Proceedings of the Zoological Society of London
London :Academic Press, [etc.],1833-1965.
https://www.biodiversitylibrary.org/bibliography/44963

1906:Jan.-Apr. [pp.1-462] [Incomplete]:
https://www.biodiversitylibrary.org/item/98471

Article/Chapter Title: Zoological Results of the Third Tanganyika Expedition conducted by Dr. W.A. Cunnington, 1904-1905. Report on the Porifera, with notes on species from the Nile and Zambesi
Author(s): Kirkpatrick, 1906
Subject(s): Porifera, Classification
Page(s): Page 218, Text, Text, Text, Text, Text, Text, Page 219, Page 220, Page 221, Page 222, Page 223, Page 224, Page 225, Page 226, Page 227

This page intentionally left blank.

Oviducal pores on xiii./xiv. *Sperm-ducts connected with long and coiled atria.*

(1) Alluroides pordagei Beddard, loc. cit.

About 25 mm. in length. Spermathecal pores double, opening near dorsal median line. Male pores opening on level with lateral setæ. A penial process present on each side near to pores.

Hab. Swamp on mainland opposite Mombasa, E. Africa.

(2) Alluroides tanganyikæ, sp. n.

About 25 mm. in length. Spermathecal pore (and spermatheca) single, opening in middle dorsal line. Male pores opening on level with ventral pair of setæ, which are absent on this segment. No penial process (?).

Hab. Lake Tanganyika in 10 fathoms.

4. Zoological Results of the Third Tanganyika Expedition, conducted by Dr. W. A. Cunnington, 1904–1905.—Report on the Porifera, with Notes on Species from the Nile and Zambesi. By R. Kirkpatrick, F.Z.S.

[Received February 6, 1906.]

(Plates XV.–XVII.*)

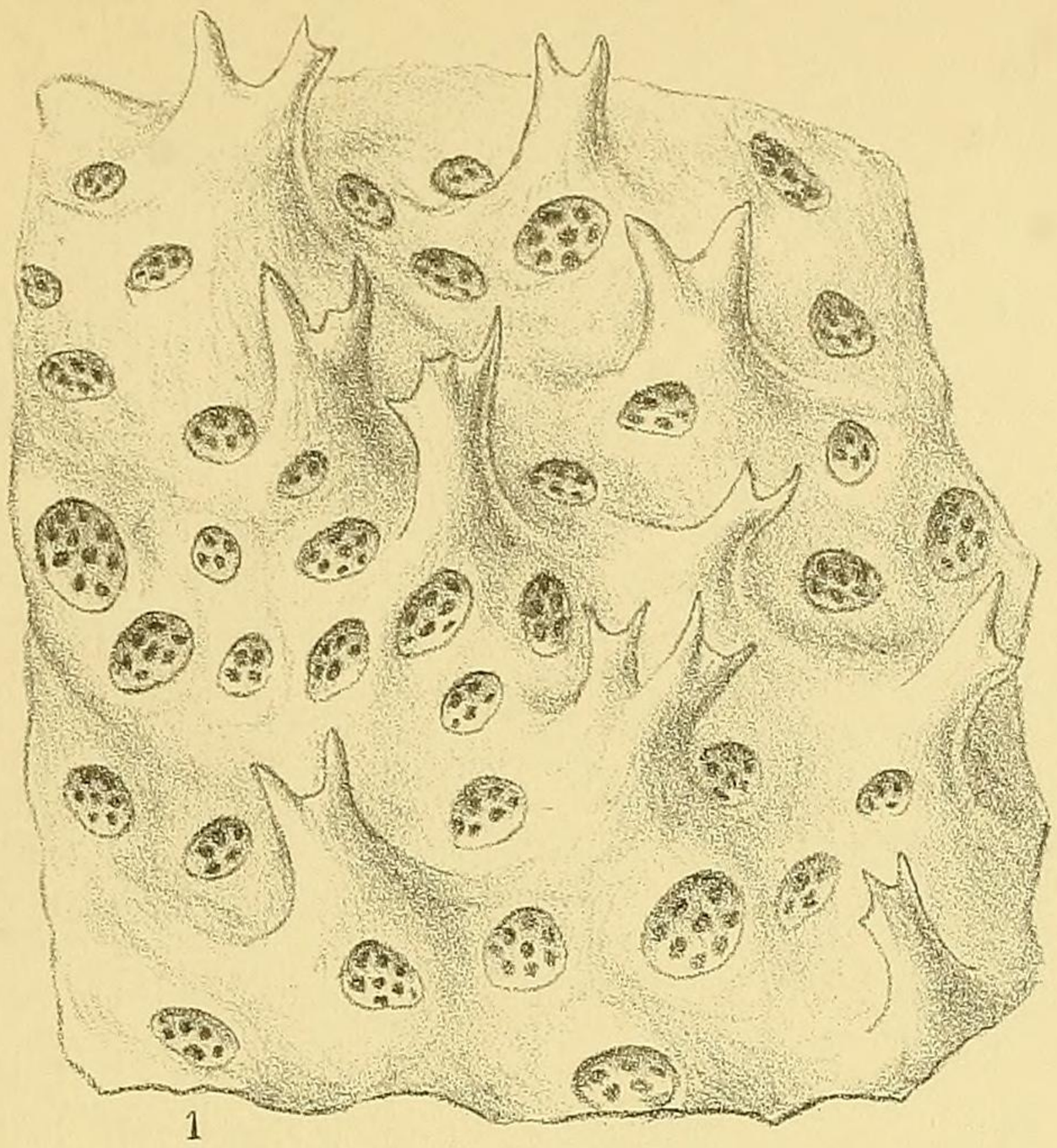
Dr. W. A. Cunnington's collection of Freshwater Sponges includes eleven specimens, nine from Lake Tanganyika, one from the Victoria Nyanza, and one from Lake Nyasa.

The Tanganyika specimens, which are all in the form of thin incrustations on stones and shells, represent three species, viz. *Spongilla moorei* Evans, *Spongilla tanganyikæ* Evans, and a new species, which I have placed under *Spongilla*, and have named after Dr. Cunnington—*Spongilla cunningtoni*, sp. n.

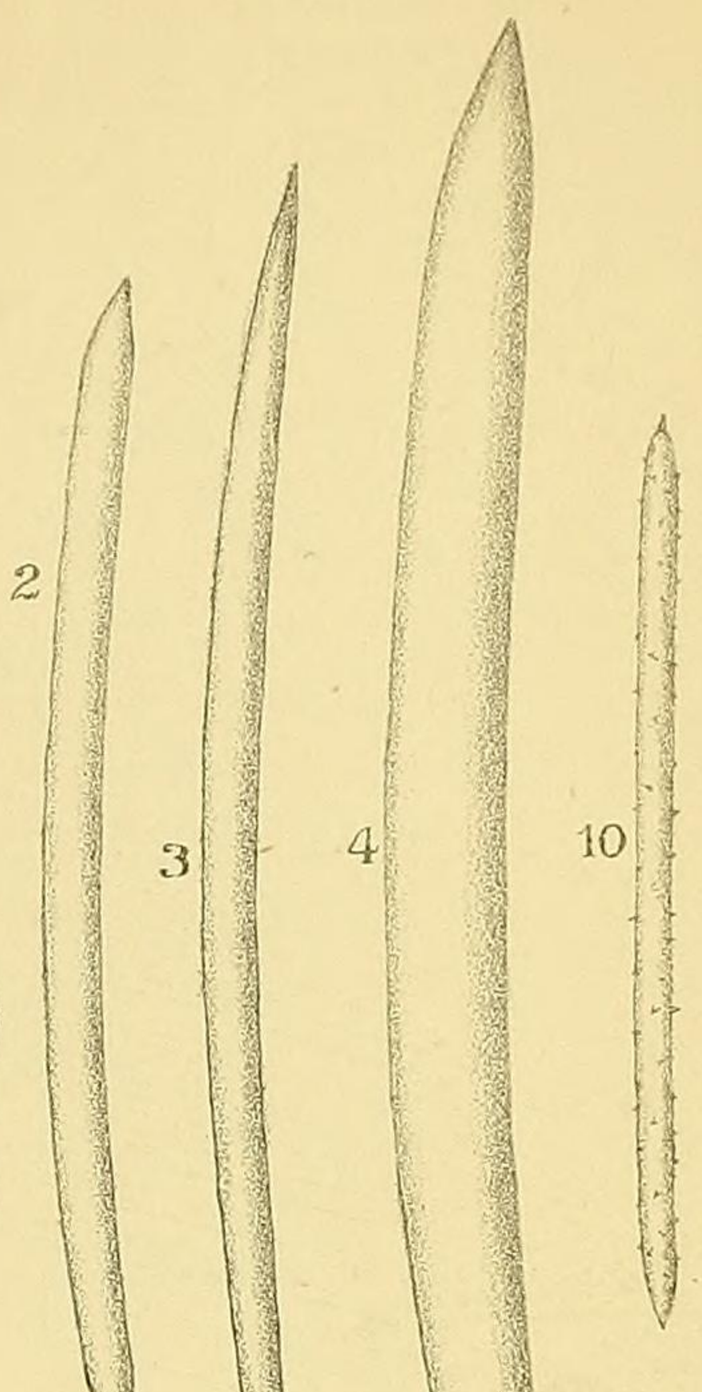
The specimen from Victoria Nyanza belongs to *Spongilla carteri* Bowerbank, and that from Nyasa to *Spongilla biseriata* Weltner. Most of the specimens were obtained from quite shallow water, but some were dredged from 10 and 20 fathoms.

