other leg of the cock grew as usual. This experiment I have repeated several times in the same manner, with the same effects, which led me to conceive that the spur of a cock would not grow upon a hen, and that they were, therefore, to be considered as distinct animals, having very distinct powers. In order to ascertain this, I took the spurs of hen chickens and placed them on the legs of young cocks. I found that those which took root grew nearly as fast, and to as large a size as the natural spur on the other leg, which appeared to be a contradiction to my other experiments. Upon another examination of my hens, however, I found that the spurs had grown considerably, although they had taken several years to do it; for I found that the same quantity of growth in the spur of a cock, while on the cock, during one year, was as much as that of the cock's spur on the hen in the course of three or four years, or as three or four to one; whereas the growth of the hen's spur on the cock was to that of the proper spur of the hen as two to one."

When a female animal belonging to a dimorphic species assumes male characters, it is truly an example of Atavism, or development of transmitted characters normally latent.

This part of the matter has been dwelt upon at some length for the following important reason. If we regard the epiblast and the structures developed therefrom as representing the chief characters derived from the male parent, it opens up a field of interesting inquiry in clinical medicine and pathology regarding hereditary diseases, and it demonstrates clearly enough that we have little knowledge concerning the germs of organs which may be latent in an animal; therefore Neogenetic Atavism is, at its best, exceedingly questionable. To assume that such a form of Atavism exists, is to believe in the sudden development of new characters: this is totally opposed to the fundamental principles of Evolution.

The question is one of great importance to the pathologist, inasmuch as there is very great probability that many aberrations of organs and tissues are atavistic in their nature.

2. On the Systematic Position and Classification of Sponges. By R. v. Lendenfeld, Ph.D., F.L.S., Assistant in the Biological Laboratory of University College, London.

[Received December 20, 1886.]

I. Introductory Remarks.

Our knowledge of the development and structure of Sponges is of such recent date that we have hardly had time to utilize it for systematic purposes till now.

Whilst the anatomical and embryological work of recent authors, particularly of F. E. Schulze and his pupils, has made us acquainted with the structure of Sponges in a satisfactory manner, our knowledge of species, which was formerly practically confined to those from the Mediterranean and the Atlantic, has been greatly extended by the collections made during the voyages of the 'Alert' and 'Challenger' in all parts of the world, and by my own labours in the Australian seas.

I think, therefore, that the time has now arrived to endeavour to establish a classification of Sponges, and to discuss the position which the Sponges, as a group, occupy in the scale of Nature.

In an Appendix to this paper a nearly complete list of publications on Sponges is given. It has been made by interpolating old, new, and omitted papers in D'Arcy Thomson's (1495) list of 551 papers, the references in which have been verified. I must express my thanks to Mrs. v. Lendenfeld and to Mr. A. Dendy for their share in this work, and also to Mr. Ridley for his kindness in allowing us to use his most valuable MS. notes on this subject.

In the section on the systematic position of Sponges, the principal views held on the subject are discussed, and reasons are given for considering the Sponges as the first Phylum of the Grade Cœlentera, which arrangement has been adopted in this paper.

The main classification of the Orders is the result of my own anatomical work, and has been arrived at independently of other authors. It affords me much pleasure to state that this classification is, in the main, similar to that established by Vosmaer (1550), although we have arrived at our results in different ways, and our diagnoses differ accordingly.

To that section of this paper which deals with the arrangement of the Families and Subfamilies, and the enumeration of the principal Genera, Mr. A. Dendy has contributed the portions relating to the Suborders Clavulina and Halichondrina with the exception of the Tethydæ and Chalininæ. The portions relating to the Hexactinellida and Tetractinellida are compiled from the recent papers of Schulze (1369), Sollas (1453), Vosmaer (1550), and Zittel (1639). The remainder is based on my own MS. notes.

II. Nomenclature of the Spicules.

Various terms for the spicules found in Sponges have been used by different authors. In consequence of this a certain confusion has arisen with regard to the meaning of the terms employed. Vosmaer (1550) made a chivalrous attempt to establish a satisfactory Nomenclature, which, however, has unfortunately not been accepted by recent authors on Sponges except myself, so that it only added to the already existing confusion.

Recently Sollas, Ridley, and Dendy have established a new nomenclature for Monaxonid spicules, which I have agreed to adopt, and which has been used by them and myself. I do not think it perfect, but I am certainly not in a position to replace it by anything better, and therefore adopt and explain it in this paper. Schulze's nomen-

clature of Hexactinellid spicules is here, of course, accepted *en bloc*, and his terms will be defined below. Sollas (1453) has used a number of terms in his preliminary report which I do not understand and which presumably nobody else understands either. It is, therefore, much to be regretted that the greater part of them are unexplained. In consequence of this I will, for the present, abstain from attempting to compile a nomenclature of Tetraxonid spicules pending the publication of Sollas's full report, in which, we may hope, he will explain his new terms.

The spicules of Sponges are, as a rule, of such shape that they appear as more or less modified geometrical figures with definite axes. The axes are always represented by a non-skeletal rod (the so-called axial canal), round which the silica or lime is precipitated in concentric layers. There may be one such axis, or there may be more than one.

Häckel (627) drew attention to this crystalline regularity of sponge-spicules, which has been of great importance in studying the skeletal elements of Sponges.

We can divide the sponge-spicules, as we do the Sponges, into the two groups Calcarea and Silicea, according to their chemical composition. Within each group we distinguish series of forms according to the number and position of the axes. The validity of this classification is proved by the correlation of these different kinds of spicules with other organs in the Sponges.

The following are the different kinds of spicules :—

I. Group Spicula Calcarea.

Composed chiefly of carbonate of lime.

1. *Monaxonia.*

With one straight or curved axis, rod-shaped.

2. *Triaxonia.*

With three distinct axes which may lie in one plane or not. When one of the rays of this tri-act spicule becomes rudimentary, Diaxonia can theoretically be produced. It is, however, advantageous to consider the Diaxon spicules as part of the Triaxonia. The calcareous triaxon spicules have only three rays—triact.

3. *Tetraxonia.*

With four axes and four rays—tetract. The points form the corners of a triangular pyramid. Generally three axes, or rays, are equivalent (tangential), and one (radial) is differentiated, longer or shorter than the others.

II. Group Spicula Silicea.

Composed chiefly of silica.

1. *Anaxonia.*

Without definite axes and with numerous rays—polyact.

To this group belongs one kind of spicule only, namely the stellate and its derivatives.

The following six forms can be distinguished :—

A. *Regularia.*

The rays radiating from one point.

1. *Oxyaster.*

With long, slender, pointed rays (*e. g. Stelletta*). = *st*, Vosmaer.

2. *Euaster.*

With stout, pointed, conic rays (*e. g. Chondrilla*).=*gl. st*, Vosmaer.

3. *Spheraster.*

The rays coalesce to form a solid ball (*e. g. Geodia*).=*gl*, Vosmaer.

B. *Irregularia.*

The centre extends to form a line which may be curved, circular, ring-shaped, or spiral.

4. *Spiraster.*

A stout spiral with thick spines attached (*e. g. Raphyrus*). = st^2, Vosmaer. When spines terminal, *Amphiaster.*

5. *Corona.*

A spined ring (*e. g. Suberocorona*) (?).

6. *Spirula.*

A spiral without spines (*e. g. Spiretta*).

These anaxon spicules never form part of the supporting skeleton, but are invariably flesh-spicules (*Microsclera*).

2. *Monaxonia.*

With one straight or curved axis, sometimes with lamellar outgrowths.

A. *Supporting Spicules* (Megasclera).

1. *Strongylus.*

A cylindrical rod rounded at each end (*e. g. Uruguaga*). = tr^2, Vosmaer.

2. *Oxystrongylus.*

A cylindrical rod abruptly pointed at each end (*e. g. Pachychalina*).

3. *Oxyus.*

A gradually pointed, spindle-shaped spicule (*e. g. Spongilla*). = *ac*, *ac*, and ac^2, Vosmaer. Diact, F. E. Schulze.

4. *Tylotus.*

A cylindrical rod with a knob at each end (*e. g. Crella*). = tr^{02}, Vosmaer.

5. *Tylostylus.*

A cylindrical rod more or less pointed at one end and knobbed at the other (*e. g. Suberites*). = tr^0 *ac*, Vosmaer. Without knob, *Stylus.*

B. *Flesh-Spicules* (Microsclera).

6. *Toxius.*

Curved in the centre, the two ends in a straight line, thus  (*e. g. Toxochalina*).=  , Vosmaer. When in bundles, *Toxodragmata.*

7. *Sigmata.*

S-shaped, curved irregularly, not expanded in one plane (*e. g. Geliodes*).=  , Vosmaer. When in bundles, *Sigmadragmata.*

8. *Isochelæ.*

Curved spicules with flat expanded ends extending in the surface of a rotation ellipsoid ; both ends equal (*e. g. Desmacidonidæ*). $=anc^2$, Vosmaer. Anchorates, auctorum.

9. *Anisochelæ.*

Curved spicules with flat expanded ends extending in the surface of a rotation ellipsoid ; ends unequal (*e. g. Desmacidonidæ*). $=anc$, *anc*, Vosmaer. Anchorates, auctorum.

10. *Diankistra.*

A rod with a hook at each end, divided by a remarkable incision (*e. g. Vomerula*).=  Vosmaer. Bundles of hair-like spicules, *Trichodragmata.*

3. *Triaxonia.*

Spicules with three axes and six rays and their derivatives. (For details compare F. E. Schulze's preliminary report.)

1. *Oxyhexact.*

With six pointed rays, the ends of which form the corners of a double square pyramid. The rays represent the crystalline axes.

2. *Oxypentact.*

One ray rudimentary, representing the axes of a simple square pyramid.

3. *Oxytetract.*

Two rays rudimentary, representing the *edges* of a square pyramid.

4. *Oxydiact.*

Four rays rudimentary, only two rays lying in one straight line remain.

5. *Hexaster.*

A star with six, generally equal rays:—

a. *Oxyhexaster.* Rays pointed.
b. *Discohexaster.* Rays terminated by disks.
c. *Floricome.* Rays terminated by a bunch of curved branches.
d. *Graphiohexaster.* Rays much curved.
Plumicome. Rays terminated with a number of plumose branches.

6. *Pinnulæ.*

A star with five or six rays. One of them is particularly highly

developed and branched or covered with disks or scales. The opposite ray smooth or absent. The other four equal (tangential).

7. *Scopulæ.*

Fork- or broom-shaped spicules consisting of a long shaft traversed by an axial rod, to the distal end of which some, generally four, slender anaxial rods are attached.

8. *Amphidisc.*

A rod with an umbrella-shaped disk at each end.

9. *Uncinatæ.*

A rod with recurved hooks throughout its entire length.

10. *Clavulæ.*

A rod pointed at one end and bearing a knob or disk at the other.

4. *Tetraxonia.*

With four axes radiating from one point. The ends of the spicules lie in the corners of a square pyramid and their derivatives.

A. *Tetractina.*

With four rays.

B. *Triactina.*

With three rays.

C. *Diactina.*

With two rays.

D. *Monactina.*

With one ray.

For the reasons given above, I shall abstain from describing the Tetraxonian spicules in detail. I will, however, mention the terms for spicules employed by Sollas in his preliminary report (1453). These, alphabetically arranged, are the following:—

Acerate (Monaxon).
Acerella (Monaxon?).
Amphiaster (?).
Amphiastrella (Spirastrella?).
*Amphitetrad.
*Anchors.
Anthaster (?).
Arculus (?).
*Bifurcated Forks.
Calthrops (?).
*Candelabra.
Chiaster (?).
Cylindrical spicules (Monaxonia?).
Echinella (?).
Ectaster (?).
Erdaster (?).
*Forks.
*Forks with trifurcate arms.
*Fusiform Acerates (Monaxonia).
Globate (Scleraster).
Globules (?).
Hispidating Acerate (Monaxonia).
*One-pronged (unicellate) Forks.
*Porrectate Forks.
Pycnaster (?).
*Radical Anchors.
Sigmella (?).
*Somal Anchor.
*Somatic Anchor.
Spinispirulæ (Spirastrella).
Spirulæ (Spirulæ).
Stellate (?).
*Tetrad.
*Triona.
Trichite Acerates (Monaxonia).
*Trichite Forks.
*Trifid Forks.
*Two-pronged (dicellate) Forks.

The names marked * presumedly apply to Tetraxon spicules. The others probably belong to different groups.

These pages will give a key to the terms of spicules used below.

There are, however, a number of other terms which require explanation.

The spicules are divided generally into two distinct groups :— (1) Those which together form the supporting skeleton of the sponge : these are called Supporting spicules or Megasclera. (2) Those which lie scattered in the ground-substance and which differ from the former in shape: these are called Flesh-spicules or Microsclera (Tension-spicules of Bowerbank).

F. E. Schulze (1369) uses particular terms for spicules according to their position, which have been adopted in this paper so far as the Hexactinellids are concerned.

These are alphabetically the following :—

Autodermalia. Spicules on the outer surface with free projecting and with centripetal (immersed) differentiated rays.

Autogastralia. Spicules on the gastral surface with free projecting and with centrifugal (immersed) differentiated rays.

Basalia. Spicules of the root-tuft.

Comitalia. Spicules accompanying the fibres.

Epidermalia. Spicules on the outer surface with free projecting differentiated ray only.

Epigastralia. Spicules on the gastral surface with free projecting differentiated ray only.

Hypodermalia. Spicules of the outer surface with immersed radial ray only.—Pentact.

Hypogastralia. Spicules of the gastral surface with immersed radial ray only.—Pentact.

Marginalia. Spicules forming a collar round the osculum.

Parenchymalia. Spicules in the interior.

Pleuralia. Spicules forming a fur.

Principalia. Spicules of the main skeleton.

III. The Systematic Position of Sponges.

The opinions of different authors on this subject diverge considerably. I shall attempt to reconcile them in the following pages and to prove the correctness of the result at which I have arrived.

Aristotle first pointed out that the Sponges were not plants—a fact which seems clear enough now, but which was doubted and combated by most authors of the dismally ignorant middle ages. This we admit as proved. I agree with Häckel in dividing the organic world into the three groups—Plants, Protista, and Animals. Among the Protista there are a great majority of forms showing affinities either to animals or to plants, so that it is not unusual to split up the Protista and divide its members among the two other old established groups. For the sake of simplicity I adopt this course here.

The Animal Kingdom, in this wider sense, including the animal Protista, is naturally to be divided into Protozoa and Metazoa, of

which the former consist of similar and equal, undifferentiated, cells, which often remain isolated throughout life, whilst the latter pass through a unicellular stage of short duration only, and consist, when adult, of a number of different cells. There is a vast difference between these two groups: the Protozoa are isocellular, whilst the Metazoa are heterocellular. The Sponges are developed in the same way as all other Metazoa and pass through the same well-known embryonic stages—the Morula, Blastula, &c. They consist, when adult, of a great number of differentiated cells. There are flat epithelial cells all over the outer surface and on the canal-wall; there are collar-cells round the ciliated chambers. There are gland-cells for different purposes, muscular and nervous cells besides ordinary tissue and amœboid cells in the Mesoglœa or ground-substance, in which also the ova and spermatozoa are developed. It is therefore quite clear that the Sponges are not Protozoa, but Metazoa, and are, in fact, not similar to Protozoa in any way.

The Metazoa are naturally divided into two Groups or Grades—the Cœlentera, with a simple undivided body-cavity, all the parts of which are in direct connection with one another; and the Cœlomata, which have two distinct and entirely separated body-cavities—a gastral cavity and a cœlom or perigastric cavity. The Sponges certainly have a simple and continuous body-cavity and no trace of a cœlom, so that they must be regarded as Cœlentera.

Long before Hertwig established the cœlom theory, Leuckart had already perceived this important fact, and placed the Sponges among the Cœlentera accordingly.

Although nobody has ever attempted to regard the Sponges as Cœlomata, there has been great opposition, principally among English authors, to Leuckart's opinion. I dismiss the arguments of those who, like James Clark (284–294), Carter (166), and Saville Kent (772), regard the Sponges as Protozoa, on the ground that their idea of Protozoa does not harmonize with the generally adopted meaning of the term, for if it did, they could not, as logical thinkers, count the Sponges among them. Their idea of Protozoa comprises the whole Animal Kingdom, because they draw no distinction between isocellular and heterocellular organisms, and of course all Metazoa are, if this distinction be omitted, colonies of unicellular Protozoa. F. E. Schulze (1361) has taken the unnecessary trouble to refute Saville Kent's (772) statements in detail, and to show that the latter had been guilty not only of levity in the philosophical treatment of his work, but also of recording incorrect observations.

Some very excellent men, particularly Balfour (17), Bütschli (138), and Sollas (1440), are inclined to consider the Sponges as a separate group equal in value to our groups Metazoa and Protozoa. This arrangement was arrived at without regard to the division of the Metazoa into Cœlentera and Cœlomata. They contrast the subkingdom Porifera (Parazoa, Sollas) with the subkingdom Metazoa as a whole. With all respect to the most important opinion of Balfour, I still do not see that there is any justification for the establishment of

a special Subkingdom for the Sponges. They are evidently Metazoa, and no doubt Cœlentera in the sense given above, namely the *Grade* Cœlentera as opposed to the *Grade* Cœlomata.

I think therefore that the Sponges form part of the *Grade* Cœlentera, and I do not believe that any one will raise any objection to this statement.

Now, however, we have to approach a much more difficult task, and that is, to ascertain what position the Sponges occupy within the *Grade* Cœlentera.

In this Grade we must place, besides the Sponges, one very well-defined group of animals (the Jellyfish, Hydroids, Corals, and Ctenophora) which is not connected with other animals by any intermediate form. There can be no doubt of the comparatively close affinity of all these, and the sharp distinction between them and the Sponges. In a like manner the Sponges are an exceedingly well circumscribed group, without any transitions in any direction to other animals. The Grade Cœlentera comprises, therefore, two well-defined groups:—(1) the Mesodermalia (910) or Sponges; and (2) the Epithelaria (910) or Nematophora (Lankester), Cnidaria (Claus), Telifera (Marshall), as they are variously termed.

A. In the Mesodermalia the archenteron communicates with the outer water by numerous small pores through which the water-current enters; and by one or a few larger pores termed oscula or vents, through which the water is expelled. It consists here of a branching canal-system.

In the Epithelaria there is no branching canal-system. The anus and mouth are not distinguished, and the mouth or mouths are equivalent to all the openings of the canal-system of sponges. Only exceptionally two different kinds of pores are met with, as in certain Actiniæ with terminally open tentacles; but there is no regular current of water through these pores.

B. The gastrula of the Mesodermalia is generally produced by invagination.

The gastrula of the Epithelaria, on the other hand, is generally the result of delamination.

C. The Mesodermalia have no movable appendages wherewith to catch their prey.

The Epithelaria have such appendages.

D. The Mesodermalia are not armed with cnidoblasts or their homologues.

The Epithelaria are defended by cnidoblasts or their homologues.

Although these differences are important, yet the principal distinction between these two groups, to which I drew attention at the last meeting of the British Association (Meeting 1886), is the following:—

E. The Mesodermalia have invariably simple ectodermal and entodermal epithelia, the cells of which are always flat pavement-cells, and never converted into muscular, glandular, sexual, or sensitive elements. The muscular, connective, slime-producing glandular, skeleton-producing glandular, sexual, sensitive, ganglionic and amœ-

boid cells met with in the Sponges are invariably modified cells of the mesoglœa. This is particularly striking and important in the case of the muscular and sensitive elements.

The Epithelaria, on the other hand, have a mesoglœa the cells of which remain more or less amœboid and are not differentiated to any extent. The muscular, glandular, sexual, sensitive, ganglionic and defensive nettle-cells are produced in the epithelia, they sink below the outer cell-layer with advancing development and lie on the surface of the mesoglœa or supporting lamella.

By a process of folding and subsequent coalescing of the fold-margins, bundles of muscular cells may become immersed in the mesoglœa, and so form a mesodermal structure, which, however, must be considered a secondary mesoderm, as compared to the primary mesoderm represented by the mesoglœa and its cells. But they are invariably produced first from the epithelia and immersed afterwards, and always retain their epithelial character in clothing the walls of tubular cavities in the mesoglœa. Single muscular cells are never surrounded on all sides by the mesoglœa. Solid bundles of muscular cells do not occur. Exceptionally nettle-cells (*Crambessa*) may be found in the mesoglœa, which is also here and there traversed by nerve-fibres (*Cycloneurous Medusæ*).

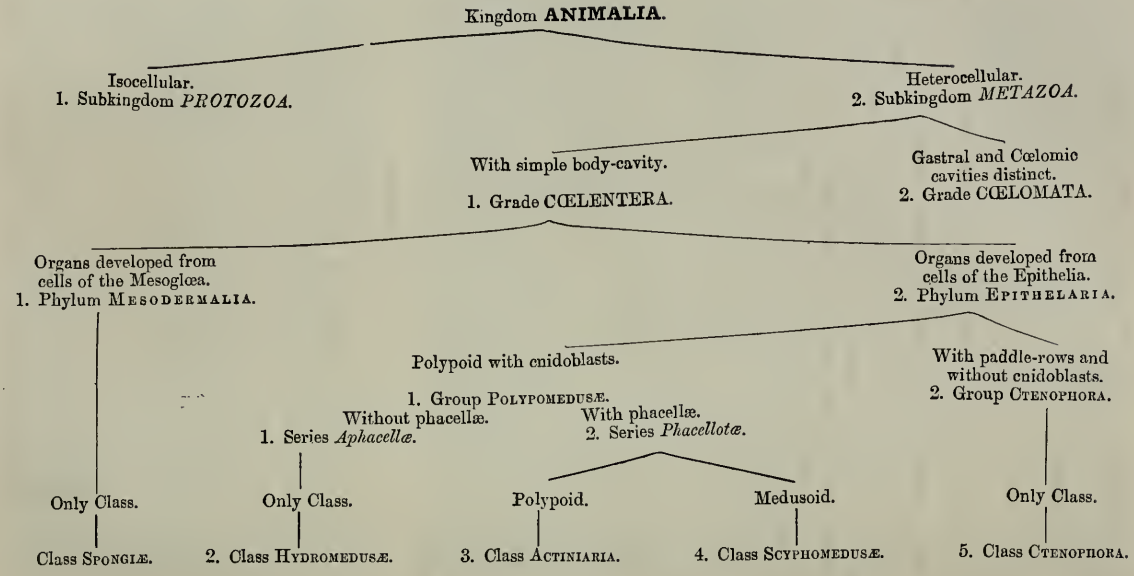
From a common sac-shaped ancestral form with simple ectoderm, simple entoderm, and undifferentiated cells in the intervening mesoglœa, representing the type of the Cœlentera, both Mesodermalia and Epithelaria have been developed. In the case of the Mesodermalia the cells of the mesoglœa became differentiated, and produced the organs, whilst the epithelia remained simple. In the case of the Epithelaria the cells of the mesoglœa remained unchanged and the organs were produced by the epithelia. I regard this as the principal difference dividing the two groups, and have therefore established the term Epithelaria in contradistinction to Mesodermalia (*l. c.*).

Having thus described the points of distinction, it remains that we should ascertain their phylogenetic value. There are only two alternatives with regard to the value we may attach to the Sponges as a group.

Either we must assume that within the Grade Cœlentera the Phylum Mesodermalia and the Phylum Epithelaria should be distinguished; or we may say that there is only one phylum in the Grade Cœlentera, namely the Phylum Cœlentera, and that this should be divided into the two Subphyla Mesodermalia and Epithelaria. It is evident that it comes much to the same thing. In this matter I adopt F. E. Schulze's opinion (1369), and consider the Sponges a separate phylum.

The result of this critical examination is given in the accompanying tabular view.

If we express this arrangement in the usual manner, we have :—


Kingdom ANIMALIA.
Isocellular.
1. Subkingdom PROTOZOA.
Heterocellular.
2. Subkingdom METAZOA.
With simple body-cavity.
1. Grade CŒLENTERA.
Gastral and Cœlomic cavities distinct.
2. Grade CŒLOMATA.
Organs developed from cells of the Mesoglœa.
1. Phylum MESODERMALIA.
Organs developed from cells of the Epithelia.
2. Phylum EPITHELARIA.
Polypoid with cnidoblasts.
1. Group POLYPOMEDUSÆ.
With paddle-rows and without cnidoblasts.
2. Group CTENOPHORA.
Without phacellæ.
1. Series Aphacellæ.
With phacellæ.
2. Series Phacellotæ.
Only Class.
Class SPONGIÆ.
Only Class.
2. Class HYDROMEDUSÆ.
Polypoid.
3. Class ACTINIARIA.
Medusoid.
4. Class SCYPHOMEDUSÆ.
Only Class.
5. Class CTENOPHORA.

Kingdom **ANIMALIA.**

I. Subkingdom *PROTOZOA.*

Animals which are either unicellular, or, if multicellular, isocellular, without archenteron.

II. Subkingdom *METAZOA.*

Multicellular, heterocellular animals with archenteron.

I. Grade CŒLENTERA.

Metazoa with simple body-cavity.

i. Phylum MESODERMALIA.

Cœlentera with branching canal-system, and organs developed from cells of the mesoglœa or primary mesoderm. No movable appendages.

1. Class SPONGIÆ.

With the characters of the phylum.

ii. Phylum EPITHELARIA.

Cœlentera with cæcal canal-system. The organs are developed from cells of the epithelia. With movable appendages.

1. Group POLYPOMEDUSÆ.

Polypoid Epithelaria with cnidoblasts.

i. Series *Aphacellæ.*

Polypomedusæ without entodermal phacellæ.

2. Class HYDROMEDUSÆ.

Aphacellæ of polypoid and medusoid character. Medusæ cycloneur.

ii. Series *Phacellotæ.*

Polypomedusæ with entodermal phacellæ.

3. Class ACTINIARIA.

Polypoid Phacellotæ with funnel and septa.

4. Class SCYPHOMEDUSÆ.

Medusoid Phacellotæ developed direct or from a *Scyphostoma* by strobilation. Toponeur.

II. Group CTENOPHORA.

Epithelaria with paddle-rows without cnidoblasts. Centroneur.

5. Class CTENOPHORA.

With the characters of the group.

II. Grade CŒLOMATA.

Metazoa with distinct gastral and cœlomic cavities.

IV. The Classification of Sponges.

Having thus ascertained the systematic position of the Sponges as a group, we now approach the second part of our work.

Every one will agree that no satisfactory classificatory system of Sponges exists at present. Spongologists are in the habit of approaching this subject with great caution, I may say with diffidence.

It is a remarkable fact that the leading spongologist of the day, my esteemed teacher Prof. F. E. Schulze, in Berlin, has not attempted to work out a classificatory system of Sponges, whilst others have made some desultory efforts in that direction. It is self-evident that the systems established by Bowerbank, O. Schmidt, Gray, and others, which date from a time when virtually nothing was known about Sponges, have now become obsolete. The most successful attempt at establishing a system of Sponges is doubtless that of Vosmaer (1550), who, however, approaches his task with great diffidence; everywhere we meet in his work with "preliminary" classifications. Some geologists, principally Zittel (1635) and Sollas (1455), have classified the Sponges in a rather high-handed manner, establishing subclasses, orders, &c., without regard to details like families and genera. Zittel particularly attached too much importance to the fossil Sponges.

In the groups themselves more satisfactory detail work has recently been done. F. E. Schulze (1369) has worked out the Hexactinellids of the 'Challenger' with results which are as valuable and useful as the material at his disposal was abundant and interesting. Zittel (1626–1629) has in a satisfactory manner dealt with the fossil Sponges belonging to the same group. The Lithistids and Tetractinellids, both fossil and recent, have been carefully investigated by Zittel (1639) and Sollas (1453). I (888) have, with the aid of the works of Häckel (627–629) and Polejaeff (1179) at my disposal, established a system of Calcareous Sponges based on my investigations of the rich Australian Sponge-fauna, which appears fairly satisfactory.

The Monactinellids have been carefully studied by Vosmaer (1545), Ridley (1261), and Ridley and Dendy (1265–1266), and I have myself devoted much labour to their investigation, and have made (870) an attempt at classifying them, which, however, was unsuccessful. The Australian Fauna is exceedingly rich in Monactinellids, and my collection, of over 300 species, has enabled me to work out the classification of some of the groups in detail.

No attempt has hitherto been made to classify the Horny Sponges excepting one, contained in a short paper of Vosmaer (1552), establishing five groups, in accordance with the views previously expressed by myself (868), and based on the result of the researches into the structure of horny sponges by F. E. Schulze (1345, 1348, 1349, 1351) and myself (868). The Australian marine fauna is exceedingly rich in horny sponges, so that I have been enabled to work out their relationships in detail.

If we review the Sponges as a whole, we shall be struck with the great fundamental difference between the Calcareous and all

the other Sponges. Grant (526) was the first to point this out, and he accordingly divided the Sponges into Calcarea and Non-Calcarea. Vosmaer (1550) agrees in this point with Grant and uses his terms. I have also (888) adopted the same view. In this paper I intend to alter the term Non-Calcarea, which is misleading, inasmuch as it might be interpreted as meaning that the group so named consisted of very heterogeneous elements, coinciding with each other only in one, and that a negative character. This is not the case. I divide the Classis Spongiæ accordingly into two *Subclasses*, I. Calcarea, and II. Silicea.

The point of distinction between these two Subclasses is, that all the *Calcarea* have a skeleton composed of spicules consisting chiefly of carbonate of lime. All the other Sponges, which I comprise under the heading *Silicea*, either have a skeleton composed of siliceous spicules or have been derived phylogenetically from siliceous Sponges, and have only recently lost their spicules or replaced them with a horny support. O. Schmidt (1305) and also myself (870) were inclined to think that *some of* the siliceous Sponges had descended from horny ones. I have, however, since abandoned this view (901), and consider that the opposite direction of development, which Vosmaer (1558) advocates, is the correct one.

We have accordingly :—

Classis SPONGIÆ.

Skeleton composed chiefly of carbonate of lime.	Skeleton originally composed of siliceous spicules.
I. Subclassis Calcarea.	II. Subclassis Silicea.

As mentioned above, in the critical introduction to this chapter, I have nothing to add to my system of Calcareous Sponges (888) published some time ago, and I adopt it unchanged in this paper. The Calcarea are a very much smaller group than the Silicea. In this Subclass we only distinguish one Order, the Calcispongiæ (Blainville); whilst the Silicea must be divided into several Orders, and it is here that we meet with the greatest difficulty in ascertaining the true relationship of the different forms. There are no transitions between the two subclasses. In examining the structure of a great number of Sponges belonging to this second group, the subclass Silicea, I found that they can be arranged in three Groups, which will appear as Orders in my system. These are the Hexactinellida, the Chondrospongiæ, and the Cornacuspongiæ. These groups are fairly distinct, and transitional forms connecting them are rare. The Sponges of these Orders are descended from siliceous Sponges, and show the same tendency of development within each group.

In the Hexactinellida we invariably meet with a skeleton composed of triaxial spicules; these are often attached to each other by a siliceous cement which greatly strengthens the structure.

All authors agree that the Hexactinellida form a well-defined group. The remaining Silicea, however, are a very mixed lot, and before Vosmaer, no satisfactory arrangement of them had been arrived

at. The one I propose in this paper, which is similar to that of Vosmaer, is certainly very far from being as perfect as I would like to make it; but I think that at all events it is much more likely to express the relationship of Sponges in a correct manner than any other existing arrangement.

The subclass Silicea minus the order Hexactinellida comprises the Sponges with a skeleton composed of tetraxial spicules (the Tetractinellida and Lithistidæ of Marshall and other authors), the Sponges with monaxial spicules (the Monactinellida of Zittel and other authors), the Sponges with a horny skeleton and without spicules in the supporting skeleton (the Ceraospongiæ or Keratosa of many authors), and, finally, the Sponges without any supporting skeleton at all (the Myxospongiæ of Häckel).

At first sight all these forms appear connected with each other in every direction by transitional forms to such an extent that it seems hopeless to bring order into this chaotic mass. A careful investigation of many forms shows that *all* the familiar groups Tetractinellida, Lithistidæ, Monactinellida, Ceraospongiæ, and Myxospongiæ run into each other at every point. If one, however, for years endeavours to find some constancy in the varying characters of any chaotic mass of this kind, he at last generally arrives at an idea which seems clear enough when once grasped. And then one only wonders how it was that it had not been conceived a long time ago. So it was also in this case. I found that all these Sponges could be very naturally divided into *two* Orders—the above-mentioned Chondrospongiæ and Cornacuspongiæ, the first of which comprises the Lithistids, Tetractinellida, and portions of the Monactinellida, together with most Myxospongiæ; whilst the second contains all the Ceraospongiæ, and the remainder of the Monactinellids and Myxospongiæ.

We find that the ground-substance, the mesodermal intercellular substance or Mesoglœa, as it is variously termed, is more or less hard and cartilage-like in the Chondrospongiæ, and that in these the spicules remain isolated. The spicules are either tetraxon or tylostyles, less frequently styles. The monaxon spicules are monact, thereby indicating their closer affinity with the tetraxon spicules. The necessary toughness is given to these Sponges not by a cementing of the spicules, but by a hardening of the ground-substance. In some the spicules disappear altogether, as in *Oscarella*, which is an askeletous form of *Plakina*, and in *Chondrosia*, which is an askeletous sponge belonging to the *Tethya* group.

In the Cornacuspongiæ, on the other hand, there is no tendency towards a hardening of the ground-substance discernible. The ground-substance remains soft and gelatinous, and the necessary toughness is given to the sponge by the formation of a substance not found in other Sponges, which cements the spicules together. This substance is chemically and physically comparable to silk or horn, and is known as Spongin.

The spongin may become very voluminous and the spicules scarce and small. They may finally disappear altogether, and then

we have Ceraospongiæ before us. Transitional forms between the Cornacuspongiæ with supporting spicules cemented by spongin, and Cornacuspongiæ without spicules in their fibres (horny sponges), are not unfrequent.

