The structure agrees closely with that of *Grantessa intusarticulata* described and figured by Dendy (**3**).

Text-fig. 100.



Grantessa zanzibaris, skeleton of dermis. × 200.

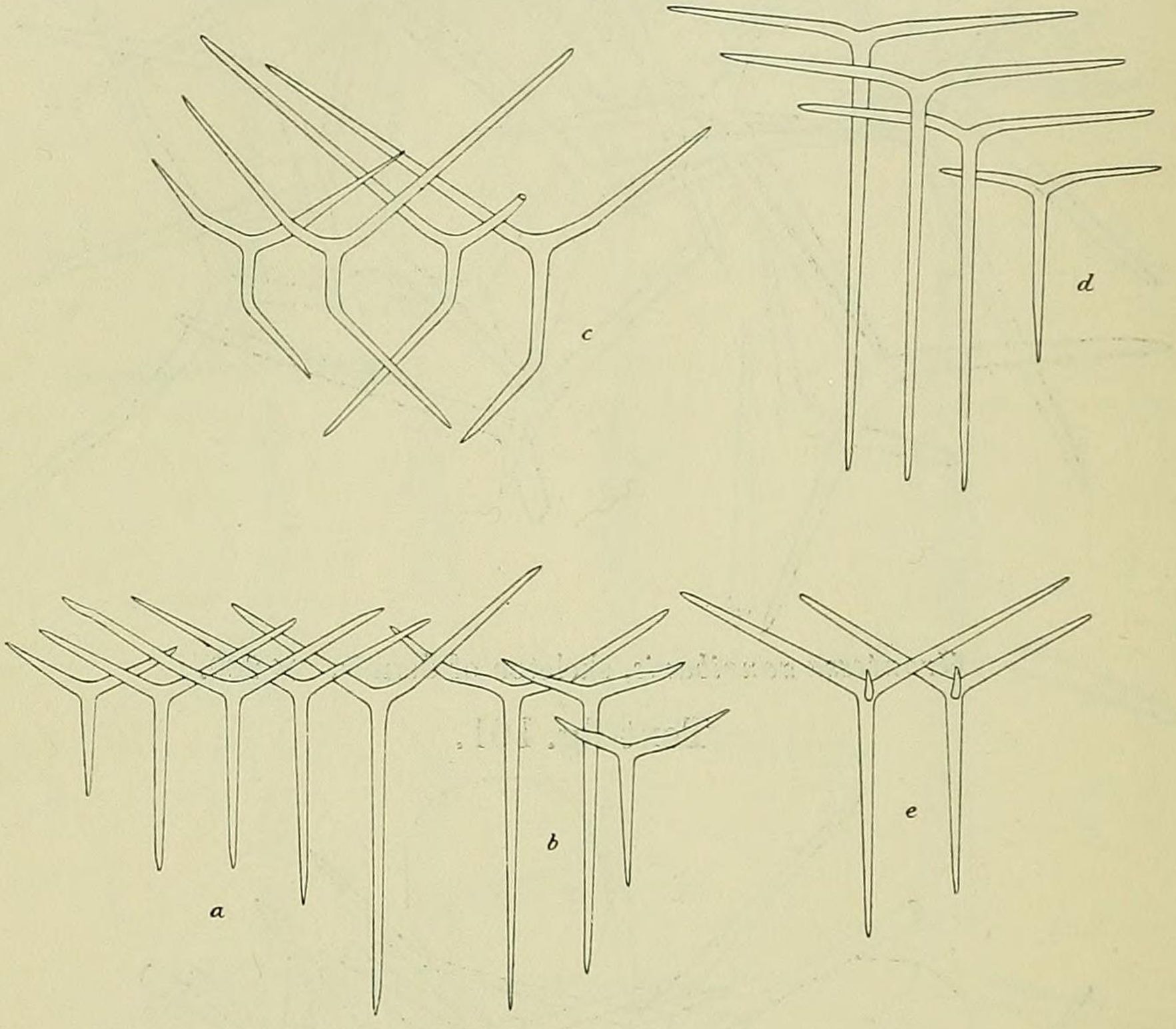
Text-fig. 101.



Grantessa zanzibaris, gastral skeleton. × 200.

Skeleton.—The dermal skeleton (text-fig. 100) consists of a thin layer of alate triradiates lying tangentially, without orientation. The subdermal triradiates are modified dermal spicules, as in *G. simplex*. The subgastral triradiates are alate, with equal paired rays and an oral angle of 165°. The gastral skeleton (text-fig. 101) consists of a thin layer of sub-regular alate quadriradiates, lying without orientation.

