THE JOURNAL OF MALACOLOGY
(Established by Walter E. Colling in 1899 as "THE CONCHOLIST, or Journal of Malacology").

EDITED BY
WILFRED MARE WEBB, F.L.S., Technical Laboratory, Essex County Council,
and
WALTER E. COLLING, F.Z.S., Mason College, Birmingham.

With the assistance in Special Departments of—

REV. A. H. COOK, M.A., F.Z.S.,
King's College, Cambridge.

CHARLES HEDLEY, F.L.S.,
D. B. WOODWARD, F.G.S., F.R.M.S.,
Australian Museum, Sydney, N.S.W.

On and after the first of January, 1905, THE JOURNAL OF MALACOLOGY will be published under the above editorialship, and will include within its pages articles dealing with ALL BRANCHES OF THE STUDY OF THE MOLLUSCA.

This JOURNAL OF CURRENT LITERATURE will still retain a special feature of the Magazine, and every effort will be made to render it as complete as possible.

Fully Illustrated. Annual Subscription, 3s. 4d. post free.
All communications to be made to Wilfred M. Webb, "Holmesdale," Brentwood, Essex.

Natural Science.

The MAY Number, now ready, contains a specially contributed paper on
FIELD-CLUB WORK IN IRELAND.

By PROF. GRENVILLE A. J. COLE.

With other Notes, Articles, Reviews, and an Obituary Notice of A. GOODMAN MORE.
ONE SHILLING NETT.

Of all Booksellers, or of the Publishers MASSEY, RUIT, HENBASON, & Co., Ltd.,
27, St. Andrew-street, Holborn Circus, London, E.C., to whom subscriptions
(Fourteen Shillings per annum, Post Free) should be sent in advance.

Punctually on the 25th of each month. Price Sixpence.

Established 1865.
NEW SERIES COMMENCED WITH MARCH NUMBER, 1894.
SCIENCE-GOSSIP.
EDITED BY JOHN T. CARRINGTON.
NEW CONTRIBUTORS. NEW ILLUSTRATORS.
Specimen Number, post free, Sixpence.

"Science-Gossip is now one of the brightest and most diversified months for the lovers of science."- Nature, Jan. 10th, 1865.

All Communications, remittances of Subscriptions (Six Shillings and Sixpence per annum, including postage), Books or Instruments for review, etc., are to be addressed to JOHN T. CARRINGTON, 12, NORTHUMBERLAND AVENUE, LONDON, W.C.

Published by SIMPSON, MARSHALL, HAMILTON, EATON & Co., Stationers' Hall Court, London, E.C.

HERBERT W. MARSDEN,
NATURAL HISTORY AGENT AND BOOKSELLER.

Cabinets and Apparatus of all kinds for Naturalists, of the best sorts only, at London prices, ready for immediate delivery.

New and Second-Hand Books and Labels (Litho), European, Russian and North American; Collections, Preserved Forms of British Invertebrata, British Entomology, etc., British and Russian Birds, Irish Collections, etc.


For General Catalogue for 1899, or Shell Catalogue of 1899, send 1d. Postage Stamp to
21, NEW BOND STREET, BATH.

Mr. Marsden's wide connection with British Naturalists is already well known, and this prompt and satisfactory attention of all business entrusted to him can be relied on.

E.G.—The Gloucester Business, so long conducted by Mr. Marsden, was entirely removed to Bath in 1899.

NOTES
ON A COLLECTION OF SPONGES
FROM THE WEST COAST OF PORTUGAL.

BY
R. HANITSCH, Ph.D.

WITH PLATES XII. AND XIII.


DENDY LIBRARY
NOTES on a COLLECTION of SPONGES from the
WEST COAST of PORTUGAL.

By R. Hanitsch, Ph.D.

With Plates XII. and XIII.

[Read May 17th, 1856.]

The following pages contain a description of a small, but
interesting collection of Portuguese Sponges, which were
sent to me by Professor Paulino de Oliveira, Coimbra.
They are all marine, with the exception of one, Euspon-
gilla lacustris, Ant., the only species of Fresh-water
Sponges thus far obtained from the Iberian Peninsula.

I have not, in all cases, succeeded in specific identifi-
cation, and with some of the forms I have not even
attempted it. Many of the specimens which I received
were mere fragments cut from larger specimens, and this
often made identification more difficult, especially with
the Horn Sponges. In the case of the genera Halichon-
dria, Reniera and Chatina, I did not seriously attempt
specific identification, as I consider a vast number of
species of those genera to be quite insufficiently defined,
and before somebody takes the trouble to work out those
genera, I do not think it of much use to attempt specific
identification.