One whole subfamily, the Chalininæ, comprising nearly 300 species, is composed of such transitional forms. The supporting spicules met with in the Cornacuspongiæ are invariably monaxon without a swelling at one end. Besides these more or less rod-shaped supporting spicules, we also find in some of the Sponges belonging to this group so-called flesh-spicules—small, irregular curved or complicated elements scattered throughout the Mesoglœa. These occur associated with spicules in the fibrous supporting skeleton and also in those forms which have no spicules in their horny supporting skeleton. To this group also the genera *Halisarca* and *Bayalus* belong, which have no skeleton at all, and appear as askeletous forms of the Aplysillide type. The term Cornacuspongiæ was established by Vosmaer (1550), and used by him in a very similar sense to that in which it is used here. The group Chondrospongiæ, on the other hand, is in the sense given above a new one; it nearly coincides with Vosmaer's group Spiculispongiæ (1550). In a former paper (889) I had retained the group Myxospongiæ, for the sake of convenience, preliminarily only, and agreeing at the time with Sollas (1440) that it was unnatural. The manner in which I have distributed the members of the Myxospongiæ among other groups is in accordance with the view expressed by F. E. Schulze in a letter.

We have accordingly to divide the subclass Silicea into three groups in the following manner:—

Subclassis *SILICEA*, Lendenfeld.

Mesoglœa soft; supporting skeleton often strengthened with siliceous cement. Spicules triaxon.	Mesoglœa hard; toughness achieved by the hardening of the ground-substance. Spicules tetraxon, monaxon, anaxon, or absent; generally corticate.	Mesoglœa soft; supporting skeleton strengthened by spongin cement; or exclusively formed of spongin, with or without foreign bodies. Spicules monaxon, or absent.
2. Ordo HEXACTINELLIDA, O. Schmidt.	3. Ordo CHONDROSPONGIÆ, Lendenfeld.	4. Ordo CORNACUSPONGIÆ, Vosmaer.

Expressed in the usual manner, the class Spongiæ would be accordingly divided into *four* Orders in the following manner:—

Classis **SPONGIÆ**, auctorum.

Cœlentera with branching canal-system, without movable appendages; the organs of which are developed from cells of the mesoglœa. With simple epithelia.

I. Subclassis *CALCAREA*, Grant.

Spongiæ with a skeleton composed of spicules which consist chiefly of carbonate of lime.

1. Ordo CALCISPONGIÆ, Blainville.

The only Order, with the characters of the Subclassis.

II. Subclassis *SILICEA*, Lendenfeld.

Spongiæ with a skeleton composed of siliceous spicules and their descendants with horny aspiculous skeleton and askeletous forms.

2. Ordo HEXACTINELLIDA, O. Schmidt.

Silicea with soft mesoglœa. Supporting skeleton often strengthened with siliceous cement. Spicules triaxon.

3. Ordo CHONDROSPONGIÆ, Lendenfeld.

Silicea in which the toughness is achieved by the mesoglœa or mesodermal ground-substance becoming cartilaginous, whilst the spicules remain isolated. Spicules tetraxon, monaxon (tylostylus), or absent; generally corticate.

4. Ordo CORNACUSPONGIÆ, Vosmaer.

Silicea with soft mesoglœa or mesodermal ground-substance; the supporting skeleton, composed of bundles of monaxonid not tylostyle spicules, is strengthened by spongin, which cements the spicules. These may disappear altogether, and the skeleton is then composed of spongin with or without foreign bodies. The skeleton rarely disappears altogether.

Having thus divided the Class Spongiæ into four Orders, we may proceed to the further division of the Orders into Families.

I. Ordo CALCISPONGIÆ, Blainville.

This Order has been divided by Häckel (627-629) into the well-known three families Ascones, Leucones, and Sycones, with seven genera in each. Poléjaeff (1179) has divided the group into two Suborders and replaced Häckel's genera by the older and wider genera of Grant and others. I (888) have tried to combine Häckel's and Poléjaeff's classifications, and have added three new families to the existing ones.

I have retained Poléjaeff's terms for the two Suborders, but have altered their meaning. In some Calcareous Sponges the whole of the entoderm consists of collar-cells. There are no entodermal pavement-cells in these forms. These constitute my first Suborder Homocœla. In others the collar-cells are found in the ciliated chambers only, while the central gastral cavity is clothed with entodermal pavement-cells. I combine these forms in the Suborder Heterocœla.

To the Homocœla belong besides Häckel's Asconidæ, my families Homodermidæ and Leucopsidæ. I acknowledge Häckel's seven genera of the Asconidæ.

In the Heterocœla, Häckel's families Leuconidæ and Syconidæ together with Carter's Teichonidæ and my family Sylleibidæ are placed.

II. Ordo HEXACTINELLIDA, O. Schmidt.

Schulze (1369) divides the living Hexactinellida into the two Suborders Lyssacina and Dictyonina of Zittel. In the first, the spicules remain isolated or coalesce secondarily in an irregular manner; in the second, the main spicules coalesce to begin with in a very regular manner, so as to form a continuous scaffolding. In the first suborder Lyssacina, the families Euplectellidæ, Gray, Asconematidæ, F. E. Schulze, Rossellidæ, F. E. Schulze, and Hyalonematidæ, Gray, are placed. The second suborder, Dictyonina, comprises the families Farreidæ, Gray, Euretidæ, F. E. Schulze, Melittionidæ, Zittel, Coscinoporidæ, Zittel, and Meandrospongidæ, Zittel. To these the fossil families Ventriculitidæ, Staurodermidæ, Callodictyonidæ, Cœloptychidæ, Receptaculitidæ, and Monakidæ must be added.

In the classificatory scheme below, Schulze's diagnoses are translated.

III. Ordo CHONDROSPONGIÆ, Lendenfeld.

As mentioned above, this Order coincides nearly with Vosmaer's (1550) order Spiculispongiæ. I divide it into the two groups, Tetraxonia and Monaxonia. The former comprises the Sponges with tetraxon spicules, Tetractinellids and Lithistids; and the latter those forms which have monaxon spicules, or which have no spicules at all.

Sollas (1453) divides the Tetraxonia into two groups:—Choristida, Sollas, without lithistid sclerites; and Lithistida, Zittel, with lithistid sclerites. In the first group the families Plakinidæ, Pachastrellidæ, Corticidæ, Tetillidæ, Theneidæ, Stellettidæ, and Geodinæ are distinguished.

Vosmaer (1550) divides the Lithistidæ, in accordance with Zittel (1639) and O. Schmidt (1306, 1322), into the families Rhizomorinidæ, Megamorinidæ, Anomacladinidæ, Tetracladinidæ.

The Monaxonia comprise the families Suberitidæ, Spirastrellidæ, Tethydæ, and Chondrosidæ. The Clavulina and portion of the Oligosilicina of Vosmaer.

IV. Ordo CORNACUSPONGIÆ.

I divide the Cornacuspongiæ into the two suborders Halichondrina with, and Ceraospongiæ without, proper spicules in the supporting skeleton.

The Halichondrina comprise the three families Homorhaphidæ, Heterorhaphidæ, and Desmacidonidæ of Ridley and Dendy (1265, 1266).

The Ceraospongiæ are divided by me into two groups—Macrocameræ with large, and Microcameræ with small, ciliated chambers. To the former belong the families Aplysillidæ and Spongelidæ, and to the latter the Spongidæ, Aplysinidæ, and Hircinidæ.

After this general view of the Classification of Sponges, I shall proceed to give a "system" of Sponges down to subfamilies, mentioning the principal genera in each group.

Classis SPONGIÆ, auctorum.

Cœlenterata with branching canal-system, the organs of which are developed from cells of the mesoglœa or primary mesoderm. With simple epithelia, with entodermal collar-cells, and without movable appendages and enidoblasts.

I. Subclassis *CALCAREA*, Grant.

Sponges with a skeleton composed of calcareous spicules.

I. Ordo CALCISPONGIÆ, Blainville.

The only order, with the characters of the subclass.

1. Subordo HOMOCŒLA, Poléjaeff, emend.

The entodermal epithelium consists exclusively of collar-cells.

1. Familia ASCONIDÆ, Häckel.

Simple sac-shaped gastral cavity with smooth surface.

Leucosolenia, Poléjaeff, *Ascetta*, *Ascissa*, *Ascilla*, *Ascaltis*, *Ascortis*, *Asculmis*, *Ascandra*, Häckel.

2. Familia HOMODERMIDÆ, Lendenfeld.

The gastral cavity forms cæcal outgrowths, which resemble the tubes of Syconidæ.

Ascaltis canariensis, Häckel, *Ascaltis lamarckii*, Häckel, and *Homoderma sycandra*, Lendenfeld.

3. Familia LEUCOPSIDÆ, Lendenfeld.

A colony of Ascon-persons which are imbedded in the thick mesoglœa. There are narrow inhalant pores and wider exhalant ones. The latter lead into a pseudogaster.

Leucopsis, Lendenfeld, and some species of *Pseudonardorus-forms*.

II. Subordo HETEROCŒLA, Poléjaeff, emend.

The entodermal epithelium is differentiated into collar-cells, which are found in the walls of the ciliated chambers only, and into flat pavement-cells, which clothe the walls of the exhalant canals and gastral cavity.

4. Familia SYCONIDÆ, Häckel.

With regular, radially disposed cylindrical ciliated chambers, which open direct into the sac-shaped gastral cavity.

1. Subfamilia *Syconinæ*, Lendenfeld.

The unbranched ciliated chambers remain isolated in their distal part.

Sycon, Poléjaeff, the subgenera of Häckel's Syconidæ which terminate with the syllable "*aga*." I divide this subfamily according to Häckel's scheme into the seven genera *Sycetta*, *Sycissa*, *Sycilla*, *Sycaltis*, *Sycortis*, *Syculmis*, and *Sycandra*.

2. Subfamilia *Uteinæ*, Lendenfeld.

With simple unbranched ciliated chambers, the distal ends of which are imbedded in a continuous cortex. *Grantessa*, Lendenfeld, *Ute*, Poléjaeff, and *Amphoriscus*, Poléjaeff, and those subgenera of the Syconidæ in Häckel's system which terminate with the syllable "*usa*."

3. Subfamilia *Grantinæ*, Lendenfeld.

With branched ciliated chambers.

Grantia, *Heteropegma*, and *Anamixilla*, Poléjaeff.

5. Familia Sylleibidæ, Lendenfeld.

With complicated exhalant canals, leading from the cylindrical ciliated chambers into the gastral cavity.

1. Subfamilia *Vosmaerinæ*, Lendenfeld.

The ciliated chambers are radially situated, and form a regularly cylindrical zone. They are connected with the gastral cavity by a network of anastomosing exhalant canals.

Vosmaeria, Lendenfeld, and *Leucetta*, Poléjaeff.

2. Subfamilia *Polejnæ*, Lendenfeld.

The ciliated chambers form a much-folded layer. The exhalant canals are wide, and do not anastomose to form a reticulation.

The genera *Polejna*, Lendenfeld, and *Leucilla*, Poléjaeff, constitute this group.

6. Familia Leuconidæ, Häckel.

Heterocœla with ramified canal-system and spherical ciliated chambers.

Leucetta, *Leucissa*, *Leucaltis*, *Leucortis*, *Leuculmis*, and *Leucandra*, Häckel. *Leuconia*, auctorum, and *Leuconia* and *Pericharax*, Poléjaeff.

7. Familia Teichonidæ, Carter.

Heterocœla without gastral cavity. The inhalant pores are situated on the one, and the exhalant on the other side of the lamellar sponge; with spherical ciliated chambers.

Teichonella, Carter, and *Eilhardia*, Poléjaeff.

II. Subclassis *SILICEA*, nov.

Sponges with a skeleton composed of siliceous spicules and their derivatives; possessing a horny skeleton or no skeleton at all, but never supported by calcareous spicules.

Comprises the Non-Calcarea of Grant and other authors.

I. Ordo HEXACTINELLIDA, O. Schmidt.

Silicea with triaxon spicules and soft mesoglœa. Strengthened by siliceous cement, generally joining the spicules.

1. Subordo Lyssacina, Zittel.

The spicules remain isolated or are subsequently cemented together irregularly.

i. Tribus *Hexasterophora*, F. E. Schulze.

Hexaster always found in the mesoglœa; chambers distinct, thimble-shaped.

1. Familia Euplectellidæ, F. E. Schulze.

Thin-walled tubes or sacs with sword-shaped hexact hypodermalia, the centripetal rays of which are the longest.

1. Subfamilia *Euplectellinæ*, F. E. Schulze.

Tubular, with terminal sieve-plates. The wall regularly perforated. To the centrifugal ray of each hypodermal a floricome is attached.

Euplectella, Owen, and *Regadrella*, O. Schmidt.

2. Subfamilia *Holascinæ*, F. E. Schulze.

Tubular, wall without perforations, without superficial floricomes.

Holascus and *Malacosaccus* of F. E. Schulze.

3. Subfamilia *Taegerinæ*, F. E. Schulze.

Tubular or sac-shaped, wall irregularly perforated. Principalia partially cemented, forming an irregular network. To the distal ray of each hypodermal sword-shaped hexact a floricome is attached.

Taegeria and *Walteria* of F. E. Schulze.

2. Familia Asconematidæ, F. E. Schulze.

Pentact or hexact pinnulæ in the dermal and gastral surfaces. Hypodermalia and hypogastralia pentact. Discohexaster in the interior.

1. Subfamilia *Asconematinæ*, F. E. Schulze.

Sessile, sac-shaped, or tubular, with thin soft wall.

Asconema, Sav. Kent, and *Aulascus*, F. E. Schulze.

2. Subfamilia *Sympagellinæ*, O. Schmidt.

Pedunculate, cup-shaped. Principalia hexact and diact. Discohexaster in the interior.

Sympagella, O. Schmidt, *Polyrhabdus*, F. E. Schulze, and *Balanites*, F. E. Schulze.

3. Subfamilia *Caulophacinæ*, F. E. Schulze.

Mushroom-shaped, with long cylindrical hollow peduncle.

Caulophacus and *Trachycaulus* of F. E. Schulze.

3. Familia Rossellidæ, F. E. Schulze.

The dermalia have no centripetal ray.

Lanuginella, O. Schmidt; *Polylophus*, F. E. Schulze; *Rossella*, Carter; *Acanthascus*, *Bathydorus*, *Rhabdocalyptus*, *Crateromorpha*, *Aulochone*, *Caulocalyx*, and *Aulocalyx*, F. E. Schulze.

ii. Tribus *Amphidiscophora*, F. E. Schulze.

Amphidiscs in the limiting membranes. Hexaster absent in the interior. A basal tuft is always present. The ciliated chambers appear as somewhat irregular sac-shaped extensions of the membrana reticularis.

4. Familia Hyalonematidæ, Gray.

Numerous pentact pinnulæ in the dermal and gastral surfaces.

1. Subfamilia *Hyalonematinæ*, F. E. Schulze.

Calyculate, with a well defined oscula-area on the upper surface.

Hyalonema, Gray; *Stylocalyx*, F. E. Schulze; *Pheronema*, Leidy; and *Poliopogon*, Wyville Thomson.

2. Subfamilia *Semperellinæ*, F. E. Schulze.

Without gastral cavity and terminal oscula-area, with root-tuft.

Semperella, Gray.

To this Subordo the fossil families Receptaculitidæ and Monakidæ belong.

ii. Subordo Dictyonina, Zittel.

The parenchymal hexacts early coalesce in a regular manner, so as to form a firm skeleton.

i. Tribus *Uncinataria*, F. E. Schulze.

With uncinates.

i. Subtribus *Clavularia*, F. E. Schulze.

With radially situated clavulæ.

1. Familia Farreidæ, F. E. Schulze.

The skeleton forms a single layer; from the joining points conical extensions arise, in a direction vertical to the surface of the network.

Farrea, Bowerbank.

2. Subtribus *Scopularia*, F. E. Schulze.

With radially situated scopulæ.

2. Familia Euretidæ, F. E. Schulze.

Branched and anastomosing tubes. The skeleton-net forms several layers.

Eurete, Carter; *Periphragella*, Marshall; and *Lefroyella*, Wyville Thomson.

3. Familia Melittionidæ, Zittel.

Forms branched tubes or calyculate structures. Skeleton honeycombed. Cavities traversed by the reticular membrane. The gastral skeleton without scopulæ.

Aphrocallistes, Gray.

4. Familia Coscinoporidæ, Zittel.

The wall of the calyculate or expanded sponge is traversed by funnel-shaped straight canals, which open alternately on the one or the other surface. Covered only by the perforated limiting membrane.

Chonelasma, F. E. Schulze; and the fossil genera *Leptophragma*, Zittel, *Guettardia*, Michelin, and *Coscinopora*, Goldfuss.

5. Familia Tretodictyidæ, F. E. Schulze.

With irregular inhalant and exhalant canals, which do not traverse the body transversely, but pass the dense dictyonal skeleton obliquely or longitudinally.

Tretodictyum, F. E. Schulze; *Euriplegma*, F. E. Schulze; *Cyrtaulon*, F. E. Schulze; *Fieldingia*, Sav. Kent; and *Sclerathamnus*, Marshall.

ii. Tribus *Inermia*, F. E. Schulze.

Without uncinates and scopulæ.

6. Familia Meandrospongidæ, Zittel.

The body consists of winding tubes of uniform width. The interstices of the tubes form a vestibule space.

Dactylocalyx, Stutchbury; *Scleroplegma*, O. Schmidt; *Margaritella*, O. Schmidt; *Myliusia*, Gray; and *Aulocystis*, F. E. Schulze; and the fossil genera:—*Placoscyphia*, Reuss; *Tremabolites*, Zittel; *Etheridgia*, Tate; *Cystispongia*, Roemer; *Toulminia*, Zittel; and *Camerospongia*, d'Orb.

To this Subordo belong the fossil families Ventriculitidæ, Staurodermidæ, Callodictyonidæ, and Cœloptychidæ.

II. Ordo CHONDROSPONGIÆ, nov.

Silicea in which the toughness is caused by the mesoglœa or mesodermal ground-substance becoming cartilaginous, whilst the spicules remain isolated. Spicules tetraxon, monaxon (tylostylus or stylus), or absent. With spherical ciliated chambers. Sponge generally corticate.

Comprises the Spiculispongiæ of Vosmaer, with the exception of the genus *Halisarca*, Vosmaer.

i. Subordo Tetraxonia, Vosmaer.

With tetraxon spicules.

I. Group Lithistida, Zittel.

Body stony, with a central gastral cavity or numerous vertical tubes. Spicules more or less clearly tetraxon, often branched. Besides these, sometimes monaxon spicules and flesh-spicules. The skeleton-spicules are interwoven so as to form a dense skeleton.

1. Familia Rhizomorinidæ, Zittel.

Spicules irregularly branched; form irregular fibres, or are loosely interwoven. Forked anchors always present.

Arabescula, Carter; *Corallistes*, Schmidt; *Heterophymia*, Pomel; *Seliscothon*, Zittel; *MacAndrewia*, Gray; *Azorica*, Carter; *Leiodermatium*, Schmidt; and the fossil genera:—*Cnemidiastrum*, *Corallidium*, *Hyalotragos*, *Pyrgochonia*, *Discostroma*, *Leiodorella*, *Epistomella*, *Platychonia*, *Bolidium*, *Astrobolia*, and *Chonella* of Zittel; *Plococonia*, Pomel; *Chenendopora*, Lamouroux; *Verruculina*, Zittel; *Amphithelion*, Zittel; *Stychophyma*, Pomel; *Allomera*, Pomel; *Pleuromera*, Pomel; *Perimera*, Pomel; *Meta*, Pomel; *Marisca*, Pomel; *Pomelia*, Zittel; *Jereica*, Zittel; *Cœlocorypha*, Zittel; *Scytalia*, Zittel; *Stachyspongia*, Zittel; *Pachinion*, Zittel.

2. Familia Anomocladinidæ, Zittel.

Spicules rod-shaped with terminal tufts of branches. The approximating ends of the spicules coalesce and form knots. In this way a regular triaxial network is formed.

Vetulina, Schmidt; and the fossil genera *Mastosia*, *Cylindrophyma*, *Melonella*, and *Protachilleum*, Zittel, and *Palæomanon* and *Astylospongia*, Roemer.

3. Familia Tetracladinidæ, Zittel.

Spicules tetractinellid with terminal branches.

Theonella, Gray; *Rhacodiscula*, Zittel; *Discodermia*, Bocage; *Kaliapsis*, Bowerbank; *Collectella*, Schmidt; *Collinella*, Schmidt; and the fossil genera:—*Aulocopium*, Oswald; *Phymatella*, *Aulaxinia*, *Callopegma*, and *Trachysycon*, Zittel; *Siphonia*, Parkinson; *Hallirhoa*, *Jerea*, Lamouroux; *Marginospongia*, d'Orbigny; *Nelumbia*, Pomel; *Polyjerea*, Fromentel; *Astrocladia*, Zittel; *Bolospongia*, Hinde; *Thecosiphonia*, Zittel; *Calymmatina*, Zittel; *Turonia*, Michelin; *Kalpinella*, *Thamnospongia*, and *Pholidocladia*, Hinde; *Ragadinia*, Zittel; *Plinthosella*, Zittel; *Spongodiscus*, Zittel; *Phymaplectia*, Hinde; *Rhopalospongia*, Hinde.

To this Subordo also the fossil family Megamorinidæ belongs.

II. Group Choristida, Sollas.

With tetraxon spicules of regular shape.

i. Tribus *Tetradina*, Sollas.

The chief spicules are tetract, with equal rays and candelabras.

i. Subtribus *Microcameræ*, nov.

With small chambers.

4. Familia Corticidæ, Vosmaer.

With candelabras.
Corticium, Schmidt, and *Thrombus*, Sollas.

5. Familia Pachastrellidæ, Sollas.

With simple tetracts, irregularly scattered.
Pachastrella, Schmidt, *Battersbya*, Bowerbank, and *Dercitus*, Gray.

ii. Subtribus *Macrocameræ*, nov.

With large chambers.

6. Familia Plakinidæ, F. E. Schulze.

With scattered diact, triact, and tetract spicules.
Plakina, *Plakinastrella*, and *Plakortis*, F. E. Schulze, and *Eupalax*, Sollas.

7. Familia Oscarellidæ, Lendenfeld.

Without spicules.
Oscarella, Vosmaer.

ii. Tribus *Trianina*, Sollas.

The centres of the tetraxon spicules with one differentiated ray lie in the surface, in which the equal rays extend tangentially.

8. Familia Geodidæ, Sollas.

A cortex of globate spicules. Chambers small, with small outlets.
Erylus, Gray; *Caminus*, Schmidt; *Cydonium*, Müller; *Synops*, Vosmaer; *Isops*, Sollas; *Geodia*, Lamarck; and *Geodissa*, Lendenfeld.

9. Familia Stellettidæ, Sollas.

With stellate flesh-spicules usually in the cortex.

1. Subfamilia *Psammasterina*, Sollas.

With stellates and spined rods.
Psammastra, Sollas.

2. Subfamilia *Stryphnina*, Sollas.

With stellates and amphiastrellæ.
Stryphnus, Sollas.

3. Subfamilia *Sanidasterina*, Sollas.

With stellate and sanidaster (?) spicules.
Tribrachium, Weltner, and *Tethyopsis*, Stewart.

4. Subfamilia *Stellettina*, Sollas.

With two kinds of stellate flesh-spicules.
Antrastra, *Dragmastra*, Sollas; *Stelletta*, Schmidt.

5. Subfamilia *Homasterina*, Sollas.

With one kind of stellate flesh-spicules.
Myriastra, Sollas; *Asterella*, Sollas; *Pilochrata*, Sollas.

10. Familia Theneidæ, Sollas.

With large outlets to the ciliated chambers, and spirastrellid spicules.

Thenea, Gray (*Tisiphonia*, Wyville Thomson, *Dorvillia*, Sav. Kent, *Wyville-Thomsonia*, Wright); *Normania*, *Vulcanella*, and *Characella*, Sollas.

11. Familia Tetillidæ, Sollas.

With flesh-spicules which are hamate, spiral, or rod-shaped.

Spiretta, Lendenfeld; *Tetilla*, Schmidt; *Craniella*, Schmidt; *Chrotella*, Sollas; *Papirula*, Schmidt; *Thalassomora*, Lendenfeld.

12. Familia Tethyopsillidæ, nov.

Spherical sponges supported by dense masses of large radial monaxonid spicules. A few tetraxonid grapnels are inserted in the surface.

Tethyopsilla, Lendenfeld, and *Protoleia*, Dendy and Ridley.

II. Subordo Monaxonida.

III. Group Clavulina, Vosmaer, emend.

With monaxonid spicules or without supporting skeleton.

Supporting spicules tylostyle, usually radially situated. (Includes the *Pseudotetraxonia*, Vosmaer.)

1. Familia Tethydæ, Vosmaer.

More or less spherical sponges, with regular subdermal cavities between the thick distally extending radial bundles of spicules.

1. Subfamilia *Tethynæ*, nov.

With stellate flesh-spicules.

Tethya, Lamarck; *Tuberella*, Keller (*Tethiophæna*, Schmidt); *Tethiosphæra*, Lendenfeld; *Mastigophora*, Lendenfeld; *Thalassodactylus*, Lendenfeld.

2. Subfamilia *Tethiopsamminæ*, nov.

With a sand cortex.

Tethiopsamma, Lendenfeld, MS.

3. Subfamilia *Tethyorhaphinæ*, nov.

With rod-shaped flesh-spicules, without stellates.

Tethyorhaphis, Lendenfeld.

4. Subfamilia *Tethyamatinæ*, nov.

With hamate flesh-spicules (sigmata) without stellates.

Tethyamata, Lendenfeld.

2. Familia Sollasellidæ, Lendenfeld.

Digitate forms with radiating spicule-bundles, and distinct ecto- and endochonæ.

Sollasella, Lendenfeld.

3. Familia Spirastrellidæ, Ridley and Dendy.

With spirastrellid flesh-spicules.

Spirastrella, Ridley; *Raphyrus*, Bowerbank; *Papillina*, Schmidt; *Cheirella*, Lendenfeld; *Axos*, Gray; and *Suberocorona*, Lendenfeld. Coincides with the family Cheirellidæ, Lendenfeld.

4. Familia Suberamatidæ, nov.

With hamate flesh-spicules (sigmata).

Suberamata, Lendenfeld.

5. Familia Suberitidæ, Vosmaer, emend.

Without flesh-spicules.

Suberitella, Lendenfeld; *Suberites*, Nardo; *Suberopetros*, Lendenfeld; *Plectodendron*, Lendenfeld; *Polymastia*, Bowerbank; *Trichostemma*, M. Sars; *Tentorium*, Vosmaer (*Thecaphora*, O. Schmidt); *Stylocordyle*, Wyv. Thomson; *Quasillina*, Norman; *Cliona*, Grant; and *Poterion*, Schlegel.

iv. Subordo Oligosilicina, Lendenfeld.

Without supporting skeleton. Flesh-spicules, when present, anaxon polyactinellid. Chambers small, with narrow outlet.

1. Familia Chondrillidæ, Lendenfeld.

With polyactinellid flesh-spicules. Comprises the genus *Chondrilla*, O. Schmidt.

2. Familia Chondrosidæ, Lendenfeld.

Without flesh-spicules. Comprises the genus *Chondrosia*, Nardo.

III. Ordo CORNACUSPONGIÆ, Vosmaer, emend.

Silicea with soft mesoglœa, or mesodermal ground-substance. The supporting skeleton is composed of bundles of monaxonids, which are never tylostyle spicules. The skeleton is strengthened by spongin, which cements the spicules. These may disappear altogether, and the skeleton is then composed of spongin, with or without foreign bodies. Exceptionally, also, this horny skeleton disappears. The ciliated chambers have large outlets.

i. Subordo Halichondrina, Vosmaer.

With siliceous spicules in the supporting skeleton.

1. Familia Spongillidæ, Carter.

Freshwater sponges with gemmulæ.

Spongilla, Lamarck; *Ephydatia*, Lamouroux; *Tubella*, Carter;

Uruguaya, Carter; *Parmula*, Carter; *Meyenia*, Bowerbank; *Heteromeyenia*, Potts; *Lubomirskya*, Dybovsky; *Lessepsia*, Keller; *Potamolepis*, Marshall.

2. Familia Homorhaphidæ, Ridley and Dendy.

Megasclera oxea or strongyla; no differentiated microsclera except toxia. Marine sponges without gemmulæ.

1. Subfamilia *Renierinæ*, auct.

Spicules never completely enveloped in horny fibre.

Halichondria, Fleming; *Petrosia*, Vosmaer, =*Schmidtia* Balsamo Crivelli; *Reniera*, Nardo.

2. Subfamilia *Chalininæ*, Ridley and Dendy.

A considerable amount of spongin present, forming distinct horny fibres, in which spicules are contained.

1. Group *Chalinorhaphinæ*, Lendenfeld.

With abundant gigantic spicules axially situated.

Chalinorhaphis, Lendenfeld.

2. Group *Hoplochalininæ*, Lendenfeld.

With abundant gigantic spicules obliquely situated, and protruding beyond the fibre-surface.

Hoplochalina, Lendenfeld.

3. Group *Cacochalininæ*, Lendenfeld.

Irregular forms with slender spicules.

Cacochalina, Schmidt; *Cladochalina*, Lendenfeld; *Chalinopora*, Lendenfeld; *Chalinella*, Lendenfeld; *Chalinopsis*, Schmidt.

4. Group *Pachychalininæ*, Lendenfeld.

Irregular, digitate, lamellar forms with stout spicules, oxystrongylus.

Chalinissa, Lendenfeld; *Pachychalina*, Schmidt; and *Ceraochalina*, Lendenfeld.

5. Group *Plakochalininæ*, Lendenfeld.

Frondose, lamellar forms with stout spicules.

Plakochalina, *Euplakella*, and *Antherochalina*, Lendenfeld; *Cribrochalina*, Schmidt; *Tragosia*, Gray; *Platychalina*, Ehlers.

6. Group *Siphonochalininæ*, Lendenfeld.

Tubular, pseudogaster with stout spicules.

Spinosella, Vosmaer; *Siphonochalina*, Schmidt; *Tuba*, Duchassaing and Michelotti; *Sclerochalina*, Ridley; *Toxochalina*, Ridley; *Phylosiphonia*, Lendenfeld; *Tubulodigitus*, Carter; *Patulascula*, Carter; and *Siphonella*, Lendenfeld.

7. Group *Arenochalininæ*, Lendenfeld.

With spicules in the connecting and sand in the main fibres.

Arenochalina, Lendenfeld.

8. Group *Euchalininæ*, Lendenfeld.

Slender, regularly digitate forms with a fine-meshed network and slender spicules.

Chalina, auctorum, and *Dactylochalina*, *Euchalina*, *Euchalinopsis*, and *Chalinodendron*, Lendenfeld.

3. Familia Heterorhaphidæ, Ridley and Dendy.

Megasclera of various forms; microsclera commonly present, but never chelæ. Marine sponges, without gemmulæ.

1. Subfamilia *Phlœodictyinæ*, Carter.

Sponge divisible into body and fistulæ, with a strong spicular rind. Megasclera oxea or strongyla; microsclera (when present) sigmata.

Rhizochalina, Schmidt; *Oceanapia*, Norman.

2. Subfamilia *Gelliinæ*, Ridley and Dendy.

Megasclera oxea or strongyla. Microsclera always present, viz. sigmata. No rind or fistulæ.

Gellius, Gray; *Gelliodes*, Ridley.

3. Subfamilia *Tedaniinæ*, Ridley and Dendy.

Megasclera of two forms: monactinal, styli, forming the main skeleton; and diactinal, tylota. Microsclera long, hair-like trichites.

Tedania, Gray; *Trachytedania*, Ridley.

4. Subfamilia *Desmacellinæ*, Ridley and Dendy.

Megasclera styli to tylostyli. Microsclera sigmata or toxia, or both.

Desmacella, Schmidt.

5. Subfamilia *Hamacanthinæ*, Ridley and Dendy.

Megasclera oxea or styli; microsclera diankistra, to which others may be added.

Hamacantha, Gray; *Vomerula*, Schmidt.

4. Familia Desmacidonidæ, Vosmaer, auct.

Megasclera of various forms. Microsclera chelæ, to which others may be added.

1. Subfamilia *Esperellinæ*, Ridley and Dendy.

Fibre not echinated by laterally projecting spicules.

Esperia, Nardo; *Esperella*, Vosmaer; *Esperiopsis*, Carter; *Cladorhiza*, Sars; *Axoniderma*, Ridley and Dendy; *Chondrocladia*, Wyv. Thomson; *Desmacidon*, Bowerbank; *Homœodictya*, *Artemisina*, Vosmaer; *Phelloderma*, Ridley and Dendy; *Sideroderma*, Ridley and Dendy; *Iophon*, Gray; *Amphilectus*, Vosmaer; *Melonanchora*, Carter; *Guitarra*, Carter.

2. Subfamilia *Ectyoninæ*, Ridley and Dendy.

Fibre echinated by laterally projecting spicules.

Myxilla, Schmidt; *Clathria*, Schmidt; *Rhaphidophlus*, Ehlers; *Plumohalichondria*, Carter; *Acarnus*, Gray; *Echinoclathria*, Carter; *Clathrissa*, Lendenfeld; *Thalassodendron*, Lendenfeld; *Ceraospina*, Lendenfeld.

5. Familia Axinellidæ, auct.

With large subdermal cavities. Skeleton non-reticulate, consisting of ascending axes of fibre, from which arise subsidiary fibres radiating to the surface pervading the subdermal cavity. Fibres plumose. Megasclera chiefly styli, to which oxea and strongyla may be added. Microsclera rarely present, never chelæ.

Dendropsis, Ridley and Dendy; *Thrinacophora*, Ridley; *Hymeniacidon*, Bowerbank; *Phakellia*, Bowerbank; *Ciocalypta*, Bowerbank; *Acanthella*, Schmidt; *Axinella*, Schmidt; *Raspailia*, Nardo; *Spirophora*, Lendenfeld.

II. Suborder Keratosa, Bowerbank, emend.

Silicea with a supporting skeleton composed of spongin; fibre with or without foreign bodies, but always without proper spicules. Flesh-spicules may be present. Exceptionally, there is no skeleton at all.

i. Tribus *Microcameræ*, Lendenfeld.

With small spherical ciliated chambers and opaque ground-substance.

1. Familia Spongidæ, F. E. Schulze.

With narrow axial thread in the horny fibres, and without filaments.