Text-fig. 102.



Grantessa zanzibaris, spicules. × 120.
(For explanation of letters see text below.)

Spicules (text-fig. 102).

The triradiates are of four sorts:—

(*a*) Alate triradiates from the dermis. Basal rays straight, 65–190 μ long × 8–10 μ thick. Paired rays nearly straight, except for a slight curvature near the junction of the basal ray, rounding the oral angle, 60–130 μ long × 8–9 μ thick. Oral angle 110° to 125°.

(*b*) Alate triradiates from the body similar to (*a*) but with doubly curved paired rays considerably folded. Oral angle 125° to 135°.

(*c*) Subdermal triradiates. Basal ray, lying in the dermis, straight, except for an angular bend near the root, 90–140 μ long × 8–9 μ thick. Centripetal paired ray straight, 120–200 μ long

× 6–8 μ thick. Dermal paired ray considerably bent near the root, 80–130 μ long × 6–8 μ thick. Oral angle 95° to 110°.

(*d*) Subgastral triradiates. Basal ray straight, 100–260 μ long × 7–9 μ thick. Paired rays equal, bent downwards near the root, 80–140 μ long × 7–8 μ thick. Oral angle 165°.

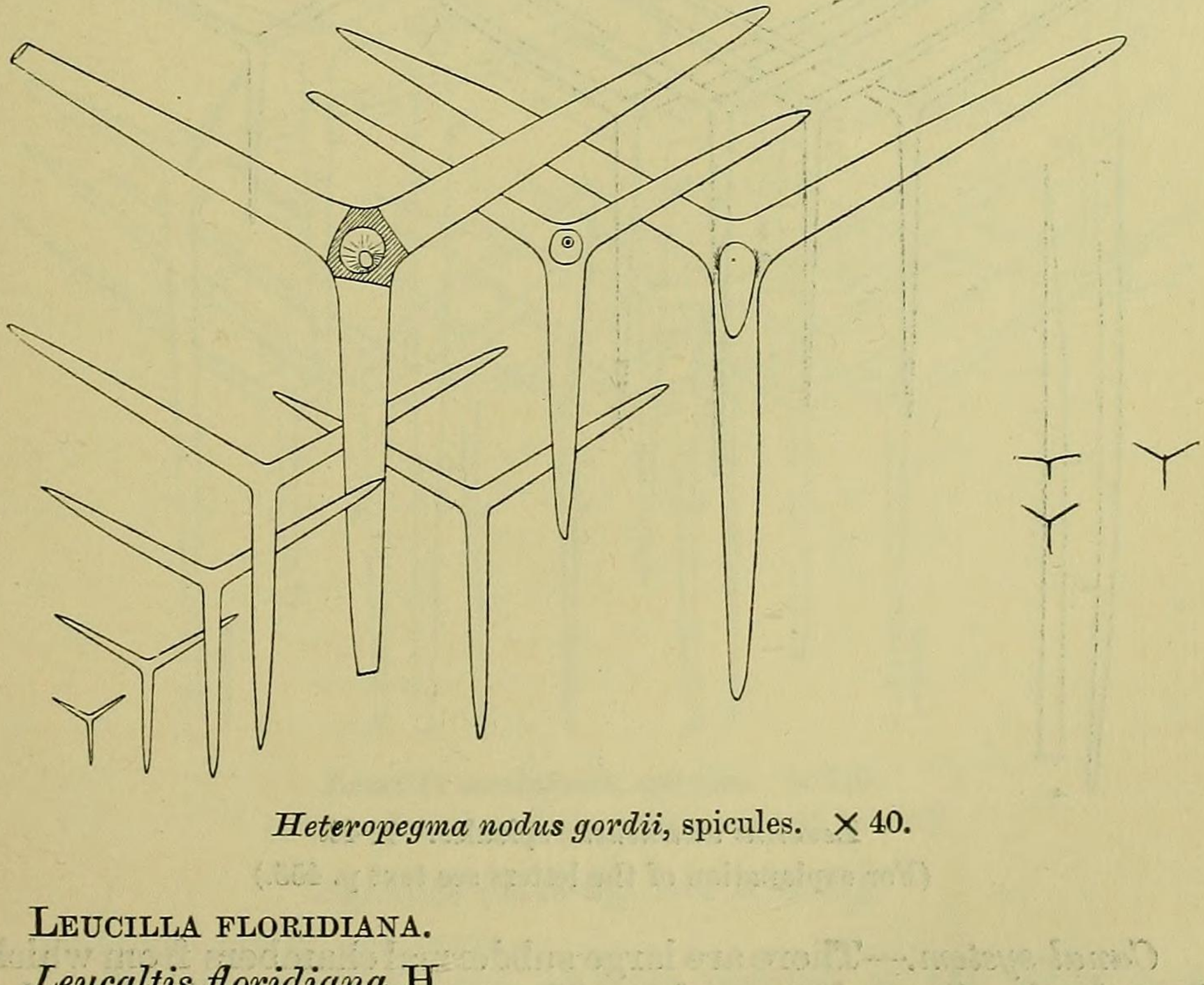
The quadriradiates are of one sort :—