The collection comprises twenty-eight forms. Two of
them represent new genera and species, and are very
interesting, viz., Amphiplia paulinae, so far the first
instance of a calcareous sponge containing large, longitu-
dinally arranged, oxococ spicules both in the dermal and
gastral cortex, and Physocaphora decorticans, a tetracli-
nellid sponge, with a new type of microscleres. There
are also four new species, belonging to the genera *Leucandra, Gellius, Rapania* and *Paciliastra* respectively. Regarding the locality of the Sponges, it may be understood, unless expressly stated to the contrary, that they were all obtained from the neighbourhood of Sines, West Coast of Portugal.

**CALCAREA.**

Order **HOMOCHILAE.**

*Leucosolenia coriacea*, Fleming.

Several specimens of the usual character.

Order **HETEROCHILAE.**

*Leucandra aspera*, O. Schmidt.

Von Lendenfeld (6, p. 125) in the year 1891 mentions this species as "beschränkt auf das Mittelmeer." Topsen (9, p. 23) in the following year, describes it as from the Azores. This is therefore only the second instance of this species being obtained outside the Mediterranean.

*Leucandra buliosa*, n.sp.

Solitary, sessile, of bulb-like, or sometimes irregular, shape, tapering upwards to a terminal osculum, which is provided with a very small oscular fringe. Surface somewhat corrugated and hispid. The larger and more regular specimens measuring about 22 mm. in diameter and 20 mm. in height. Width of osculum 2·5 mm. Colour (in spirit) white or yellowish grey.

Canal system typical. Inhabiting pores 0·04—0·07 mm. in diameter, flagellated chambers 0·075 mm., exhalant canals 0·06 mm., or slightly more in diameter, sometimes uniting in slit-like depressions.

Skeleton: (1) Gastral tetracts: apical ray 0·1 by 0·01 mm., basal ray 0·17—0·27 by 0·01 mm., oral rays 0·29—0·45 by 0·01 mm. The basal and oral rays lie in and parallel to the gastric cortex, the apical ray projects right angles into the gastric cavity. The basal rays of all the spicules are directed vertically downwards, the lateral rays laterally and slightly upwards. (2) Tracts of chamber layer: basal ray 0·4 by 0·022 mm.; oral rays 0·34 by 0·022 mm. (3) Dermal tetracts: basal ray 0·2 by 0·018 mm.; oral rays 0·17 by 0·018 mm. (4) Dermal oxea, radially arranged and projecting, up to 1·4 by 0·075 mm. (5) Dermal club-shaped spicules, radially arranged, only slightly projecting, 0·45—0·75 by 0·05 mm. (6) Dermal hastates, minute, 0·07 by 0·002 mm. (7) Oscular radials 0·42 by 0·0018 mm.

**Amphiute, n.g.**

This genus belongs to Dendy's family *Heteropidae* (Dendy, J. p. 75) as possessing a distinct and continuous dermal cortex, covering the chamber layer and pierced by inhalant pores, and also subdermal sagittal tracts. Its flagellated chambers are sometimes elongated and radially arranged, starting finger-like from large exhalant canals, at other times quite irregular. Of the other three genera belonging to this family (viz., *Grantesia*, v. Lendenfeld, *Heteropia*, Carter, *Vosmaeropsis*, Dendy) *Amphiute* stands nearest to *Heteropia*, as possessing large oxea, lying in the dermal cortex, and arranged parallel to the long axis of the sponge, but it differs from *Heteropia* in having a similar layer of oxea in the gastric cortex. We find a strong resemblance to *Amphiute* in two genera belonging to the *Grantesia*, viz., *Uto*, O. Schmidt, with a layer of longitudinally arranged oxea in the dermal cortex, and *Uella*, Dendy, with a similar layer in the gastric cortex. In proposing the name *Amphiute* in my preliminary definition (2) of this genus, I had paid more attention to these characters, than to the presence or absence of subdermal tetracts. If we accept Dendy's classification,
the presence of those triacts brings Amphineute under his family Heteropida. Their absence would have shown this genus to belong to the Gramtida.