1. Subfamilia *Auleninæ*, Lendenfeld.

Reticulate sponges with vestibules, without flesh-spicules.

Halme, *Aphroditella*, *Halmopsis*, and *Aulena*, Lendenfeld; *Psammaclema*, Marshall.

2. Subfamilia *Chalinopsillinæ*, Lendenfeld.

When dry of light yellow colour, digitate, lamellar, more or less flower-shaped, imitating very closely Chalininæ, from which they appear only recently to have developed. Without flesh-spicules, with smooth surface.

Chalinopsilla and *Antheroplax*, Lendenfeld; *Dactylia*, Carter.

3. Subfamilia *Sponginæ*, Lendenfeld.

Massive, when dry dark brown, with conulated or granulated surface. Vestibules, when present, belong exclusively to the *inhalant* system. Without flesh-spicules.

Euspongia, Bronn; *Cacospongia*, Schmidt; *Hippospongia*, F. E.

Schulze; *Coscinoderma*, Carter; *Spongodendron*, Lendenfeld; and many of the species of the genus *Spongia*, auctorum.

4. Subfamilia *Spongissinæ*, Lendenfeld.

With flesh-spicules.
Spongissa, Lendenfeld, MS.

2. Familia Aplysinidæ, Lendenfeld.

The skeleton is composed of spongin-tubes, the walls of which are thinner than the diameter of the lumen, which is filled with pith.

1. Subfamilia *Aplysininæ*.

Without flesh-spicules.
Luffaria, Duchassaing and Michelotti; *Aplysina*, Nardo; *Luffarella*, Lendenfeld, MS.; *Dendrospongia*, Hyatt.

2. Subfamilia *Aplysissinæ*, Lendenfeld.

With flesh-spicules.
Aplysissa, Lendenfeld, MS.

3. Familia Hircinidæ, Lendenfeld.

With narrow axial canal in the fibres, and filaments in the ground-substance.

1. Subfamilia *Hircininæ*, Lendenfeld.

Without proper spicules.
Hircinia, Nardo; *Hircinopsis*, *Nodosina*, *Aphrotriche*, and *Styphlos*, Lendenfeld, MS.; *Stematonemia*, Bowerbank; *Filifera*, Lieberkühn; *Sarcatragus*, Schmidt; and *Polytherses*, Duchassaing and Michelotti.

2. Subfamilia *Hircinissinæ*, Lendenfeld.

With proper spicules.

1. Group *Chalinocinia*, nov.

With proper spicules in the connecting fibres.
Chalinocinia, Lendenfeld.

2. Group *Hircinissa*, nov.

Without proper spicules in the fibres; with flesh-spicules.
Hircinissa, Lendenfeld, MS.

ii. Tribus *Macrocameræ*, Lendenfeld.

With large sac-shaped ciliated chambers, and soft, transparent ground-substance.

4. Familia Spongelidæ, Lendenfeld.

The horny fibres contain slender axial thread and form a reticulated skeleton.

1. Subfamilia *Spongelinæ*, Lendenfeld.

Without flesh-spicules. The skeleton consists of distinct horny fibre containing a varying amount of foreign matter.

Spongelia, Nardo; *Dysidea*, Johnston; and *Reteplax*, Lendenfeld, MS.

2. Subfamilia *Psamm· inæ*, nov.

The skeleton consists of foreign bodies cemented by spongin, which, however, is not distinctly visible; without flesh-spicules.

Psammapemma, Marshall; *Psammella*, Lendenfeld, MS.; and *Holopsamma*, Carter.

3. Subfamilia *Spongelissinæ*, Lendenfeld.

The skeleton is composed of distinct horny fibres containing foreign bodies. With flesh-spicules.

Dysideissa, Lendenfeld, MS.

4. Subfamilia *Psammopessinæ*, nov.

The skeleton consists of cemented foreign bodies without distinct horny fibres. With flesh-spicules.

Psammopessa, Lendenfeld, MS.; *Phoriospongia*, Marshall; and *Haastia*, Lendenfeld, MS.

5. Familia Aplysillidæ, Lendenfeld.

The skeleton consists of spongin-tubes ramified in a dendritic fashion and filled with pith.

1. Subfamilia *Aplysillinæ*, Lendenfeld.

Cells are found in the pith of the fibres only.

Darwinella, Fritz Müller; *Aplysilla*, F. E. Schulze; *Verongia*, Bowerbank; and *Dendrilla*, Lendenfeld.

2. Subfamilia *Ianthellinæ*, nov.

Cells are found in the spongin-sheath of the fibre.

Ianthella, Gray.

6. Familia Halisarcidæ, Vosmaer.

Without skeleton.

Halisarca, Schmidt, and *Bajalus*, Lendenfeld.

V. Key to the Recent Families of Sponges.

0.	Skeleton calcareous	1.
	No calcareous skeleton	(2.)
1.	Entoderm consists exclusively of collar-cells	3.
	Entoderm consists of collar- and pavement-cells	(4.)
3.	Mesoderm thin, gastral cavity irregular	1. *Asconidæ*.
	Mesoderm thin, radial cylindrical chambers	2. *Homodermidæ*.
	Mesoderm thick, irregular chambers	3. *Leucopsidæ*.

(4.)	With cylindrical chambers	5.
	With spherical chambers	(6.)
5.	Chambers radial, opening direct into gastral cavity	4. *Syconidæ.*
	Chambers opening into exhalant canals which lead into the gastral cavity	5. *Sylleibidæ.*
(6.)	Exhalants lead into oscular tubes	6. *Leuconidæ.*
	Exhalants open direct on one side of the lamellar sponge; inhalant pores on the other side exclusively	7. *Teichonidæ.*

(2.)	With hexact spicules and thimble-shaped chambers	7.
	Without hexact spicules, with sac-shaped or spherical chambers	(8.)
7.	The spicules remain isolated or partly coalesce afterwards irregularly	9.
	The supporting spicules early coalesce in a regular Dictyonid manner	(10.)
9.	Hexaster in the interior	11.
	No hexasters, but amphidiscs	(12.)
11.	Hypodermalia hexact sword-shaped, with centripetal radial ray longest; no pinnulæ	8. *Euplectellidæ.*
	Pinnulæ in the gastral and dermal surfaces	9. *Asconematidæ.*
	Dermalia without centripetal ray; no pinnulæ	10. *Rossellidæ.*

(12.)	With numerous pinnulæ	11. *Hyalonematidæ.*

(10.)	With uncinates	13.
	Without uncinates	(14.)
13.	With radially situated clavulæ	12. *Farreidæ.*
	With radially situated scopulæ	15.
15.	Branched and anastomosing tubes; the skeleton-net forms several layers	13. *Euretidæ.*
	Branching tubular or calyculate, honeycombed; cavities traversed by reticular membrane	14. *Melittionidæ.*
	Calyculate or expanded, traversed transversely by funnel-shaped canals opening alternately on one or other surface	15. *Coscinoporidæ.*
	Canals irregular, traversing the dense dictyonal skeleton obliquely or longitudinally	16. *Tetrodictyidæ.*

(14.)	Meandrically winding tubes	17. *Meandrospongidæ.*

(8.)	With cartilaginous ground-substance and spherical chambers. Spicules polyact, tetract, lithistid, tylostylote, or stylote, never cemented with spongin. Askeletous forms with spherical chambers	16.
	With soft ground-substance, spherical or sac-shaped chambers. Spicules monaxon, never tylostylote, cemented with spongin. Or skeleton composed of horny fibre without proper spicules. Askeletous forms with sac-shaped chambers	(17.)

16.	With lithistid irregular tetraxon spicules	18.
	With tetraxon spicules of irregular shape; askeletous forms with large chambers, which have large outlets	(19.)
	With monaxon tylostylote spicules	(20.)
	Without supporting spicules; flesh-spicules when present polyact, with small chambers which have narrow outlets	(21.)
18.	Spicules quite irregular	18. *Rhizomorinidæ.*
	Spicules rod-shaped, with terminal tufts of branches	19. *Anomocladinidæ.*
	Spicules tetractin, with terminal branches.....	20. *Tetracladinidæ.*

(19.)	The spicules are chiefly tetracts with equal rays and candelabras.....	22.
	There are large tetract spicules with three equal rays lying tangentially in or beyond the surface, and one differentiated, radial ray ...	(23.)
22.	With small inconspicuous ciliated chambers with small outlets	24.
	With large conspicuous ciliated chambers with wide outlets.....	(25.)
24.	With candelabra	21. *Corticidæ.*
	With simple tetracts	22. *Pachastrellidæ.*

(25.)	With scattered tetracts, triacts, diacts	23. *Plakinidæ.*
	Without spicules	24. *Oscarellidæ.*

(23.)	Tetracts with differentiated large centripetal ray and large tangential rays numerous	26.
	Tetracts with differentiated large centripetal ray rare, with small tangential rays	(27.)
26.	With spherasters	25. *Geodidæ.*
	Without spherasters	28.
28.	Flesh-spicules euaster and oxyaster	26. *Stellettidæ.*
	Flesh-spicules spirastrella	27. *Theneidæ.*
	Flesh-spicules spirula and sigmata	28. *Tetillidæ.*

(27.)	Without flesh-spicules	29. *Tethyopsillidæ.*

(20.)	The widened distal ends of the radial spicule-bundles divide the regular subdermal cavities into ectochonæ or vestibules at the entrance of the inhalant canals	30. *Tethydæ.*
	Between the distal ends of the radial spicule-bundles ecto- and entochonæ are found	31. *Sollascllidæ.*
	The inhalant pores lead direct into the inhalant canals	29.
29.	With spirastrellid flesh-spicules	32. *Spirastrellidæ.*
	With sigmate flesh-spicules	33. *Suberamatidæ.*
	Without flesh-spicules	34. *Suberitidæ.*

(21.)	With polyact flesh-spicules	35. *Chondrillidæ.*
	Without flesh-spicules	36. *Chondrosidæ.*

(17.)	With proper spicules in the supporting skeleton.	30.	
	Without proper spicules in the supporting skeleton	(31.)	
30.	With uniformly distributed skeleton-reticulation and not very large subdermal cavities.	32.	
	The skeleton consists of a dense axial reticulation and isolated fibres extending from this to the surface. Between these very extensive subdermal cavities are situated	(33.)	
32.	With gemmulæ; living in fresh water	37.	*Spongillidæ*.
	Without gemmulæ	34.	
34.	Without flesh-spicules; fibres of the supporting skeleton not spined	38.	*Homorhaphidæ*.
	Flesh-spicules sigmata or spiral; no chelæ	39.	*Heterorhaphidæ*.
	Flesh-spicules chelæ; when absent, fibres of supporting skeleton spined	40.	*Desmacidonidæ*.

(33.) No chelæ ..... 41. *Axinellidæ*.

(31.)	With small spherical chambers and opaque ground-substance	35.	
	With large sac-shaped chambers and transparent ground-substance	(36.)	
35.	Without filaments in the ground-substance	37.	
	With filaments in the ground-substance	38.	
37.	Skeleton-fibres with thin axial canal	42.	*Spongidæ*.
	Skeleton-fibres tubular, with thick pith	43.	*Aplysinidæ*.

(38.) Skeleton-fibre with thin axial canal ..... 44. *Hircinidæ*

(36.)	Skeleton-fibres with thin axial canal; reticulate	45.	*Spongelida*.
	Skeleton-fibres tubular with thick pith; dendritic	46.	*Aplysillidæ*.
	No skeleton	47.	*Halisarcidæ*.

APPENDIX.

LIST OF PUBLICATIONS RELATING TO THE SPONGES.

(*Explanations of the Abbreviations used are appended.*)

1. **Ælianus, Claudius.** Περὶ ζώων. Liber 8, Cap. 16.

2. **Agassiz, Alexander.** (On Hexactinellids.) *Bull. Mus. C. Z.* 1868, p. 367 (1868).

3. **Aldrovandi, U.** De reliquis animalibus exanguibus nempe de Mollibus, Crustaceis, Testaceis et Zoophytis libri quatuor. Bononiæ, 1606. Fol. (2nd ed. 1618; 3rd ed. 1623; 4th ed. 1642.) (1606–1642.)

4. **Allman, G. J.** A new Order of Hydrozoa. *Ann. M. N. H.* ser. 4, vol. xiv. p. 237 (1874).

[5.] ——. A new Order of Hydrozoa. *Nature*, vol. x. p. 251 (1874).

6. ——. A new Order of Hydrozoa. *Tr. L. S.* vol. i. p. 61 (1875).

7. **Andrews, W.** On Irish Sponges. *Ann. M. N. H.* ser. 4, vol. i. pp. 307, 308 (1868).

8. **Aristoteles.** Περὶ ζώων ἱστορίας. Liber 1, cap. 1; Liber 5, cap. 16; Liber 8, cap. 1.

9. ——. Περὶ ζώων μορίων. Liber 4, Cap. 5.

10. **Audouin, J. V.,** et **Milne-Edwards.** Résumé des recherches sur les animaux sans vertèbres, faites aux îles Chausey. *Ann. Sci. Nat.* tom. xv. p. 5 (1828).

11. ——, ——. Recherches pour servir à l'histoire naturelle du Littoral de la France, ou recueil de mémoires sur l'anatomie, la physiologie, la classification et les mœurs des animaux de nos côtes. Tom. 1. Paris (1832).

12. **Austin, T.** Note on Mr. Bowerbank's paper on the genus *Dunstervillia* (Bwk.), with remarks on the *Ischadites Königii*, the *Tentaculites*, and the *Conularia*. *Ann. M. N. H.* ser. 1, vol. xv. p. 406 (1845).

13. **Badcock, T.** Red flints in the Chalk. *Nature*, vol. xxv. p. 529 (1882).

14. **Baier, J. J.** Oryctographia Norica, sive rerum fossilium et ad minerals regnum pertinentium in territorio Norimbergensi ejusque vicinia observatarum succincta descriptio. (1708.)

15. ——. Monumenta rerum petrif. Norimbergæ (1757).

16. **Baird, S. F.** American Sponges. United States Commission of Fish and Fisheries. Part 1. (1873.)

17. **Balfour, F. M.** The Morphology and Systematic Position of the Spongida. *J. R. Micr. Sci.* n. s. vol. xix. pp. 103–109 (1879).

[18.] ——. Sur la morphologie et la position systématique des Éponges. (Extr.) *Arch. Z. Expér.* tom. viii. pp. 5–8 (1880).

19. ——. Treatise on Comparative Embryology, vol. i. p. 18 (1880).

20. ——. On the structure and homologies of the germinal layers of the Embryo. *Q. J. Micr. Sci.* vol. xx. p. 247 (1880).

21. ——. Larval Forms. *Q. J. Micr. Sci.* vol. xx. p. 381 (1880).

22. **Balsamo-Crivelli, G.** Memoria di alcuni Spongiari del golfo di Napoli. *Atti Soc. Ital.* vol. v. pp. 284–302 (1863).

23. ——. Di alcuni organi speciali osservati in una Spugna. *Rendic. Ist. Lomb.* vol. iii. pp. 333–336 (1866).

24. **Barrois, C.** Spongiaires des sables d'Ostricourt et observations sur la phylogénie des Éponges. *Ann. Soc. Géol. Nord*, p. 71 (1875).

25. ——. Recherches sur le Terrain crétacé supérieur de l'Angleterre et de l'Irlande. (1876.)

26. ——. Mémoire sur l'Embryologie de quelques Éponges de la Manche (*Sycandra, Halisarca, Verongia, Isodictya, Desmacidon*). *Ann. Sci. Nat.* sér. 6, tom. iii. (1876).

[27.] ——. Embryologie de quelques Éponges de la Manche. (Extr.) *J. l'Anat. Phys.* tom. xii. pp. 656–661 (1876).

[28.] ——. On the development of Sponges. (Abstr.) *Monthl. Micr. J.* vol. xvi. pp. 254–256 (1876).

[29.] ——. Embryologie de quelques Éponges de la Manche. (Extr.) *Bull. Scient. du dép. du Nord*, tom. viii. pp. 151–155 (1877).

30. ——. Sur les Dictyospongidæ des Psammites des Chondroz. *Ann. Soc. Géol. Nord*, tom. xi. p. 80 (1883).

31. **Bauhin, J.** Hist. fontis Bollensis. Montisbelgardi (1598).
32. **Bauhin, J.**, et **Cherler, J. H.** Hist. plant. Ebroduni (1651).
33. **Bauhin, K.** Pinax Theatri Botanici. Basileæ, Helvet. (1623).
34. **Bell, T.** Remarks on the animal nature of Sponges. *Zool. Journ.* vol. i. p. 202 (1824).
35. **Bellamy, J. C.** Natural History of South Devon. London (1840).
36. **Belon, A.** De aquatilibus. Liber ii. Parisiis (1553).
37. **Beltremieux.** Faune du département de la Charente-Inférieur. (1860.)
38. **Beneaume.** Spongia fluviatilis fragilis et piscem olens. *Mém. Acad. Sci. Paris*, p. 231 (1814).
39. **Beneden, E. Van.** Die Cœlenteraten-Natur der Spongien. *Ber. Vers. Nat. Hannover*, p. 263 (1864).
40. **Benett, E.** Catalogue of the organic remains of the county of Wilts. Warminster (1831).
41. **Bennett, George.** On the *Euplectella aspergillum*, Owen, or "Venus's Flower-Basket." *Proc. R. Soc. Tasm.* pp. 59–65 (1875).
42. **Bertolini, A.** Rariorum Italiæ plantarum dec. 3 accedit specim. zoophyt. Portus Lunæ. Pisæ (1810).
43. ——. Sopra alcuni paradox nat. (Spongitarii) nel golfo della Spezia. Modena (1832).
44. **Bianchi, G.** De conchis minus notis. Ed. ii. Romæ (1760).
45. **Bianconi, G. G.** Sopra alcuni Zoofiti descriti sotto i nomi di *Cliona celata*, etc. *Nuovi Ann. Sci. Nat.* vol. vi. p. 455 (1841).
46. **Bigsby, J. J.** Thesaurus Siluricus. London (1868).
47. ——. Thesaurus Devonico-Carboniferus. London (1878).
48. **Billings, E.** Palæozoic fossils. *Geol. Surv. Canada*, Fasc. i. 1–5. Montreal (1861–1865).
49. ——. On some new or little-known Fossils from the Silurian and Devonian Rocks of Ontario. *Canadian Nat. and Geol.* n. s. vol. vii. (1875).
50. **Blainville, M. H. D. de.** Planches. ii. Partie, Zoologie, Vers et Zoophytes. *Dictionnaire Sci. Nat.*, Paris et Strasbourg (1816–1839).
51. ——. Éponges. *Dictionnaire Sci. Nat.* tom. xv. p. 93 (1819).
52. ——. Zoophytes. *Dictionnaire Sci. Nat.* tom. lx. p. 1 (1830).
53. ——. Manuel d'Actinologie et de Zoophytologie. Paris (1834–1837).
54. **Barboza du Bocage, J. V.** Note sur la découverte d'un Zoophyte de la famille Hyalochætides sur la côte du Portugal. *P. Z. S.* 1864, pp. 265–269 (1864).
55. ——. Sur l'habitat du *Hyalonema lusitanicum*. *P. Z. S.* 1865, pp. 662–663 (1865).
56. ——. On *Hyalonema lusitanicum*. *Ann. M. N. H.* ser. 3, vol. xx. pp. 123–127 (1867).
57. ——. Notes on *Hyalonema boreale* and a new Genus of Sponges. *Ann. M. N. H.* ser. 4, vol. ii. pp. 36–38 (1868).
58. ——. Éponges siliceuses nouvelles de Portugal et de l'île St. Jago : *Podospongia lovenii*, *Reniera* (?) *grayi*, *Discodermia polydiscus*, *Latrunculia cratera*. *J. Sci. Lisb.* tom. ii. pp. 159–161 (1870).
59. ——. Sur l'existence de la *Holtenia carpenteri*, Wyville Thomson, dans les côtes du Portugal. *J. Sci. Lisb.* tom. iii. pp. 69–70 (1870).
60. **Boerhave, H.** Index alter. plant. hort. Lugd. Batav. (1720).
61. **Bosc, L. A. G.** Histoire Naturelle des Vers. Paris, tom. iii. (1802).
62. ——. Histoire Naturelle des Vers. Paris, tom. iii. 2nd. edit. (1827).
63. **Bourguet, L.**, et **Cortier, P.** Traité des pétrefactions. Paris (1742).

64. **Bowerbank, J. S.** On the Keratose or Horny Sponge of commerce. *Micr. J.* vol. i. pp. 8–11 (1841).

65. ——. Descriptions of three species of Sponge containing some new forms of organization. *Micr. J.* vol. i. pp. 161–162 (1841).

66. ——. Observations on a Keratose Sponge from Australia. *Ann. M. N. H.* ser. 1, vol. vii. p. 129 (1841).

[67.] ——. Sur les Kératoses ou Éponges cornées du commerce. (Trad.) *L'Institut*, tom. ix. no. 382, p. 137 (1841).

68. ——. On the spongeous origin of Mossagates and other siliceous bodies. *Ann. M. N. H.* ser. 1, vol. x. p. 9 (1842).

69. ——. On the spongeous origin of Mossagates and other siliceous bodies. *Ann. M. N. H.* ser. 1, vol. x. p. 84 (1842).

70. ——. On the Keratose or Horny Sponges of commerce. *Tr. R. Micr. Soc.* vol. i. pp. 32–39 (1844).

71. ——. On three species of Sponge, containing some new forms of organization. *Tr. R. Micr. Soc.* vol. i. pp. 63–76 (1844).

72. ——. Description of a new genus of Calcareous Sponges (*Dunstervillia*). *Ann. M. N. H.* ser. 1, vol. xv. pp. 297–300 (1845).

73. ——. Observations on the Spongiadæ. *Ann. M. N. H.* ser. 1, vol. xvi. p. 400 (1845).

74. ——. On the Ciliary Action in Spongiadæ. *Tr. R. Micr. Soc.* vol. iii. p. 137 (1852).

75. ——. Further Report on the Vitality of Sponges. *Rep. Brit. Assoc.* 1857, pp. 121–125 (1857).

76. ——. On the Vital Powers of the Spongiadæ. *Rep. Brit. Assoc.* 1857, p. 438 (1857).

77. ——. On the Anatomy and Physiology of the Spongiadæ. *P. R. Soc.* vol. viii. p. 573 (1857).

78. ——. On the Anatomy and Physiology of the Spongiadæ. *Ann. M. N. H.* ser. 2, vol. xx. p. 298 (1857).

[79.] ——. Sur les forces vitales des Spongiadées. (Trad.) *L'Institut*, tom. xxv. no. 1208, p. 63 (1857).

[80.] ——. Seconde rapport sur la vitalité des Spongiadées. (Trad.). *L'Institut*, tom. xxvi. no. 1266, p. 121 (1858).

81. ——. On the Anatomy and Physiology of the Spongiadæ. Part I. *Phil. Tr.* vol. cxlviii. p. 279 (1858).

82. ——. Further Report on the Vitality of Sponges. *J. R. Micr. Soc.* vol. vi. pp. 78–79 (1858).

83. ——. On the Organization of *Grantia ciliata*. *Tr. R. Micr. Soc.* n. s. vol. vii. pp. 79–84 (1859).

84. ——. On the fibre in Keratose Sponges. *Q. J. Micr. Sci.* vol. viii. p. 187 (1860).

85. ——. On the Anatomy and Physiology of the Spongiadæ. II. *P. R. Soc.* vol. xi. pp. 372–375 (1862).

86. ——. On the Anatomy and Physiology of the Spongiadæ. II. *Phil. Tr.* vol. cliii. pp. 747–836 (1862).

87. ——. On the Anatomy and Physiology of the Spongiadæ. Part III. *Phil. Tr.* vol. cliii. p. 1087 (1862).

88. ——. On the Anatomy and Physiology of the Spongiadæ. *P. R. Soc.* vol. xii. pp. 146–148 (1863).

89. ——. A Monograph of the Spongillidæ. *P. R. Soc.* vol. xii. pp. 440–472 (1863).

90. ——. A Monograph of the British Spongiadæ. (Ray Society.) Vol. I. (1864).

91. **Bowerbank, J. S.** Description of two American Sponges (*Tethea hispida, Spongilla dawsonii*). *Can. Nat.* n. s. vol. i. pp. 304–307 (1864).
92. ——. A Monograph of the British Spongiadæ. (Ray Society.) Vol. II. (1866.)
93. ——. On *Hyalonema mirabilis*, in reply to Dr. Gray. *Ann. M. N. H.* ser. 3, vol. xviii. pp. 397–401 (1866).
94. ——. Two Sponges new to Science—*Halichondria couchi, Microciona frondosa*. *Rep. Brit. Assoc.* 1867, pp. 285–286 (1867).
95. ——. On *Hyalonema mirabile*. *P. Z. S.* 1867, pp. 18–34 (1867).
96. ——. Additional observations on *Hyalonema mirabile*. *P. Z. S.* 1867, pp. 350–351 (1867).
97. ——. On *Alcyoncellum* (*Euplectella*) *speciosum*, Quoy and Gaimard. *P. Z. S.* 1867, pp. 351–359 (1867).
98. ——. On *Hyalonema lusitanicum*. *P. Z. S.* 1867, pp. 901–907 (1868).
99. ——. Observations on Dr. Gray's "Notes on the Arrangement of Sponges, with the Description of some New Genera." *P. Z. S.* 1868, pp. 118–137 (1868).
100. ——. A Monograph of the Siliceo-fibrous Sponges. Part I. *P. Z. S.* 1869, pp. 66–100 (1869).
101. ——. A Monograph of the Siliceo-fibrous Sponges. Part II. *P. Z. S.* 1869, pp. 323–351 (1869).
102. ——. On Dr. Gray's Genus *Theonella* (*Dactylocalyx*). *P. Z. S.* 1869, pp. 389, 390 (1869).
103. ——. On the generic name *Alcyoncellum*, and in reply to Dr. Gray's "Observations on Sponges and on their Arrangement and Nomenclature." *Ann. M. N. H.* ser. 4, vol. iii. pp. 84–87 (1869).
104. ——. Observations on Mr. Carter's paper "On two new Sponges from the Antarctic Sea, &c." *Ann. M. N. H.* ser. 4, vol. x. pp. 58–61 (1872).
105. ——. Contributions to a general History of the Spongiadæ. Part I. *P. Z. S.* 1872, pp. 115–129 (1872).
106. ——. Contributions to a general History of the Spongiadæ. Part II. *P. Z. S.* 1872, pp. 196–202 (1872).
107. ——. Contributions to a general History of the Spongiadæ. Part III. *P. Z. S.* 1872, pp. 626–634 (1872).
108. ——. Reply to Dr. J. E. Gray's Observations on certain Species of Sponges described in the 'Proceedings of the Zoological Society' for 1873. *Ann. M. N. H.* ser. 4, vol. xii. pp. 488–491 (1873).
109. ——. Contributions to a general History of the Spongiadæ. Part IV. *P. Z. S.* 1873, pp. 3–25 (1873).
110. ——. Report on a Collection of Sponges found at Ceylon by E. W. H. Holdsworth, Esq. *P. Z. S.* 1873, pp. 25–32 (1873).
111. ——. Contributions to a general History of the Spongiadæ. Part V. *P. Z. S.* 1873, pp. 319–333 (1873).
112. ——. Contributions to a general History of the Spongiadæ. Part VI. *P. Z. S.* 1874, pp. 298–305 (1874).
113. ——. A Monograph of the British Spongiadæ. (Ray Society.) Vol. III. (1874).
114. ——. A Monograph of the Siliceo-fibrous Sponges. Part III. *P. Z. S.* 1875, pp. 272–281 (1875).
115. ——. Contributions to a general History of the Spongiadæ. Part VII. *P. Z. S.* 1875, pp. 281–296 (1875).
116. ——. A Monograph of the Siliceo-fibrous Sponges. Part IV. *P. Z. S.* 1875, pp. 503–509 (1875).
117. ——. A Monograph of the Siliceo-fibrous Sponges. Part V. *P. Z. S.* 1875, pp. 558–565 (1875).

118. **Bowerbank, J. S.** Further observations on *Alcyoncellum speciosum*, Quoy et Gaimard, and *Hyalonema mirabilis*, Gray. *P. Z. S.* 1875, pp. 607–610 (1875).

119. ——. A Monograph of the Siliceo-fibrous Sponges. Part VI. *P. Z. S.* 1876, pp. 535–540 (1876).

120. ——. Contributions to a general History of the Spongiadæ. Part VIII. *P. Z. S.* 1876, pp. 768–775 (1876).

121. ——. Description of five new Species of Sponges discovered by A. B. Meyer on the Philippine Islands and New Guinea. (*Opus posthum.*) *P. Z. S.* 1877, pp. 456–464 (1877).

122. ——. A Monograph of the British Spongiadæ, by the late Dr. Bowerbank; edited, with additions, by the Rev. A. M. Norman. (Ray Society.) Vol. IV. (1882).

123. **Brandt, J. F.** Extrait d'un mémoire: de nova polyporum familia Hyalochætidium nomine designanda. *Bull. Ac. Pétersb.* vol. xvi. p. 65 (1850).

124. ——. Symbolæ ad polypos Hyalochætidium spectantes. Petropoli (1859).

125. **Brandt, K.** Ueber das Zusammenleben von Thieren und Algen. *Ver. Phys. Ges. Berlin*, no. 5, p. 22 (1881).

126. ——. Ueber die morphologische und physiologische Bedeutung des Chlorophylls bei Thieren. *Arch. Anat. Phys.* p. 125 (1882).

127. ——. Ueber die morphologische und physiologische Bedeutung des Chlorophylls bei Thieren. 2. Artikel. *MT. z. Stat. Neap.* Bd. iv. pp. 191–302 (1883).

128. **Braun, H. G.** Lethæa Geognostica. 2nd ed. Stuttgart (1834–38).

129. ——. Lethæa Geognostica. 3rd ed. Stuttgart (1846–56).

130. ——. Index Palæontologicus. 1 Abth. Stuttgart (1848).

131. ——. Index Palæontologicus. 2 Abth. Stuttgart (1849).

132. ——. Bronn's Klassen und Ordnungen des Thierreichs. I. Amorphozoa. Leipzig (1859).

133. **Braun, M.** Ueber die Geschlechts verhältnisse bei *Halisarca lobularis*, O. Schm. *Zool. Anz.* vol. iv. pp. 232–234 (1881).

134. **Brotherus.** *Spongilla. Meddel af. Soc. pro Fauna et Flora Fennica*, vol. iii. p. 168 (1878).

135. **Bruder, K.** Zur Kenntniss der Juraablagerung von Sternberg bei Zeidler in Böhmen. *SB. Ak. Wien*, 1881, p. 47 (1881).

136. **Buckland, W.** On the Paramandra. *Tr. Geol. Soc.* vol. ix. p. 412 (1817).

137. **Burg, van der.** Beschrijving van een exemplar *Euplectella aspergillum*. *Natuurk. Tijdschrift voor Nederlandsch Indië*, vol. xxxi. pp. 473–475 (1869).

138. **Bütschli, O.** Ueber die Stellung der Spongien. *Z. wiss. Zool.* Bd. xxx. p. 221 (1878).

139. ——. Bemerkungen zur Gastræatheorie. *Morph. Jahrb.* Bd. 9, pp. 416–427 (1884).

[140.] ——. Remarks on the Gastræa Theory. (Transl.) *Ann. M. N. H.* ser. 5, vol. xiii. pp. 373–383 (1884).

141. **Buxbaum, J. C.** Nova Plantarum genera. *Comm. Acad. Petropol.* ii. p. 343 (1729).

142. **Capellini, Dr.,** und **Dr. Pagenstecher.** Mikroscopische Untersuchungen über den innern Bau einiger fossilen Schwämme. *Z. wiss. Zool.* Bd. x. pp. 364–372 (1860)

143. **Carpenter, Dr.** On Hexactinellids. *Ann. M. N. H.* ser. 4, vol. ii. p. 320 (1868).

144. **Carpenter, Dr.**, and **Wyville Thomson.** On Hexactinellids. *Ann. M. N. H.* ser. 4, vol. iv. p. 120 (1869).

145. ——. On Hexactinellids. *Ann. M. N. H.* ser. 4, vol. iv. p. 281 (1869).

146. ——, **Jeffreys**, and **W. Thomson.** Report on the Dredging Expedition of the 'Porcupine.' *P. R. Soc.* vol. xviii. pp. 397–492 (1869).

147. ——. Report on the Dredging Expedition of the 'Porcupine.' *P. R. Soc.* vol. xix. pp. 146–221 (1870).

[148.] —— and **W. Thomson.** Sur Éponges. *Arch. Sci. Nat.* tom. xli. pp. 81–83 (1870).

149. **Carter, H. J.** Notes on the Species, Structure, and Animality of the Freshwater Sponges in the tanks of Bombay. *Ann. M. N. H.* ser. 2, vol. i. pp. 303–311 (1848).

150. ——. A descriptive account of the Freshwater Sponges (Genus *Spongilla*) in the Island of Bombay, with Observations on their Structure and Development. *Ann. M. N. H.* ser. 2, vol. iv. pp. 81–100 (1849).

151. ——. A descriptive account of the Freshwater Sponges (Genus *Spongilla*) in the Island of Bombay, with Observations on their Structure and Development. *J. Bombay Branch R. Asiatic Soc.* vol. iii. p. 29 (1849).

152. ——. Zoosperms in *Spongilla*. *Ann. M. N. H.* ser. 2, vol. xiv. pp. 334–336 (1854).

153. ——. On the Ultimate Structure of *Spongilla*, and Additional Notes on Freshwater Infusoria. *Ann. M. N. H.* ser. 2, vol. xx. pp. 21–41 (1857).

154. ——. On a Variety of *Spongilla meyeni* from the River Exe, Devonshire. *Ann. M. N. H.* ser. 4, vol. i. p. 247 (1868).

155. ——. Description of a Siliceous Sand-Sponge found on the south-east coast of Arabia. *Ann. M. N. H.* ser. 4, vol. iii. p. 151 (1869).

156. ——. Calcareous Sponges (Central Canal in Spicules). *Ann. M. N. H.* ser. 4, vol. iii. p. 466 (1869).