(*e*) Quadriradiates from the gastral layer. Basal rays straight, 130–150 μ long × 9 μ thick. Paired rays straight, 90–130 μ long × 8–10 μ thick. Apical rays 80–130 μ long × 4 μ thick.

HETEROPEGMA NODUS GORDII Pol. (Text-fig. 103.)

Three specimens of this sponge were dredged in 6–10 fathoms at Wasin. In form and size they agree closely with Poléjaeff's description and figures (2). The spicules (text-fig. 103) also agree with his description with the following slight differences. The minute tri- and quadriradiates in the Wasin specimens are about 4 μ thick, whereas Poléjaeff gives 2 μ. There are none of the intermediate forms mentioned by Poléjaeff between the remarkable alate tri- and quadriradiates which line the gastral cavity and the regular tri- and quadriradiates which are scattered through the body.

Text-fig. 103.



Heteropegma nodus gordii, spicules. × 40.

LEUCILLA FLORIDIANA.

Leucaltis floridiana H.

One specimen of this sponge was dredged in 10 fathoms at Wasin. It is irregular in shape, 10 × 7 × 5 mm., and has an

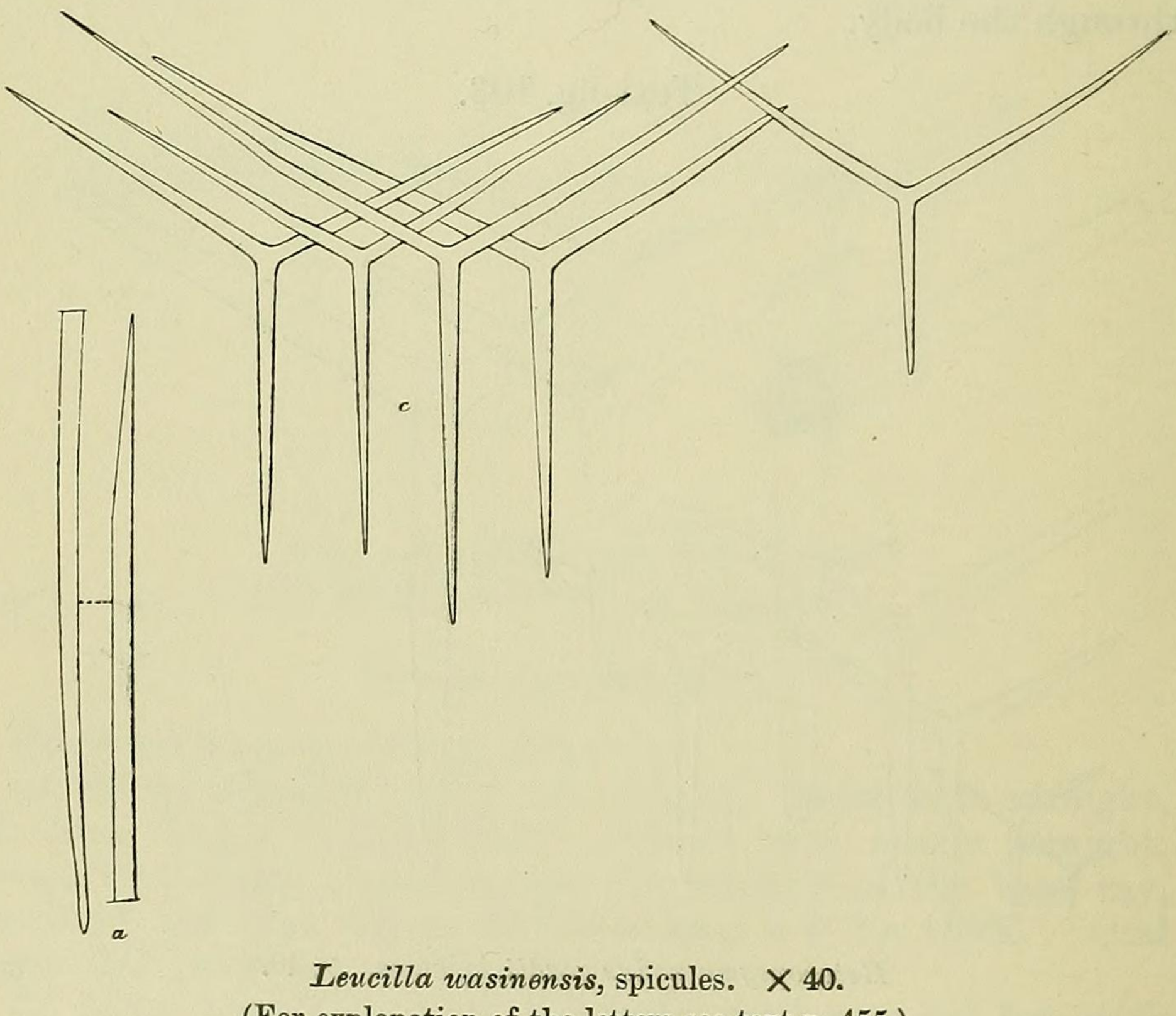
oscule $\frac{3}{4}$ mm. diameter flush with the surface; there is no collar or fringe.