I would here take the opportunity of describing three other Freshwater Sponges from Africa, viz. a specimen from above the Victoria Falls, Zambesi, collected and presented to the British Museum by Mr. C. F. Rousselet, and belonging to a new species of *Spongilla*; a second one from the same locality, representing a new species provisionally placed under *Spongilla*, presented by Prof. A. Dendy; and, lastly, a new variety of *Ephydatia plumosa* Carter from the White Nile, presented by Mrs. H. Broun. Six species are now known from the Tanganyika area, four from the lake itself, viz. *Spongilla moorei* Evans, *S. tanganyikæ* Evans, *S. cunningtoni*, sp. n., and *Potamolepis weltneri* Moore; and two

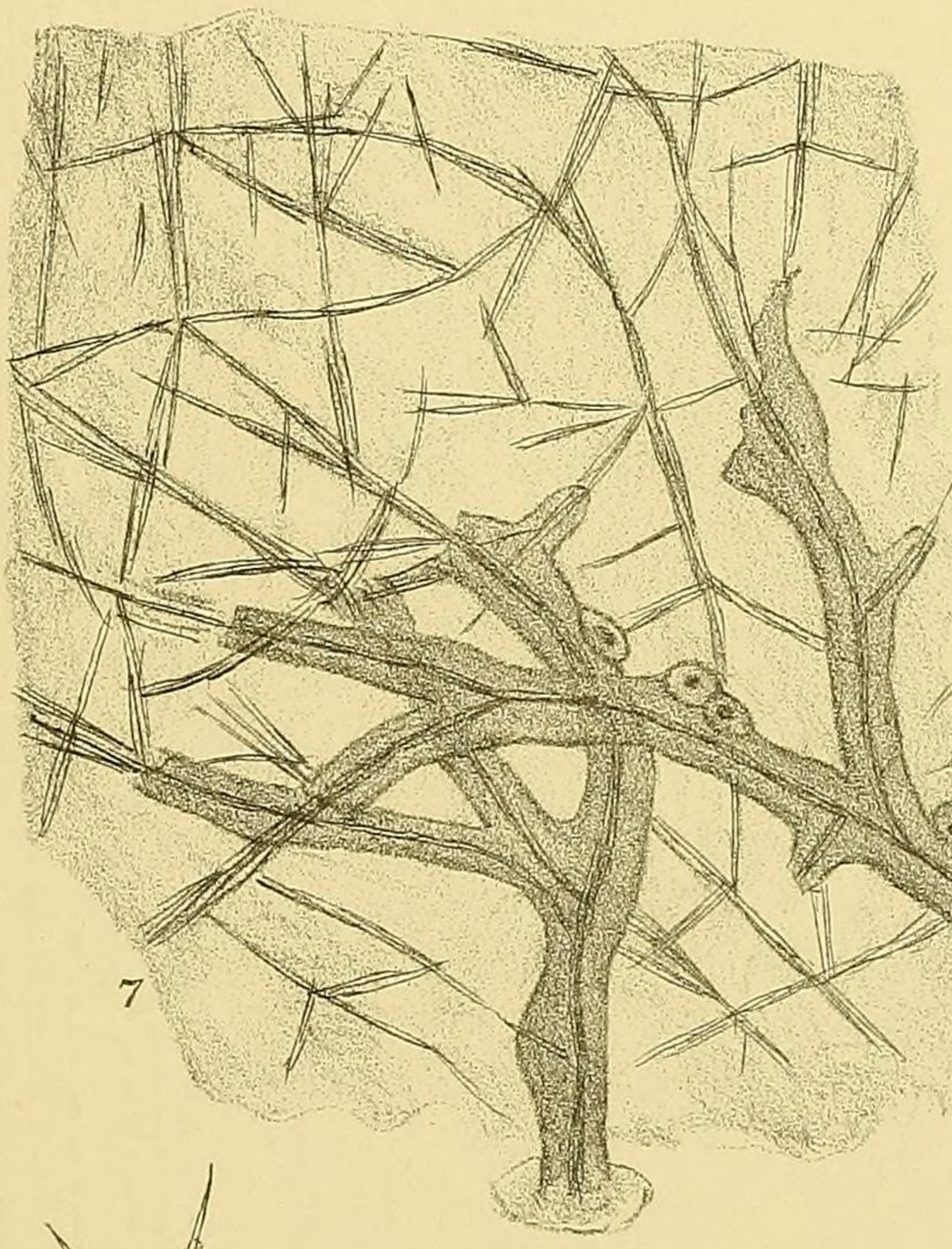
* For explanation of the Plates, see p. 227.