157. ——. Descriptive account of four Subspherous Sponges, Arabian and British, with general observations. *Ann. M. N. H.* ser. 4, vol. iv. p. 1 (1869).

158. ——. On *Grayella cyathophora*, a new genus and species of Sponge. *Ann. M. N. H.* ser. 4, vol. iv. p. 189 (1869).

159. ——. Note on the Sponges *Grayella*, *Osculina*, and *Cliona*. *Ann. M. N. H.* ser. 4, vol. v. p. 73–83 (1870).

160. ——. On *Haliphysema ramulosa*, Bowerbank, and the Sponge-spicules of *Polytrema*. *Ann. M. N. H.* ser. 4, vol. v. pp. 389–392 (1870).

161. ——. On two new species of Subsphærous Sponges. *Ann. M. N. H.* ser. 4, vol. vi. p. 176 (1870).

162. ——. On the Ultimate Structure of Marine Sponges. *Ann. M. N. H.* ser. 4, vol. vi. pp. 329–342 (1870).

163. ——. A descriptive account of three Pachytragous Sponges growing on the rocks of the South Coast of Devon (*Dercitus*, *Stelletta*). *Ann. M. N. H.* ser. 4, vol. vii. pp. 1–15 (1871).

164. ——. On Fossil Sponge-spicules of the Greensand compared with those of existing Species. *Ann. M. N. H.* ser. 4, vol. vii. pp. 112–141 (1871).

165. ——. On two undescribed Sponges (*Ectyon*, *Acarnus*) and two Esperiadæ from the West Indies; also on the Nomenclature of the Calcisponge, *Clathrina*, Gray. *Ann. M. N. H.* ser. 4, vol. vii. pp. 268–283 (1871).

166. ——. Discovery of the Animal of the Spongiadæ confirmed. *Ann. M. N. H.* ser. 4, vol. vii. p. 445 (1871).

167. ——. A description of two new Calcispongiæ (*Trichogypsia*, *Leuconia*), to which is added confirmatiou of Prof. James-Clark's Discovery of the True Form of the Sponge-cell (Animal), and an Account of the Polype-like Pore-area of *Cliona coralloides* contrasted with Prof. E.

Häckel's View on the Relationship of the Sponges to the Corals. *Ann. M. N. H.* ser. 4, vol. viii. pp. 1–28 (1871).

168. **Carter, H. J.** Description and Illustration of a new Species of *Tethya*, with observations on the Nomenclature of the Tethyadæ. *Ann. M. N. H.* ser. 4, vol. viii. pp. 99–106 (1871).

169. ——. Parasites of the Sponges. *Ann. M. N. H.* ser. 4, vol. viii. pp. 330–332 (1871).

170. ——. Additional information on the structure of *Tethya dactyloidea*, Cart. *Ann. M. N. H.* ser. 4, vol. ix. pp. 82–84 (1872).

171. ——. On two new Sponges from the Antarctic Sea, and on a new Species of *Tethya* from Shetland (*Tethya antarctica, Rossella antarctica*): together with observations on the Reproduction of Sponges, commencing from Zygosis of the Sponge-animal. *Ann. M. N. H.* ser. 4, vol. ix. pp. 409–436 (1872).

172. ——. Proposed name for the Sponge-animal, viz. "*Spongozoon*"; also on the origin of Thread-cells in the Spongiadæ. *Ann M. N. H.* ser. 4, vol. x. pp. 45–51 (1872).

173. ——. Description, with illustrations, of a new species of *Aplysina* from the N.W. coast of Spain. *Ann. M. N. H.* ser. 4, vol. x. pp. 101–110 (1872).

174. ——. Description of two new Sponges from the Philippine Islands (*Meyenia, Crateromorpha*). *Ann. M. N. H.* ser. 4, vol. x. pp. 110–114 (1872).

175. ——. Answer to Dr. Bowerbank's "Observations on Mr. Carter's Paper &c.," in the last number of the 'Annals.' *Ann. M. N. H.* ser. 4, vol. x. pp. 141–142 (1872).

176. ——. Description of *Labaria hemisphærica*, Gray, a new species of Hexactinellid Sponge, with observations on it and the Sarco-hexactinellid Sponges generally. *Ann. M. N. H.* ser. 4, vol. xi. pp. 275–286 (1873).

177. ——. Points of distinction between the Spongidæ and the Foraminifera. *Ann. M. N. H.* ser. 4, vol. xi. pp. 351–356 (1873).

178. ——. On two new species of *Gummineæ* (*Corticium abyssi, Chondrilla australiensis*), with special and general observations. *Ann. M. N. H.* ser. 4, vol. xii. pp. 17–30 (1873).

179. ——. On the *Hexactinellidæ* and *Lithistidæ* generally, and particularly on the *Aphrocallistidæ*, *Aulodictyon*, and *Farreæ*, together with Facts elicited from their Deciduous Structures, and Descriptions respectively of three new Species (I.). *Ann. M. N. H.* ser. 4, vol. xii. pp. 349–373 (1873).

180. ——. On the *Hexactinellidæ* and *Lithistidæ* generally, and particularly on the *Aphrocallistidæ*, *Aulodictyon*, and *Farreæ*, together with Facts elicited from their Deciduous Structures, and Descriptions respectively of three new Species (II.). *Ann. M. N. H.* ser. 4, vol. xii. pp. 437–472 (1873).

181. ——. On the Spongozoa of *Halisarca Dujardinii*. *Ann. M. N. H.* ser. 4, vol. xii. pp. 315–316 (1874).

182. ——. On *Halisarca lobularis*, Schmidt, off the south coast of Devon with observaions on the Relationship of the Sponges to the Ascidians and Hints for Microscopy. *Ann. M. N. H.* ser. 4, vol. xiii. pp. 433–440 (1874).

183. ——. On *Microciona*. *Ann. M. N. H.* ser. 4, vol. xiv. p. 45 (1874).

184. ——. On the Nature of the Seed-like Body of *Spongilla*; on the Origin or Mother-cell of the Spicule; and on the presence of Spermatozoa in the Sponges. *Ann. M. N. H.* ser. 4, vol. xiv. pp. 97–111 (1874).

185. ——. Descriptions and Figures of Deep-sea Sponges and their Spicules from the Atlantic Ocean, dredged up on board H.M.S. 'Porcupine,'

chiefly in 1869; with Figures and Descriptions of some remarkable Spicules from the Agulhas Shoals and Colon, Panama. I. *Ann. M. N. H.* ser. 4, xiv. pp. 207–222 (1874).

186. **Carter, H. J.** Descriptions and Figures of Deep-sea Sponges and their Spicules from the Atlantic Ocean, dredged up on board H.M.S. 'Porcupine,' chiefly in 1869; with Figures and Descriptions of some remarkable Spicules from the Agulhas Shoals and Colon, Panama. II. *Ann. M. N. H.* ser. xiv. pp. 245–257 (1874).

187. ——. Development of the Marine Sponges from the earliest recognizable appearance of the Ovum to the perfected Individual. I. *Ann. M. N. H.* ser. 4, vol. xiv. pp. 321–337 (1874).

188. ——. Development of the Marine Sponges from the earliest recognizable appearance of the Ovum to the perfected Individual. II. *Ann. M. N. H.* ser. 4, vol. xiv. pp. 389–406 (1874).

189. ——. Further instances of the Sponge-spicule in its Mother-cell. *Ann. M. N. H.* ser. 4, vol. xiv. pp. 456–458 (1874).

190. ——. On the Genus *Rossella* (a Hexactinellid Sponge), with the Descriptions of three new Species. *Ann. M. N. H.* ser. 4, vol. xv. pp. 113–122 (1875).

191. ——. Notes Introductory to the Study and Classification of the Spongida. I. Anatomy and Physiology. *Ann. M. N. H.* ser. 4, vol. xvi. pp. 1–41 (1875).

192. ——. Notes Introductory to the Study and Classification of the Spongida. II. Proposed Classification of the Spongida (I.). *Ann. M. N. H.* ser. 4, vol. xvi. pp. 126–145 (1875).

193. ——. Notes Introductory to the Study and Classification of the Spongida. II. Proposed Classification (II.). *Ann. M. N. H.* ser. 4, vol. xvi. pp. 177–200 (1875).

194. ——. Descriptions and Figures of Deep-sea Sponges and their Spicules from the North Atlantic Ocean, dredged up on board H.M.S. 'Porcupine.' *Ann. M. N. H.* ser. 4, vol. xviii. pp. 226–240 (1876).

195. ——. Description and Figures of Deep-sea Sponges and their Spicules from the North-Atlantic Ocean, dredged up on board H.M.S. 'Porcupine.' *Ann. M. N. H.* ser. 4, vol. xviii. pp. 307–324 (1876).

196. ——. Descriptions and Figures of Deep-sea Sponges and their Spicules from the North-Atlantic Ocean, dredged up on board H.M.S. 'Porcupine.' *Ann. M. N. H.* ser. 4, vol. xviii. pp. 388–410 (1876).

197. ——. Descriptions and Figures of Deep-sea Sponges and their Spicules from the North-Atlantic Ocean, dredged up on board H.M.S. 'Porcupine.' *Ann. M. N. H.* ser. 4, vol. xviii. pp. 458–473 (1876).

198. ——. On two Vitreo-hexactinellid Sponges (*Eurete farreopsis*, n. sp., and *Myliusia grayi*, Bk.). *Ann. M. N. H.* ser. 4, vol. xix. pp. 121–131 (1877).

199. ——. Description of *Mauricea*. *Ann. M. N. H.* ser. 4, vol. xix. p. 174 (1877).

200. ——. Note on the "Tubulations Sableuses" of the étage Bruxellien in the environs of Brussels. *Ann. M. N. H.* ser. 4, vol. xix. pp. 382–393 (1877).

201. ——. Arctic and Antarctic Sponges. *Ann. M. N. H.* ser. 4, vol. xx. pp. 38–43 (1877).

202. ——. On a Fossil species of Sarco-hexactinellid Sponge allied to *Hyalonema*. *Ann. M. N. H.* ser. 4, vol. xx. pp. 176–178 (1877).

203. ——. Mr. James Thomson's Fossil Sponges from the Carboniferous System of the South-west of Scotland. *Ann. M. N. H.* ser. 5, vol. i. pp. 128–143 (1878).

204. ——. Position of the Sponge-spicule in the Spongida; and Postscript on the identity of *Squamulina scopula* with the Sponges. *Ann. M. N. H.* ser. 5, vol. i. pp. 170–174 (1878).

205. **Carter, H. J.** Emendatory Description of *Purisiphonia clarkei*, Bk., a hexactinellid fossil Sponge from N.W. Australia. *Ann. M. N. H.* ser. 5, vol. i. pp. 376–379 (1878).

206. ——. On Calcareous Hexactinellid Structures in the Devonian Limestone, large fossil Hydrozoic Coralla from the Chalk, and further observations on the replacement of Silex by Calcite. *Ann. M. N. H.* ser. 5, vol. i. pp. 412–419 (1878).

207. ——. On *Teichonia*, a new Family of Calcareous Sponges, with descriptions of two species. *Ann. M. N. H.* ser. 5, vol. ii. pp. 35–40 (1878).

208. ——. Parasites of the Spongida. *Ann. M. N. H.* ser. 5, vol. ii. pp. 157–172 (1878).

209. ——. Note on *Tethya muricata*, Bowerbank. *Ann. M. N. H.* ser. 5, vol. ii. pp. 174–177 (1878).

210. ——. On *Holastrella*, a Fossil Sponge of the Carboniferous era, and on *Hemiastrella*, a new species of recent Sponge. *Ann. M. N. H.* ser. 5, vol. iii. pp. 141–150 (1879).

211. ——. Contributions to our Knowledge of the Spongida. *Ann. M. N. H.* ser. 5, vol. iii. pp. 284–304 (1879).

212. ——. Contributions to our Knowledge of the Spongida. *Ann. M. N. H.* ser. 5, vol. iii. pp. 343–360 (1879).

213. ——. On the Nutritive and Reproductive Processes of Sponges. *Ann. M. N. H.* ser. 5, vol. iv. pp. 374–386 (1879).

214. ——. Note on the so-called "Farringdon (Coral-Rag) Sponges" (*Calcispongiæ*, Zittel). *Ann. M. N. H.* ser. 5, vol. iv. pp. 431–437 (1879).

215. ——. On a new species of excavating Sponge (*Alcetona millari*), and on a new species of *Rhaphidotheca* (*R. affinis*). *J. R. Micr. Soc.* vol. ii. pp. 443–449 (1879).

216. ——. Spongidæ from Kerguelen's Island. *Phil. Trans.* vol. clxviii. pp. 286–288 (1879).

217. ——. On a new genus of Foraminifera; and Spiculation of an unknown Sponge. *Tr. R. Micr. Soc.* vol. ii. pp. 500–502 (1879).

218. ——. Report on Specimens dredged up from the Gulf of Manaar and presented to the Liverpool Free Museum by Capt. W. H. Cawne Warren. *Ann. M. N. H.* ser. 5, vol. vi. p. 35 (1880).

219. ——. On Fossil Sponge-spicules from the Carboniferous strata of Ben Bulben, near Sligo. *Ann. M. N. H.* ser. 5, vol. vi. pp. 209–214 (1880).

[220.] ——. Report on Sponges dredged in the Gulf of Manaar. (Abstr.) *P. Liverp. Soc.* vol. xxxiv. p. 273 (1880).

221. ——. List of fourteen Species of Sponges dredged at Falmouth. *Tr. Birmingham Soc.* vol. 1880, p. 59 (1880).

222. ——, and **W. S. M. D'Urban.** On the Zoology of the Barents Sea. *Ann. M. N. H.* ser. 5, vol. vi. p. 253 (1880).

223. ——. Sponges. Including list of Sponges dredged by the Birmingham Natural History and Microscopical Society, Falmouth Excursion, 1879; depth 15–20 fathoms. *Midland Naturalist*, p. 190 (1880).

224. ——. History and Classification of the known species of *Spongilla*. *Ann. M. N. H.* ser. 5, vol. vii. pp. 77–107 (1881).

225. ——. On *Spongilla cinerea*. *Ann. M. N. H.* ser. 5, vol. vii. pp. 263, 264 (1881).

226. ——. Supplementary Report on the Specimens dredged up from the Gulf of Manaar, together with others from the Sea in the vicinity of the Bass Rocks and from Bass's Straits respectively, presented to the Liverpool Free Museum by Capt. H. Cawne Warren. *Ann. M. N. H.* ser. 5, vol. vii. p. 361 (1881).

227. ——. Contributions to our Knowledge of the Spongida.—Order II. *Ceratina*. *Ann. M. N. H.* ser. 5, vol. viii. pp. 101–112 (1881).

228. **Carter, H. J.** On the Development of the Fibre in the Spongida. *Ann. M. N. H.* ser. 5, vol. viii. pp. 112–120 (1881).

229. ——. On Spongiophaga in *Spongilla*. *Ann. M. N. H.* ser. 5, vol. viii. p. 222 (1881).

230. ——. Contributions to our Knowledge of the Spongida.—Order I. *Carnosa*. *Ann. M. N. H.* ser. 5, vol. viii. pp. 241–259 (1881).

231. ——. On *Spongiophaga pottsi*. *Ann. M. N. H.* ser. 5, vol. viii. p. 354 (1881).

232. ——. Addendum to our Knowledge of the *Carnosa*. *Ann. M. N. H.* ser. 5, vol. viii. p. 450 (1881).

233. ——. Some Sponges from the West Indies and Acapulco, in the Liverpool Free Museum, described, with general and classificatory remarks. *Ann. M. N. H.* ser. 5, vol. ix. pp. 260–301 (1882).

234. ——. Some Sponges from the West Indies and Acapulco, in the Liverpool Free Museum, described, with general and classificatory remarks. *Ann. M. N. H.* ser. 5, vol ix. pp. 346–369 (1882).

235. ——. Form and Nature of the Cirrous Appendages on the Statoblast of *Carterella latitenta*, Potts, &c., originally designated *Spongiophaga pottsi*. *Ann. M. N. H.* ser. 5, vol. ix. pp. 390–396 (1882).

[236.] ——. Form and Nature of the Cirrous Appendages on the Statoblast of *Carterella latitenta*, Potts, &c., originally designated *Spongiophaga pottsi*. (Abstr.) *J. R. Micr. Soc.* vol. ii. p. 350 (1882).

237. ——. New Sponges, observations on old ones, and a proposed new group (*Phlœodictyina*). *Ann. M. N. H.* ser. 5, vol. x. pp. 106–125 (1882).

238. ——. Spermatozoa, Polygonal Cell-structure, and the Green Colour in *Spongilla*, together with a new species. *Ann. M. N. H.* ser. 5, vol. x. pp. 362–372 (1882).

239. ——. Further observations on the so-called "Farringdon Sponges" (*Calcispongiæ*, Zittel), followed by a description of an existing species of a like kind (*Leucetta clathrata*, n. sp.). *Ann. M. N. H.* ser. 5, vol. xi. pp. 20–37 (1883).

240. ——. Contributions to our Knowledge of the Spongida.—*Pachytragida*. *Ann. M. N. H.* ser. 5, vol. xi. pp. 344–369 (1883).

241. ——. A new genus of Sponges (*Monanchora clathrata*). *Ann. M. N. H.* ser. 5, vol. xi. pp. 369–370 (1883).

242. ——. On the Microscopic Structure of thin slices of Fossil Calcispongiæ. *Ann. M. N. H.* ser. 5, vol. xii. pp. 26–30 (1883).

243. ——. On the Presence of Starch-Granules in the Ovum of the Marine Sponges, and on the Ovigerous Layer of *Suberites domuncula*, Nardo. *Ann. M. N. H.* ser. 5, vol. xii. pp. 30–36 (1883).

244. ——. Contributions to our Knowledge of the Spongida. *Ann. M. N. H.* ser. 5, vol. xii. pp. 308–329 (1883).

245. ——. Spicules of *Spongilla* in the Diluvium of the Altmühl Valley, Bavaria. *Ann. M. N. H.* ser. 5, vol. xii. pp. 329–333 (1883).

246. ——. Remarks on Dr. Vejdovsky's Paper [*vide infrà*]. *Ann. M. N. H.* ser. 5, vol. xiii. p. 99 (1884).

247. ——. Generic Characters of the Sponges described in Mr. Carter's "Contributions to our Knowledge of the Spongida," Ann. M. N. H. ser. 5, vol. xii. p. 308 (1883). *Ann. M. N. H.* ser. 5, vol. xiii. pp. 129–130 (1884).

248. ——. On *Grantia ciliata*, var. *spinispiculum*. *Ann. M. N. H.* ser. 5, vol. xiii. pp. 153–163 (1884).

249. ——. The Branched and Unbranched Forms of the Freshwater Sponges considered generally. *Ann. M. N. H.* ser. 5, vol. xiii. pp. 269–273 (1884).

250. **Carter, H. J.** Note on the assumed relationship of *Parkeria* to *Stromatopora*, and on a microscopic section of *Stromatopora mamillata*, Fr. Schmidt. *Ann. M. N. H.* ser. 5, vol. xiii. pp. 353–356 (1884).

251. ——. Catalogue of the Marine Sponges collected by Mr. Jos. Willcox on the West Coast of Florida. *P. Ac. Philad.* 1884, pp. 202–209 (1884).

252. ——. On the *Spongia coriacea* of Montagu = *Leucosolenia coriacea*, Bwk., together with a new Variety of *Leucosolenia lacunosa*, Bwk., elucidating the Spicular Structure of some of the Fossil Calcispongiæ; followed by Illustrations of the Pin-like Spicules on *Verticillites helvetica*, De Loriol. *Ann. M. N. H.* ser. 5, vol. xiv. p. 17 (1884).

253. ——. Note on *Spongilla fragilis*, Leidy, and a new Species of *Spongilla* [*mackayi*] from Nova Scotia. *Ann. M. N. H.* ser. 5, vol. xv. pp. 18–20 (1885).

254. ——. Descriptions of Sponges from the neighbourhood of Port Phillip Heads, South Australia. *Ann. M. N. H.* ser. 5, vol. xv. pp. 107–117 (1885).

255. ——. Mode of Circulation in the Spongida. *Ann. M. N. H.* ser. 5, vol. xv. pp. 117–122 (1885).

[256.] ——. New Sponges from South Australia. (Abstr.) *J. R. Micr. Soc.* ser. 2, vol. v. p. 465 (1885).

257. ——. Descriptions of Sponges from the neighbourhood of Port Phillip Heads, South Australia. *Ann. M. N. H.* ser. 5, vol. xv. pp. 196–222 (1885).

258. ——. Descriptions of Sponges from the neighbourhood of Port Phillip Heads, South Australia. *Ann. M. N. H.* ser. 5, vol. xv. pp. 301–321 (1885).

[259.] ——. Circulation in Spongida. (Abstr.) *J. R. Micr. Soc.* ser. 2, vol. v. pp. 816–817 (1885).

260. ——. Report on a Collection of Marine Sponges from Japan, made by Dr. J. Anderson, F.R.S. *Ann. M. N. H.* ser. 5, vol. xv. pp. 387–406 (1885).

261. ——. On a variety of the Freshwater Sponge, *Meyenia fluviatilis*. *Ann. M. N. H.* ser. 5, vol. xv. pp. 453–456 (1885).

262. ——. On a variety of the Freshwater Sponge *Meyenia fluviatilis*, from Florida. *Ann. M. N. H.* ser. 5, vol. xvi. pp. 179–181 (1885).

263. ——. Descriptions of Sponges from the neighbourhood of Port Phillip Heads, South Australia. *Ann. M. N. H.* ser. 5, vol. xvi. pp. 277–294 (1885).

264. ——. Descriptions of Sponges from the neighbourhood of Port Phillip Heads, South Australia. *Ann. M. N. H.* ser. 5, vol. xvi. pp. 347–368 (1885).

265. ——. Descriptions of Sponges from the neighbourhood of Port Phillip Heads, South Australia. *Ann. M. N. H.* ser. 5, vol. xvii. pp. 40–53 (1886).

266. ——. Descriptions of Sponges from the neighbourhood of Port Phillip Heads, South Australia. *Ann. M. N. H.* ser. 5, vol. xvii. pp. 112–127 (1886).

267. ——. Descriptions of Sponges from the neighbourhood of Port Phillip Heads, South Australia. *Ann. M. N. H.* ser. 5, vol. xvii. pp. 431–441 (1886).

268. ——. Descriptions of Sponges from the neighbourhood of Port Phillip Heads, South Australia. *Ann. M. N. H.* ser. 5, vol. xvii. pp. 502–516 (1886).

269. ——. Descriptions of Sponges from the neighbourhood of Port Phillip Heads, South Australia. *Ann. M. N. H.* ser. 5, vol. xviii. pp. 34–55 (1886).

270. ——. Descriptions of Sponges from the neighbourhood of Port Phillip Heads, South Australia. *Ann. M. N. H.* ser. 5, vol. xviii. pp. 126–149 (1886).

[271.] **Carter, H. J.** Description of Sponges from South Australia. (Abstr.) *J. R. Micr. Soc.* vol. vi. p. 811.

272. ——. Supplement to the Descriptions of Mr. J. BracebridgeWilson's Australian Sponges. *Ann. M. N. H.* ser. 5, vol. xviii. pp. 271–290 (1886).

273. ——. Supplement to the Descriptions of Mr. J. Bracebridge Wilson's Australian Sponges. *Ann. M. N. H.* ser. 5, vol. xviii. pp. 369–379 (1886).

274. ——. Supplement to the Descriptions of Mr. J. Bracebridge Wilson's Australian Sponges. *Ann. M. N. H.* ser. 5, vol. xviii. pp. 445–466 (1886).

275. **Cavolini, T.** Memorie per servir a la storia de Polipi marini. Napoli (1785).

276. ——. Memorie postumæ per cura di Societa de la Chiaje. Benvenuto (1853).

277. **Charlesworth, E.** On the Mineral Condition and general Affinities of the Chalk at Flamborough and Bridlington. *Proc. Yorkshire Phil. Soc.* (1848).

278. **Chiaje, S. delle.** Memorie sulla storia e anatomia degli animali senza vertebre. Vol. iii. Napoli (1828).

279. ——. Memorie sulla storia e anatomia degli animali senza vertebre. Vol. iv. Napoli (1829).

280. ——. Memorie sulla storia e anatomia degli animali senza vertebre. Vol. iii. Napoli (1843).

281. **Chilton, C.** A New Zealand Freshwater Sponge. *New Z. J. Sci.* vol. i. pp. 383–384 (1883).

282. **Chimmo, W.** Natural History of the *Euplectella aspergillum* from the Philippine Islands. London (1878).

283. **Choffat, Paul.** Note sur la distribution des bancs de Spongiaires à Spicules siliceux dans la chaîne du Jura et sur le parallélisme de l'Argovien. *Bull. Soc. Géol.* sér. 3, tom. xiii. 1885, pp. 834–841 (1886).

284. **Clark, H. James.** Conclusive Proofs of the Animality of the Ciliate Sponges, and of their affinities with the Infusoria Flagellata. *Am. J. Sci.* ser. 2, vol. xviii. pp. 320–325 (1866).

285. ——. Conclusive Proofs of the Animality of the Ciliate Sponges, and of their affinities with the Infusoria Flagellata. *Ann. M. N. H.* ser. 3, vol. xix. pp. 13–18 (1867).

286. ——. On the Spongiæ Ciliatæ as Infusoria Flagellata; or observations on the Structure, Animality, and Relationship of *Leucosolenia botryoides*, Bowerbank. *Ann. M. N. H.* ser. 4, vol. i. pp. 133–142 (1868).

287. ——. On the Spongiæ Ciliatæ as Infusoria Flagellata; or observations on the Structure, Animality, and Relationship of *Leucosolenia botryoides*, Bowerbank. *Ann. M. N. H.* ser. 4, vol. i. pp. 188–215 (1868).

288. ——. On the Spongiæ Ciliatæ as Infusoria Flagellata; or observations on the Structure, Animality, and Relationship of *Leucosolenia botryoides*, Bowerbank. *Ann. M. N. H.* ser. 4, vol. i. 250–264 (1868).

289. ——. On the Nature of Sponges. *P. Bost. Soc.* vol. xi. pp. 16–17 (1868).

290. ——. On the Spongiæ Ciliatæ as Infusoria Flagellata; or observations on the Structure, Animality, and Relationship of *Leucosolenia botryoides*, Bowerbank. *Mem. Bost. Soc.* vol. i. pp. 305–340 (1869).

291. ——. Note on the Infusoria Flagellata and the Spongiæ Ciliatæ. *Am. J. Sci.* ser. 3, vol. i. p. 113 (1871).

292. ——. Note on the Infusoria Flagellata and the Spongiæ Ciliatæ. *Ann. M. N. H.* ser. 4, vol. vii. p. 247 (1871).

293. ——. The American *Spongilla*, a craspedote, flagellate Infusorian. *Am. J. Sci.* ser. 3, vol. ii. pp. 426–436 (1871).

294. ——. Note on the Infusoria Flagellata and the Spongiæ Ciliatæ. *Am. J. Sci.* ser. 3, vol. ii. p. 426 (1872).

295. **Clark, H. James.** The American *Spongilla*, a craspedote, flagellate Infusorian. *Monthl. Micr. J.* vol. vii. pp. 104–114 (1872).

296. ——. The American *Spongilla*, a craspedote, flagellate Infusorian. *Ann. M. N. H.* ser. 4, vol. ix. pp. 71–82 (1872).

297. **Claus, C.** Die Cœlenteraten-Natur der Spongien. *Ber. Vers. Nat. Hannover*, 1864, p. 263 (1864).

298. ——. Ueber *Euplectella aspergillum*, R. Owen. Ein Beitrag zur Naturgeschichte der Kieselschwämme. Marburg (1868).

299. ——. Grundzüge d. Zoologie. 4th ed. Bd. i. p. 208 (1882).

300. **Cohn, F.** Ueber das Vorkommen von Kieselschwammnadeln in einem dichten grauen Kalkstein. *JB. Schles. Ges.* Bd. xlviii. pp. 63–64 (1870).

301. **Conrad, D. A.** Observation on the Silurian and Devonian Systems of the United States, with descriptions of new Organic Remains. *J. Ac. Philad.* vol. viii. p. 228 (1842).

302. **Cooke, M. C.** On Kent's Manual of the Infusoria &c. *Grevillea*, vol. ix. pp. 41–43 (1880).

303. **Costa, A.** Rapporto preliminare e sommario sulle ricerche zoologiche fatte in Sardegna durante la primavera del 1882. *Rendic. Accad. Sc. Napoli*, anno xxi. p. 189 (1882).

304. **Costa, O. G.** Fauna del Regno di Napoli, Polypi, a poliparia flessibili, Tethya. (1843.)

305. **Couch, R. Q.** Observations on the Sponges of Cornwall. *Rep. R. Polytechn. Soc. Cornwall* for 1842, p. 41 (1842).

306. **Coues, E.,** and **Yarrow, H. C.** Notes on the Natural History of Fort Macon, N. C., and vicinity. *P. Ac. Philad.* 1878, p. 297 (1878).

307. **Courtiller, A.** Éponges fossiles des sables du terrain crétacé supérieur des environs de Saumur [étage sénonien de d'Orbigny]. Angers (1862).

308. ——. Éponges fossiles des sables du terrain crétacé supérieur des environs de Saumur (étage sénonien de d'Orbigny). *Extr. des Annales de la Soc. Linnéenne de Maine-et-Loire*, vol. iv. (1868).

309. ——. Éponges fossiles des sables du terrain crétacé supérieur des environs de Saumur (étage sénonien de d'Orbigny) suivies des nullipores à squelette silicieux de l'étage sénonien. 2e édition, revue et augmentée. Paris (1874).

310. **Croockewit, J. H.** Zamenskelling van Spons. Scheik. Onderzoek. Labor. Vol. ii. p. 1. Utrecht (1843).

311. **Cubitt, A.** *Dorvillia agariciformis. Monthl. Micr. J.* vol. v. (1873).

312. **Cunningham, R. O.** On Sponges. *P. Belf. Soc.* 1878–80, pp. 208–209 (1880).

313. **Cunnington, W.** On a peculiarity in the structure of one of the fossil Sponges of the Chalk, *Choanites königi*, Mant. *Rep. Brit. Assoc.* 1848, pt. 2, p. 67 (1848).

314. **Cuvier, G. L. C. F. D.** Règne Animal. Vol. iv. (1817).

315. ——. Règne Animal. 3e édition par Milne-Edwards, Blanchard et de Quatrefages. Zoophytes. Paris (1849).

[316.] **Czerniavski, W.** The littoral Sponges of the Black and Caspian Seas. (Russ.) (Preliminary report). *Bull. Mosc.* vol. liii. pt. 2, pp. 375–397 (1878).

317. ——. Spongiæ Littorales Marium Pontici et Caspii. *Bull. Mosc.* vol. liv. pt. 2, pp. 88–128 (1879).

318. ——. Spongiæ Littorales Marium Pontici et Caspii. *Bull. Mosc.* vol. liv. pt. 2, pp. 228–320 (1879).

319. **Dames.** Ueber Spongien von Gotland. Bd. 1874, p. 613 (1874).

320. **D'Archiac, Le V.** Descriptions des fossiles recueillis par M. Thorent, dans les couches à Nummulines des environs de Bayonne. *Mém. Soc. Géol. France*, sér. 2, tom. ii. (1846).

321. **Davey, E. C.** The Sponge-Gravel beds at Coxwell, near Farringdon. *Tr. Newbury District Field Club*, vol. ii. (1874).

[322.] ——. The Sponge-Gravel beds at Coxwell, near Farringdon. (Abstr.) *Geol. Mag.* vol. i. p. 228 (1874).

323. **Dawson, George M.** On some Canadian Species of *Spongilla*. *Can. Nat.* n. s. vol. viii. pp. 1–5 (1878).

324. **Dawson, J. W.** Note on the structure of a specimen of *Uphantænia* from the Collection of the American Museum of Natural History. *Am. J. Sci.* vol. xxii. pp. 132–133 (1881).

325. ——. Note on the structure of a specimen of *Uphantænia* from the Collection of the American Museum of Natural History. *Ann. M. N. H.* ser. 5, vol. viii. pp. 237–238 (1881).

326. **Defrance.** Verticillistes. *Dictionnaire Sci. Nat.* tom. lviii. (1829).

327. **Dendy** and **Ridley** (*see also* Ridley and Dendy). On *Protolcia sollasi*, a new genus and species of Monaxonid Sponges allied to *Polymastia*. *Ann. M. N. H.* ser. 5, vol. xviii. pp. 152–159 (1886).

[328.] ——. New Monaxonid Sponge (*Protoleia sollasii*). (Abstr.) *J. R. Micr. Soc.* vol. vi. p. 1001 (1886).

329. **Desor, E.** Two new Sponges (*Spongia arceolata* and *sulphurea*). *P. Bost. Soc.* vol. iii. p. 67 (1848).

330. **Dewalque, G.** Un spongiaire nouveau du système Eifelien (*Astræospongium meniscoides*). *Bull. Acad. Belg.* sér. 2, vol. xxxiv. pp. 23–26 (1872).

331. **Dewalque, G.** Prodromus d'une description géologique de la Belgique. Sec. éd. conf. à la prém. Bruxelles (1880).

332. **Dezallier d'Argenville, A.** Oryctologie. Paris (1755).

333. **Dezsö, Béla.** Die Histologie und Sprossenentwickelung der Tethyen, besonders der *Tethya lyncurium*, Lbk. *Arch. mikr. Anat.* Bd. xvi. pp. 626–651 (1878).

334. ——. Die Histologie und Sprossenentwickelung der Tethyen, besonders der *Tethya lyncurium*, Lbk. *Arch. mikr. Anat.* Bd. xvii. pp. 151–164 (1879).

335. ——. A Magyar tengerpart Szivacsfaunája. I. Koslemeny, Ectezczesck a Természettudomayok, Köv. x. Kot. xiii. Szam, 1880.

336. **Dioscorides, P.** Περὶ ὕλης ἰατρικῆς. Liber v. cap. 135, 137, 162.

337. **Dixon, T.** The Geology and Fossils of the Cretaceous Formation of Sussex. (1850.)

338. **Dobie, W. M.** Note on the observation of Cilia in *Grantia*. *P. Mcd. Soc. Edinburgh*, 1852, pp. 127–129 (1852).