The spicules agree very well with Haeckel's description of *Leucaltis floridiana*. The apical rays of the large quadriradiates in the dermis point inwards, the species must therefore be placed in the genus *Leucilla*. The small quadriradiates line the excurrent canals, with their apical rays projecting into them.

LEUCILLA WASINENSIS, sp. n. (Text-fig. 104.)

One specimen of this new species was dredged in 6–8 fathoms at Wasin. It is ovoid in form, 16 mm. long × 7 mm. diameter, with a fringed oscule, 2 mm. in diameter. It is white, as preserved in spirit. The body-walls are about 2 mm. thick, leaving a gastral cavity 3 mm. diameter in the centre. Externally it is rough with the stumps of large projecting oxea. The oscule is protected by a dense fringe of thin oxea, surrounded by a few thick ones like those projecting from the dermis.

Text-fig. 104 A.



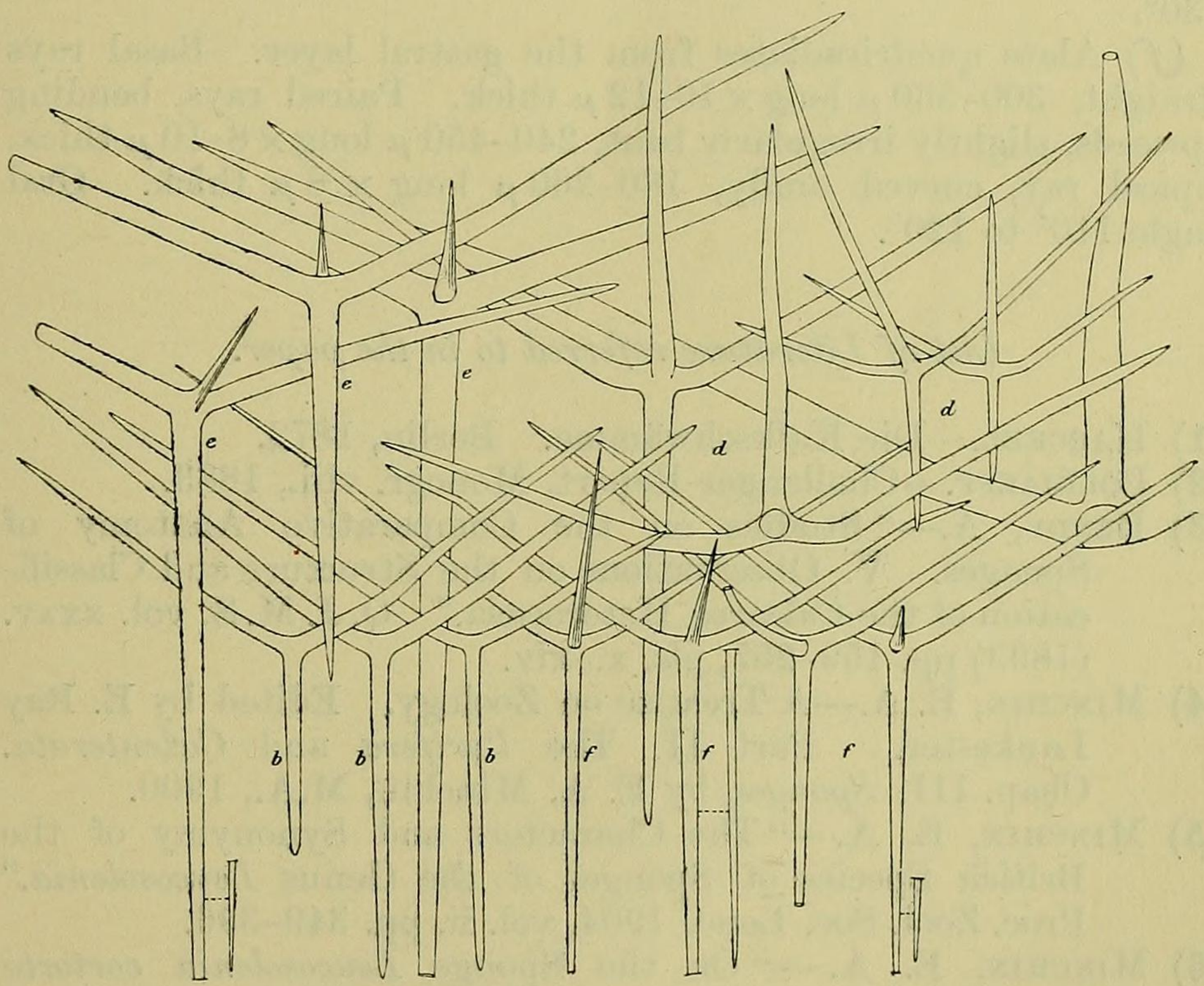
Leucilla wasinensis, spicules. × 40.
(For explanation of the letters see text p. 455.)