Diagnosis of Amphineute, n. g. The flagellated chambers are sometimes elongated and radially arranged, sometimes irregular. Dermal cortex and gastric cortex are both well developed and both contain large oxea arranged parallel to the long axis of the sponge.

Amphineute paulini, n. sp. (Pl. XII., figs. 1—5; Pl. XIII, fig. 1).

Two specimens were sent to me for examination. The larger of the two is a colony of eight individuals, united together at their bases (Pl. XII., fig. 1). The individual have a somewhat curved elongated cylindrical form, tapering very slightly towards the distal osculum which bears a small fringe. The larger individuals measure 10 mm. in length and 3 mm. in diameter, the oscular fringe is 1 mm. in length. The surface is smooth and shows a distinct longitudinal striation, due to the presence of large oxea in the dermal cortex. Colour in spinous greyish or whitish.

The canal system is sylleibid, and resembles closely that of Voenaeropis majorca, as described by Dendy (2, p. 182). The dermal pores are from 0.032 to 0.036 mm. in diameter, and lead into inhalant canals which soon become narrower. The flagellated chambers are in many cases elongated (0.44 by 0.1 mm.) and open into very wide exhalant canals, which narrow again before opening into the gastric cavity. Thus the flagellated chambers seem to be radially arranged with respect to the gastric cavity, than to the exhalant canals (Pl. XIII., fig. 1). Sections, longitudinal or transverse, through the sponge show also a large number of spherical, oval, and irregular chambers. But whether the chambers are really of these shapes, or whether this appearance is due more to the direction of the section passing at different angles through the chambers, is difficult to decide.

The skeleton is composed of seven kinds of spicules: (1) Gastral tetract, the facial rays measuring 0.132 to 0.15 mm. by 0.004 to 0.008 mm., the apical ray 0.056 to 0.076 mm. by 0.004 to 0.008 mm. (2) Subgastral triact, the basal ray 0.28 by 0.012 mm., the oral rays 0.092 by 0.012 mm. (3) Subdermal triacts, fewer in number than the subgastral triacts, but of about the same dimensions. (4) Dermal triacts, regular, each ray 0.1 to 0.12 mm. by 0.01 mm. (5) Huge oxea, 1.2 to 2.5 mm. by 0.06 to 0.09 mm., occurring both in the gastric and dermal cortex and arranged parallel to the long axis of the sponge. (6) Rhabds, situated in the dermal cortex and projecting at right angles, 0.2 by 0.0025 mm., or larger. (7) Oscular rhabds; 1.2 to 2 mm., by 0.007 mm., forming a dense fringe.

Heteropida nodus-gordii, Poléjeffe (?).

Represented in our collection by a single small colony, easily recognised by the large subdermal tetracts. Poléjeffe described this species first as from off the Bermudas and Cape York.

SILICEA.

Order Monaxonida.

Halichondria, sp. ?

A single small encrusting specimen, 2 mm. in thickness, yellowish-grey (in spirit), very soft and pulpy. Oxea 0.125 by 0.005 mm.

Reniera (cinerca, Grant ?).

Fistulous, consisting of three conical branches, the largest of them being 23 mm. in height, 12 mm. in its greatest diameter, and the osculum 3 mm. in diameter.
Very soft and elastic. Dermal skeleton unispicular; primary fibres of the choanosomal skeleton unispicular, sometimes bispicular, secondary fibres unispicular. Oxea 0·088 by 0·005 mm.

Reniera, sp.?

Small ridge-like specimen, 25 mm. in length, 8 mm. in width, 8 mm. in height, with four large oscula along its summit, the oscula 2 mm. in diameter. Colour (in spirit) almost black. Very soft, somewhat elastic. Skeleton fibres unispicular, rarely bispicular. Oxea 0·084 by 0·0035 mm.

Reniera, sp.?

Small sessile specimen, 2 cm. in diameter, 5 mm. in thickness, with three oscula each about 2 mm. in diameter. Very soft and pulpy. Colour (in spirit) greyish brown. Skeleton: meshes irregular, unispicular. Oxea slender, 0·088 by 0·003 mm., sometimes stouter.

Reniera, sp.?

About a dozen small finger-like specimens, attached to the severed claws of a Crustacean, each about 12 mm. in length, 1·5 mm. in thickness. Soft and elastic. Colour (in spirit) brown. Oxea 0·104 by 0·005 mm.

Dactylochalinacylindracea, v. Lendenfeld (2).