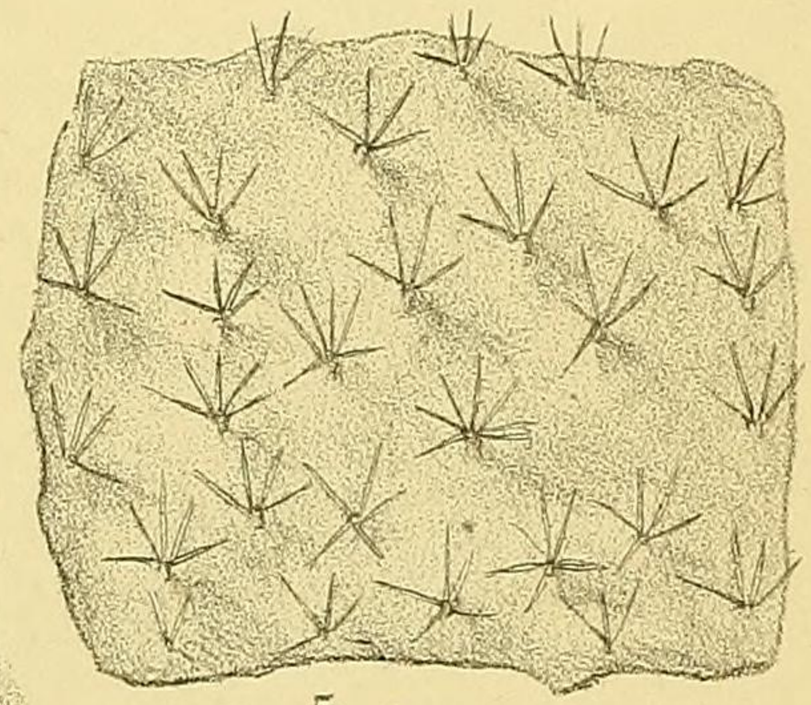
1



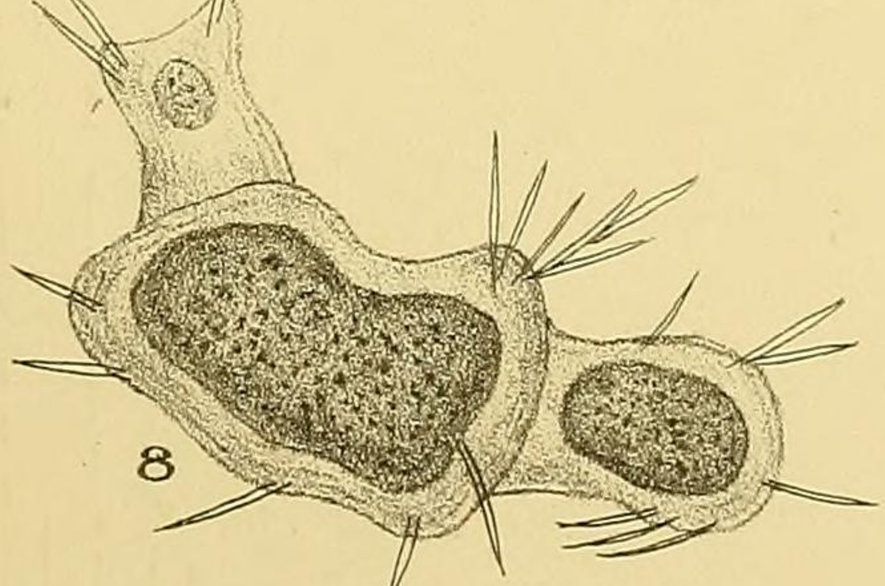
2 3 4 10



7

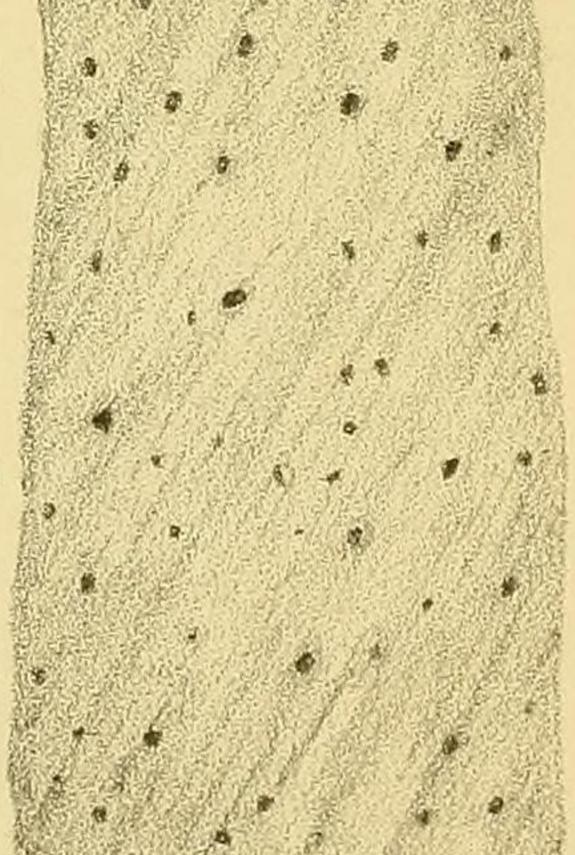


5



8

9

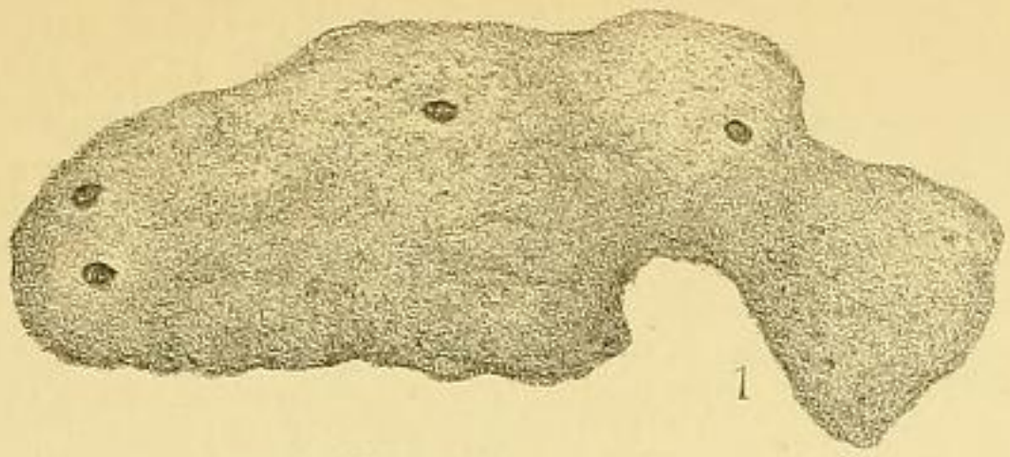


6

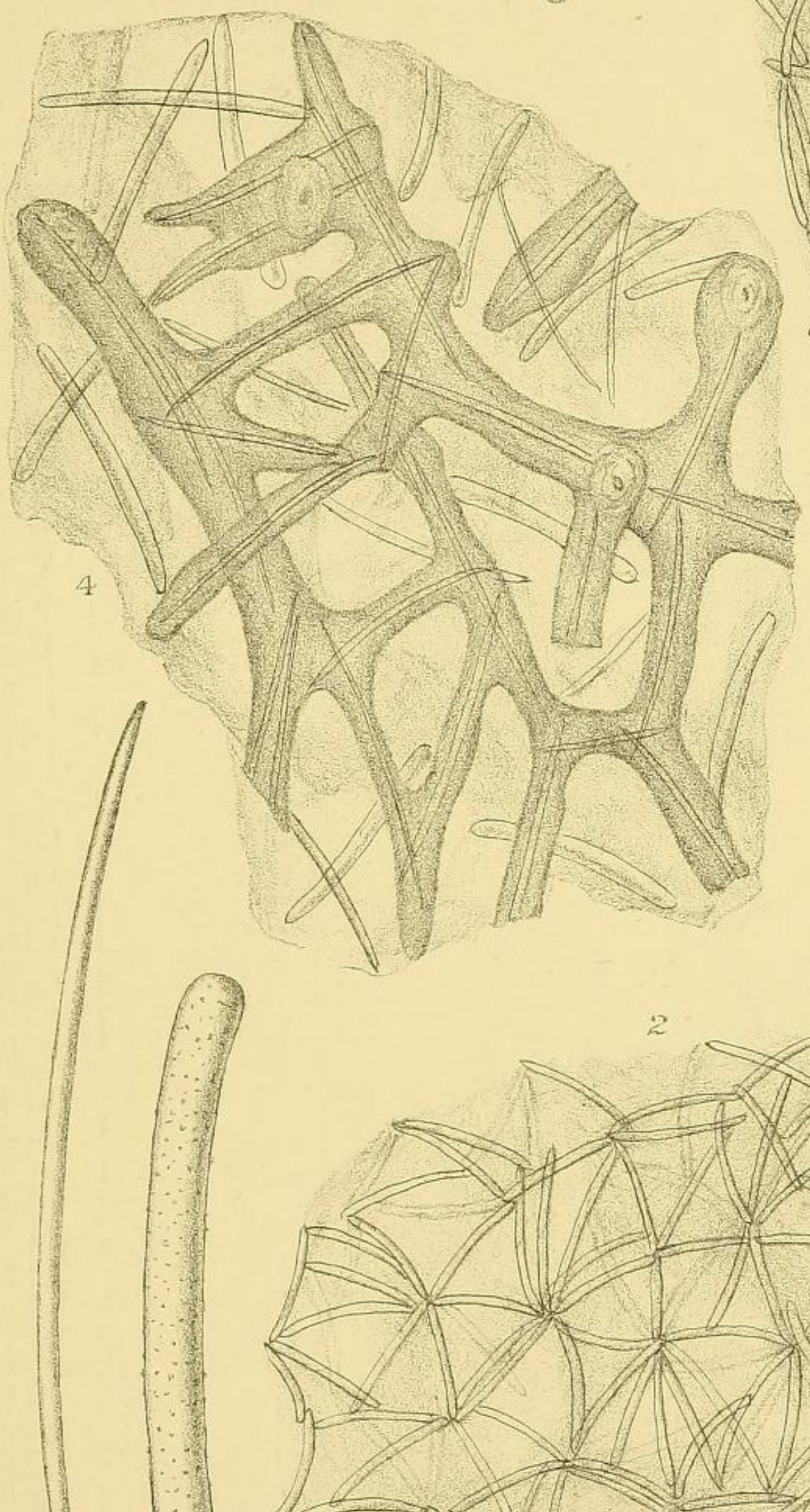
P. Highley del et lith.

Highley, imp.