339. ——. Note on the observation of Cilia in *Grantia*. *Ann. M. N. H.* ser. 2, vol. x. p. 317 (1852).

340. ——. Second Notice on the observation of Cilia in *Grantia*. *Ann. Anat. and Physiol.* (Goodsir), 1852, No. 2, p. 129 (1852).

341. **Döderlein, L.** Studien an japanischen Lithistiden. *Z. wiss. Zool.* Bd. xl. pp. 62–104 (1884).

342. ——. Ueber Lithistiden aus Japan. *Ber. Vers. Nat.* pp. 110–112 (1884).

343. ——. Faunistische Studien in Japan, Enoshima, und die Sagami-Bai. *Arch. f. Nat.* (2) xlix. p. 102 (1884).

344. **Donati, V.** Della storia naturale marina dell' Adriatico. *Venezia* (1750).

345. **D'Orbigny, A.** Prodrôme de Paléontologie stratigraphique universelle des animaux mollusques et rayonnés. (1849–1850.) Compare Orbigny, no. 1121–1123.

346. ——. Cours élémentaire de Paléontologie et de Géologie stratigraphique. (1849–1852.) Compare Orbigny, no. 1124–1126.

347. **Duchassaing, P.,** et **G. Michelotti.** Spongiaires de la Mer Caraïbe. Haarlem (1864).

348. ——. Revue des Zoophytes et des Spongiaires des Antilles. Paris (1870).

349. **Dufour, T.** Notice sur un champignon parasit des Éponges. *Bull. Soc. Vaudoise Sc. Nat.* vol. xviii. p. 144 (1882).

350. **Dujardin, F.** Observations sur les Éponges et en particulier sur la Spongille ou Éponge d'eau douce. *Ann. Sci. Nat.* sér. 2, tom. x. pp. 5–13 (1838).

351. ——. Observations sur les Éponges. *C. R.* tom. vi. p. 676 (1838).

352. ——. Observations sur les Éponges. *L'Institut*, tom. vi. no. 229, p. 157 (1838).

[353.] ——. Observations sur les Éponges. *Soc. Philom. Extr. Proc.-verb.* p. 81 (1838).

354. ——. Histoire naturelle des Zoophytes Infusoires, pp. 305, 306. Paris (1841–1842).

355. **Duncan, P. Martin.** On some Spheroidal Lithistid Spongida from the Upper Silurian Formation of New Brunswick. *Ann. M. N. H* ser. 5, vol. iv. pp. 84–92 (1879).

356. ——. On a Parasitic Sponge of the Order Calcarea (*Möbiusispongia parasitica*). *J. R. Micr. Soc.* vol. iii. pp. 377–383 (1880).

357. ——. On some Remarkable Enlargements of the Axial Canals of Sponge-Spicules, and their Causes. *J. R. Micr. Soc.* ser. 2, vol. i. pp. 557–572 (1881).

358. ——. On a Lithistid Sponge, and on a form of *Aphrocallistes* from the Deep Sea off the Coast of Spain. *J. L. S.* vol. xv. pp. 320–328 (1881).

359. ——. Descriptions of two species of *Dirrhopalum*. *J. L. S.* vol. xv. pp. 487–492 (1881).

360. ——. On a Radiolarian and some Microspongida from considerable depths in the Atlantic Ocean. *J. R. Micr. Soc.* n. s. vol. i. p. 173 (1881).

361. ——. On an Organism which penetrates and excavates Siliceous Sponge-spicules (*Spongiophagus carteri*). *Ann. M. N. H.* vol. ser. 5, viii. p. 120 (1881).

362. ——. On the Genus *Hindia* and its Species. *Ann. M. N. H.* ser. 5 vol. xviii. pp. 226–228 (1886).

363. **Dunikowsky, Emil v.** Die Spongien, Radiolarien und Foraminiferen der unterliassischen Schichten vom Schafberg bei Salzburg. *Denk. Ak. Wien*, Bd. xlv. pp. 163–194 (1882).

364. ——. Die Pharetronen aus dem Cenoman von Essen, und die systematische Stellung der Pharetronen. *Pal.* Bd. xxix. pp. 281–324 (1883).

365. **D'Urban.** The Zoology of the Barents-Sea. *Ann. M. N. H.* ser. 5, vol. vi. pp. 253–276 (1880). Compare Carter and D'Urban, no. 222.

366. **Dutour, E. F.** Observations sur une éponge de mer. *Mém. Acad. Sci. Paris* for 1766, p. 39 (1769).

367. **Dutrochet, R. J. H.** Observations sur la *Spongilla ramosa*, Lam. (*Ephydatia lacustris*). *Ann. Sci. Nat.* tom. xv. pp. 205–218 (1828).

368. ——. Observation sur la *Spongilla ramosa*, Lam. (*Ephydatia lacustris*). *Féruss. Bull. Sc. Nat.* tom. xvii. p. 156 (1829).

[369.] ——. Observation sur la *Spongilla ramosa*, Lam. (*Ephydatia lacustris*). *Isis*, p. 370 (1830).

370. **Dutrochet, R. J. H.** Observations sur la *Spongilla ramosa*, Lam. Mémoires pour servir à l'histologie, anatomie et physiologie des Végétaux et des Animaux, tom. i. p. 430 (1837).

371. **Duvernoy, G. L.** Note sur une espèce d'Éponge qui se loge dans la Coquille de l'huître à pied-de-cheval (*Ostrea hippopus*, Lam.), en creusant de canaux des d'épaisser des valves de cette coquille (*Spongia terebrans*). *C. R.* tom. ix. pp. 683–686 (1840).

372. ——. Note additionelle sur les Éponges perforantes. *C. R.* tom. ix. pp. 1021–1023 (1840).

373. **Dybowsky, W.** Ueber die Spongillen der Ostseeprovinzen. *SB. Ges. Dorp.* 104te Sitzung, pp. 517–533, Nov. (1877).

374. ——. Ueber die Spongillen des Ostseeprovinzen. *Beitr. balt. Wochens.* 1878, pp. 10–12 (1878).

375. ——. Mittheilungen über Spongien. I. *Zool. Anz.* Bd. i. pp. 30–32 (1878).

376. ——. Mittheilungen über Spongien. II. *Zool. Anz.* Bd. i. pp. 53–54 (1878).

377. ——. Studien über die Spongien des russischen Reiches, mit besonderer Berücksichtigung der Spongien-Fauna des Baikal-Sees. *Mém. Ac. Pétersb.* sér. 7, tom. xxvii. No. 6 (1880).

378. ——. Einige Bemerkungen über die Veränderlichkeit der Form und Gestalt von *Lubomirskia baicalensis* und über ihre Verbreitung im Allgemeinen. *Bull. Ac. Pétersb.* tom. xxvii. (1880).

379. ——. Einige Bemerkungen über die Veränderlichkeit der Form und Gestalt von *Lubomirskia variabilis* und über die Verbreitung der Baikal-Schwämme im Allgemeinen. *Mél. Biol. Pétersb.* vol. ix. pp. 41–47 (1881).

380. ——. Studien über die Süsswasser-Schwämme des russischen Reiches. *Mém. Acad. Pétersb.* sér. 7, tom. xxx. part 10 (1882).

[381.] ——. Studien über die Süsswasser-Schwämme des russischen Reiches. (Abstr.) *J. R. Micr. Soc.* ser. 2, vol. iii. pp. 378–379 (1883).

382. ——. Ein Beitrag zur Kenntniss des Süsswasser-Schwammes *Dosilia stepanowii*. *Zool. Anz.* Bd. vii. pp. 476–480 (1884).

[383.] ——. Some remarks upon the variability in form of *Lubomirskia baicalensis*, and upon the Distribution of the Baical Sponges in general. (Transl.) With PS. by H. J. Carter. *Ann. M. N. H.* ser. 5, vol. xiv. pp. 29–34 (1884).

[384.] ——. Notes on the South-Russian *Spongillidæ*. (Transl.) *Ann. M. N. H.* ser. 5, vol. xiv. p. 58 (1884).

[385.] ——. Contribution to the Knowledge of the Freshwater Sponge *Dosilia stepanowii*. (Transl.) *Ann. M. N. H.* ser. 5, vol. xiv. pp. 60–63 (1884).

[386.] ——. Contribution to the Knowledge of the Freshwater Sponge *Lo-silia stepanowii*. (Transl.) *Ann. M. N. H.* ser. 5, vol. xiv. pp. 249–254 (1884).

387. ——. (On a collection of Sponges from the Sea of Ochotsk.) *Wszechswiat*, tom. iii. 1884, p. 175.

388. ——. Notiz über die aus Süd-Russland stammenden Spongillen. *SB. Ges. Dorp.* Bd. vii. pp. 507–515 (1884).

389. ——. Samjetka o bodjagasch juschnoi Rossii. *Arb. Nat. Ges. Univ. Chorkow*, Bd. xvii. p. 289 (1884).

390. ——. Mittheilungen über einen neuen Fundort des Schwammes *Lulo-mirskia baicalensis*. *SB. Ges. Dorp.* Bd. vii. p. 44 (1885).

391. ——. Monographie der *Spongilla sibirica*. *SB. Ges. Dorp.* Bd. vii. pp. 64–75 (1885).

392. **Dybowsky, W.** Monographie der *Spongilla sibirica*. *SB. Ges. Dorp.* Bd. vii. pp. 137–139 (1885).

393. ——. Mittheilungen über die aus dem Flusse Niemen Stammende *Trochospongilla erinaceus*. *SB. Ges. Dorp.* Bd. vii. pp. 295–298 (1886).

394. **Eck, H.** Ueber die Formationen des bunten Sandsteins und des Muschelkalks in Oberschlesien und ihre Versteinerungen. (1865.)

395. **Eckhel, Geo. v.** Der Badeschwamm in Rücksicht auf die Art seiner Gewinnung, die geographische Verbreitung und locale Variation. Triest (1873).

[396.] ——. Le spugne da bagno in riguardo al modo di raccoglierle e alla loro propagazione geografica e varietà locale. (Transl.) Trieste (1874).

397. ——. Nuove communicazioni sopra le Spugne. *Bull. Soc. Adriat.* p. 100 (1875).

398. **Ehlers, E.** Die Esper'schen Spongien in den zoologischen Sammlungen d. k. Universität. Univ. Progr. Erlangen (1870).

399. ——. *Aulorhipis elegans*, eine neue Spongienform. *Z. wiss. Zool.* Bd. xxi. pp. 540–567 (1871).

400. ——. *Aulorhipis elegans*. *SB. Soc. Erlang.* Bd. iii. (1871).

401. ——. *Aulorhipis elegans*, a new form of Sponge, with notes on a few points on the Organization of Sponges. *Ann. M. N. H.* ser. 5, vol. vii. pp. 302–303 (1881).

402. **Ehrenberg, C. G.** Ueber die geformten unkristallinischen Kieseltheile von Pflanzen, besonders über *Spongilla erinaceus*. *SB. Ak. Berlin*, 1846 p. 96 (1846).

403. ——. Ueber eine neue einflussreiche Anwendung des polarisierten Lichtes. *SB. Ak. Berlin*, 1848, p. 238 (1848).

404. ——. Ueber eine neue einflussreiche Anwendung des polarisierten Lichtes. *SB. Ak. Berlin*, 1848, p. 473.

405. ——. Weitere Mittheilungen über Anwendung chromatischen, polarisierten Lichtes. *SB. Ak. Berlin*, 1849, p. 55 (1849).

406. ——. Mikrogeologie. Leipzig (1854).

407. ——. Mikrogeologie. Fortsetzung. Lieferung 1. Leipzig (1856).

408. ——. Beitrag zur Beurtheilung der Gattung *Hyalonema* etc. *MB. Ak. Berl.* 1860, p. 173 (1860).

409. ——. Ueber die neueren die japanische Glaspflanze als *Spongia* betreffenden Ansichten, und Erläuterungen der Synonyme zu Hrn. Bowerbank's Spongolithen-Tabellen. *MB. Ak. Berl.* 1861, pp. 448–452 (1862).

410. ——. Ueber die nicht natürliche Gestaltung der Glaspflanze, *Hyalonema sieboldii*, Gray. *SB. Ak. Berlin*, 1863, pp. 300–305 (1863).

411. ——. Ueber *Hyalonema lusitanicum*. *MB. Ak. Berl.* 1866, pp. 823–837 (1866).

412. ——. Ueber *Hyalonema lusitanicum*. *MB. Ak. Berl.* 1867, pp. 300–307 (1867).

413. ——. Ueber *Hyalonema lusitanicum*. *MB. Ak. Berl.* 1867, pp. 310–317 (1867).

414. ——. Weitere Entwickelung des *Hyalonema lusitanicum* und der Spongiaceen. *MB. Ak. Berl.* 1867, pp. 843–857 (1867).

415. ——. On *Hyalonema lusitanicum*, and on the Animal or Vegetable Nature of Sponges. *Ann. M. N. H.* ser. 3, vol. xix. pp. 419–427 (1867).

416. ——. Mikrogeologische Studien. *Abh. Ak. Berl.* 1872, p. 131 (1872).

417. ——. Mikrogeologische Studien. *Abh. Ak. Berl.* 1875, p. 1 (1875).

418. **Eichwald, E. de.** Lethæa Rossica. Vol. i. (1860).

419. **Eimer, T.** Nesselzellen und Saamen bei Seeschwämmen. *Arch. mikr. Anat.* Bd. vii. pp. 281–284 (1872).

[420.] ——. Thread-cells and Spermatozoa in Marine Sponges. (Abstr.) *Ann. M. N. H.* ser. 4, vol. x. pp. 306–309 (1872).

421. ——. Sur cellules utricules et Spermatozoa dans les Éponges marines. *Arch. Sci. Nat.* tom. x. (xliv.) p. 350 (1872).

422. ——. Untersuchungen an Seeschwämmen. *Z. ges. Naturw.* Bd. vi. pp. 202–205 (1872).

423. **Ellis, John.** Essay towards a Natural History of the Corallines and other Marine Productions of a like kind, commonly found on the Coasts of Great Britain and Ireland. P. 78. (1755.)

424. ——. On the Nature and Formation of Sponges. *Phil. Tr.* vol. lv. p. 280 (1765).

425. ——, and **Solander.** Natural History of many curious and uncommon Zoophytes, collected from various parts of the Globe. (1786.)

[426.] ——. On the Nature and Formation of Sponges. (Abstr.) *Zool. Journ.* vol. i. 1824, p. 285 (1825).

427. **Esper, E. J. C.** Oryctographiæ Erlangensis specimina quædam, imprimis Spongiarum petrificatarum. *Nova Acta Natur. Curios.* vol. viii. pp. 194–204 (1791).

428. ——. Die Pflanzenthiere. Theil II. Nürnberg (1791–1794).

429. ——. Fortsetzung der Pflanzenthiere. Theil I. Nürnberg (1794–1797).

430. ——. Fortsetzung der Pflanzenthiere. Theil II. Nürnberg (1798–1806).

431. ——. Die Pflanzenthiere. Theil III. Nürnberg (1805–1830).

432. **Etallon, A.** Études Paléontologiques sur le Haut-Jura. *Mém. Soc. Juras. d'émul. Départ. du Doubs* (1858).

433. ——. Sur la Classification des Spongiaires du Haut-Jura, et leur distribution dans les étages. *Actes Soc. Juras. d'émul. Porrentruy* (1860).

434. ——, et **Thurmann, J.** Lethea bruntruthana. *Neue Denkschriften der schweizerischen Gesell.* Bd. xix. (1862).

435. ——, ——. Lethea bruntruthana. *Neue Denkschriften der schweizerischen Gesell.* Bd. xx. p. 357 (1863).

436. **Etheridge, R., Jun.** Further localities for *Acanthospongia Smithii*. *Geol. Mag.* dec. 2, vol. iii. p. 576 (1876).

437. ——. Palæontological Notes. (*Hyalonema*, &c.) *Geol. Mag.* dec. 2, vol. v. pp. 117–119 (1878).

438. ——, and **H. A. Nicholson.** On the Genus *Palæacis*, and the Species occurring in British Carboniferous Rocks (Sponge?). *Ann. M. N. H.* ser. 5, vol. i. pp. 206–227 (1878).

439. **Ewald.** Ueber ein neues *Cæloptychium* aus der obern Senonen Kreide von Halden in Westphalen. *SB. nat. Fr.* p. 38 (1873).

440. **Faber, G. L.** Sponge Fisheries of the Adriatic, in 'The Fisheries of the Adriatic.' London, 1883, p. 96 (1883).

441. **Fabricius, O.** Fauna Grœnlandica. Hafniæ et Lipsiæ (1780).

442. **Ferry, de.** Note sur les Crustacées et les Spongitaires de la base de l'étage Bathonien des environs de Maçon. *Bull. Soc. Linn. Normandie* (*Caen*), tom. ix. pp. 365–375 (1866).

443. **Fisher, O.** On the Phosphatic Nodules of the Cretaceous Rocks of Cambridgeshire (*Porospongia*). *Phil. Mag.* vol. xliv. p. 543 (1872).

444. ——. On the Phosphatic Nodules of the Cretaceous Rocks of Cambridgeshire (*Porospongia*). *J. G. Soc.* vol. xxix. pp. 52–63 (1873).

445. **Fischer, P.** Recherches sur les éponges perforantes fossiles (*Cliona*). *Arch. nouv. Mus.* vol. iv. pp. 117–170 (1868).

446. **Fischer, P.** Sur la présence, dans les mers actuels, d'un type de Sarcodaires des terrains secondaires (*Dendrina*). *J. de Zool.* tom. iv. pp. 530–533 (1875).

447. ——. Sur la présence, dans les mers actuel, d'un type de Sarcodaires des terrains secondaires (*Dendrina*). *C. R.* tom. lxxxi. pp. 1131–1133 (1875).

448. **Fischer Waldheim, G. de.** Oryctographie du Gouvernement de Moscou, p. 178. (1873.)

449. ——. Observations sur le genre de Polypier *Cœloptychium* de Goldfuss. *Bull. Mosc.* tom. xvii. p. 276 (1844).

450. **Fitton, W. H.** On some of the strata between the Chalk and the Oxford Oolite. *Tr. Geol. Soc.* vol. iv. p. 103 (1836).

451. **Fleming, T.** Philosophy of Zoology. Vol. ii. Edinburgh (1822).

452. ——. History of British Animals. Edinburgh (1828).

453. **Flemming, W.** Ueber *Ianthella*, Gray. *Verh. phys.-med. Gesell. Würzb.* n. s. vol. ii. p. 1 (1871).

[454.] ——. Ueber *Ianthella*, Gray. (Ausz.) *Z. ges. Naturw.* vol. iv. p. 206 (1871).

455. **Forel, F. A.** Matériaux pour servir à l'étude de la faune profonde du Lac Leman. (*Spongilla lacustris*, p. 204.) Geneva (1876).

456. **František, P.** Dodatky ku faune ceskych hub Sladkovodnich. [Contribution to the Bohemian freshwater Sponge-fauna.] *SB. böhm. Ges.* 1886, p. 147. (In Bohemian, with German *résumé*.) (1886.)

[457.] ——. Sponges of Bohemia. (Abstr.) *J. R. Micr. Soc.* ser. 2, vol. vi. p. 629 (1886).

458. **Franzius, W.** Historia animalium ..... Opera Cypriani. Lipsiæ et Francofurti (1688).

459. **Freistedt, R.** Om en fossil Spongia. *Œfv. Vet.-Ak. Förh.* xli. p. 55 (1884).

460. ——. Bidrag till konnedamer am de vid Sveriges nestra kust befvande Spongiæ. *Bih. Sv. Ak. Handl.* vol. xxi. no. 9, pp. 1–56 (1885).

461. **Fromentel, E. de.** Introduction à l'étude des éponges fossiles. *Mém. Soc. Linnéene Normandie*, tom. xi. p. 1 (1860).

462. ——. Catalogue raisonné des Spongitaires de l'étage Néocomien. *Bull. Soc. de Sci. de l'Yonne*, vol. xiv. p. 355 (1861).

463. ——. Polypiers Corallines des environs de Gray. *Mém. Soc. Linnéene Normandie*, vol. xiv. (1864).

464. **Fuchs, Th.** Welche Ablagerungen haben wir als Tiefseebildungen zu betrachten? *Jahrb. Mineral.* 1882, p. 487 (1883).

465. **Fullagar, J.** Note on the Development of *Spongilla*. *Monthl. Micr. J.* vol. xviii. p. 45 (1877).

466. ——. Note on the Development of the Spicules of *Spongilla fluviatilis*. *Sci. Gos.* (1877).

467. ——. On Freshwater Sponges. *Sci. Gos.* vol. xvi. p. 3 (1880).

468. ——. On Freshwater Sponges. *Sci. Gos.* vol. xvi. p. 11 (1880).

469. ——. On Freshwater Sponges. *Sci. Gos.* vol. xvi. p. 64 (1880).

470. ——. The Freshwater Sponge. *Sci. Gos.* No. 181, pp. 3–5 (1882).

471. ——. Development of Freshwater Sponges. *Sci. Gos.* No. 185, pp. 111–112 (1882).

472. **Funck, N.** Notice sur l'*Euplectella aspergillum*, R. Owen. *Ann. Soc. Mal. Belg.* vol. iii. pp. 12–14 (1868).

473. ——. Sur l'*Euplectella*. Publications de l'*Institut Royale de Luxembourg, Section des Sciences Naturelles et Mathématiques*, tom. x. p. 266 (1871).

474. **Ganin, M.** Zur Entwickelung der *Spongilla fluviatilis*. *Zool. Anz.* tom. i. pp. 195–199 (1878).

475. ——. Contributions to our knowledge of the Structure and Development of Sponges. (Russian.) Warsaw (1879).

476. **Geddes, P.** On the Nature and Function of the "Yellow-Cells" of Radiolarians and Cœlenterates. *P. R. Soc. Edinburgh*, pp. 378–396 (1882).

[477.] ——. On the Nature and Function of the "Yellow-Cells" of Radiolarians and Cœlenterates. (Abstr.) *Amer. J. Sc.* vol. xxiii. pp. 328–329 (1882).

[478.] ——. Sur la Nature et Fonction des Cellules jaunes des Radiolaires et Cœlenterates. (Extr.) *Arch. Z. Expér.* vol. x. p. 28 (1882).

[479.] ——. On the Nature and Function of the "Yellow-Cells" of Radiolarians and Cœlenterates. (Abstr.) *J. R. Micr. Soc.* vol. ii. p. 244 (1882).

[480.] ——. Ueber die gelben Zellen der Radiolarien und Cœlenteraten. (Auszug.) *Naturf.* Bd. xv. p. 94 (1882).

481. **Geinitz, H. B.** Die Versteinerungen von Kieslingswalda. 1843.

482. ——. Zwei Arten von *Spongillopsis*; *S. dyadica, S. carbonica*. *Neues Jahrb. Mineral. Geol.* 1864, pp. 517–519 (1864).

483. ——. Ueber fossile Seeschwämme. *SB. Dresden*, pp. 88–90 (1871).

484. ——. Das Elbthalgebirge in Sachsen. 1 Theil. i. Die Seeschwämme des unteren Quaders. *Pal.* Bd. xx. p. 1 (1871).

485. ——. Das Elbthalgebirge in Sachsen. 2 Theil. i. Seeschwämme des mittleren und oberen Quaders. *Pal.* (1872).

486. **Geoffroy, C. J.** Analyse chimicale de l'éponge de la moyenne espèce. *Hist. et Mém. Acad. Paris*, 1706, p. 507 (1707).

487. **Gerarde, J.** The Herball. Ed. 2 by J. Johnson. London (1633).

488 **Gervais, P.** Lettre sur les Éponges d'eau douce. *C. R.* 1835, pp. 260–262 (1835).

489. ——. Sur les Éponges d'eau douce. *L'Institut*, iii. no. 129, p. 396 (1835).

490. ——. Neue Untersuchungen über die Spongillen. *Fror. Notizen*, Bd. xlvii. pp. 55–56 (1835).

491. **Gesner, C.** Historia Animalium. Lib. IV. Tiguri (1558).

492. ——. Icones animalium aquatiliuu. Tiguri (1560).

493. **Giard, M.** Sur le rapport des Éponges à des Anthozoa. *Arch. z. Expér.* tom. i. pp. iv–v.

494. ——. Sur la Nature des Éponges. *Arch. z. Expér.* tom. i. pp. lxv–lxvii.

495. ——. Deux ennemis de l'ostreiculture. *Bull. Scient.* tom. iv. no. 2, p. 70 (1881).

496. **Gibson, R. J. Harvey.** On a new Species of *Sycandra* [*aspera*]. First Report upon the Fauna of Liverpool Bay, pp. 364–367. London (1886).

497. **Giebel.** Referat über Flemmings "*Ianthella*." *Z. ges. Naturw.* n. F. Bd. iv. p. 380 (1871).

498. **Ginanni, G.** Opere postume. Venezia. Tom. I. (1755.)

499. **Godet, P.** Sur une éponge des îles Philippines (*Euplectella aspergillum*). *Bull. Soc. Sci. Neuchâtel*, tom. ix. pp. 178–182 (1873).

500. **Goette, A.** Ueber die Entwicklung der Spongillen. *Zool. Anz.* Bd. vii. p. 676 (1884).

501. ——. Ueber die Entwicklung der Spongillen. *Zool. Anz.* Bd. vii. p. 703 (1884).

502. ——. Ueber die Entwicklung der Spongillen. *Zool. Anz.* Bd. viii. pp. 377–380 (1885).

[503.] ——. On the Development of the Spongillæ. (Transl.) *Ann. M. N. H.* ser. 5, vol. xv. pp. 73–75 (1885).

[504.] **Goette, A.** Development of *Spongilla*. (Abstr.) *J. R. Micr. Soc.* vol. v. p. 254–255 (1885).

[505.] ——. Development of *Spongilla*. (Abstr.) *J. R. Micr. Soc.* ser. 2, vol. v. p. 817 (1885).

506. ——. Nachträgliche Bemerkungen zur Entwicklungsgeschichte der Schwämme. *Zool. Anz.* Bd. ix. p. 292 (1886).

507. ——. Untersuchungen zur Entwicklungsgeschichte von *Spongilla fluviatilis*. *Untersuch. z. Entwicklungsgeschichte der Thiere*. 3 Hft. (1886.)

[508.] ——. Relationship of Sponges. (Abstr.) *J. R. Micr. Soc.* vol. vi. pp. 809–810 (1886).

509. **Goldfuss, G. A.** Petrefacta Germanica. Unter Mitwirkung des Grafen Georg zu Münster. Bd. I. Heft 1. Düsseldorf (1826).

510. ——. Petrefacta Germanica. Unter Mitwirkung des Grafen Georg zu Münster. Bd. I. Heft 2. Düsseldorf (1829).

511. ——. Petrefacta Germanica. Unter Mitwirkung des Grafen Georg zu Münster. Bd. I. Heft 3. Düsseldorf (1831).

512. ——. Petrefacta Germanica. Unter Mitwirkung des Grafen Georg zu Münster. Bd. I. Heft 4. Düsseldorf (1833).

513. ——. Petrefacta Germanica. Unter Mitwirkung des Grafen Georg zu Münster. 2 Auflage. Leipzig (1862).

514. **Gosse, P. H.** Naturalist's Rambles on the Devonshire Coast, pp. 234–239 (1853).

515. ——. Manual of British Marine Zoology, pp. 1–6 (1855).

516. **Graeffe, Ed.** Uebersicht der Seethierfauna des Golfes von Triest, nebst Notizen über Vorkommen, Lebensweise, Erscheinungs- und Fortpflanzungszeit der einzelnen Arten. II. Cœlenteraten: Spongiariæ. *Arb. z. Inst. Wien*, Bd. iv. pp. 313–321 (1882).

[517.] ——. The Marine Fauna of the Gulf of Triest. (Abstr.) *J. R. Micr. Soc.* vol. ii. p. 350 (1883).

518. **Grant, R. E.** Observations and Experiments on the Structure and Function of the Sponge. *Edinb. Phil. Journ.* vol. xiii. p. 94 (1825).

519. ——. Observations and Experiments on the Structure and Function of the Sponge. *Edinb. Phil. Journ.* vol. xiii. p. 343 (1825).

520. ——. Observations and Experiments on the Structure and Function of the Sponge. *Edinb. Phil. Journ.* vol. xiv. p. 113 (1826).

521. ——. On the Structure and Nature of *Spongilla friabilis*. *Edinb. Phil. Journ.* vol. xiv. p. 183 (1826).

522. ——. On the Structure and Nature of *Spongilla friabilis*. *Edinb. Phil. Journ.* vol. xiv. p. 270 (1826).

523. ——. Observations and Experiments on the Structure and Function of the Sponge. *Edinb. Phil. Journ.* vol. xiv. p. 336 (1826).

524. ——. Notice of a new Zoophyte from the Frith of Forth. *Edinb. New Phil. Journ.* vol. i. p. 78 (1826).

525. ——. Observations on the Spontaneous Motion of the Ova of . . . . . *Spongia panicea, papillaris, cristata, tomentosa*. *Edinb. New Phil. Journ.* vol. i. p. 150 (1826).

526. ——. Remarks on the Structure of some Calcareous Sponges. *Edinb. New Phil. Journ.* vol. i. p. 166 (1826).

527. ——. Observations on the Structure of some Siliceous Sponges. *Edinb. New Phil. Journ.* vol. i. p. 341 (1826).

[528.] ——. Sur l'organization et les fonctions de l'Éponges. *Féruss. Bull. Sc. Nat.* tom. ix. p. 376 (1826).

[529.] ——. Note sur le *Clione celata*, nouveau genre de Zoophyte trouvé dans le Firth du Forth près d'Edinbourgh. *Ann. Sci. Nat.* tom. x. p. 162 (1827).

[530.] **Grant, R. E.** Sur la Structure de quelques Éponges à axes calcaires. *Féruss. Bull. Sc. Nat.* tom. xii. p. 187 (1827).

[531.] ——. De la Structure et de la Nature de la *Spongilla friabilis*. *Féruss. Bull. Sc. Nat.* tom. xii. p. 189 (1827).

532. ——. Observations and Experiments on the Structure and Functions of the Sponge. *Edinb. New Phil. Journ.* vol. ii. p. 121 (1827).

533. ——. Notice of two new species of British Sponges (*Spongia sanguinea* and *Spongia cinerea*). *Edinburgh New Phil. Journ.* vol. ii. p. 203 (1827).

[534.] —— Observations et Expériments sur la Structure et les Fonctions des Éponges. *Ann. Sc. Nat.* tom. xi. p. 150 (1827).

[535.] ——. Note sur le *Clione celata*, nouveau genre de Zoophyte, trouvé dans le Firth du Forth près d'Edinbourgh. *Féruss. Bull. Sc. Nat.* tom. xiii. p. 263 (1828).

[536.] ——. Ueber die Struktur and Funktionen der Schwämme. *Isis*, p. 1236 (1832).

[537.] ——. Ueber *Clione celata*. *Isis*, p. 918 (1834).

538. ——. Outlines of Comparative Anatomy. London (1835–1841).

539. ——. Tabular view of the Primary Divisions of the Animal Kingdom. London (1861).

540. **Grave,** —. Sur le tissu sarcodique de l'éponge. *C. R.* tom. lxiii. pp. 54–55 (1866).

541. ——. Sur le tissu sarcodique de l'éponge. *Ann. Sci. Nat.* tom. vi. p. 50 (1866).

542. **Gray, J. E.** On the Situation and Rank of Sponges in the Scale of Nature and on their internal structure. *Zool. Journ.* vol. i. p. 46 (1824).

543. ——. On the Chemical Composition of Sponges. *Ann. of Philos.* n. s. vol. ix. p. 431 (1825).

544. ——. On the Coral known as the Glass-Plant. *P. Z. S.* 1835, p. 63 (1835).

545. ——. List of the Specimens of British Animals. Brit. Mus. Part 2. Sponges. London (1848).

546. ——. On the Genus *Hyalonema*. *Ann. M. N. H.* ser. 2, vol. vi. p. 307 (1850).

547. ——. Description of *Aphroceras*, a new Genus of Calcareous Spongiadæ from Hongkong. *P. Z. S.* 1858, p. 113 (1858).

548. ——. On *Aphrocallistes*, a new Genus of Spongiadæ from Malacca. *P. Z. S.* 1858, pp. 114, 115 (1858).

549. ——. Description of *Aphroceras*, a new Genus of Calcareous Spongiadæ from Hongkong. *Ann. M. N. H.* ser. 3, vol. ii. p. 83 (1858).

550. ——. On *Aphrocallistes*, a new Genus of Spongiadæ from Malacca. *Ann. M. N. H.* ser. 3, vol. ii. p. 224 (1858).

551. ——. Description of a new Genus of Sponge (*Xenospongia*) from Torres Straits. *P. Z. S.* 1858, pp. 229–230 (1858).

552. ——. Description of a new Genus of Sponge (*Xenospongia*) from Torres Straits. *Ann. M. N. H.* ser. 3, vol. ii. p. 369 (1858).

553. ——. Description of *MacAndrewia* and *Myliusia*, two new forms of Sponges. *P. Z. S.* 1859, pp. 357–361.

554. ——. Description of *MacAndrewia* and *Myliusia*, two new forms of Sponges. *Ann. M. N. H.* ser. 3, vol. v. p. 495 (1860).

555. ——. Notes on *Pustularia rosea*, Gray, and *Hyalonema*. *Ann. M. N. H.* ser. 3, vol. xiii. p. 111 (1864).

556. ——. Note on the Glassrope, *Hyalonema sieboldii*. *Ann. N. M. H.* ser. 3, vol. xviii. pp. 287-296 (1866).

557. ——. Notes on Dr. Bowerbank's Paper on *Hyalonema*. *Ann. M. N. H.* ser. 3, vol. xviii. pp. 485–487 (1866).

558. **Gray, J. E.** Venus's Flower-basket (*Euplectella speciosa*). *Ann. M. N. H.* ser. 3, vol. xviii. pp. 487–490 (1866).

559. ——. Venus's Flower-basket (*Euplectella*). *Pop. Sci. Review*, vol. vi. pp. 239–247 (1867).