The specimen in question offers a strong resemblance in its external characters to the above species, as figured by von Lendenfeld (5, Pl. II., fig. 1) in his Monograph of the "Horny Sponges," Pl. II., fig. 1. The sponge is digitate, and consists of a number of slender cylindrical branches arising from a common trunk. The entire height of the specimen is 14 cm., the diameter of the branches 3 to 4 mm. The oscula are very small, less than 1 mm. in diameter, and not raised. Consistency elastic. Colour (in spirit) brown. The fibres are stout and contain a large amount of spongin. The primary fibres, 0·045 mm.

Sponges from Portugal. 211

in diameter, are multispicular; the secondary fibres are nearly as thick, but unispicular. The oxea are stout, 0·108 by 0·009 mm. The dimensions of the spicules of the type-specimen (from Australia) as given by von Lendenfeld, are considerably less, and therefore I am in doubt in regard to the identity of the two forms. Locality: Leman.

Chalinca, sp.?

Three small finger-like specimens, about 20 mm. in length, 2 mm. in thickness. Oscula very minute. Colour (in spirit) yellowish-grey. With very little spongins. Primary fibres multispicular, about three spicules side by side; secondary fibres unispicular. Oxea stout, 0·076 by 0·006 mm. Locality: Buarcos.

Chalinca, sp.?

Small, irregular specimen, encrusting Corallina. Primary fibres, with a considerable amount of spongins, unispicular, 0·024 mm. thick; secondary fibres very thin, spongins scarcely covering the spicules. The spicules are slender oxea, 0·076 by 0·003 mm.

Euspongiella lacustris, Anst.

A single specimen, from a small river near Caldas de Nixella, North Portugal.

Gellius pyrrhi, n.sp.

This new species is represented by two fragments, the larger of which is apparently a piece of a sessile, branching specimen. It is 3·5 cm. in its greatest horizontal expansion, 1 cm. in thickness, with about fifteen oscula which are not raised, and are 1 mm. in diameter. Consistency pretty firm and elastic. Colour (in spirit) greyish-yellow. The skeleton consists of oxea which are very variable in size, averaging 0·15 by 0·006 mm., and of sigmata which are exceedingly slender, measuring 0·012 by 0·0004 mm. or even thinner.
Dendoryx incrustans, Gray, v. viscosa, Topsent (9, p. 98).
The larger of the two pieces sent to me for examination is roughly cylindrical, 5 cm. in height, 2 cm. in diameter, and is apparently cut off from a much larger specimen. The meandering ridges of its surface are very similar to those of Dendoryx incrustans of the British Coast. The strongyle of the ectosomes have two minute spines at each end, and measure 0.16 by 0.005 mm. The spined stylar of the choanosome are 0.136 by 0.008 mm. The microscleres are isochelae, 0.016 mm. in length or less and sigmoida, 0.024 mm. in length.

Echinocladia seriata, Grant.
One specimen, of the usual character.

Raspailia formidabilis, n.sp.
One single specimen, 4 cm. in height, consisting of a large number of bushy branches from a common trunk, the trunk being 8 mm. in diameter. Entire surface of the sponge exceedingly spiny, the spicules projecting a good distance beyond its surface. Skeleton consisting of two kinds of spicules, (1) smooth stylar, straight or slightly curved 1.5 by 0.02 mm, and (2) echinating spined stylar, 0.095 by 0.008 mm.

Hymeniacidon carunculatum, Bowerbank.
One specimen, massive, measuring 3.5 by 2.5 cm. horizontally and 1.5 cm. in thickness, of the usual characters.

Tethya lynceum, Lin.
A single small specimen, 1.5 cm. in diameter.

Order Monoceratina.

Euspongia (osculata, v. Lendenfeld?). See v. Lendenfeld (5).
Represented by a piece apparently cut off from a large specimen. Colour (in spirit) reddish-brown.

Aplysilla (archeri, Higgin?). See v. Lendenfeld (5).

Represented only by a worn out fragment of the skeleton.

Aplysinopsis, sp.?
Two of the specimens are flat, sessile, not branching, measuring 4 cm. horizontally and 7 mm. in thickness, their surfaces being raised into blunt conules. A third specimen, possibly belonging to a different species of Aplysinopsis, is apparently cut off from a larger specimen. It consists of a basal portion with three branches and measures 5 cm. in length, each branch being about 12 mm. in thickness. Its surface is covered by sharp-pointed conules, arranged in irregular ridges. Consistency elastic and very tough. Colour (in spirit) yellowish.