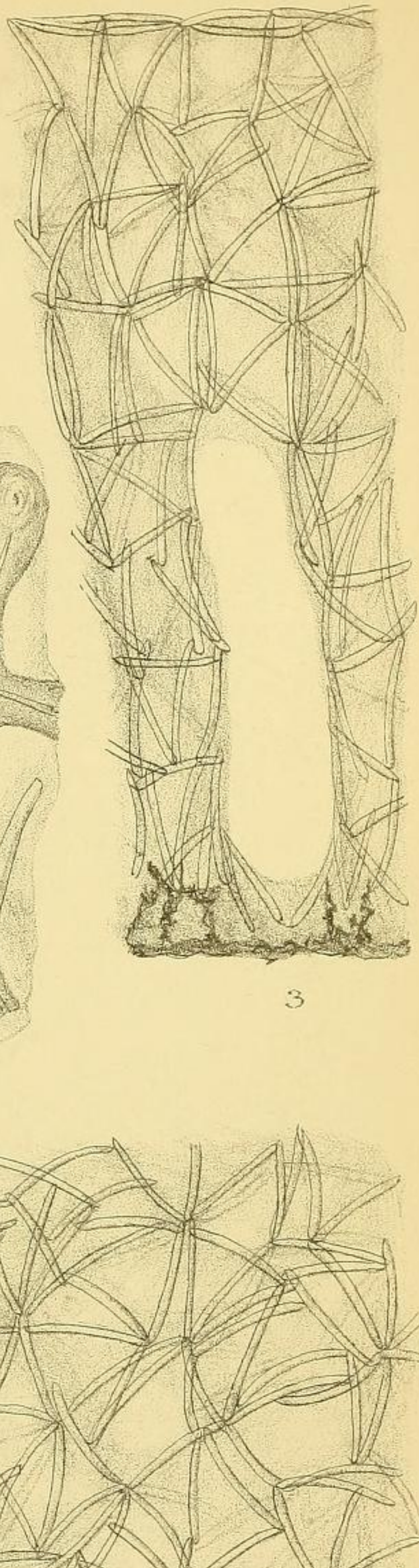
AFRICAN FRESH-WATER SPONGES.



1



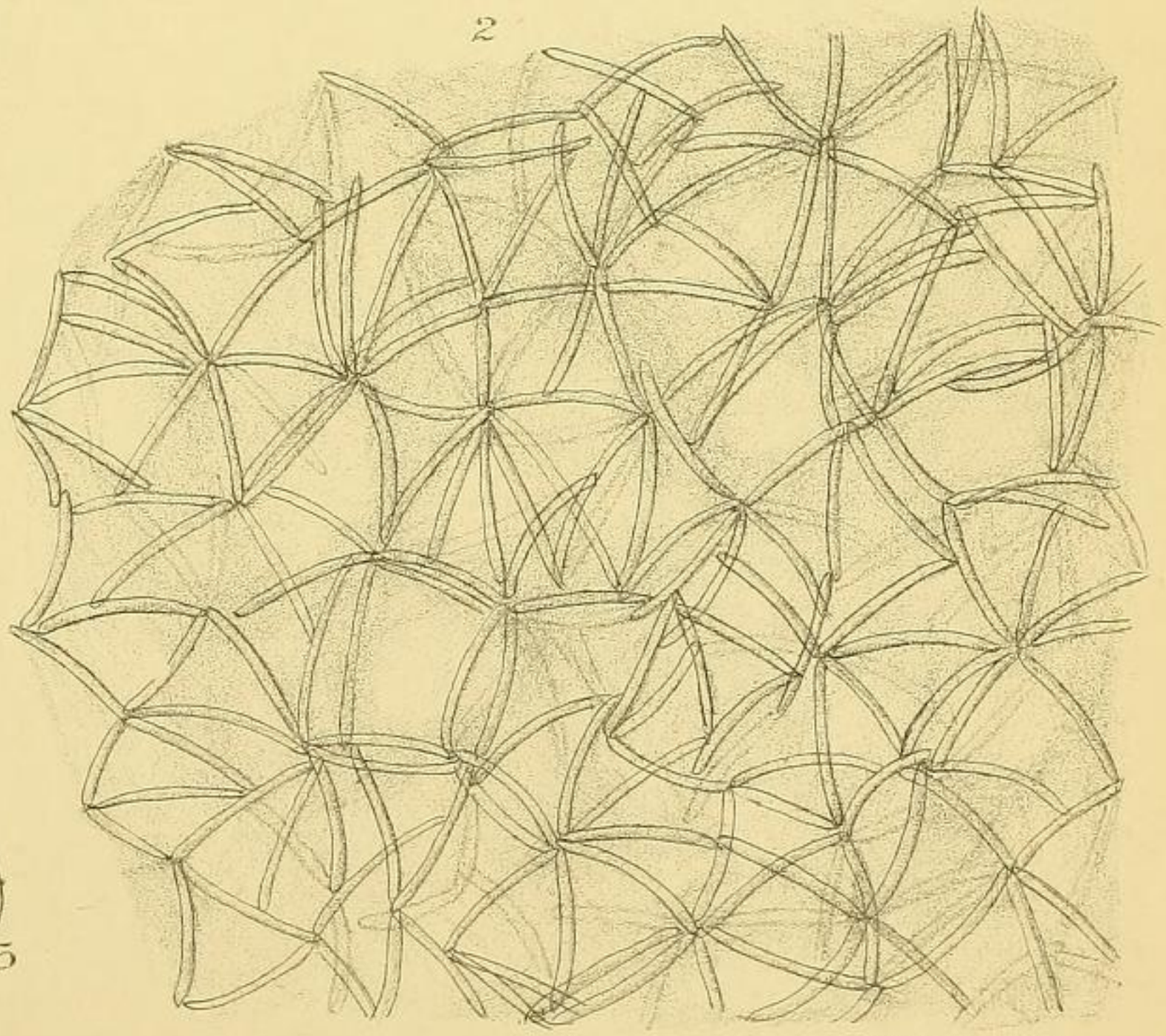
4



3

6

5

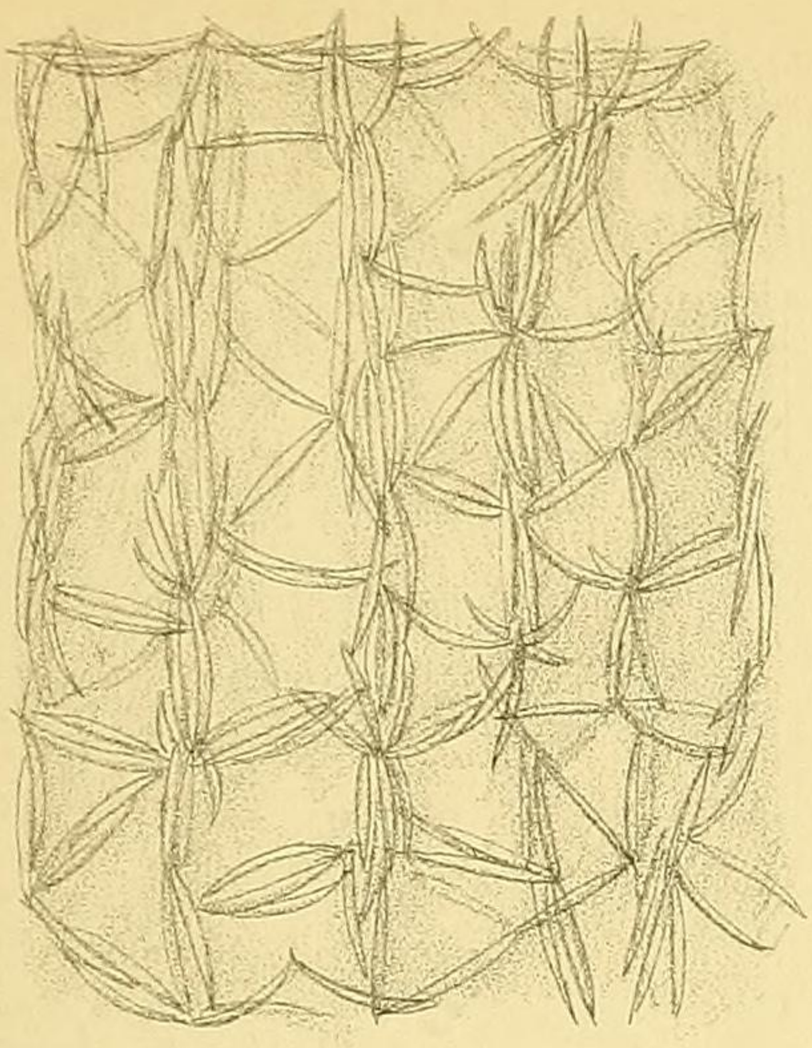


2

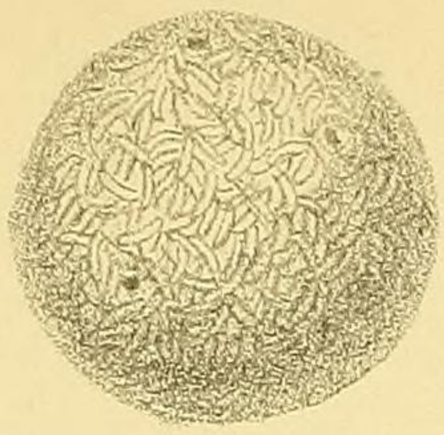
P. Highley, del et lith.

Highley, imp.

AFRICAN FRESH-WATER SPONGES.