560. ——. Further observations on Venus's Flower-basket (*Euplectella speciosa*). *Ann. M. N. H.* ser. 3, vol. xix. pp. 44–45 (1867).

561. ——. Additional Notes on *Euplectella speciosa*. *Ann. M. N. H.* ser. 3, vol. xix. pp. 138–140 (1867).

562. ——. Notes on *Hyalonema lusitanicum*, and on the Genus in general. *P. Z. S.* 1867, pp. 117–125 (1867).

563. ——. On *Placospongia*, a new Generic Form of Spongiadæ in the British Museum. *P. Z. S.* 1867, pp. 127–129 (1867).

564. ——. Notes on the Arrangement of Sponges, with the Description of some new Genera. *P. Z. S.* 1867, pp. 492–558 (1867).

565. ——. Observations on Dr. Bowerbank's Paper on *Hyalonema lusitanicum*. *P. Z. S.* 1867, pp. 1001–1003 (1867).

566. ——. On Dr. Bowerbank's "Observations on Dr. Gray's 'Notes on the Arrangement of Sponges, &c.'" *P. Z. S.* 1868, pp. 532–533 (1868).

567. ——. Note on *Theonella*, a new Genus of Coralloid Sponges from Formosa. *P. Z. S.* 1868, pp. 565–566 (1868).

568. ——. Notes on the Ceratellidæ, a family of Keratose Sponges. *P. Z. S.* 1868, pp. 575–579 (1868).

569. ——. Note on *Xylospongia cookii*, a new Genus of Palmated Sponges in the collection of the British Museum. *P. Z. S.* 1868, p. 637 (1868).

570. ——. Observations on Sponges and on their Arrangement and Nomenclature. *Ann. M. N. H.* ser. 4, vol. i. pp. 161–173 (1868).

571. ——. On the peculiar Structure and Function of the Spicules of *Hyalonema*. *Ann. M. N. H.* ser. 4, vol. i. pp. 292–295 (1868).

572. ——. Note on *Hyalonema boreale*, Lovén. *Ann. M. N. H.* ser. 4, vol. i. p. 484 (1868).

573. ——. Note on a new Japanese Coral (*Isis gregorii*), and on *Hyalonema*. *Ann. M. N. H.* ser. 4, vol. ii. p. 264 (1868).

574. ——. On a new Free Form of *Hyalonema sieboldii*, and its manner of Growth. *Ann. M. N. H.* ser. 4, vol. ii. pp. 264–276 (1868).

575. ——. On *Tetilla euplocamus* and *Hyalonema boreale*. *Ann. M. N. H.* ser. 4, vol. ii. p. 319 (1868).

576. ——. Note on *Hyalonema schultzei*, Semper. *Ann. M. N. H.* ser. 4, vol. ii. pp. 373–378 (1868).

577. ——. On the name *Alcyoncellum*. *Ann. M. N. H.* ser. 4, vol. ii. pp. 390–391 (1868).

578. ——. Note on *Ianthella*, a new genus of Keratose Sponges. *P. Z. S.* 1869, pp. 49–51 (1869).

579. ——. On the Manner of Growth of *Hyalonema*. *Ann. M. N. H.* ser. 4, vol. iii. pp. 192–196 (1869).

580. ——. Note on a new Genus of Sponge from West Australia (*Echinospongia australis*=*Axos cliftoni*). *Ann. M. N. H.* ser. 4, vol. vi. p. 272 (1870).

581. ——. Notes on Anchoring Sponges (*Pheronema*, *Holtenia*). *Ann. M. N. H.* ser. 4, vol. vi. pp. 309–312 (1870).

582. ——. Note on a new Genus of Sponge from West Australia. *Ann. M. N. H.* ser. 4, vol. vi. p. 346 (1870).

583. ——. Note on *Spongia linteiformis* and *S. lycopodium*, Esper. *Ann. M. N. H.* ser. 4, vol. viii. p. 142 (1871).

584. ——. On the Animal of the Glassrope. *Ann. M. N. H.* ser. 4, vol. ix. pp. 324–325 (1872).

585. **Gray, J. E.** Notes on the Classification of the Sponges. *Ann. M. N. H.* ser. 4, vol. ix. pp. 442–462 (1872).

586. ——. Notice of a new Netted Sponge (*Meyerella*) from the Philippines. *Ann. M. N. H.* ser. 4, vol. x. p. 76 (1872).

587. ——. List of Echinoderms collected by Robert M'Andrew, Esq., F.R.S., in the Gulf of Suez in the Red Sea. (Sponge, p. 124.) *Ann. M. N. H.* ser. 4, vol. x. pp. 115–128 (1872).

588. ——. On a new Genus of Hexaradiate and other Sponges discovered in the Philippine Islands by Dr. A. B. Meyer (*Crateromorpha*). *Ann. M. N. H.* ser. 4, vol. x. pp. 134–139 (1872).

589. ——. On the Animal of the Glassrope.—On the Name *Tethya* and its Varieties of Spelling. *Ann. M. N. H.* ser. 4, vol. x. p. 152 (1872).

590. ——. On two new Free Sponges from Singapore (*Psetalia, Labaria*). *Ann. M. N. H.* ser. 4, vol. xi. pp. 234, 235 (1873).

591. ——. Notes on the Siliceous Spicules of Sponges, and on their Division into Types. *Ann. M. N. H.* ser. 4, vol. xii. pp. 203–217 (1873).

592. ——. Natal Sponges (*Leuconia, Ciocalyptà*). *Ann. M. N. H.* ser. 4, vol. xii. p. 264 (1873).

593. ——. On the Genus *Oceanapia*, Norman (*Rhizochalina* of Oscar Schmidt). *Ann. M. N. H.* ser. 4, vol. xii. p. 266 (1873).

594. ——. Sponges from Ceylon. *Ann. M. N. H.* ser. 4, vol. xii. pp. 266, 267 (1873).

595. ——. On the Arrangement of Sponges. *Ann. M. N. H.* ser. 4, vol. xiii. pp. 284–290 (1874).

596. ——. Note on A. B. Meyer's paper on: Note on the Habitat of *Psetalia globulosa* and *Labaria hemisphærica*, Gray. *Ann. M. N. H.* ser. 4, vol. xiii. p. 188 (1874).

597. ——. On *Hyalonema cebuense*. *Ann. M. N. H.* ser. 4, vol. xvi. pp. 76–78 (1875).

598. **Gray, S. T.** Natural Arrangement of British Plants. (1821.)

599. **Greene, J. R.** Manual of the Protozoa. Pp. 30–43. (1859.)

600. **Grimm, E. O.** Kaspiiskoe more i ego fauna. Tetrad 1-ja. Trudi Aralo-Kasp. exped. (Description of some Sponges discovered during his Aral and Caspian Researches.) Pp. 80–84. (1876.)

601. ——. Kaspiiskoe more i ego fauna. Tetrad 2-ja. Trudi Aralo-Kasp. exped. (Description of some Sponges discovered during his Aral and Caspian Researches.) (1877.)

602. **Grote,** Remarks on the Spongiadæ of Cuba, and descriptions of new species. *Ann. Lyceum N. H. New Y.* vol. viii. pp. 195–207.

603. **Grube, A. E.** Ausflug nach Triest und dem Quarnero. Berlin (1861).

604. ——. Die Insel Lussin und ihre Meeresfauna. Breslau (1864).

605. ——. Mittheilungen über St. Malo und Roskoff, p. 58. Breslau (1870).

606. —— Ueber Spongien von Roscoff und St. Malo. *Abh. schles. Ges.* für 1869–1872, pp. 132–144 (1872).

607. ——. Ueber *Spongia baikalensis*. *JB. schles. Ges.* p. 36 (1873.)

608. ——. Ueber Spongien. *JB. schles. Ges.* Bd. xlvii. p. 45.

609. **Gümbel, C. W.** Spongien-Nadeln im Flysch. *Verh. geol. Reichsanst. Wien*, 1880, pp. 213–215 (1880).

610. **Guettard, J. E.** Mémoires sur quelques corps foss. *Hist. et Mém. Acad. Paris*, 1751, p. 239. (1755.)

611. ——. Nouvelle collection de Mémoires sur différentes parties de la physique de l'histoire naturelle des Sciences et des Arts. Tom. ii. Paris (1768).

612. ——. Nouvelle collection de Mémoires sur différentes parties de la physique de l'histoire naturelle des Sciences et des Arts. Tom. iii. Paris (1774).

613. **Guettard, J. E.** Nouvelle collection de Mémoires sur différentes parties de la physique de l'histoire naturelle des Sciences et des Arts. Tom. iv. Paris (1778).

614. ——. Nouvelle collection de Mémoires sur differentes parties de la physique de l'histoire naturelle des Sciences et des Arts. Tom. v. Paris (1783).

615. **Guillaume, —.** Notice sur les éponges du lac de Neuchâtel. *Bull. Soc. Sci. Nat. de Neuchâtel*, tom. vi. pp. 405–411 (1864).

616. **Gunner, J. E.** Om adskillige Söesnampe. *Nors. Vid. Selsk. Skrifter*, vol. iv. p. 74 (1768).

[617.] ——. Von verschiedenen Seeschwämmen. *Deutsche Uebersetzung, Schrift. Dronthh. Ges.* Bd. iv. p. 65 (1770).

618. **Hadlaw, H.** The *Hyalonema mirabilis*. *Tr. R. Asiatic Soc. Japan*, 1872–1873, pp. 10–19 (1874).

619. **Haeckel, E.** Die Generelle Morphologie der Organismen. Band 2. Jena (1866).

620. ——. Ueber den Organismus der Schwämme und ihre Verwandtschaft mit den Korallen. *Jen. Z. Nat.* Bd. v. pp. 207–254 (1869).

[621.] ——. On the Organization of Sponges, and their Relationship to the Corals. *Ann. M. N. H.* ser. 4, Bd. v. pp. 1–13 (1870).

[622.] ——. The Organization of Sponges and their Relation to the Corals. (Transl.) *Ann. M. N. H.* ser. 4, vol. v. pp. 107–120 (1870).

623. ——. Prodromus eines Systems der Kalkschwämme. *Jen. Z. Nat.* Bd. v. pp. 236–254 (1870).

[624.] ——. Prodromus of a System of the Calcareous Sponges. *Ann. M. N. H.* ser. 4, vol. v. pp. 176–191 (1870).

625. ——. Ueber die sexuelle Fortpflanzung und des natürliche System der Schwämme. *Jen. Z. Nat.* Bd. vi. pp. 641–651 (1871).

626. ——. Prodromus eines Systems der Kalkschwamme. *Z. ges. Naturw.* Bd. vi. pp. 507–515 (1872).

627. ——. Die Kalkschwämme. Eine Monographie. Berlin (1872). Band i. Biologie der Kalkschwämme (Calcispongien oder Grantien). (1872.)

628. ——. Die Kalkschwämme. Eine Monographie. Band ii. System der Kalkschwämme. Berlin (1872).

629. ——. Die Kalkschwämme. Eine Monographie. Band iii. Atlas. Berlin (1872).

[630.] ——. On the Affinities of Sponges. (Abstr.) *Q. J. Micr. Sc.* vol. xii. p. 409 (1872).

631. ——. Die auf der Pommeraniafahrt nach Arendal gefangenen Calcispongiæ. *Ber. Com. wiss. Unters. deutsch. Meere Kiel*, Bd. i. p. 149 (1873).

[632.] ——. On the Calcispongiæ, their Position in the Animal Kingdom, and their Relation to the Theory of Descendence. *Ann. M. N. H.* ser. 4, vol. xi. pp. 241–262 (1873).

[633.] ——. On the Calcispongiæ, their Position in the Animal Kingdom, and their Relation to the Theory of Descendence. *Ann. M. N. H.* ser. 4, vol. xi. pp. 421–431 (1873).

634. ——. Kalk- und Gallertspongien. *Die zweite Deutsche Nordpol. Fahrt*, ii. p. 434. Leipzig (1874).

635. ——. Die Gastræa-Theorie. *Jen. Z. Nat.* Band viii. p. 1 (1874).

636. ——. Die Gastrula und die Eifurchung der Thiere. *Jen. Z. Nat.* Bd. ix. p. 402 (1875).

[637.] ——. Die Gastræa-Theorie. *Biologische Studien*, ii. (1877).

[638.] ——. Die Gastrula und die Eifurchung der Thiere. *Biologische Studien*, ii. (1877).

639. **Haeckel, E.** Die Physemarien (*Haliphysema* und *Gastrophysema*), Gastræaden der Gegenwart. *Jen. Z. Nat.* Bd. xi. pp. 1–54 (1877).

[640.] ——. On *Physemaria* &c. *Nature*, vol. xiv. p. 685 (1877).

641. **Hagenow, F.** Monographie der Rügenschen Kreide-Versteinerungen. *Neues Jahrb. Mineral. Geol.* (1839–40).

642. **Hahn, O.** Die Meteoriten (Chondrite) und ihre Organismen. Tübingen (1880).

643. **Hall, J.** Observations upon the Genera *Uphantænia* and *Dictyophyton*. 16*th Annual Rep. State Cabinet Nat. Hist. New York* (1863).

644. ——. Note on the occurrence of *Astylospongia* in the Lower Helderberg Rocks. 16*th Annual Rep. State Cabinet Nat. Hist. New York*, pp. 69–70 (1863).

645. ——. Descriptions of the Fossil Reticulate Sponges constituting the Family Dictyospongidæ. *Report of the New York Scientific Museum*, 1884, pp. 465–481 (1884).

646. ——. On the Fossil Reticulate Sponges constituting the Family Dictyospongidæ. *Rep. Brit. Assoc.* 1884, pp. 725–726 (1884).

647. **Hancock, A.** On the Excavating Powers of certain Sponges belonging to the genus *Cliona*, with descriptions of several new species and an allied generic form. *Ann. M. N. H.* ser. 2, vol. iii. p. 321 (1849).

648. ——. Note on the Excavating Sponges; with descriptions of four new Species (*Cliona*). *Ann. M. N. H.* ser. 3, vol. xix. pp. 229–242 (1867).

649. ——. Notes on the Excavating Sponges; with descriptions of four new Species (*Cliona*). *Tr. Tynes. N. Club*, n. ser. vol. i. pp. 337–353 (1867).

650. **Hanow, M. C.** Erläuterungen der Merkwürdigkeiten der Natur. 1. Danzig (1737).

651. **Hansen, G. A.** Spongiada. *The Norwegian North Atlantic Expedition*, (1885).

652. **Hardwicke, T.** Description of a Zoophyte, commonly found about the Coast of Singapore Island (*Spongia patera*). *Asiatic Researches*, vol. xiv. p. 180 (1822).

[653.] ——. Sur la *Spongia patera*, Féruss. *Bull. Soc. Nat.* tom. viii. p. 165 (1826).

654. **Harting, P.** Bijdrage tot de kennis der mikroskopische fauna en flora van de Banda-Zee. *Verh. d. K. Akad. Wetensch.* vol. x. p. 1 (1865).

655. ——. Mémoire sur le genre *Poterion*. *Naturh. Verh. Utrecht*, vol. ii. p. 2 (1870).

656. **Harmer, S. F.** On a method for the Silver-staining of Marine Objects. *MT. z. Stat. Neap.* 1884, p. 445 (1884).

657. **Haswell, W. A.** On Australian Freshwater Sponges. *Proc. Linn. Soc. N. S. W.* vol. vii. pp. 208–210 (1882).

[658.] ——. On Australian Freshwater Sponges. (Abstr.) *Nature*, vol. xxvii. p. 91 (1882).

659. **Hatchett, C.** Chemical Experiments of Zoophytes. *Phil. Tr.* 1880, p. 327 (1880).

660. **Heider, A. v.** Die Gattung *Cladocora*. *SB. Ak. Wien*, Bd. lxxxiv. p. 634 (1882).

661. **Heider, K.** Zur Metamorphose der *Oscarella lobularis*. *Arb. Z. Inst. Wien*, Bd. vi. Heft 2, pp. 175–236 (1886).

[662.] ——. Metamorphoses of *Oscarella lobularis*. (Abstr.) *J. R. Micr. Soc.* vol. vi. pp. 807–809 (1886).

663. **Herklots, J. A.**, et **W. Marshall.** Notice sur deux espèces nouvelles d'éponges de la famille des Lophospongiæ (*Hyalothauma ludekingi*, *Euplectella ludekingi*). *Arch. Néerl.* (*Haarlem*), vol. iii. pp. 435–438 (1868).

664. **Hicks, H.** On the Ancient Rocks of the St. David's Promontory and their fossil contents; with descriptions of new species. *J. G. Soc.* vol. xxvii. (1871).

665. **Higgin, T.** On the Structure of the Skeleton of *Euplectella aspergillum*. *Ann. M. N. H.* ser. 4, vol. xiii. pp. 44–48 (1874).

666. ——. On two Hexactinellid Sponges from the Philippine Islands in the Liverpool Free Museum. With Remarks by H. J. Carter. *Ann. M. N. H.* ser. 4, vol. xv. pp. 377–389 (1875).

667. ——. On a new Sponge of the Genus *Luffaria*, from Yucatan, in the Liverpool Free Museum. *Ann. M. N. H.* ser. 4, vol. xvi. pp. 223–228 (1875).

668. ——. Description of some Sponges obtained during a Cruise of the Steam-yacht 'Argo' in the Caribbean and neighbouring Seas (*Higginsia*, n. gen., &c.). *Ann. M. N. H.* ser. 4, vol. xiv. pp. 291–292 (1877).

669. ——. Sponges, their anatomy, physiology, and classification. *Proc. Lit. Liverpool*, vol. xxix. p. 193 (1875).

670. ——. "*Porifera*." First Report upon the Fauna of Liverpool Bay, pp. 72–94. London (1886).

671. **Hilgendorf, F.** Ueber *Spongilla fluviatilis*, Lbk., var. *japonica*. *SB. nat. Fr.* 1882, p. 26 (1882).

672. ——. On two Freshwater Sponges (*Spongilla nitens*, Carter, and *S. böhmii*, sp. nov.) collected by Dr. R. Böhm in the River Ugalla, near Lake Tanganyika. *Ann. M. N. H.* ser. 5, vol. xii. pp. 120–123 (1883).

673. ——. Süsswasserschwämme aus Centralafrica gesammelt von Dr. R. Böhm im Ugalla Fluss beim Tanganyika-See. *SB. nat. Fr.* 1883, pp. 87–90 (1883).

674. **Hinde, George Jennings.** Fossil Sponge-spicules from the Upper Chalk, found in the interior of a single flint-stone from Horstead in Norfolk. München (1880).

675. ——. Notes on Fossil Calcispongiæ, with descriptions of new species. *Ann. M. N. H.* ser. 5, vol. x. pp. 185–206 (1882).

676. ——. Catalogue of Fossil Sponges in the Geological Department of the British Museum (Nat. Hist.); with Descriptions of new and little-known Species (1883).

677. ——. Fossil Calcisponges from the Well-boring at Richmond, Surrey. *J. G. Soc.* vol. xl. pp. 778–783 (1884).

678. ——. On the Structure and Affinities of the Family of the Receptaculites, including therein the genera *Ischadites*, Murch. (*Tetragonis*, Eichw.), *Sphærospongia*, Pengelly, *Acontactionia*, g. n., and *Receptaculites*, Defr. *J. G. Soc.* vol. xl. pp. 795–849 (1884).

679. ——. On Beds of Sponge-remains in the Lower and Upper Greensand of the South of England. *Phil. Tr.* 1885, p. 403 (1885).

680. ——. Sponge-spicules from the Deposits of St. Erth. *J. G. Soc.* vol. xlii. p. 214 (1886).

681. **Hisinger, W.** Anteckningar i physik och Geognosi. H. v. 1831. Stockholm (1831).

682. ——. Anteckningar i physik och Geognosi. H. vi. 1837. Stockholm (1837).

683. ——. Lethæa Suecica. Holmiæ (1837).

684. **Hogg, J.** Observations on *Spongilla fluviatilis*. *P. Linn. Soc.* vol. i. p. 8 (1839).

685. ——. Observations on *Spongilla fluviatilis*. *P. Linn. Soc.* vol. i. p. 36 (1839).

686. ——. Observations on *Spongilla fluviatilis*. *P. Linn. Soc.* vol. i. p. 226 (1840).

687. **Hogg, J.** On the Action of Light upon the Colour of the River-Sponge. *Charlesworth Mag. N. H.* vol. iv. p. 259 (1840).

688. ——. Observations on *Spongilla fluviatilis*, and further observations, with some remarks on the nature of the *Spongiæ marinæ*. *Tr. L. Soc.* vol. xviii. p. 363 (1841).

689. ——. Observations on *Spongilla fluviatilis*, and further observations, with some remarks on the nature of the *Spongiæ marinæ*. *Tr. Linn. Soc.* vol. xviii. p. 368 (1841).

[690.] ——. On the Action of Light upon the Colour of the River-Sponge. (Abstr.) *Phil. Tr.* 1843, p. 72 (1843).

[691.] ——. Auszug aus den Beobachtungen über *Spongilla fluviatilis*. *Isis*, 1843, p. 444 (1843).

692. ——. Further notice on *Spongilla fluviatilis*. *Ann. M. N. H.* ser. 2, vol. vii. p. 790 (1851).

693. ——. On Nardo's Classification of the Sponges. *Ann. M. N. H.* ser. 2, vol. vii. p. 190 (1851).

694. ——. Remarks on the Horny Sponges, with proposed Division of the Order Spongii. *Ann. M. N. H.* ser. 2, vol. viii. p. 3 (1852).

[695.] ——. Is the Freshwater Sponge (*Spongilla*) an Animal? *Pop. Sci. Review*, vol. vii. pp. 134–141 (1868).

696. **Holdsworth, E. W. H.** Note on the Occurrence of *Xenospongia patelliformis*, Gray, on the Coast of Ceylon. *P. Z. S.* 1873, pp. 32–33 (1873).

697. **Holl, Harvey B.** Notes on Fossil Sponges. *Geol. Mag.* vol. ix. pp. 309–315 (1872).

698. ——. Notes on Fossil Sponges. *Geol. Mag.* vol. ix. pp. 343–352 (1872).

699. ——. The Epitheca in Fossil Sponges. *Monthl. Micr. J.* vol. viii. pp. 141–142 (1872).

700. **Hudleston, W. H.** On the Middle Secondary Rocks of Yorkshire. *P. Geol. Assoc.* vol. v. pp. 443–494 (1878).

701. **Hughes, T. McKenny.** On the so-called *Spongia paradoxica*. *J. G. Soc.* vol. xl. p. 273 (1884).

[702.] ——. On the so-called *Spongia paradoxica*, S. Woodw., from the Red and White Chalk of Huustanton. (Abstr.) *Ann. M. N. H.* ser. 5, vol. xiii. p. 298 (1884).

703. **Hughes, W. R.** Notes on the Development of a Deep-sea Sponge (*Halichondria*). *Rep. Brit. Assoc.* 1865, pp. 86–87 (1866).

704. **Huxley, T. H.** Zoological Notes and Observations.—2. On *Tethya*. *Ann. M. N. H.* ser. 2, vol. vii. p. 370 (1851).

705. ——. Zoological Notes and Observations on *Thalassicolla*. *Ann. M. N. H.* ser. 2, vol. viii. p. 433 (1851).

706. ——. Manual of the Anatomy of the Invertebrate Animals, p. 110 (1877).

707. **Hyatt, A.** Remarks on the *Beatriceæ*, a new division of Mollusca. *Am. Journ. Sci.* (2) vol. xxxix. pp. 261–266 (1865).

708. ——. Revision of the North-American Poriferæ, with Remarks upon Foreign Species.—Part I. *Mem. Bost. Soc.* vol. ii. pp. 1–10 (1875).

[709.] ——. Hollow-fibred Horny Sponges. (Abstr.) *P. Bost. Soc.* vol. xvi. pp. 204–205 (1875).

710. ——. Revision of the North-American Poriferæ.—Part II. *Mem. Bost. Soc.* vol. ii. pp. 481–554 (1877).

711. ——. The Embryology of Sponges. *P. Bost. Soc.* vol. xix. pp. 12–17 (1878).

712. ——. On a new Species of Sponge (*Aplysina pedicellata*). *P. Ac. Philad.* 1878, pp. 163, 164 (1879).

713. **Hyatt, A.** Guides for Science-teaching.—No. 3. Commercial and other Sponges. Boston, U.S. (1879).

714. ——. On Classification of Sponges. *Mem. Bost. Soc.* vol. ii. pp. 11–84 (1881).

715. ——. The Boring Sponge: Does it excavate the burrows in which it is found? *Am. Micr. J.* vol. iii. p. 81 (1882).

[716.] ——. The Boring Sponge: Does it excavate the burrows in which it is found? (Abstr.) *J. R. Micr. Soc.* vol. ii. p. 216 (1882).

717. **Imperato, F.** Dell' historia naturale. Libri 27. Napoli (1599).

718. **Jameson, R.** Catalogue of the Animals of the Class Vermes found in the Frith of Forth. *Mem. Wern. Soc.* vol. ii. p. 556. (1811.)

719. **Jardin, —.** (On Secretion of a Violet Juice by Sponges). *Mém. Soc. Imp. Sci. Nat. Cherbourg*, vol. vi. p. 199 (1859).

720. **Johnson, J. Yate.** Description of a new Siliceous Sponge from the coast of Madeira (*Dactylocalyx bowerbankii*). *P. Z. S.* 1863, pp. 257–259 (1863).

721. ——. Description of a new Siliceous Sponge from the Coast of Madeira (*Dactylocalyx bowerbankii*). *Ann. M. N. H.* ser. 3, vol. xiii. p. 257 (1864).

722. **Johnston, G.** A Descriptive Catalogue of the Recent Zoophytes of North Durham. *Tr. North. Durh.* vol. ii. p. 239 (1832).

723. ——. *Spongia suberea. Loudon's Mag. N. H.* vol. vii. p. 491 (1834).

724. ——. Natural History of British Zoophytes. *Mag. Zool. Bot.* vol. i. p. 64 (1836).

725. ——. Natural History of British Zoophytes. *Mag. Zool. Bot.* vol. i. p. 225 (1836).

726. ——. Natural History of British Zoophytes. *Mag. Zool. Bot.* vol. i. p. 440 (1837).

727. ——. List of five Sponges found on the North-Durham Coast. *Tr. North. Durh.* p. 269 (1838).

728. ——. History of British Zoophytes. Edinburgh, 1838.

729. ——. History of British Sponges and Lithophytes. Edinburgh, 1842.

730. ——. Description of a new British Sponge (*Halichondria macularis*). *Ann. M. N. H.* ser. 1, vol. xviii. p. 475 (1846).

731. ——. Description of a new British Sponge (*Halichondria macularis*). *Tr. Berwick N. H. Club*, vol. ii. p. 196 (1849).

732. **Johnston, J.** Hist. natur. de Exanguibus aquat. Libri 4. Francoforti (1650).

733. ——. Theatrum univers. omnium anim. cura Rysch. Amstelod. (1718).

734. **Jones, T. Rymer.** General Outline of the Animal Kingdom.—Part I. London (1838).

735. ——. Article "Porifera." *Todd's Cyclop. Anat.* vol. iv. p. 64 (1847).

736. ——. General Outline of the Animal Kingdom.—Part I. 4th ed. London (1871).

737. **Joseph, G.** Ueber einen Grottenschwamm (*Spongilla stygia*, n. sp.). 59 *Jahresbericht Schles. Gesellsch. f. vaterl. Cultur*, p. 253 (1882).

738. **Jourdan, E.** Sur les Zoanthaires du Golfe de Marseille. *Ann. Sci. Nat.* tom. x. pp. 1–154 (1881).

[739.] ——. On Zoantharia of the Gulf of Marseilles. *J. R. Micr. Soc.* vol. i. pp. 55–62 (1881).

740. **Julien, Alexis A.** On two Varieties of Sponge-spicules. *Amer. Journ. Sci.* ser. 2, vol. xl. pp. 379–383 (1865).

741. **Jussieu, B. de.** Examen de quelques productions marines. *Hist. et Mém. Acad. Paris*, 1742, p. 290 (1745).

742. **Kaijser, E.** Beiträge zur Paläontologie und Geologie der Argentinischen Republik.—II. Paläontologischer Theil. *Pal.* Sup. 3 (1876).

743. **Keeping, W.** The Fossils and Palæontological Affinities of the Neocomian Deposits of Upmore and Brickhill. (1883.)

744. **Keller, C.** On Three Layers in Sponges. *Verh. naturf. Gesell. Zürich*, 1875, p. 68 (1876).

745. ——. Untersuchungen über die Anatomie und Entwickelungsgeschichte einiger Spongien d. Mittelmeeres. Ein Beitrag zur Lösung der Spongienfrage. 39 pp. Basel (1876).

746. ——. Ueber den Bau von *Reniera semitubulosa*, O. S. Ein Beitrag zur Anatomie der Kieselschwämme. *Z. wiss. Zool.* Bd. xxx. pp. 563–586 (1878).

747. ——. Ueber Spermabildung bei *Spongilla*. *Zool. Anz.* Bd. i. pp. 314–315 (1878).

748. ——. Zur Entwickelungsgeschichte der Chalineen. *Zool. Anz.* Bd. ii. pp. 302–303 (1879).

749. ——. Studien über Organisation und Entwickelung der Chalineen. *Z. wiss. Zool.* Bd. xxxiii. pp. 317–349 (1880).

750. ——. Neue Cœlenteraten aus dem Golf von Neapel. *Arch. mikr. Anat.* Bd. xviii. p. 271 (1880).

751. ——. On the Systematic Position of Sponges. *Ann. M. N. H.* ser. 5, vol. v. p. 268 (1880).

752. ——. Die Fauna im Suez-Canal und die Diffusion der mediterranischen und erythräischen Thierwelt. Eine thiergeographische Untersuchung. *N. Denksch. schweiz. naturf. Gesellsch.* Bd. xxviii. Abth. 3 (1882).

[753.] ——. The Fauna of the Suez Canal &c. *Nature*, vol. xxvi. p. 42.

754. **Kent, W. Saville.** On the *Hexactinellidæ*, or Hexradiate Spiculed Siliceous Sponges taken in the 'Norna' Expedition off the Coast of Spain and Portugal. With Description of New Species, and Revision of the Order. *Monthl. Micr. J.* vol. iv. pp. 241–252 (1870).

755. ——. On a new Anchoring Sponge, *Dorvillia agariciformis*. *Monthl. Micr. J.* vol. iv. pp. 293–295 (1870).

756. ——. Notice of a new Vitreous Sponge, *Pheronema* (*Holtenia*) *grayi*. *Ann. M. N. H.* ser. 4, vol. v. pp. 182–186 (1870).

757. ——. Häckel on the Relationship of the Sponges to the Corals. *Ann. M. N. H.* ser. 4, vol. v. pp. 204–218 (1870).

758. ——. On two new Siliceous Sponges taken in the late Dredging-Expedition of the yacht 'Norna' off the Coast of Spain and Portugal (*Rhaphidotheca*, *Fieldingia*). *Ann. M. N. H.* ser. 4, vol. vi. pp. 217–224 (1870).

759. ——. Prof. Häckel and Mr. E. Ray Lankester on the Affinities of the Sponges. *Ann. M. N. H.* ser. 4, vol. vi. pp. 250–255 (1870).

760. ——. Note on *Dorvillia agariciformis*. *Ann. M. N. H.* ser. 4, vol. vii. pp. 37, 38 (1871).

761. ——. On a new Genus of Sponges from North Australia (*Caulospongia*). *P. Z. S.* 1871, pp. 615–616 (1871).

762. ——. Note on *Tethya muricata*, Bowerbank, and *Dorvillia agariciformis* Kent. *Ann. M. N. H.* ser. 4, vol. x. pp. 209–212 (1872).

763. ——. Note on Zittel's Studies on Fossil Sponges.—I. *Ann. M. N. H.* ser. 4, vol. xx. pp. 446–447 (1877).

764. ——. Note on *Haliphysema*. *Ann. M. N. H.* ser. 4, vol. xx. p. 448 (1877).

765. **Kent, W. Saville.** A new Field for the Microscope. *Pop. Sci. Review*, n. s. vol. ii. p. 113 (1878).

766. ——. Observations upon Prof. Ernst Haeckel's Group of the "*Physemaria*," and on the Affinity of the Sponges. *Ann. M. N. H.* ser. 5, vol. i. pp. 1–17 (1878).

767. ——. Notes on the Embryology of Sponges. *Ann. M. N. H.* ser. 5, vol. ii. pp. 139–157 (1878).

768. ——. The Foraminiferal nature of *Haliphysema tumanowiczii*. *Ann. M. N. H.* ser. 5, vol. ii. p. 68 (1878).

[769.] ——. Études sur les Physémaires. (Extr.) *Arch. Z. expér.* tom. viii. pp. viii–x (1879–80).

[770.] ——. Sur l'embryogénie des éponges. (Extr.) *Arch. Z. expér.* tom. viii. pp. xxix–xxxi (1879–80).

771. ——. A Manual of the Infusoria; including a description of all known Flagellate, Ciliate, and Tentaculiferous Protozoa, British and Foreign, and an account of the Organization and Affinities of the Sponges. London (1880–82).

[772.] ——. A Manual of the Infusoria, &c. (Abstr.) *J. R. Micr. Soc.* vol. i. p. 288 (1881).

[773.] ——. A Manual of the Infusoria, &c. (Abstr.) *J. R. Micr. Soc.* vol. ii. pp. 615–616 (1881).

[774.] ——. A Manual of the Infusoria, &c. (Abstr.) *J. R. Micr. Soc.* vol. ii. pp. 638–639 (1881).

[775.] ——. A Manual of the Infusoria, &c. (Notice.) *Nature*, vol. xxiii. p. 264 (1881).

[776.] ——. A Manual of the Infusoria, &c. (Abstr.) *Q. J. Micr. Sci.* vol. xxi. pp. 377–378 (1881).

777. **Kiesow, J.** Ueber silurische und devonische Geschiebe Westpreussens. *Schr. Ges. Danz.* ser. 2, Bd. vi. pp. 205–300 (1881).

778. **Klebs, G.** Ueber Symbiose und ungleichartige Organismen. *Biol. Centralbl.* Bd. ii. pp. 288–299.