Canal-system.—There are large subdermal chambers from which branch the incurrent canals. The excurrent canals are also branched. The canal-system is similar to that most usual in the genus *Leucandra*.

Skeleton.—The dermal skeleton consists of a thin layer of alate triradiates lying tangentially without orientation; amongst them are a few quadriradiates, with the apical rays directed inwards, some of very large size. The gastral skeleton consists of a thick layer of large alate quadriradiates, regularly placed with the basal rays directed aborally and the apical rays projecting into the gastral cavity. The skeleton of the central mass of the body-wall between the dermal and gastral layers is a closely packed mass of irregularly placed tri- and quadriradiates. The quadriradiates, some of which are very large, are mostly arranged round the mouths of the excurrent canals, with the apical rays projecting into the canals. The large projecting oxea are bunched into little tufts. The inner ends usually pierce nearly through the wall, and occasionally right through into the gastral cavity.

But for the presence of the large dermal quadriradiates this sponge would be a typical *Leucandra*.

Text-fig. 104 B.



Leucilla wasinensis, spicules. × 110.
(For explanation of the letters see text below.)

Spicules (text-fig. 104 A & B).

The oxea are of one sort:—

(*a*) Nearly straight oxea, sharply pointed at the inner end, outer end snake-headed. The largest fragment is 2·8 mm. long × 45 μ thick.

The triradiates are of two sorts :—

(*b*) Alate triradiates from the dermis. Basal rays straight, 150–240 μ long $\times$ 10–13 μ thick. Paired rays, curving slightly upwards, 160–320 μ long $\times$ 9–13 μ thick. Oral angle 110°.

(*c*) Subregular triradiates from the body. Rays very sharply pointed, 600–950 μ long $\times$ 35–40 μ thick. Individual spicules often have their three rays of different lengths, but the angles are always approximately 120°.

The quadriradiates are of three sorts :—

(*d*) Subdermal quadriradiates. These spicules vary enormously in size, and are of peculiar form as shown in the drawing. The facial rays are folded inwards, *i. e.* towards the side from which the apical ray projects. The maximum facial ray found is 700 μ long $\times$ 26 μ thick. The maximum apical ray is 500 μ long $\times$ 26 μ thick.

(*e*) Alate quadriradiates from the lining of the excurrent canals. Basal rays straight, 280–480 μ long $\times$ 20–28 μ thick. Paired rays nearly straight, 340–420 μ long $\times$ 14–24 μ thick. Oral angle 130°.

(*f*) Alate quadriradiates from the gastral layer. Basal rays straight, 300–560 μ long $\times$ 10–12 μ thick. Paired rays, bending upwards, slightly irregularly bent, 240–450 μ long $\times$ 8–10 μ thick. Apical ray, curved orally, 180–260 μ long $\times$ 8 μ thick. Oral angle 110° to 120°.

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