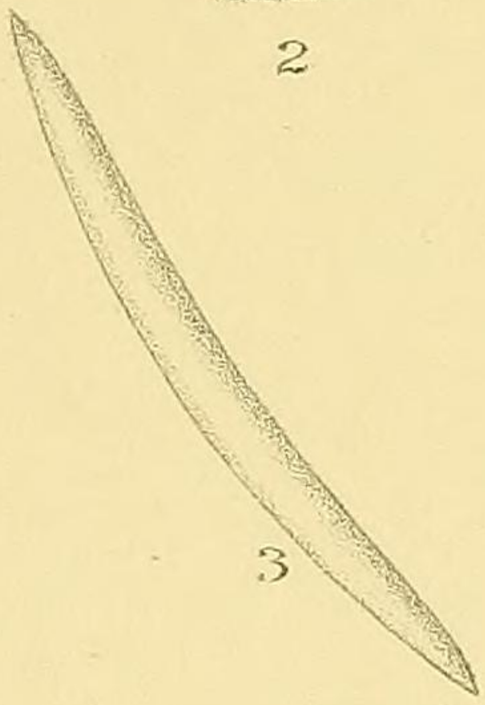


1



2

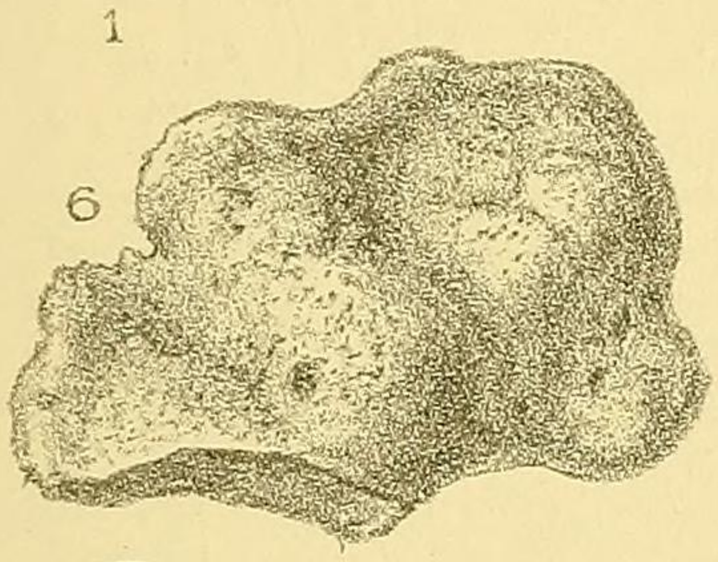
2a



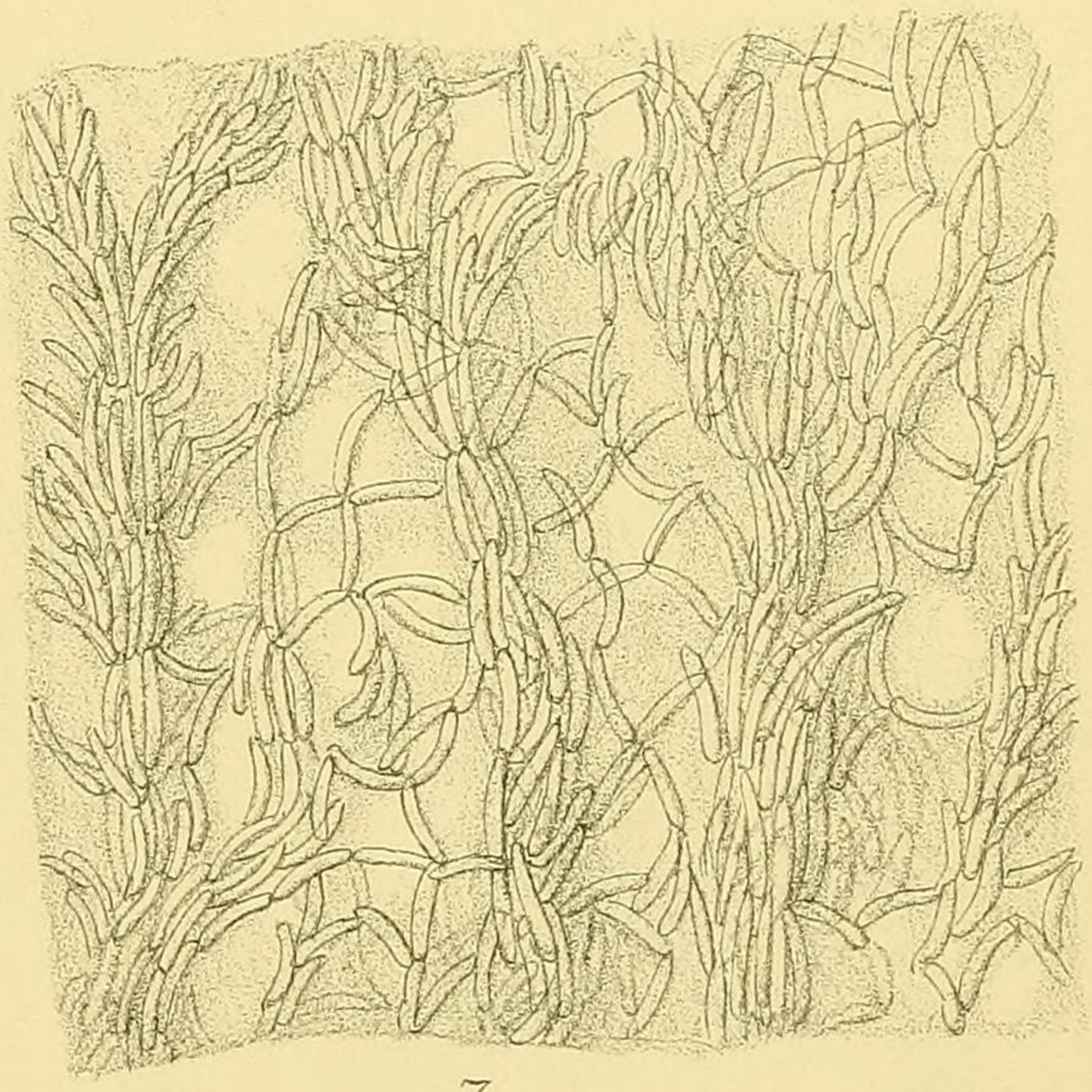
3

4

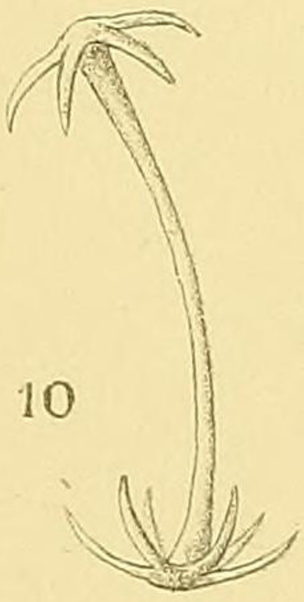
5



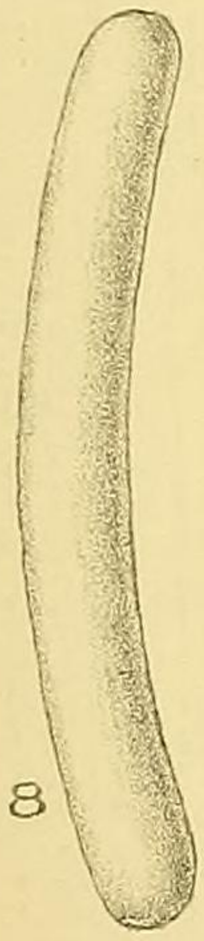
6



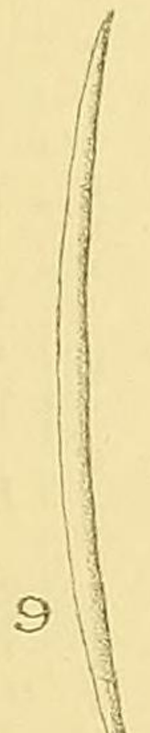
7



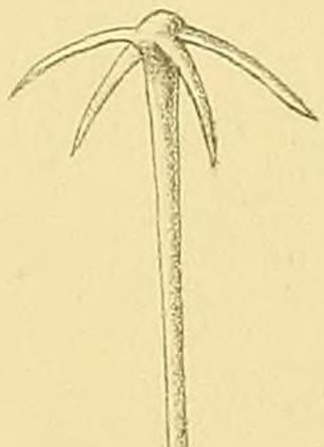
10

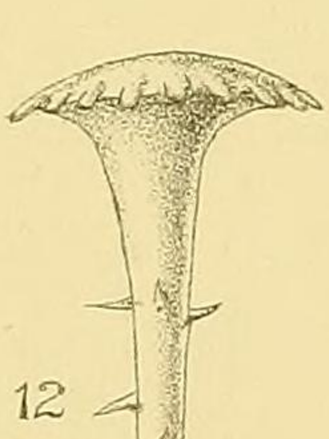


8



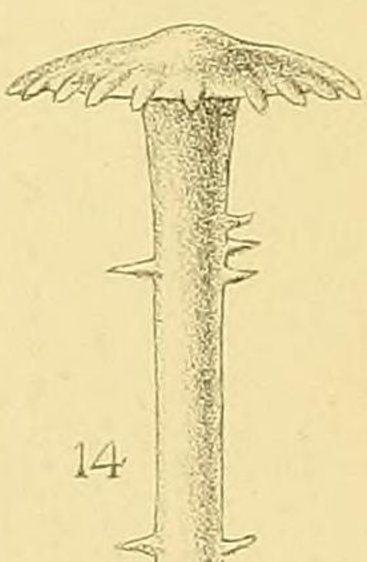
9





12

13



14

11

P. Highley, del et lith.

Highley, imp.