779. **Klemm, E.** Ueber alte und neue Ramispongien und andere verwandte Schwammformen aus der Geislinger Gegend. *JH. Ver. N. Württ.* Bd. xxxix. pp. 243–308 (1883).

780. **Klipstein, A. N.** Beiträge zur geologischen Kenntniss der östlichen Alpen (1843).

781. **Klostermann.** Ueber Hexactinelliden. *Arch. mikr. Anat.* Bd. xi. pp. 286–291.

782. **Knorr, G. W.,** et **Walch, J. E. M.** Recueil des monumens des Catastrophes que le Globe de la Terre a essuiées, contenant des Pétrifications dessinées, gravées et enluminées d'après les originaux. (1775.)

783. **Koch, G. von.** Zur Anatomie von *Halisarca Dujardini*. *Morph. Jahrb.* Bd. ii. p. 83 (1876).

784. **Koehler, R.** Remarques sur le genre *Caminus*, et sur une éponge voisine du *Caminus osculosus*, Grube. *Bibl. Haut. Étud.* tom. xxix. (1885).

785. ——. Sur le faune littoral des Isles Anglo-Normans. *Ann. Sci. Nat.* sér. 6, tom. xx. p. 62 (1886).

[786.] ——. On the Littoral Fauna of the Anglo-Norman Islands. *Ann. M. N. H.* ser. 5, vol. xviii. p. 229 (1886).

[787.] ——. Contributions to the Study of the Littoral Fauna of the Anglo-Norman Islands. *Ann. M. N. H.* ser. 5, vol. xviii. p. 290 (1886).

[788.] ——. Contributions to the Study of the Littoral Fauna of the Anglo-Norman Islands. *Ann. M. N. H.* ser. 5, vol. xviii. p. 351 (1886).

789. **Kölliker, A. v.** Ueber den Bau der Spongien. *Würzb. naturw. Zeitschr.* vol. v. p. xiv (1863).

790. **Kölliker, A. v.** Icones Histiologicæ oder Atlas der vergleichenden Gewebelehre. I. Der feinere Bau der Protozoen. Leipzig (1864).

791. **König, C.** Icones fossilium sectiles (1820).

792. **Koerte, F. F. E.** Utrum Spongiæ officinalis tela fibrosa animali an vegetabili sit Natura. Berolini (1848).

793. **Kostytscheff, A.**, und **O. Marggrof.** Ueber die chemische Zusammensetzung der in dem Apatitsandstein der russischen Kreideformation vorkommenden versteinerten Schwämme. *Journ. prakt. Chem.* Bd. cv. pp. 63–64 (1868).

794. ——. Ueber die chemische Zusammensetzung der in dem Apatitsandstein der russischen Kreideformation vorkommenden versteinerten Schwämme. *Bull. Ac. Pétersb.* vol. xiii. col. 19, 20 (1869).

795. **Kräpelin, K.** Zur Biologie und Fauna der Süsswasserbryozoën. *Zool. Anz.* Bd. vii. pp. 319–321 (1884).

796. **Kriegel, A.** Diss. de Spong. apud veteres usu. Resp. J. G. Hænischius. Lipsiæ (1734).

797. **Krukenberg, C. F. W.** Ueber die Enzymbildung in den Geweben etc., der Evertebraten. *Unters. Phys. Instit. Heidelberg*, Bd. ii. p. 338 (1878).

798. ——. Tetronerythrin in Schwämmen. *Centralbl. med. Wiss.* no. 40 (1879).

799. ——. Verdauung der Spongien. *Vergl. phys. Studien Heidelberg*, 1879, pp. 64–75 (1879).

800. ——. Vergleichende-physiologische Studien an den Küsten der Adria. 1. Heidelberg, October (1879).

801. ——. Vergleichend-physiologische Studien an den Küsten der Adria. 2. Heidelberg (1880).

802. ——. Die Floridine der Renieren. *Vergl. phys. Studien*, 2te Reihe, 3te Abth. pp. 36–40 (1882).

803. ——. Ueber die melanotischen Verfärbungen der Uranidine. *Vergl. phys. Studien*, 2te Reihe, 3te Abth. pp. 41–56 (1882).

804. ——. Die Lipochrome der Spongien. *Vergl. phys. Studien*, 2te Reihe, 3te Abth. pp. 108–115 (1882).

805. ——. Vergleichend-physiologische Vorträge. II. Grundzüge einer vergleichenden Physiologie der Verdauung, iii., iv. (1882).

806. **Kusta, J.** *Spongilla jordanensis* bei Radonitz. *Verh. z.-b. Ges. Wien*, Bd. xxix. (1879).

807. **Kustermann, H.** *Hyalonema sieboldii. Arch. mikr. Anat.* Bd. xi. pp. 286–291 (1874).

808. **Lacaze-Duthiers, H. de.** Sur la nature des Éponges. *Arch. Z. expér.* tom. i. pp. lxv–lxvii (1872).

809. **Lakschewitz, P.** Ueber die Kalkschwämme Menorcas. *SB. Ges. Dorpat*, Band vii. pp. 336–341 (1886).

810. ——. Ueber die Kalkschwämme Menorcas. *Zool. Jahrb.* Bd. i. pp. 297–310 (1886).

[811.] ——. On the Calcareous Sponges of Minorca. *Ann. M. N. H.* ser. 5, vol. xvii. pp. 536–539 (1886).

812. **Lamarck, J. B. P. A. de.** Système des animaux sans vertèbres. Paris, An 9 (1801).

813. ——. Sur les polypiers empâtés, Éponges. *Ann. d. Mus.* tom. xx. p. 294 (1813).

814. ——. Sur les polypiers empâtés, Éponges. *Ann. d. Mus.* tom. xx. p. 370 (1813).

815. ——. Sur les polypiers empâtés, Éponges. *Ann. d. Mus.* tom. xx. p. 432 (1813).

816. **Lamarck, J. B. P. A.** Histoire des Animaux sans Vertèbres. Tom. II. Paris (1816).

817. ——. Sur les polypiers empâtés. *Mém. d. Mus.* tom. i. p. 69 (1825).

818. ——. Sur les polypiers empâtés. *Mém. d. Mus.* tom. i. p. 162 (1825).

819. ——. Sur les polypiers empâtés. *Mém. d. Mus.* tom. i. p. 331 (1825).

820. ——. Histoire des Animaux sans Vertèbres. Ed. 2, par Deshayes et Milne-Edwards. Tom. II. Paris (1835).

821. **Lamirol, E.** Sur l'acclimatation des éponges. *Bull. Soc. Acclim.* tom. viii. p. 327 (1861).

822. ——. Rapport sur l'acclimatation des éponges de Syrie, etc. *Bull. Soc. Acclim.* tom. ix. p. 641 (1862).

823. ——. Second rapport sur l'acclimatation des éponges de Syrie, etc. *Bull. Soc. Acclim.* tom. x. p. 8 (1863).

824. **Lamouroux, J. O. F.** Histoire des polypiers coralliaires flexibles vulgairement nommées Zoophytes. Caen (1816).

825. ——. Exposition méthodique des genres des Polypiers. Paris (1821).

[826.] ——. Corallina. (Transl.) London (1824).

827. ——. Éponges. *Encyclop. méth.* tom. ii. p. 327 (1824).

828. **Lampe, W.** *Tetilla japonica*, eine neue Tetractinellidenform mit radiärem Bau. *Arch. f. Nat.* 52 Jhg. 1 Hft. pp. 1–18 (1886).

[829.] ——. New Tetractinellid Sponge with Radial Structure (*Tetilla japonica*). (Abstr.) *J. R. Micr. Soc.* vol. vi. pp. 1000–1001 (1886).

830. **Lankester, E. R.** Professor Häckel and Mr. Kent on the Zoological Affinities of the Sponges. *Ann. M. N. H.* ser. 4, vol. vi. pp. 86–93 (1870).

831. ——. Note: The Mode of Occurrence of Chlorophyll in *Spongilla*. *Q. J. Micr. Sci.* new ser. vol. xiv. pp. 400, 401 (1874).

832. ——. On the Granular Condition of the Chlorophyll in *Spongilla*. *Nature*, vol. xviii. pp. 307–308 (1878).

833. ——. The Structure of *Haliphysema tumanowiczii*. *Q. J. Micr. Sci.* new ser. vol. xix. pp. 473–484 (1879).

834. ——. On the Chlorophyll-corpuscles and Amyloid Deposits of *Spongilla* and *Hydra*. *Q. J. Micr. Sci.* new ser. vol. xxii. pp. 229–254 (1882).

835. ——. On the Chlorophyll-corpuscles and Amyloid Deposits of *Spongilla* and *Hydra*. *Nature*, vol. xxvi. p. 70 (1882).

836. ——. The Chlorophyll-corpuscles in *Hydra*. *Nature*, vol. xxvii. pp. 87–88 (1882).

[837.] ——. On the Chlorophyll-corpuscles and Amyloid Deposits of *Spongilla* and *Hydra*. (Abstr.) *J. R. Micr. Soc.* vol. ii. pp. 322–342 (1882).

838. ——. Dredging in the Norwegian Fjords. *Nature*, vol. xxvi. pp. 478–479 (1882).

839. **Laube, Gustav C.** Die Fauna der Schichten von St. Cassian. 1 Abth. Spongitarien, Corallen, Echiniden, und Crinoiden. *Denk. Ak. Wien* (1865).

840. **Laurent, P.** Recherches sur la Spongille fluviatile. *C. R.* tom. vii. p. 617 (1838).

841. ——. Recherches sur la nature de la *Spongilla fluviatilis*. *Ann. franç. et étrang. d'Anat.* tom. ii. p. 316 (1838).

842. ——. Sur les Spongilles, et spécialement sur leur mode de reproduction. *C. R.* tom. xi. p. 478 (1840).

843. ——. Sur les Spongilles, et spécialement sur leur mode de reproduction. *C. R.* tom. xi. p. 693 (1840).

844. ——. Études des masses spongillaires. *C. R.* tom. xi. p. 1048 (1840).

845. **Laurent, P.** Sur les Spongilles, et spécialement sur leur mode de reproduction. *C. R.* tom. xi. p. 1051 (1840).

846. ——. Nature de la *Spongilla fluviatilis* sur le corps reproducteurs de la Spongille. *Soc. Philom. Paris, Proc.-verb.* 1840, pp. 69–74 (1840).

847. ——. Sur la nature de la *Spongilla fluviatilis*. *L'Institut*, tom. viii. no. 310, p. 223 (1840).

848. ——. Sur la nature de la *Spongilla fluviatilis*. *L'Institut*, tom. viii. no. 341, p. 231 (1840).

849. ——. Sur la nature de la *Spongilla fluviatilis*. *L'Institut*, tom. viii. no. 342, p. 240 (1840).

850. ——. Sur les embryones ciliées et libre de Spongille. *L'Institut*, tom. ix. no. 394, p. 242 (1841).

851. ——. Sur les embryones ciliées et libre de Spongille. *Soc. Philom. Paris, Proc.-verb.* (1841) pp. 73–74 (1841).

852. ——. Zoophytologie de Voyage de 'la Bonite' en 1827. Nouvelles recherches sur l'Hydre et la Spongille (1844).

853. ——. Sur les corps reproducteurs des Éponges (*Spongia usitatissima*). *Soc. Philom. Paris, Proc.-verb.* (1848) p. 40 (1848).

854. ——. Sur les corps reproducteurs des Éponges (*Spongia usitatissima*). *L'Institut*, tom. xvi. p. 160 (1848).

855. **Lecoq, Henri.** Observations sur une grande espèce de Spongille de lac Pavin. *C. R.* tom. l. pp. 1116–1165 (1860).

856. ——. Observations sur les corps reproducteurs et sur retard d'agrégation d'un grande espèce de Spongille de lac Pavin (Puy-de-Dôme). *C. R.* tom. l. p. 1165 (1860).

857. ——. Observation sur le degrée d'animalité et sur les espèce de Spongille et particulièrement sur la grande espèce du lac Pavin. *C. R.* tom. li. p. 5 (1860).

858. ——. Observation sur le degrée d'animalité et sur les espèce de Spongille et particulièrement sur le grande espèce du Lac Pavin. *C. R.* tom. li. p. 9 (1860).

859. ——. Observations sur une grande espèce de Spongille du lac Pavin. 20 pp. Clermont (1862).

860. **Lee, J. E.** Notice of undescribed Zoophytes from the Yorkshire Chalk. *Mag. N. H.* new ser. vol. iii. (1839).

861. **Leeuwenhoek, A. van.** Microscopical Observations. *Phil. Tr.* vol. xxiv. p. 1158 (1706).

862. **Leidy, J.** On *Cliona*. *P. Ac. Philad.* vol. viii. p. 162 (1856).

863. ——. On a boring Sponge (*Cliona*). *Am. Journ. Sci.* ser. 2, vol. xxiii. pp. 281–282 (1857).

864. ——. Description of a new species of Sponge (*Phcronema annæ*). *P. Ac. Philad.* 1868, pp. 9–11 (1868).

865. ——. Remarks on some curious Sponges (*Hyalonema, Euplectella, Pheronema*). *Am. Nat.* vol. iv. pp. 17–22 (1871).

866. ——. Remarks on Sponges. *P. Ac. Philad.* 1874, p. 144 (1874).

867. **Lendenfeld, R. v.** Das Hornfaserwachsthum der *Aplysinidæ*. *Zool. Anz.* Bd. v. pp. 634–636 (1882).

868. ——. Ueber Coelenteraten der Südsee. II. Mitth. Neue *Aplysinidæ*. *Z. wiss. Zool.* Bd. xxxviii. pp. 234–313 (1883).

[869.] ——. New *Aplysinidæ*. (Abstr.) *J. R. Micr. Soc.* ser. 2, vol. iii p. 519 (1883).

870. ——. Das System der *Monactinellidæ*. *Zool. Anz.* Bd. vii. pp. 201–206 (1884).

[871.] **Lendenfeld, R. v.** The System of the Monactinellids. (Transl.) *Ann. M. N. H.* ser. 5, vol. xiv. pp. 65–69 (1884).

[872.] ——. The System of the Monactinellids. (Abstr.) *J. R. Micr. Soc.* ser. 2, vol. iv. p. 394 (1884).

873. ——. A Monograph of the Australian Sponges.—1. Introduction. *P. Linn. Soc. N. S. W.* vol. ix. pp. 121–154 (1884).

874. ——. A Monograph of the Australian Sponges.—2. Morphology and Physiology. *P. Linn. Soc. N. S. W.* vol. ix. pp. 310–346 (1884).

875. ——. The Digestion of Sponges effected by the Ectoderm or Entoderm. *P. Linn. Soc. N. S. W.* vol. ix. pp. 434–438 (1884).

[876.] ——. The Digestion of Sponges effected by the Ectoderm or Entoderm. (Abstr.) *J. R. Micr. Soc.* vol. v. pp. 74–75 (1885).

877. ——. Das Nervensystem der Spongien. *Zool. Anz.* Bd. viii. pp. 47–50 (1885).

878. ——. On the occurrence of Flesh-spicules in Sponges. *P. Linn. Soc. N. S. W.* vol. ix. pp. 493–494 (1885).

879. ——. Notes on the Fibres of certain Australian *Hircinidæ*. *P. Linn. Soc. N. S. W.* vol. ix. pp. 641–642 (1885).

[880.] ——. A Monograph of the Australian Sponges. (Abstr.) *J. R. Micr. Soc.* vol. v. p. 76 (1885).

[881.] ——. The Nervous System of Sponges. (Abstr.) *J. R. Micr. Soc.* ser. 2, vol. v. pp. 253–254 (1885).

[882.] ——. A Nervous System in Sponges. (Abstr.) *Am. Nat.* vol. xix. p. 611 (1885).

[883.] ——. Notes on the Fibres of certain Hircinidæ. (Abstr.) *J. R. Micr. Soc.* vol. v. p. 254 (1885).

884. ——. The Homocœla of Australia and the new Family Homodermidæ. *P. Linn. Soc. N. S. W.* vol. ix. pp. 896–907 (1885).

885. ——. The Histology and Nervous System of Calcareous Sponges. *P. Linn. Soc. N. S. W.* vol. ix. pp. 977–983 (1885).

886. ——. A Monograph of the Australian Sponges.—Part 3. The Calcispongiæ. *P. Linn. Soc. N. S. W.* vol. ix. pp. 1083–1150 (1885).

[887.] ——. Histology and Nervous System of Calcareous Sponges. (Abstr.) *J. R. Micr. Soc.* ser. 2, vol. v. p. 1011 (1885).

888. ——. Die Verwandtschafts verhältnisse der Kalkschwämme. *Zool. Anz.* Bd. viii. pp. 211–215 (1885).

889. ——. A Monograph of the Australian Sponges.—Part 4. The Myxospongiæ. *P. Linn. Soc. N. S. W.* vol. x. pp. 3–22 (1885).

890. ——. Das Nervensystem der Spongien, Berichtigung und Ergänzung. *Zool. Anz.* Bd. viii. p. 448 (1885).

891. ——. Zur Histologie der Spongien. *Zool. Anz.* Bd. viii. pp. 466–469 (1885).

892. ——. Zur Histologie der Spongien. *Zool. Anz.* Bd. viii. pp. 483–486 (1885).

893. ——. Die Verwandtschaftsverhältnisse der Myxospongien. *Zool. Anz.* Bd. viii. pp. 510–515 (1885).

894. ——. The Phoriospongiæ. *P. Linn. Soc. N. S. W.* vol. x. pp. 81–84 (1885).

895. ——. Notes on Australian Sponges recently described by Carter. *P. Linn. Soc. N. S. W.* vol. x. pp. 151–156 (1885).

896. ——. A Monograph of the Australian Sponges.—Part 5. The Auleninæ. *P. Linn. Soc. N. S. W.* vol. x. pp. 283–325 (1885).

897. ——. Addendum to the Monograph of the Australian Sponges. *P. Linn. Soc. N. S. W.* vol. x. pp. 475–476 (1885).

898. **Lendenfeld, R. v.** A Monograph of the Australian Sponges.—Part 6. The genus *Euspongia*. *P. Linn. Soc. N. S. W.* vol. x. pp. 481–553 (1885).

899. ——. Notes on the Australian Sponges recently described by Carter. *Ann. M. N. H.* ser. 4, vol. xvi. pp. 20–25 (1885).

900. ——. Beitrag zur Kenntniss des Nerven- und Muskelsystems der Hornschwämme. *SB. Ak. Berlin*, 1885, pp. 1015–1020 (1885).

901. ——. Studies on Sponges.—I. The vestibule of *Dendrilla cavernosa*, n. sp. II. On *Raphyrus hixonii*, a new gigantic Sponge from Port Jackson. III. On *Halme tingens*, a Sponge with a remarkable colouring-power. IV. On two cases of Mimicry in Sponges. *P. Linn. Soc. N. S. W.* vol. x. pp. 557–574 (1886).

902. ——. An Alga forming a Pseudomorph of a Siliceous Sponge (*Dactylochalina australis*). *P. Linn. Soc. N. S. W.* vol. x. pp. 726–728 (1886).

903. ——. Second Addendum to the Monograph of the Australian Sponges. *P. Linn. Soc. N. S. W.* vol. x. pp. 845–850 (1886).

904. ——. Australian Homocœla and the Homodermidæ. (Abstr.) *J. R. Micr. Soc.* ser. 2, vol. vi. p. 82 (1886).

905. ——. On a Sponge destructive of the Oyster Culture in the Clarence river. *P. Linn. Soc. N. S. W.* vol. x. pp. 326–329 (1886).

[906.] ——. Contributions towards the Knowledge of the Nervous and Muscular Systems of the Horny Sponges. (Transl.) *Ann. M. N. H.* ser. 5, vol. xvii. p. 372 (1886).

[907.] ——. Nervous and Muscular Systems of Horny Sponges. (Abstr.) *J. R. Micr. Soc.* ser. 2, vol. vi. p. 457 (1886).

[908.] ——. Sponge destructive of Oysters (*Chalinula coxii*). (Abstr.) *J. R. Micr. Soc.* ser. 2, vol. vi. p. 458 (1886).

[909.] ——. Australian Sponges. (Abstr.) *J. R. Micr. Soc.* ser. 2, vol. vi. pp. 458–459 (1886).

910. ——. Die Süsswasser Coelenteraten Australiens. *Zool. Jahrb.* Bd. ii. pp. 87–108 (1886).

911. ——. The Nervous System of Sponges. *Rep. Brit. Assoc.* for 1886.

[912.] ——. Muscle and Nerve in Sponges. (Abstr.) *Am. Micr. J.* vol. vii. pp. 205–206 (1886).

[913.] ——. Mimicry in Sponges. (Abstr.) *J. R. Micr. Soc.* vol. vi. p. 811 (1886).

[914.] ——. An Alga forming a Pseudomorph of a Sponge (*Dactylochalina australis*). (Abstr.) *J. R. Micr. Soc.* vol. vi. p. 812 (1886).

[915.] ——. Vestibule of *Dendrilla cavernosa*. (Abstr.) *J. R. Micr. Soc.* vol. vi. p. 810 (1886).

[916.] ——. Gigantic Sponge (*Raphyrus hixonii*). (Abstr.) *J. R. Micr. Soc.* vol. vi. pp. 810–811 (1886).

917. **Lenz, H.** Die wirbellosen Thiere der Travemündung Bucht, 4. *Ber. Com. wiss. Unters. deutsch. Meere Kiel*, für die Jahre 1877–81, ii. pp. 169–180 (1877–81).

918. **Lereboullet, A.** Sur une espèce d'Éponge perforante qui occupe l'épaisseur des valves de l'huître comestible (*Spongia terebrans*, Duv.). *L'Institut*, tom. ix. p. 137 (1841).

919. **Leuckart, R.** Jahresberichte über die Fortschritte auf dem Gebiete der niederen Thiere. *Arch. f. Nat.* 1854, pt. 2 (1854).

920. **Leymerie, M. A.** Sur le terrain cretacé du Département de l'Aube. *Mém. Soc. Géol. France* (1842).

921. **Lhwyd, E.** Lithophylacii Britann. ichnogr. Londini (1699).

22. **Lichtenstein.** Ueber die Badeschwämme. *Intellig.-Bl. zur Al. Lit. Zeit.* no. 140 (1795).

923. **Lichtenstein.** Ueber die Badeschwämme. *Lichtenberg-Voigt's Magaz.* Bd. xi. 2, pp. 17–19 (1795).

924. **Lieberkühn, N.** Beiträge zur Entwickelungsgeschichte der Spongillen. *Arch. Anat. Phys.* 1856, p. 1 (1856).

925. ——. Zur Entwickelungsgeschichte der Spongillen. (Nachtrag.) *Arch. Anat. Phys.* 1856, p. 399 (1856).

926. ——. Beiträge zur Entwickelungsgeschichte der Spongillen. *Arch. Anat. Phys.* 1856, pp. 496–514 (1856).

927. ——. On the Development of the Freshwater Sponges. *Ann. M. N. H.* ser. 2, vol. xvii. 1856, p. 403 (1856).

928. ——. Contribution to the History and Development of the Spongillæ. *Q. J. Micr. Sci.* vol. v. p. 212 (1857).

929. ——. Zusätze zur Entwickelungsgeschichte der Spongillen. *Arch. Anat. Phys.* 1857, p. 376 (1857).

930. ——. Beiträge zur Anatomie der Spongien. *Arch. Anat. Phys.* 1857, p. 376 (1857).

931. ——. Neue Beiträge zur Anatomie der Spongien. *Arch. Anat. Phys.* 1859, p. 353 (1859).

932. ——. Neue Beiträge zur Anatomie der Spongien. *Arch. Anat. Phys.* 1859, p. 515 (1859).

933. ——. Ueber Bewegungserscheinungen bei den Schwämmen. *Arch. Anat. Phys.* 1863, pp. 717–729 (1863).

[934.] ——. On Motile Phenomena in Sponges. (Transl.) *Q. J. Micr. Sci.* n. s. vol. iv. pp. 189–193 (1864).

935. ——. Observations sur les phénomènes de mouvement chez les éponges. *Ann. Sci. Nat.* vol. ii. pp. 247–250 (1864).

936. ——. Beiträge zur Anatomie der Kalkspongien. *Arch. Anat. Phys.* 1865, pp. 732–748 (1865).

937. ——. Ueber das contractile Gewebe der Spongien. *Arch. Anat. Phys.* 1867, pp. 74–86 (1867).

[938.] ——. On the Contractile Tissue of Sponges. (Transl.) *Ann. M. N. H.* ser. 4, vol. vi. p. 497 (1870).

939. ——. Ueber Bewegungserscheinungen der Zellen von Rhizopoden, Spongillen, etc. *Schrift. Gesell. Bef. Naturwissens. Marburg,* Bd. ix. (1870).

940. **Linck, G.** Zwei neue Spongiengattungen (*Didymosphæra* und *Polyrhizophora*). *Neues Jahrb. Mineral. Geol.* 1883, pp. 59–62 (1883).

941. **Link, H. F.** Ueber Pflanzenthiere etc. *Abh. Ak. Berlin,* 1830, p. 109 (1830).

942. **Linné, C. v.** Systema Naturæ. Ed. 1. Lugd. Batav. (1735).

943. ——. Flora Lapponica. Amstelædami (1737).

944. ——. Hortus Cliffort. Amstelædami (1737).

945. ——. Flora Suecica. Stockholmiæ (1745).

946. ——. Species Plant., 1. Holmiæ (1753).

947. ——. Systema Naturæ. Ed. 10. Vol. i. Holmiæ (1758).

948. ——. Systema Naturæ. Ed. 10. Vol. ii. Holmiæ (1759).

949. ——. Systema Naturæ. Ed. 12. Vol. i. Holmiæ (1767).

950. ——. Systema Naturæ. Ed. 12. Vol. ii. Holmiæ (1767).

951. ——. Systema Naturæ. Ed. 13, curante Gmelin. Vol. i. pars 6. Lipsiæ (1789).

952. **Lockwood, S.** *Heteromeyenia rydcri,* a Freshwater Sponge. *J. N. York Micr. Soc.* vol. i. pp. 37–40 (1885).

953. **Lorenz, J. R.** Physikalische Verhältnisse und Vertheilung der Organismen im Quarnerischen Golfe. Wien (1863).

954. **Loretz, H.** Einige Petrefacten des alpinen Trias aus den Südalpen. *Z. gcol. Ges.* Bd. xxvii. (1875).

955. **Loriol, P. de.** Descriptions des animaux invertébrés fossiles contenue dans l'étage Néocomien moyen du Mont Salève. (1861.)

956. ——. Monographie des Couches de l'étage Valangien des Carrièrs d'Arzier (Vaud). Matériaux pour la Paléontologie Suisse, par Pictet. (1868.)

957. ——, et **Gilliéron, V.** Monographie paléontologique et stratigraphique de l'étage urgonien inférieur du Lauderon (Canton de Neuchâtel). *Mém. Soc. Helvetique Sci. Nat.* tom. xxiii. (1869).

958. **Lortet,** —. Quelques points de l'organisation des éponges fibreuses de Syrie. (Extr.) *Assoc. franç. l'av. sci.* (*Nantes*), tom. iv. pp. 815–890 (1875).

959. **Lovén, S.** Om en märklig i Nordsjön lefvande art af *Spongia*. *Öfv. Ak. Förh.* p. 105 (1868).

[960.] ——. Ueber eine merkwürdige in der Nordsee lebende Art *Spongia* (*Hyalonema boreale*). (Uebers.) *Arch. f. Nat.* vol. xxxiv. pp. 82–101 (1868).

[961.] ——. On a remarkable Sponge from the North Sea (*Hyalonema boreale*). (Transl.) *Ann. M. N. H.* ser. 4, vol. ii. pp. 81–91 (1868).

962. ——. Observations sur une éponge remarquable de la mer du Nord (*Hyalonema borcale*). *C. R.* tom. lxvi. pp. 1265–1267 (1868).

963. **Ludwig, Chrstn. Friedr.** Praes., et Aug. Tuercteg. Uhle, Auctor, Diss. pharmacol.-med. de Spongia marina. Lipsiæ, literis Staritz, 4 (1819).

964. **Lütken, C.** Catalogue of Spongozoa, in 'Manual of Nat. Hist. etc. of Greenland,' edited by Prof. T. Rymer Jones, p. 190. London (1875).

965. **MacAndrew.** List of Marine Animals of the British Coast. (1860.)

966. **M'Coy, F.**, and **Griffiths, R.** A Synopsis of the Silurian Fossils of Ireland. (1846.)

967. ——. On some new Mesozoic Radiata. *Ann. M. N. H.* ser. 2, vol. ii. p. 397 (1848).

968. ——. Systematic description of the British Paleozoic Fossils of the Geological Museum of the University of Cambridge. (1855.)

969. ——. Prodromus of the Palæontology of Victoria. Decade V. (1880.)

970. **M'Intosh, W. C.** On the Invertebrate Marine Fauna of St. Andrews. I. Sponges. *Ann. M. N. H.* ser. 4, vol. xiii. pp. 140–145 (1874).

971. ——. On the Marine Invertebrates and Fishes of St. Andrews. (1875.)

972. ——. On Budding in the Syllidian Annelids, chiefly with references to a branched form procured by H.M.S. 'Challenger.' *Rep. Brit. Assoc.*, 49*th Meeting*, pp. 372–375 (1879).

973. **Mackie, S. J.** Illustrated Catalogue of British Fossil Sponges. Part I. London (1866).

974. **Mantell, G. A.** The Fossils of the South Downs, or Illustrations of the Geology of Sussex. London (1822).

975. ——. The Wonders of Geology. London (1848).

976. ——. Medals of Creation. Vol. i. London (1854).

977. ——. The Wonders of Geology. Ed. 7. London (1857–58).

978. **Manzoni, A.**, e **G. Mazzetti.** Le spugne fossili di Montese. *Atti Soc. Toscana sci. nat.* vol. iv. pp. 57–66 (1879).

979. ——. Spugne silicee della Molassa miocenica del Bolognese. *Atti Soc. Toscana sci. nat.* vol. v. pp. 173–176 (1881).

980. ——. La struttura microscopica delle spugne silicee del Miocene medio della Provincia di Bologna e di Modena. 1882. Bologna (1882).

981. **Marchi, Pietro.** Spugne e coralli. Milano, 1871. *Scienza del popolo*, ser. 2, vol. ii. (1871).

982. **Marenzeller, E. v.** Die Cœlenteraten, Echinodermen und Würmer der k.-k. oester.-ungar. Nordpol-Expedition. *Denk. Ak. Wien*, Bd. xxxv. p. 357 (1878).

983. ——. Die Aufzucht des Badeschwammes aus Theilstücken. *Verh. z.-b. Wien*, Bd. xxviii. pp. 687–694 (1878).

[984.] ——. Propagation of Sponges by Cuttings. (Transl.) *Report U. S. Fish. Comm.* 1879, pp. 771–777 (1879).

[985.] ——. Propagation of Sponge by Cuttings. *Am. Nat.* xvii. p. 200 (1883).

986. ——. Poriferen, Anthozoen, Ctenophoren und Würmer von Jan Meyen. Gesammelt von Dr. F. Fischer. Die Internationale Polarforschung, 1882–83. Die österreich. Polarstation Jan Meyen. Beobachtungs-Ergebnisse, Bd. iii. Zool. pp. 9–24 (1886).

987. **Margó, T.** Die Classification des Thierreiches. *Math. nat. Ber. Ungarn*, Bd. i. pp. 234–260 (1883).

[988.] ——. The Classification of the Animal Kingdom. *Ann. M. N. H.* ser. 5, vol. xiii. pp. 313–334 (1884).

989. **Marsh, O. C.** Notice of a new genus of Fossil Sponges from the Lower Silurian (*Brachiospongia*). *Am. J. Sci.* ser. 2, vol. xliv. p. 88 (1867).

990. **Marshall, W.** Untersuchungen über Hexactinelliden. *Z. wiss. Z.* Bd. xxv. Supplem. pp. 142–243 (1875).

991. ——. Ideen über die Verwandschaftsverhältnisse der Hexactinelliden. *Z. wiss. Z.* Bd. xxvii. pp. 114–136 (1876).

992. ——. Spongiologische Mittheilungen. *Ber. Vers. Nat. München*, p. 187 (1878). (*Euplectella*, *Ceratodendron*, n. g.)

993. ——, und **A. B. Meyer.** Ueber einige neue und wenig bekannte Philippinische *Hexactinelliden*. *MT. Mus. Dresden*, Bd. ii. p. 261 (1879).

994. ——. Untersuchungen über Dysideiden und Phoriospongien. *Z. wiss. Z.* Bd. xxxv. pp. 88–129 (1880).

995. ——. Die Ontogenie von *Reniera filigrana*, O. Schm. *Z. wiss. Z.* Bd. xxxvii. pp. 221–246 (1882).

996. ——. Die Ontogenie von *Reniera filigrana*. *Biol. Centralbl.* Bd. iii. pp. 72–74 (1883).

[997.] ——. The Development of *Reniera filigrana*. *J. R. Micr. Soc.* vol. ii. p. 798 (1883).

998. ——. Einige vorläufige Bemerkungen über die Gemmulæ der Süsswasserschwämme. *Zool. Anz.* Bd. vi. pp. 630–634 (1883).

999. ——. Einige vorläufige Bemerkungen über die Gemmulæ der Süsswasserschwämme. *Zool. Anz.* Bd. vi. pp. 648–652 (1883).

1000. ——. Ueber einige neue von Herrn Pechuël-Loesche aus dem Congo gesammelte Kieselschwämme. (*Potamolepis*, n. g.) *Jen. Z. Nat.* Bd. xvi. pp. 553–577 (1883).

1001. ——. New Siliceous Sponges from the Congo. *Jen. Z. Nat.* Bd. xvi. p. 553 (1884).

[1002.] ——. New Siliceous Sponges from the Congo. (Abstr.) *J. R. Micr. Soc.* ser. 2, vol. iv. p. 66.

1003. ——. *Agilardiella radiata*, eine neue Tetractinellidenform mit radiärem Bau. *Abh. Ak. Berl.* (1884).

1004. ——. Vorläufige Bemerkungen über die Fortpflanzungsverhältnisse von *Spongilla lacustris*. *SB. Ges. Leipzig*, 1884, pp. 22–29 (1884).