Oligoceras collectriz, F. E. Schulze. See v. Lendenfeld (5).
Two specimens, of a very crumbling consistency.

Hiroria variabilis, F. E. Schulze. See v. Lendenfeld (5).
Two specimens, the larger of the two being flat and sessile, measuring 5 cm. horizontally, 8 mm. in thickness. Thickness of the fibres 0.07 to 0.12 mm., thickness of the filaments 0.002 mm.

Order Tetractinellida.

Pacillastra armata, n.sp.
This species differs from all other known species of the genus by possessing anastreana in addition to other spicules.

Sponge massive, irregular, measuring 10 by 5 by 5 cm. Surface even, rough to touch. Oscula 1 mm. in diameter, scattered. Examined in the dried condition.

The skeleton appears very confused, and is made up as follows: Megascleres: (1) Oxea, of huge dimensions, somewhat slantingly arranged towards the surface, straight, or only slightly curved, measuring 3 by 0.055 mm. (2)
Calthrops, the actines 0·45 by 0·045 mm. (3) Ortho-
triaena, mostly deformed, rhabdome only slightly longer
than the cladi, of about the same dimensions as the
calthrops. (4) Anatriaena, fewer in number than the other
megascleres, projecting beyond the surface of the sponge,
with wide and distinct axial canal in rhabdome and
cladi, the rhabdome measuring 2·5 by 0·02 mm., the
cladi 0·09 by 0·02 mm.

The Microscleres are of two kinds, (1) Smooth Microxes,
present in vast numbers and forming a felted mass
throughout the whole sponge, 0·17 by 0·0035 mm., (2)
Spiraster, 0·02 mm. in length.

Physocaphora decorticans, n. g. & sp. (Pl. XIII., figs. 2 & 3).

The collection contains only a single fragment of this
highly interesting sponge, and that fragment apparently
represents only the euctosome of a tetractinellid sponge
which had become peeled off, as often happens in cases
where the cortex is highly developed. The specimen is
a thin flat piece, of stony consistency, measuring hori-
zontally 4 by 3 cm., and 0·5 to 1 mm. in thickness.
The surface is raised in minute conuli which may bear the
oscula at their summits. Its colour (in spirit) is yellowish
white or greyish, here and there rusty, in some parts
almost transparent.

The skeleton consists of megascleres and microscleres.
The former are tylostyles, 0·01 by 0·008 mm., arranged in
bundles converging towards the surface of the sponge,
and raising it up in little conuli, and forming also a
support for the tissue round and below the oscula (Pl.
XIII., fig. 3). The microscleres are of four kinds: (1)
Spirasters, 0·014 mm. in length, forming a thin crust
along the surface of the sponge. (2) Spherasters, with
large centres and very short rays, forming a layer just
below the Spirasters, 0·013 mm. in diameter. (3) Spher-
sters, few in number, with small centres and long rays,
0·016 mm. in diameter, occurring here and there in the
lowermost part of the specimen. (4) "Selenasters," forming a thick layer below the spherasters with large
centres, in fact constituting the chief mass of the specimen.

These spicules correspond in structure and position to
the sterrasters of the genera Pachynatema, Cydonium,
etc., and I have chosen the name from their faint resem-
blance to a half-moon. They are really more sausage-like
in shape and the generic name Physocaphora has been
adopted to express this. The full-grown spicule measures
0·06 by 0·028 mm., and fortunately a number of young
stages were met with, so that the development of the
spicule could be traced. In the youngest condition
present the spicules had the shape of rods, nearly straight
or slightly twisted, beset with minute spines (Pl. XIII.,
fig. 2a). In the next stage the spicule is still pretty
straight, but the spines are large and numerous, although
still distinctly separated (Pl. XIII., fig. 2b). In the next
stage, the spicule has already its typical sausage-shape,
the spines are very closely set, but still recognisable
in their individuality (Pl. XIII., fig. 2c). The last stage is
the full-grown selenaster, in which the spines, except
their most distal ends, are all fused so as to form one
solid mass (Pl. XIII., fig. 2d). The distal ends of the spines
project a short distance beyond the surface of the spicule,
and being polygonal, chiefly hexagonal in transverse
section, offer a delicate pattern, when the spicule is being
focussed at different depths. A hilus is present as in the
Sterrasters. We thus see a great resemblance in the
structure and development of Sterrasters and Selenasters.