AFRICAN FRESH-WATER SPONGES.

from the Ugalla River, a tributary of the Malagarassi River flowing into the lake, viz. *S. böhmii* Hilgendorf and *S. nitens* Carter.

The number of known species of African Freshwater Sponges is thus brought up to 19.

The following is a list of the species referred to in this paper :—

Spongilla carteri Bowerbank. Victoria Nyanza.
Spongilla moorei Evans. Tanganyika.
Spongilla tanganyikæ Evans. Tanganyika.
Spongilla cunningtoni, sp. n. Tanganyika.
Spongilla biseriata Weltner. Nyasa.
Spongilla rousseletii, sp. n. Victoria Falls, Zambesi.
Spongilla? zambesiana, sp. n. Victoria Falls, Zambesi.
Ephydatia plumosa Carter var. *brouni*, nov. var. White Nile.

Spongilla carteri Bowerbank. (Plate XV. figs. 1–4.)

1848. *Spongilla friabilis* Lamarck, Carter, Ann. Mag. N. H. (2) i. p. 310; 1849. Carter, *ibid.* (2) iv. p. 81.

1863. *Spongilla carteri* Bowerbank, Proc. Zool. Soc. 1863, p. 469.

1887. *Spongilla carteri* Potts, Proc. Acad. N. S. Philadelphia, 1887, p. 194.

There are two small specimens of this species, one of which has been removed from a piece of rock, the other from a shell of *Aetheria*. Unfortunately there are no gemmules present, but the characters of the surface and of the skeletal framework are those of Bowerbank's species. Plate XV. figs. 2, 3, 4 represent the oxeas * of specimens from the Victoria Nyanza, Bombay, and Mauritius respectively; it will be seen that the first ($258 \times 9{\cdot}5\ \mu$) is the smallest and has abruptly pointed almost tornote ends. The average size of the oxeas of the type specimen from Bombay is $287 \times 11{\cdot}75\ \mu$ and of the Mauritius specimen $349 \times 18{\cdot}5\ \mu$. The thin dermal membrane, perforated by groups of pores, stretches between the sharp-pointed irregular conules formed by the ends of the longitudinal main fibres.

Localities.—Entebbe, Victoria Nyanza, shallow water. Bombay; Mauritius; Calcutta; Madura I.; N. Java; Lake Balaton, Hungary.

Spongilla moorei Evans. (Plate XV. figs. 5–9.)

1899. *Spongilla moorei* Evans, Quart. Journ. Micr. Sci. vol. xli. p. 472, pl. xxxvii. figs. 1–5, and pl. xxxviii. figs. 6–8.

There are five specimens of this species from five localities in Lake Tanganyika: three come from shallow water, and two from about 10 fathoms. They are all in the form of thin crusts from $\frac{1}{2}$ to $1\frac{1}{2}$ mm. thick on stones and shells, and none of them attains

* The terms "oxea," "tornote," "strongyle," clearly defined by Sollas in 1888 ('Challenger' Rep. Tetractinellida, pp. liv, lv), seem to me preferable to "amphioxea," &c., because, in addition to having claims of priority and brevity, they leave no doubt as to the form of the spicules they are intended to designate.

the size of the large nodulated type specimen obtained by Mr. J. E. S. Moore from deeper water in the same lake.

The colour varies: in the case of one specimen (No. 173), preserved in formalin, it is bright green. Dr. Cunnington gives yellowish grey as the colour of another; the rest are pale buff.

The surface appears very finely granulated to the naked eye. Under magnification this appearance is seen to be due to the little projecting tufts of the main columns of spicules, each tuft—about ·160 mm. in height—being formed of 2–5 spicules slightly curved away from each other; in the nearly related *Spongilla tanganyikæ* Evans the tufts are only 1–3 spicules thick, and the spicules are not separated at the distal end.

Skeleton.—There is some variation in the size of the megascleres. In several of the specimens they average about 160 × 9 μ, but in No. 142 they are more slender, being 150 × 6 μ.

An interesting feature which is found in this and in two other species, *Spongilla tanganyikæ* and *S. cunningtoni*, sp. n., from Tanganyika, lies in the presence of a basal lamella of spongin from which spongin-fibres arise (Plate XV. figs. 6, 7).

In a small specimen (No. 593) preserved in picric acid, the spongin-lamella is especially well shown and the bases of the fibres can be seen through the lamella as dark round spots just visible to the naked eye. The spongin-lamella occurs also in another specimen taken from the smooth inner surface of broken Gasteropod shells (*Neothauma tanganyicensis*), where there could be no question of the presence of the horny layer found on the outer surface of freshwater shells. In the case of *Spongilla cunningtoni*, the specimen, which likewise has a basal spongin-lamella, was detached from a stone.

Plate XV. fig. 7 shows spongin-fibres enclosing a core of spicules. At a short distance from the basal lamella the skeleton-fibres have only a thin, barely visible, sheath of spongin. In *Euspongilla lacustris* also the basal skeletal fibres are ensheathed in spongin, which diminishes from the base upwards. This condition also is found in the Chalinidæ. In the marine Sponge *Chalina oculata*, for instance, the base of specimens is very rich in spongin, but near the summits of the branches scarcely any of this substance is perceptible, so that sections from the base and summit respectively might almost seem to anyone ignorant of their origin to belong to specimens of different species.

In addition to the fibres, there are masses or blobs of spongin enclosing granular matter: one of these (780 × 390 μ) is shown in Plate XV. fig. 8.

The *gemmules* occur plentifully at the base of the crust in several of the specimens. They are oval and with a very thin naked chitinous coat, through which the large polygonal statocytes can be seen. On no part of the surface is there any special opening or area through which the contents escape.

Localities.—Lake Tanganyika. No. 113 from rocks, shallow water, Mbete, 29/9/04; No. 142, from rocks, shallow water,

Moliro, 24/10/09; No. 161, from rocks, shallow water, Chamkaluki, 15/11/04 (gemmules plentiful); No. 173, from shells, dredged in 10 fms., Pembe, 23/11/04; No. 593, 10 fms., Mtondwe Bay.

SPONGILLA TANGANYIKÆ Evans. (Plate XV. fig. 10.)

1899. *Spongilla tanganyikæ* Evans, Quart. Journ. Micr. Sci. vol. xli. p. 481, pl. xxxviii. figs. 9, 10.

There are several small specimens, whole and in fragments, of this species in Dr. Cunnington's Collection. Two of the specimens (Nos. 163 and 224) are associated with Polyzoa, and although there are, in each case, only a few crumbling fragments, they are interesting, because in some respects they show an intermediate condition between *S. moorei* and the present species. The megascleres are spined as in *S. tanganyikæ*, but more nearly resemble the form of those of *S. moorei*. There are no strongyles, for instance, their place being taken by spined tornotes. Plate XV. fig. 10 shows a tornote on the way to becoming a strongyle; the sharp point of the oxea still persists, though it has nearly disappeared; its complete disappearance would result in the strongylate form. On account of the spined condition of the spicules I have classed the specimens under *S. tanganyikæ*. The remaining specimens are in the form of small incrustations on broken fragments of the shells of the Gasteropod *Neothauma tanganyicensis* together with incrustations of *S. moorei*.

Specimens of these two species so closely resemble each other externally that it is only possible to separate them by an examination of the spicules. The surface is uniformly level and finely granulated, the granular appearance being due here, as in *S. moorei*, to the minute projecting tufts of the main longitudinal spicule-bundles. The tufts only project the length of a spicule, and differ slightly from those of *S. moorei* in being composed of only 1–3 in place of 2–5 spicules, and in the spicules being adherent to each other along their whole length.