The chief difference is that in the Sterrasters all rays
start from a point, whilst in the Selenasters the rays
start from a line.
Regarding the systematic position of Physcephora, we have apparently placed it in the family Placospogida, Sollas (8), provided we are right in our supposition that the specimen in question is only the ectsosome of a sponge, and that the choanosome, when discovered, will not show spicules of a different type. The Placospogidae are sterrastrous Tetractinellida, possessing, however, no tetract, but only monaxonid megascleres. Of the two genera of this family, Physcephora is more closely allied to Placospogia, Gray, both possessing tylostyle, whilst Antares, Sollas, possesses diactine spicules.

Thus we may perhaps propose the following diagnosis of Physcephora: Placospogidae in which the megasclere is tylostyle and in which the cortex is formed chiefly of selenasters.

I now give a list of all the Sponges contained in the collection. The classification is the same as used in my "Revision of Bowerbank's Nomenclature" (3).

CALCAREA.
Order Homocelae.
Leucosolenia coriacea, Fleming.

Order Heterocelae.
Family Granidae: Leucandra aspera, O. Schmidt.
Leucandra bulbosa, n.sp.

Family Heteropidae: Amphipute paulini, n.g. & sp.
Family Amphiocidiae: Heteropegma nodus-gordii, Polöjæff.

SILICEA.
Order Monaxonida.
Family Haploscleridae: Holothomoria, sp.?
Reniera (cinerea, Grant?)

SPONGES FROM PORTUGAL: 217

Reniera, sp.?
Reniera, sp.?
Reniera, sp.?
Dactylochalinia cylindracea, v.
Lendenfeld (?).
Chalina, sp.?
Chalina, sp.?
Euspongilla laeustris, Autt.
Gallius pyrrhi, n.sp.

Family Pacilosclerida: Dendoryx incarnatus, Gray,
var. viscosa, T.
Echinocelithria seriata, Grant.
Raspailia formidabilis, n.sp.

Family Axinellida: Hymediacidon curvunculum, B.
Family Tethyidae: Tethya lyncirium, Lin.

Order Monoceratina.
Family Spongidae: Euspongia (osculata, v. Lendenfeld?)
Aplysilla (archeri, Higgins?)
Aplysioxia, sp.?
Oligoseras collectrix, F. E. Schulze.
Hirchinius variabilis, F. E. Schulze.

Order Tetractinellida.
Family Pachastrellidae: Pacillastra armata, n.sp.
Family Placospogidae: Physcephora decorcians,
  n.g. & sp.

LITERATURE.
1. DENDY, A. Synopsis of the Australian Calcarea
   Heterocela, with a proposed classification of the
   group and descriptions of some new genera and
2. DENDY, A. Studies on the Comparative Anatomy of
   Sponges. V. Observations on the structure and


**Explanation of the Plates.**

**Plate XII.**

Fig. 1. *Amphiocte paulini*, n.g. and n.pl. Natural size. [One or two individuals of the colony may be somewhat misleading. The surface of the sponge should appear smooth, not spiny, and the spicules less pronounced.]

Fig. 2. Gastral tetract. The three straight rays are facial, the fourth, curved ray is apical. (× 150.)

**Sponges from Portugal.** 219

Fig. 3. Represents both subgastral and subdermal tracts. (× 150.)

Fig. 4. Dermal tract. (× 150.)

Fig. 5. Vertical section through the upper portion of one of the individuals of *Amphiocte paulini*. o., osculum; g.c., gastric cavity. [In this figure as well in fig. 1, Pl. XIII., Dendy's plan has been adopted to represent the collar cells diagrammatically by red dots.] (× 50.)

**Plate XIII.**

Fig. 1. Portion of a transverse section through one of the individuals of *Amphiocte paulini*. d.p., dermal pore; i.e., inhalant canal; f.c., flagellated chamber; e.c., exhalant canal; g.c., gastric cavity. (× 80.)

Fig. 2. Microscleres of *Physcaphora decorticans*, n.g. and n.pl. a, b, c, young stages of Selenaster; d, adult stage of the same. The somewhat eccentrically placed marking in 'd' is the hilus. f., various forms of spiraster; e and g, forms of spheraster. (× 500.)

Fig. 3. Vertical section through the ectosome of *Physcaphora decorticans*. o., osculum. (× 7 7 / 8.)