As in *S. moorei* there is a basal spongin-lamella, but it is very thin, nor are the spongin-fibres arising from it developed to the same extent as in the first species; at the same time, there are here also distinct spongin-fibres enclosing a core of spicules.

There are no gemmules in any of Dr. Cunnington's specimens. Those described by Evans in the type had only a thin chitinous capsule, and were apparently very like those of *S. moorei*.

Localities.—Lake Tanganyika, No. 163, associated with a Polyzoan, from rocks, shallow water, Chamkaluki, 16/11/04; No. 224, with Polyzoan, on shells, 20 fms., Mshale, 6/2/05; No. 593, dredged in 10 fms., Mtondwe Bay.

SPONGILLA CUNNINGTONI, sp. n. (Plate XVI. figs. 1–6.)

Sponge in form of a thin spreading crust. Surface smooth and devoid of projecting spicules. Skeleton a network with triangular and polygonal meshes, without distinct main and secondary fibres; dermal skeleton composed of a definite layer of horizontally

arranged spicules. Spicules of two kinds, viz., thick, slightly curved, sparsely spined strongyles and longer, more slender, smooth strongyles. Gemmules ?

Description.—Of the new species there are three small specimens in the form of thin crusts, the largest of which is 26×11 mm. in area and ·5–·7 mm in thickness. The crusts, which have been separated from stones, still retain the curvature of the surfaces on which they grew. Their consistence is flexible and elastic, so that when they are pressed flat they immediately resume their convexity when pressure is removed.

The surface is uniformly level, and in the dried condition has a glistening aspect, owing to the reflexion of the light from the tangentially disposed dermal spicules.

The oscules are nearly circular, and in the specimens quite level with the surface; but probably in the perfect condition each is surrounded by a slightly raised membranous rim, since traces of such a membrane still remain on one of the oscules. Each oscule leads into a shallow basin, whence the main exhalant canals radiate out horizontally.

The *skeleton* forms a network in which main and secondary fibres are not perceptible; the meshes (about 95 μ in diameter) are irregularly triangular and polygonal, the strands being from 2–3 spicules thick.

The dermal skeleton (Plate XVI. fig. 2) forms a lattice-work with triangular meshes, with strands 1–2 spicules thick formed of tangentially arranged spicules. Though the dermal layer is distinct, it is not easily separable from the parts beneath.

At the base of the sponge is a well-defined lamella of spongin (Plate XVI. fig. 4), whence arise thick horny fibres with a core of one or more siliceous spicules; the fibres attain a thickness of 38 μ. A short distance above the basal plate the spongin disappears, and the core of spicules is continued on into the general spicular network.

Spicules.—The strongyles with sparsely and finely granulated surface are 115–145 μ long and 5–6 μ broad, with the ends often, but not always, slightly and gradually enlarged (Plate XVI. fig. 5); occasionally also there is a central swelling.

The longer and more slender strongyles, 150–170 $\mu \times 2{\cdot}75\,\mu$, are smooth and taper towards the blunt rounded ends (Plate XVI. fig. 6).

There are no gemmules present in the specimens.

Affinities.—Although there are no gemmules present, and the megascleres are strongyles, I have placed the species in the genus *Spongilla*, rather than in *Uruguaya* (*Potamolepis*), because its affinities seem to be with certain species of *Spongilla*, viz. *S. böhmii* Hilgendorf *, *S. nitens* Carter, and *S. permixta* Weltner,

* Possibly *Potamolepis weltneri* Moore ('The Tanganyika Problem,' 1903, p. 323) may be synonymous with *Spongilla böhmii*. I find the shape and size of many of the strongyles of the skeletal framework to be absolutely identical in the two species. Moore's figures (*l. c.* p. 323) of the spicules of *P. weltneri* are not quite correct, in

in all of which there is a skeleton of strongyles. In none of these, however, are there two kinds of strongyles. In *S. loricata* Weltner, in addition to large strongyles (220–260 μ × 20 μ) there is a smaller kind of megascleres (124 μ × 7 μ) with finely granular surface and swollen ends; here the very different sizes of the two kinds of spicules will at once serve to distinguish the respective species.

Locality.—From stones dredged in a few fathoms, Niamkolo Harbour, Lake Tanganyika.

SPONGILLA BISERIATA Weltner.

1895. *Spongilla biseriata* Weltner, Arch. Naturg. 1895, (1) p. 138.
1897. *Spongilla biseriata* Weltner, Deutsch-Ost-Afrika, Bd. iv. Die Coelenteraten und Schwämme des süssen Wassers Ost-Afrikas, p. 6.
1898. *Spongilla biseriata* Weltner, Mittheil. naturhist. Mus. Hamburg, xv. Beiheft, p. 1.

Dr. Cunnington's collection contains an example of this species from Lake Nyasa.

The specimen is in the form of an irregular clump about 4 cm. in diameter, growing round the stem of a reed. The sponge, which is in spirit, is dirty grey in colour, and is full of pale yellow gemmules.

An interesting additional fact to record is Dr. Cunnington's observation that the colour of this specimen was bright green when alive. The large dry type specimen from Cairo is described by Dr. Weltner as dirty white.

Localities.—From swamp, Karonga, Lake Nyasa, 2/7/04 (*Cunnington*). From a pool at Cairo (*Inez and Stuhlmann*).

SPONGILLA ROUSSELETII, sp. n. (Plate XVII. figs. 1–5.)

Sponge in form of a whitish incrustation.

Skeleton a network with longitudinal main and tranverse and oblique secondary fibres formed of bundles of oxeas with very little spongin.

Spicules curved oxeas, 214 × 18·5 μ.

Gemmules spherical, with one or several pore-tubes, with a thick coat of spongin and with gemmule-spicules in form of spined micro-strongyles arranged tangentially in one or two layers.

Locality.—Above Victoria Falls, Zambesi. (Collected by Mr. C. F. Rousselet, Sept. 13, 1905.)

Description.—The new species is represented only by some small fragments of dirty-white colour. Mr. Rousselet, who kindly entrusted me with the material for description, informed me that

---

that the general surface of the spicules is not smooth, but fine-spined or granular all over, just as in *S. böhmii*. There are no amphidisk flesh-spicules in the tiny scrap which represents, I believe, the type specimen of Moore's species. *S. böhmii* and *P. weltneri* both come from the same region, the former from the Ugalla River, a tributary of Tanganyika, and the latter from the lake itself. It would be well, however, to wait till more material is available for examination before deciding whether *Potamolepis weltneri* is a good species or otherwise.

"the specimen covered the submerged surface of a large stone to the extent of over a square foot in area; the crust was closely adherent and very thin."

The thickness of the crust is 2 mm. There are no oscules on the fragments of the specimen. The surface is level and provided with tufts of spicules ·16 mm. in height, formed by the ends of the main fibres.

The *skeleton* is formed of main longitudinal fibres about 6 spicules thick; at varying levels these fibres give off transverse secondary fibres 2–3 spicules thick, which meet the extremities of those from other main fibres; in parts where the main fibres are closer together the secondary bundles reach across from one main fibre to another, and the secondary bundles are thicker.

There are traces of a basal spongin-lamella in the form of broken scale-like fragments; but the spongin-fibres are reduced to mere cushions, into which the ends of the basal oxeas are immersed.

Spicules.—The megascleres are smooth curved oxeas $214 \times 18{\cdot}5\,\mu$, with subtornote ends; frequently with a central knob.

Micro-strongyles, scattered about in the tissues, are identical with those of the gemmules, and in all probability have belonged to those bodies.

The *gemmules* are spherical, 380–425 μ in diameter, with one, two, or three pore-tubes, each rising about 18 μ beyond the surface. The position of the pore-tubes varies, and when there are several they may be scattered over the circumference or close together. In one instance a pore-tube is thick-walled, closed at the end, and bent over.

The *gemmule-spicules* are micro-strongyles, arranged tangentially in one or two layers on the chitinous capsule. When there is only one layer, a tessellated or parquet-like pattern is discernible, each tessella being made up of a parallel row of 4–6 micro-strongyles, and fitting in with neighbouring tessellæ at varying angles. When the layer is double it is difficult to make out any pattern; here and there the spined ends of the spicules project above the general level.

The strongyles are of two kinds: in one, $70 \times 12\,\mu$, the spicule is slightly curved, of nearly uniform diameter, spined all over with short blunt vertical spines, but less so in the centre; in the other, which is $65 \times 16\,\mu$, the centre is nearly smooth, swollen, and barrel-shaped, and tapering to the spined ends.

Affinities.—The gemmule-spicules somewhat resemble those of *Spongilla sumatrana* Weber, of which species Weltner describes two African varieties; in all these there are short spined micro-strongyles, but there are no flesh-spicules in the new species, and the megascleres are smooth, whereas in *S. sumatrana* and its varieties there are flesh-spicules and the megascleres are spined. *Spongilla permixta* Weltner from German East Africa, of which species only the gemmules are known, has spined microstrongyles for its gemmule-spicules, but these are much more slender, being only 3 μ in diameter, and with recurved spines.

In *S. biseriata* Weltner the oxeas of the skeletal framework are

considerably longer and more slender, viz. $314 \times 12\ \mu$; likewise the microstrongyles are longer and thinner, being $80–96 \times 4\ \mu$.

The multiporal condition of the gemmule is found also in *Spongilla lacustris* var. *multiforis* Carter from British Columbia and the Yellowstone; at first Carter based a new species (*Spongilla multiforis*) on this character, but later considered the multiporal condition to be only of varietal importance.

SPONGILLA ? ZAMBESIANA, sp. n. (Plate XVII. figs. 6–10.)

Sponge in form of a thick, nodulated, hard crust or cake with irregular upper surface.

Skeleton a dense network with very thick main fibres and with secondary fibres.

Spicules.—Megascleres of two kinds, viz. (1) thick, smooth, slightly curved strongyles ($180 \times 24\ \mu$), slightly and gradually swollen at the ends, forming the mass of the skeleton; and (2) a few slender, curved, smooth oxea, $170 \times 7\ \mu$. Microscleres amphidisk flesh-spicules, with slender stem ending in disks with usually four sharp recurved prongs; average dimensions:—length $33\ \mu$, diameter of disks $13{\cdot}5\ \mu$, thickness of stem in centre $1{\cdot}6\ \mu$, at the ends $2{\cdot}8\ \mu$.

Gemmules ?

Locality.—Above Victoria Falls, Zambesi. (Collected by Miss Gibbs; presented to the British Museum by Prof. A. Dendy.)

The specimen on which the new species is based is in the form of a thick hard crust, $2{\cdot}5 \times 1{\cdot}8$ cm. in area and about 8 mm. thick. The rough surface is covered with a closely applied dermal membrane, in which, however, no pores are visible. There are several oscules 1 mm. in diameter scattered about.

The great main fibres of the skeleton are visible under a lens.

Permeating the sponge are several little white Chironomid larvæ, each surrounded by a sheath of spongin, which the sponge has secreted in self-protection. The spongin-sheath is crowded with the amphidisk flesh-spicules, and often has strongyles partly embedded. Sometimes the sheath encloses a mass of decayed sponge-tissue containing innumerable amphidisks. Some of these chitin-tubes are slightly branched, but they do not resemble true spongin-fibres, and do not seem to be proper to the sponge itself; but on this point I am not at all certain.

Affinities.—The hard consistence of the sponge and the possession of a dense skeleton constructed of thick smooth strongyles are characters of *Uruguaya* rather than of *Spongilla*; but in its skeletal arrangement and megascleres the new sponge closely resembles *Spongilla nitens* Carter; the latter species, however, has no amphidisks and its strongyles are longer and more slender, being $306 \times 20{\cdot}5\ \mu$. Further, the new species comes near *Spongilla loricata* Weltner and *Spongilla böhmii* Hilgend., in both of which there are strongylate megascleres and amphidisk flesh-spicules.

The new form differs from all species of *Uruguaya* in possessing amphidisk flesh-spicules with toothed disks.

EPHYDATIA PLUMOSA Carter var. BROUNI, nov. var. (Plate XVII. figs. 11–13.)

This new variety is represented by a small nodule 1·5 cm. in diameter growing round a twig, collected on the banks of the White Nile on land previously submerged, about 200 miles above Khartoum, by Mrs. Hilda Broun.

The type specimens of the species were described by Carter, who found them growing on the sides of the freshwater tanks of Bombay, in which situation they were uncovered during six months of the year (Carter, Ann. Mag. N. H. 1849, (2) iv. p. 85).

In 1885 Potts described (Proc. U.S. National Mus. 1885, p. 587) a variety of this species (var. *palmeri*) from the Colorado River, N.W. Mexico, differing from the type in having spined megascleres. The Colorado River specimens occur in thousands suspended like wasps' nests on the drooping branches of the Screw Bean, and exposed for ten months in the year.

As Potts observes concerning the distribution : "That it should skip a whole hemisphere and only be found a second time at its own antipodes is indeed remarkable." Accordingly it is interesting to note an intermediate locality.

The example from the Nile resembles the Bombay specimens in having smooth megascleres, but differs from the latter in the characters of the amphidisks and stellate microscleres. In the Nile specimen the stem of the amphidisks is markedly curved and considerably thinner at the centre than at the ends; in the specimens from Bombay and Colorado R. the stem is straight and uniform in diameter. The stellate microscleres in the Nile specimen are almost or entirely devoid of a centrum and the rays are not capitate, whereas in the type these spicules have a well-marked centrum and the rays are capitate. The characters of the spicules of the three forms are tabulated below :—

	Oxeas.	*Amphidisks.*	*Stellate microscleres.*
Type specimen. Bombay.	425 × 16 μ. Smooth.	Length 62 μ. Diam. of disks 24 μ. Stem straight. Diam. of stem uniformly 4 μ.	With marked centrum ; "rays" capitate.
var. *palmeri*. Colorado River.	325 × 12 μ. Spined.	Length 78 μ. Diam. of disks 27 μ. Stem straight. Diam. of stem uniformly 6 μ.	With slight centrum ; rays not capitate ; also other peculiar microscleres.
var. *brouni*. White Nile.	392 × 16 μ. Smooth.	Length 63 μ. Diam. of disk 24 μ. Stem curved. Diam. of stem at centre 4 μ. Diam. of stem at ends 6 μ.	Rays not capitate ; without centrum.

Two species of *Ephydatia*, viz. *E. blembingia* Evans from the Malay Peninsula and *E. multidentata* Weltner from Queensland, resemble in many respects *E. plumosa*, but differ in being devoid of flesh-spicules.

EXPLANATION OF THE PLATES.

Plate XV.

Fig. 1. *Spongilla carteri* Bowerbank (p. 219), from Victoria Nyanza, surface. × 2.
2. Oxea of *S. carteri*, from Victoria Nyanza. × 210.
3. Oxea of *S. carteri*, from Bombay. × 210.
4. Oxea of *S. carteri*, from Mauritius. × 210.
5. *Spongilla moorei* Evans (p. 219), surface. × 44.
6. *Spongilla moorei*, under surface of basal spongin-lamella, with bases of spongin-fibres showing through. × 25.
7. *Spongilla moorei*, basal part of skeleton showing spongin-fibres with spicular core arising from detached portions of basal lamella. × 44.
8. *Spongilla moorei*, irregular mass of spongin with spicules partly embedded and enclosing granular matter. × 44.
9. *Spongilla moorei*, gemmule. × 25.
10. *Spongilla tanganyikæ* Evans (p. 221), spicule partly tornote, partly strongylate, × 425.

Plate XVI.

Fig. 1. *Spongilla cunningtoni*, sp. n. (p. 221). × 2.
2. Surface of the same. × 100.
3. Vertical section. × 100.
4. Basal spongin-lamella and fibres. × 160.
5. Strongyle. × 425.
6. Strongyle, long smooth kind. × 425.

Plate XVII.

Fig. 1. *Spongilla rousseletii*, sp. n. (p. 223), section. × 44.
2. Gemmule of same. × 44.
3. Oxea. × 210.
4, 5. Micro-strongyles. × 700.
6. *Spongilla? zambesiana*, sp. n. (p. 225). Nat. size.
7. Vertical section. × 44.
8. Strongyle. × 210.
9. Oxea. × 210.
10. Amphidisk flesh-spicules. × 700.
11. *Ephydatia plumosa* Carter, var. *brouni*, nov. var. (p. 226), specimen. × 2.
12. *Ephydatia plumosa* var. *brouni*, amphidisk. × 700.
13. Substellate microscleres of *E. plumosa* var. *brouni*. × 700.
14. *Ephydatia plumosa*, from Bombay (type), amphidisk. × 700.

5. A Note on "Flying" Snakes.

By R. Shelford, M.A., C.M.Z.S.

[Received March 6, 1906.]

(Text-figures 56 & 57.)

A large number of the Snakes of Borneo are almost entirely arboreal in their habits, spending much of their life in the branches of lofty trees and feeding on birds, birds' eggs, and tree-haunting lizards, such as *Calotes versicolor* and some of the geckos. That snakes can climb tree-trunks is well-known; and