[1005.] ——. Preliminary remarks on the Gemmules of the Freshwater Sponges. (Transl.) *Ann. M. N. H.* ser. 5, vol. xiii. pp. 163–171 (1884).

[1006.] ——. Reproduction of *Spongilla lacustris*. (Abstr.) *J. R. Micr. Soc.* ser. 2, vol. v. pp. 1011–1113 (1885).

1007. **Marshall, W.** Bemerkungen über die Cœlenteraten Natur der Spongien. *Jen. Z. Nat.* Bd. xviii. pp. 868–880 (1885).

[1008.] ——. Cœlenterate Nature of Sponges. (Abstr.) *J. R. Micr. Soc.* ser. 2, vol. v. p. 816 (1885).

[1009.] ——. Remarks on the Cœlenterate Nature of Sponges. (Transl.) *Ann. M. N. H.* ser. 5, vol. xvi. pp. 90–100 (1885).

1010. ——, and **Herklotz.** On Hexactinellids. *Arch. Nécrl.* vol. iii. pp. 423–438.

1011. **Marsigli, C. F.** Storia del mare. Venezia (1711).

1012. ——. Histoire physique de la mer. Amsterdam (1725).

1013. **Martens, Eduard v.** On Hexactinellids. *Berl. Monats.* 1861, p. 450 (1861).

1014. ——. Ueber einige ostasiatische Süsswasserthiere. IV. Ein Süsswasserschwamm aus Borneo. *Arch. f. Nat.* Bd. xxxiv. pp. 61–64 (1868).

1015. **Martens, J. M. v.** Reise nach Venedig. II. Ulm (1824).

1016. **Martin-Wismar, K.** Untersuchungen über die Organisation von *Astylospongia*, Ferd. Roem., und Bemerkungen über die Natur der Wallsteine, Meyn. *Arch. Ver. Mecklenb.* Bd. xxxi. pp. 1–32, 1878.

1017. ——. Niederländische und nordwestdeutsche Sedimentärgeschiebe, ihre Uebereinstimmung, gemeinschaftliche Herkuuft und Petrefacten. (*Silurispongia*, n. g.) Leiden, 1878.

1018. **Matyasowsky, J. v.** Ein fossiler Spongit aus dem Karpathensandsteine von Kis-Lipnik im Sároser Comitate (*Glenodictyum carpathicum*). *Természetrajzi füsetck*, vol. ii. pt. 4 (1878).

1019. ——. Ein fossiler Spongit aus dem Karpatheusandsteine von Kis-Lipnik im Sároser Comitate (*Glenodictyum carpathicum*). *Verh. geol. Reichsans. Wien*, 1878, p. 405 (1878).

1020. **Mayer, Paul.** *Wagnerella borealis. Zool. Anz.* Bd. ii. pp. 357–358 (1879).

1021. ——. Noch einmal *Wagnerella borealis. Zool. Anz.* Bd. iv. pp. 592–593 (1881).

1022. **Mayor, Père.** Recherches sur l'organisation des éponges. *C. R. et Mém. Soc. Biologic*, tom. i. p. 153 (1849).

1023. **Meek** and **Worthen.** Palæontology of Illinois. Vol. iii. p. 419 (1868).

1024. **Mérat, F. V.**, et **A. T. de Lens.** Dictionnaire universelle de mathémathique médicine. Tom. vi. Paris (1834).

1025. **Mereschkowsky, C. S.** Preliminary Report on the Sponges of the White Sea. (Russian.) St. Petersburg (1878).

1026. ——. On *Wagnerella*, a new genus of Sponge nearly allied to the *Physemaria* of Ernst Haeckel. *Ann. M. N. H.* ser. 5, vol. i. pp. 70–77 (1878).

1027. ——. Études sur les éponges de la Mer Blanche. *Mém. Ac. Pétersb.* sér. 7, tom. xxvi. (1879).

1028. ——. Reproduction des éponges par bourgeonnement extérieur. *Arch. Z. expér.* tom. viii. pp. 417–432 (1879–80).

[1029.] ——. External gemmation in the Spongidæ. (Abstr.) *J. R. Micr. Soc.* vol. iii. p. 970 (1881).

1030. ——. Note on *Wagnerella borealis*, a Protozoan. *Ann. M. N. H.* ser. 5, vol. viii. p. 288 (1881).

1031. ——. Nouvelles recherches sur la zoonerythrine et autres pigments animaux. *Bull. Soc. Zool. Fr.* tom. viii. p. 81 (1883).

1032. **Metschnikoff, Elias.** Beiträge zur Morphologie der Spongien. *Z. wiss. Zool.* Bd. xxvii. pp. 275–286 (1866).

1033. ——. Zur Entwickelungsgeschichte der Kalkschwämme. *Z. wiss. Zool.* Bd. xxiv. pp. 1–14 (1874).

1034. **Metschnikoff, Elias.** On the Development of the *Calcispongiæ*. *Ann. M. N. H.* ser. 4, vol. xvi. pp. 41–43 (1875).

[1035.] ——. Contributions à la morphologie des Spongiaires. (Trad.) *Arch. Z. expér.* tom. v. pp. 357–368 (1876).

1036. ——. Researches on Sponges. (Russian.) *Mém. Soc. nouv. Russ.* vol. iv. (1878).

1037. ——. Spongiologische Studien. I. Entwickelungsgeschichte der *Halisarca dujardinii*. *Z. wiss. Zool.* Bd. xxxii. pp. 349–358 (1879).

1038. ——. Spongiologische Studien. II. Anatomisches über Ascetten. *Z. wiss. Zool.* Bd. xxxii. pp. 358–362 (1879).

1039. ——. Spongiologische Studien. III. Entwickelungsgeschichtliches über die Kalkschwämme. *Z. wiss. Zool.* Bd. xxxii. pp. 362–371 (1879).

1040. ——. Spongiologische Studien. IV. Ueber die Nahrungsaufnahme bei Spongien. *Z. wiss. Zool.* Bd. xxxii. pp. 371–374 (1879).

1041. ——. Zur Lehre über die intracelluläre Verdauung niederer Thiere. *Zool. Anz.* Bd. v. pp. 310–316 (1882).

1042. **Meyen, F. J. F.** Beiträge zur Kenntniss unseres Süsswasser-Schwammes (*Spongilla lacustris*). *Arch. Anat. Phys.* 1839, p. 83 (1839).

1043. **Meyer, A. B.** Note on the Habitat of *Psetalia globulosa* and *Labaria hemisphærica*, Gray. *Ann. M. N. H.* ser. 4, vol. xiii. pp. 66, 67 (1874).

1044. ——. On *Hyalonema cebuense*, with a note by Mr. Higgin. *Ann. M. N. H.* ser. 4, vol. xvi. p. 76 (1875).

1045. **Meyn, T.** Silurische Schwämme und deren eigenthümliche Verbreitung, ein Beitrag zur Kunde der Geschiebe. *Z. geol. Ges.* Bd. xxv. pp. 41–58 (1873).

1046. **Michelin, H.** Iconographie zoophytologique. Paris (1840–47).

1047. ——. Note sur différentes espèces du genre *Vioa* (Spongiaires). *Revue zool.* 1846, p. 56 (1846).

1048. **Miklucho-Maclay, N. de.** Beiträge zur Kenntniss der Spongien. I. Ueber *Guancha blanca*, einen neuen Kalkschwamm. *Jen. Z. Nat.* Bd. iv. pp. 221–240 (1868).

1049. ——. Ueber einige Schwämme des nördlichen stillen Oceans und des Eismeeres, welche im zoologischen Museum der kaiserlichen Akademie der Wissenschaften in St. Petersburg aufgestellt sind. Ein Beitrag zur Morphologie und Verbreitung der Spongien. *Mém. Ac. Pétersb.* sér. 7, tom. xv. (1870).

1050. ——. Bemerkungen zur Schwammfauna des Weissen Meeres, und des Arktischen Oceans. *Bull. Ac. Pétersb.* tom. xv. col. 203–205 (1871).

1051. **Miller, S. A.** Description of two new genera and eight new species of Fossils from the Hudson River group, with remarks upon others. *J. Cincinnati Soc. Nat. Hist.* vol. v. pp. 10–20 (1882).

1052. **Mills, H.** Freshwater Sponges. *Am. Micr. J.* vol. v. pp. 125–132 (1880).

[1053.] ——. Les éponges d'eau douce. (Extr.) *J. Microgr.* tom. iv. p. 285 (1880).

[1054.] ——. Les éponges d'eau douce. (Extr.) *J. Microgr.* tom. v. p. 265 (1881).

1055. ——. A variety of *Spongilla* &c. *Am. Micr. J.* vol. vi. pp. 30–31 (1881).

1056. ——. Notes on the *Spongillæ* of Buffalo. *Bull. Buff. Nat. Club*, vol. iv. pp. 57–60 (1882).

1057. ——. Serial Arrangement of Birotulate Spicules in Statoblasts of American Sponges. *Am. Micr. J.* 1884, p. 41.

1058. **Milne-Edwards** and **J. Haime.** Cuvier Règne Animal. Edition Masson. Zoophytes, pl. 95. (1850.)

1059. **Milne-Edwards** and **J. Haime.** Monograph of the British Fossil Corals. Part 1. London (1850).

1060. ——. Compte-rendu sommaire d'une exploration zoologique, faite dans l'Atlantique, à bord du navire "le Travailleur." *C. R.* tom. xci. p. 260 (1880).

1061. ——. Compte-rendu sommaire d'une exploration zoologique, faite dans Méditerranée, à bord du navire de l'état "le Travailleur." *C. R.* tom. xciii. pp. 876–882 (1881).

1062. ——. Compte-rendu sommaire d'une exploration zoologique, faite dans l'Atlantique, à bord du navire "le Travailleur." *C. R.* tom. xciii. pp. 931–936 (1881).

1063. **Minct, C. S.** A Sketch of Comparative Anatomy. IV. The Embryology of Sponges. *Am. Nat.* vol. xiv. pp. 479–485 (1880).

1064. **Möbius, K.** Die wirbellosen Thiere der Ostsee, p. 148. Bericht über die Expedition zur physikalisch-chemischen und biologischen Untersuchung der Ostsee, Sommer 1871, auf dem Aviso-Dampfer Pommerania. Kiel (1873).

1065. ——. Beiträge zur Meeresfauna der Insel Mauritius und der Seychellen Foraminifera. (1880.)

1066. **Montagu, G.** An Essay on Sponges, with the descriptions of all the Species which have been discovered on the Coast of Great Britain. *Mem. Wern. Nat. Hist. Soc.* vol. ii. no. 1, p. 67 (1818)

1067. **Moore, C.** On Abnormal Conditions of Secondary Deposits connected with the Somersetshire and South-Wales Coal-basin. Descriptions of Species. *J. G. Soc.* vol. xxiii. p. 538 (1867).

1068. ——. Australian Mesozoic Geology and Palæontology. *J. G. Soc.* vol. xxvi. (1870).

1069. **Moore, T. J.** On the Habitat of the *Regadera* (Watering-pot) or Venus's Flower-pot (*Euplectella aspergillum*, Owen). *Ann. M. N. H.* ser. 4, vol. iii. pp. 196–199 (1869).

1070. **Morris, J.** Paleontological Notes. *Ann. M. N. H.* ser. 2, vol. viii. (1851).

1071. ——. Catalogue of British Fossils. 2nd ed. London (1854).

1072. **Moseley, H. N.** On the Colouring Matters of various Animals, and especially of Deep-sea Forms, dredged by H.M.S. 'Challenger.' *J. R. Micr. Soc.* n. s. vol. xvii. pp. 1–23 (1877).

1073. **Moulins, C. des.** Questions obscures relatives à l'*Hydractinia echinata*, Flem., et à l'*Alcyonium domuncula*, Lam., tous deux logeurs de Pagures. Sec. 2, *Alcyonium domuncula*. *Act. Soc. Lin. Bordeaux*, tom. xxviii. p. 342 (1872).

1074. **Müller, Fritz.** Ueber *Darwinella aurea*, einen Schwamm mit sternförmigen Hornnadeln. *Arch. mikr. Anat.* Bd. i. pp. 344–353 (1865).

1075. **Müller, O. F.** Zoologiæ Danicæ. Icones. Fasc. 1. Hafniæ (1777).

1076. ——. Zoologia Danica. Vol. i. Hafniæ et Lipsiæ (1779).

1077. ——. Zoologia Danica. Vol. i. 2nd ed. Hafniæ (1788).

1078. ——. Zoologia Danica. Vol. ii. 2nd ed. Hafniæ (1789).

1079. ——. Zoologia Danica. Vol. iii. 2nd ed. Hafniæ (1796).

1080. ——. Zoologiæ Danicæ Prodromus. Hafniæ (1854).

1081. **Munster, Graf,** und **Wissmann.** Beiträge zur Geognosie und Petrefactenkunde des südöstlichen Tirols, vorzüglich der Schichten von St. Cassian. (1841.)

1082. **Munier-Chalmas, E.** *Barroisia*, n. g. des Éponges. *Bull. Soc. Géol.* ser. 3, tom. x. p. 425 (1882).

1083. **Murchison, R. J.** Silurian System. London (1839).

1084. ——. Silurian System. 5th ed. London (1872).

1085. **Murie, J.** On Steere's Sponge, a new Genus of the Hexactinellid Group of the Spongida (*Dendrospongia steerii*). *Tr. L. Soc.* ser. 2, Zool. vol. i. pp. 219–234 (1877).

1086. **Nardo, G. D.** Auszug aus einem neuen System du Spongiarien. *Isis*, 1833, p. 519 (1833).

1087. ——. Ueber die Spongien und nächst verwandten Thiergattungen. *Isis*, 1833, p. 519 (1833).

1088. ——. De Spongiis. *Isis*, p. 714 (1834).

1089. ——. Ueber die Spongien und Asterica, Oken. *Isis*, 1834, p. 724 (1834).

1090. ——. Memoria sopra un nuovo genere di Spugne, *Vioa*. *Ann. regno Lomb. Venet.* vol. ix. p. 221 (1839).

1091. ——. Observat. anatom. sopra l'animale marino detto rognone di mare. *Atti Ist. Venet.* vol. vi. p. 267 (1847).

1092. **Nassonow, Nic.** Ueber die aushöhlende Kraft, und zum feineren Bau der *Clione*. (Vorläuf. Mittheil.) *Zool. Anz.* Bd. iv. pp. 459–460 (1881).

1093. ——. Zur Biologie und Anatomie der Clione. *Z. wiss. Zool.* Bd. xxxix. pp. 295–308 (1883).

1094. **Nathorst, A. G.** Om aftryk af Medusor i Sveriges Kambriska Lager. *Kgl. Svenska Vidensk. Akad. Handlingar*, Bd. xix (1882).

1095. **Neumayr, M.** Ueber den alterthümlichen Charakter der Tiefseefauna. *Neues Jahrb. Mineral. Geol.* Bd. i. pp. 122–131 (1882).

[1096.] ——. Ueber den alterthümlichen Charakter der Tiefseefauna. (Auszug.) *Humboldt*, Bd. i. p. 228.

[1097.] ——. Ueber den alterthümlichen Charakter der Tiefseefauna. (Auszug.) *Kosmos*, Bd. vi. pp. 124–126.

[1098.] ——. Ueber den alterthümlichen Charakter der Tiefseefauna. (Auszug.) *Naturforscher*, Bd. xv. pp. 162–164.

1099. **Nicholson, H. A.** On the affinities of the genus *Stromatopora*, with descriptions of two new species. *Ann. M. N. H.* ser. 4, vol. xiii. pp. 4–14 (1874).

1100. ——, and **R. Etheridge.** On *Palæacis*. *Ann. M. N. H.* ser. 5, vol. iii. p. 206 (1878).

1101. ——. Report on the Palæontology of the Province of Ontario, p. 11 (1879).

1102. ——. Manual of Palæontology.

1103. **Nieremberg, J. E.** Historia naturæ. Antverpiæ (1635).

1104. **Noll, F. C.** Einige Beobachtungen im Seewasser-Zimmeraquarium. *Reniera*, &c. *Zool. Anz.* Bd. ii. pp. 402–405 (1879).

1105. ——. Einige Beobachtungen im Seewasser-Zimmeraquarium. *Reniera*, &c. *Zool. Anz.* Bd. ii. p. 455 (1879).

1106. ——. *Spongilla glomerata*. *Zool. Anz.* Bd. ii. pp. 682–684 (1879).

1107. ——. Eau de Javelle als Mittel zum Entfernen des Weichtheile aus mikroskopischen Präparaten. *Zool. Anz.* Bd. v. pp. 528–530 (1882).

1108. **Norman, A. M.** Shetland Final Dredging Report. Part 2. *Rep. Brit. Assoc.* 1868, p. 327 (1868).

1109. ——. Shetland Final Dredging Report. Part 2. *Rep. Brit. Assoc.* 1868, pp. 341–342 (1868).

1110. ——. Notes on a few Hebridean Sponges, and on a new *Desmacidon* from Jersey. *Ann. M. N. H.* ser. 4, vol. iii. pp. 296–300 (1869).

1111. ——. Submarine-Cable Fauna. *Ann. M. N. H.* ser. 4, vol. xv. p. 176 (1875).

1112. **Norman, A. N.** Note to the genus *Haliphysema*, with Description of several Forms apparently allied to it. *Ann. M. N. H.* ser. 5, vol. i. p. 424 (1878).

1113. ——. On the genus *Haliphysema*, with Descriptions of several Forms apparently allied to it. *Ann. M. N. H.* ser. 5, vol. ii. pp. 264–284 (1878).

1114. ——. Note on Sponges dredged off the Coast of Norway. *J. of Conch.* vol. ii. p. 11 (1879).

1115. ——. Notes on the French Exploring Voyage of 'Le Travailleur' in the Bay of Biscay. *Ann. M. N. H.* ser. 5, vol. vi. pp. 430–436 (1880).

1116. ——. Notes on the French Exploring Voyage of 'Le Travailleur' in the Bay of Biscay. *Rep. Brit. Assoc.* 1880, p. 387 (1880).

1117. **Nozeman, C.** Over di imlandische zoetwater Spongii. Haarlem (1788).

1118. **Oken, L.** Lehrbuch der Naturgeschichte. 3 Band: Zoologie 1. *Jena*, (1817).

1119. ——. Ueber *Spongia fluviatilis*. *Isis*, 1818, p. 1274 (1818).

1120. **Olivi, G.** Zoologia Adriatica. Bassono (1792).

1121. **Orbigny, A. D. d'.** Cours élémentaire de Paléontologie. Tom. i. part 1. Paris (1849).

1122. ——. Prodromus de Paléontologie. Tom. i. Paris (1849).

1123. ——. Prodromus de Paléontologie. Tom. ii. Paris (1850).

1124. ——. Cours élémentaire de Paléontologie. Tom. i. part 2. Paris (1850).

1125. ——. Cours élémentaire de Paléontologie. Tom. ii. part 1. Paris (1851).

1126. ——. Cours élémentaire de Paléontologie. Tom. ii. part 2. Paris (1852).

1127. **Oswald, F.** Ueber die Petrefacten von Sadewitz. *Uebers. Arb. schles. Ges. Breslau*, 1846, p. 56 (1847).

1128. **Owen, R.** On a new Genus and Species of Sponge (*Euplectella aspergillum*). *P. Z. S.* 1841, p. 3 (1841).

1129. ——. On a new Genus and Species of Sponge (*Euplectella aspergillum*). *Ann. M. N. H.* ser. 1, vol. viii. p. 222 (1842).

1130. ——. Description of a new Genus and Species of Sponge (*Euplectella aspergillum*, O.). *Tr. Z. S.* vol. iii. p. 203 (1849).

1131. ——. Description of a new Species of *Euplectella* (*E. cucumer*, O.). *Tr. L. Soc.* vol. xxii. p. 117 (1857).

1132. ——. Palæontology, or a systematic summary of extinct animals and their geological relations.

1133. **Pagenstecher, H. A.** Zur Kenntniss der Schwämme. *Verh. naturh. Ver. Heidelb.* Bd. vi. pp. 1–66 (1871).

1134. ——. Lehrbuch der Zoologie. (1875.)

1135. **Pallas, P. S.** Elenchus zoophytorum. Hagæ-Comit. (1766.)

1136. ——. Reise durch verschiedene Provinzen des Russischen Reichs. Band i. Petersburg (1771).

1137. ——. Reise durch verschiedene Provinzen des Russischen Reichs. Band. iii. Petersburg (1776).

1138. ——. Charakteristik der Thierpflanzen. Pp. 229-236. (1787.)

1139. **Parfitt, E.** On the Marine and Freshwater Sponges of Devonshire. *Tr. Devon. Assoc.* vol. ii. pp. 443–462 (1868).

1140. ——. Fossil Sponge-spicules in the Greensand of Haldon and Blackdown. *Tr. Devon. Assoc.* vol. iv. pp. 138–144 (1871).

1141. ——. Mode in which *Cliona* burrows. *Monthl. Micr. J.* vol. vii. pp. 123–125 (1872).

1142. **Parfitt, E.** Does *Cliona* burrow? *Monthl. Micr. J.* vol. vii. pp. 186–188 (1872).

1143. ——. On *Haliphysema*. *Zool. Anz.* Bd. ii. pp. 88–90 (1879).

1144. ——. On the Structure of *Haliphysema tumanowiczii*. *Ann. M. N. H.* ser. 5, vol. ii. pp. 88–90 (1878).

1145. **Parkinson, James.** Organic remains of a former World. Vol. ii. London (1808).

1146. ——. Outlines of Oryctology. London (1822).

1147. **Parkinson, John.** Theatrum botanicum. London (1640).

1148. **Paterson, R.** On Sponges. *Pop. Sci. Review*, vol. iv. pp. 302–310 (1865).

1149. **Pavesi, Pietro.** Di una Spugna d' acqua dolce nuova per l' Italia (*Spongilla lacustris*). *Rendic. Ist. Lomb.* ser. 2, vol. xiv. part 6, p. 6 (1881).

1150. **Payer, Julius.** Oesterreichische Nordpol-Expedition. (1875.)

[1151.] ——. Austrian Polar Expedition. (Transl.) Vol. ii. p. 93. (1876.)

1152. **Perty, Max.** Ueber Spongien. *MT. Ges. Bern*, 1870, pp. xix–xxv (1870).

1153. **Petiver, J.** Petrigraphia americana. Londini (1712).

1154. **Petr, Frant.** *Spongilla fragilis*, Leidy, in Bohemia. (Bohemian with German Résumé.) *SB. böhm. Ges.* Bd. xii. pp. 99–111 (1885).

1155. **Peyssonel, J. A.** Account of a MS. treatise, int. "Traité du Corail etc." *Phil. Tr.* vol. xlvii. p. 445 (1752).

1156. ——. New observations upon the Worms that form Sponges. *Phil. Tr.* vol. 50. p. 590 (1758).

1157. **Phillips, J.** Illustr. of the Geology of Yorkshire. Part 1. York (1829).

1158. ——. Illustration of the Geology of Yorkshire. Ed. 2, part 1. London (1835).

1159. ——. Illustration of the Geology of Yorkshire. Ed. 2, part 2. London (1836).

1160. ——. Geology of Oxford and the Valley of the Thames. (1871.)

1161. **Pictet, F. T.** Traité élémentaire de Paléontologie, ou histoire naturelle des animaux fossiles considérés dans leur rapport zoologique et géologique. Tom. iv. (1846.)

1162. ——. Traité de Paléontologie. Ed. 2, vol. vi. Paris (1857).

1163. **Pillet, M. L.,** et **Fromentel, M. E. de.** Descriptions géologiques et paléontologiques de la Colline de Lémene sur Chambéry. (1875.)

1164. **Plancus, J.** Ariminensis de conchis minus notis. Liber. Venetiis (1739).

1165. **Plinius secundus, C.** Historiæ naturalis. Libri 37.

1166. **Plot, R.** The Natural History of Oxfordshire. Oxford (1677).

1167. **Plukenet, L.** Phytographia. Pars 2. Londini (1691).

1168. ——. Phytographia. Pars 4. Londini (1696).

1169. ——. Almagestum. Londini (1696).

1170. **Pocta, P.** Einige Bemerkungen über das Gitterskelet der fossilen Hexactinelliden. *SB. böhm. Ges.* Bd. xi. (1883).

1171. ——. Beiträge zur Kenntniss der Spongien der Böhmischen Kreideformation.—Pt. 1. *Hexactinellidæ*. *Abh. böhm. Ges.* ser. 6, Bd. xii. pp. 1–15 (1884).

1172. ——. Ueber Spongiennadeln des Brüsauer Sandsteins. *SB. böhm. Ges.* Bd. xii. pp. 243–245 (1885).

1173. ——. Beiträge zur Kenntniss der Spongien der Böhmischen Kreideformation. Theil 2. Lithistidæ. *Abh. böhm. Ges.* ser. 6, Bd. xii. No. 9 (1885).

1174. **Pocta, P.** Le développement des Éponges fossiles. *Arch. Slav. Biol.* tom. i. fasc. 1, pp. 23–25 (1886).

1175. ——. Ueber einige Spongien aus dem Dogger des Fünfkirchner Gebirges. *JB. kön. ungar. geolog. Anstalt.* Budapest, Kilian (1886).

[1176.] **Polejaeff, N. de.** Ueber das Sperma und die Spermatogenese bei *Sycandra raphanus* (Haeckel). *Anzeiger der kaiserlichen Akademie der Wissenschaften Wien*, Bd. 1882, pp. 237–238 (1882).

1177. ——. Ueber das Sperma und die Spermatogenese bei *Sycandra raphanus*, Haeck. *SB. Ak. Wien*, Bd. lxxxvi. pp. 276–298 (1882).

[1178.] ——. Ueber das Sperma und die Spermatogenese bei *Sycandra raphanus*. (Ausz.) *Biol. Centralbl.* pp. 180–181 (1882).

1179. ——. Report on the Scientific Results of the Voyage of H.M.S. 'Challenger.' Calcarea. (1884.)

1180. ——. Report on the Scientific Results of the Voyage of H.M.S. 'Challenger.' Keratosa. (1884.)

1181. **Poleschajew, K. N.** On the Structure and Classification of Horny Sponges. [Russian.] *Arb. Petersb. Ges.* Bd. xvi. Heft 1, p. 17 (1886).

1182. **Pomel, A.** Paléontologie de la Province d'Oran. Spongiaires. Oran (1872).

1183. **Pontoppidan, E.** Norges natuurl. historie. I. Kjöbenhavn (1752).

1184. ——. Natural History of Norway. London (1755).

1185. **Portis, A.** On Sponges. *Mem. Acc. Tor.* ser. 2, vol. xxxiv. p. 71 (1883).

1186. **Potts, E.** Some new genera of Freshwater Sponges. *P. Ac. Philad.* p. 149 (1880).

1187. ——. Some new genera of Freshwater Sponges. *P. Ac. Philad.* p. 176 (1880).

1188. ——. Freshwater Sponges of Fairmont Park. *P. Ac. Philad.* 1880, pp. 330–331 (1880).

1189. ——. Some new genera of Freshwater Sponges. *P. Ac. Philad.* 1880, p. 356 (1880).

1190. ——. Some new genera of Freshwater Sponges. *P. Ac. Philad.* 1881, pp. 149, 150 (1881).

1191. ——. The genus *Carterella* vs. *Spongiophaga pottsi*. *P. Ac. Philad.* 1881, pp. 460–463 (1881).

[1192.] ——. New genera and forms of Freshwater Sponges. (Abstr.) *Ann. M. N. H.* ser. 5, vol. viii. pp. 387–389 (1881).

1193. ——. The genus *Carterella* vs. *Spongiophaga pottsi*. *Ann. M. N. H.* ser 5, vol. ix. pp. 330–333 (1881).

[1194.] ——. Freshwater Sponges of Fairmont Park. (Abstr.) *J. R. Micr. Soc.* vol. i. pp. 613–614 (1881).

1195. ——. Three more Freshwater Sponges. *P. Ac. Philad.* 1882, pp. 12–14 (1882).

1196. ——. Three more Freshwater Sponges. *J. R. Micr. Soc.* vol. ii. p. 351 (1882).

1197. ——. Sponges from the neighbourhood of Boston. *P. Ac. Philad.* 1882, pp. 69–70 (1882).

[1198.] ——. Sponges from the neighbourhood of Boston. (Abstr.) *J. R. Micr. Soc.* vol. ii. pp. 515–516 (1882).

1199. ——. Three more Freshwater Sponges. *Ann. M. N. H.* ser. 5, vol. ix. pp. 474–476 (1882).

1200. ——. Sponges from the neighbourhood of Boston. *Ann. M. N. H.* ser. 5, vol. x. pp. 72–73 (1882).

[1201.] ——. Three more Freshwater Sponges. (Abstr.) *Nature*, vol. xxvi. p. 43 (1882).

1202. **Potts, E.** Our Freshwater Sponges. *Am. Nat.* vol. xvii. pp. 1293–1296 (1883).

1203. ——. Freshwater Sponges; what, where, when, and who wants them. *Bull. U. S. Fish. Comm.* vol. iii. pp. 389–391 (1883).

1204. ——. Freshwater Sponges as improbable causes of the pollution of river-water. *P. Ac. Philad.* 1884, p. 28 (1884).

1205. ——. Some modifications observed in the form of Sponge-spicules. *P. Ac. Philad.* 1884, pp. 184–185 (1884).

1206. ——. On the wide distribution of some American Sponges. *P. Ac. Philad.* 1884, pp. 215–217 (1884).

[1207.] ——. Freshwater Sponges as improbable causes of the pollution of river-water. (Abstr.) *Ann. M. N. H.* ser. 5, vol. xiii. p. 486 (1884).

1208. ——. A new Freshwater Sponge from Nova Scotia (*Heteromeyenia pictonensis*). *P. Ac. Philad.* 1885, pp. 28–29 (1885).

1209. ——. On the wide distribution of some American Freshwater Sponges. *Ann. M. N. H.* ser. 5, vol. xv. pp. 20–22 (1885).

[1210.] ——. Modification in the form of Sponge-spicules. (Abstr.) *J. R. Micr. Soc.* vol. v. pp. 75–76 (1885).

[1211.] ——. On the wide distribution of some American Sponges. (Abstr.) *J. R. Micr. Soc.* vol. v. p. 76 (1885).

1212. ——. A new Freshwater Sponge from Nova Scotia (*Heteromeyenia pictonensis*). *Ann. M. N. H.* ser. 5, vol. xv. pp. 425–426 (1885).

1213. ——. A Freshwater Sponge from Mexico (*Meyenia mexicana*). *Am. Nat.* vol. xix. pp. 810–811 (1885).

[1214.] ——. New Freshwater Sponge (*Heteromeyenia pictonensis*). (Abstr.) *J. R. Micr. Soc.* ser. 2, vol. v. p. 817 (1885).

1215. ——. Freshwater Sponges from Mexico. *Proc. U. S. Nat. Mus.* 1885, p. 587 (1885).

1216. ——. Freshwater Sponges from Mexico. *Ann. M. N. H.* ser. 5, vol. xvii. p. 170 (1886).

1217. ——. Freshwater Sponges from Newfoundland; a new Species. *Ann. M. N. H.* ser. 5, vol. xviii. p. 243 (1886).

[1218.] ——. Freshwater Sponges from Mexico. (Abstr.) *J. R. Micr. Soc.* vol. vi. p. 82 (1886).

1219. ——. Freshwater Sponges from Newfoundland. *P. Ac. Philad.* 1886, pp. 227–230 (1886).

1220. **Pourtales, de.** Report on the dredging operations of the U.S. Coast Survey. *Bull. Mus. C. Z.* vol. v. pp. 201–211 (1879).

1221. **Price, F. G. H.** On the beds between the Gault and Upper Chalk near Folkestone. *J. G. Soc.* vol. xxxiii. p. 431 (1877).

1222. **Priest, B. W.** On the Natural History and Histology of Sponges. *J. Quek. Club*, vol. vi. pp. 229–238 (1881).

1223. ——. Further Remarks on the Histology of Sponges. *J. Quek. Club*, vol. vi. pp. 269–271 (1881).

1224. ——. On an undescribed species of Sponge of the genus *Polymastia* (*P. biclavata*). *J. Quek. Club*, vol. vi. pp. 302–304 (1881).

1225. ——. On Statoblasts of the Freshwater Sponges. *J. Quek. Club*, vol. i. pp. 173–181 (1883).

1226. ——. Statoblasts of the Freshwater Sponges. *Am. Micr. J.* vol. iv. pp. 208–213 (1884).

1227. ——. On the Hexactinellidæ. *J. Quek. Club*, ser. 2, vol. ii. p. 8 (1884).

1228. **Pusch, G. G.** Palæ's Palæontologie, p. 6 (1837).

1229 **Quenstedt, F. A.** Das Flötzgebirge Württembergs. Tübingen (1843).

1230. **Quenstedt, F. A.** Handbuch der Petrefacktenkunde. (1852.)

1231. ——. Der Jura. Tübingen (1856–1857).

1232. ——. Der Jura (1858).

1233. ——. Petrefactenkunde Deutschlands. 1 Abth. Bd. v. Schwämme. Leipzig (1877–1878).

1234 **Quoy, J. R. C.,** et **P. Gaimard.** Voyage autour du Monde sur les corvettes l'Uranie et la Physicienne. Zoologie. Paris (1824).

1235. ——, ——. Zoologie de l'Astrolabe. Tom. IV. Paris (1833).

1236. **Raspail, F. V.** Analyse physiologique du *Spongilla friabilis*. *Féruss. Bull. Sc. Nat.* tom. xiii. p. 170 (1828).

1237. ——. Anatomie microscopique des Spongilles. Expériences de chimie microscopique. *Mém. Soc. Hist. Nat. Paris*, p. 204 (1828).

1238. ——. Anatomie microscopique des Spongilles. Expériences de chimie microscopique. *Mém. Soc. Hist. Nat. Paris*, p. 246 (1828).

1239. **Rathbun, Richard.** List of Marine Invertebrates; Porifera. *Pr. U. S. Nat. Mus.* vol. iv. pp. 303–307 (1881).

1240. ——. List of Marine Invertebrates; Porifera. *Sm. Misc. Contrib.* vol. xvii. (1882).

1241. ——. The Porifera (Useful Aquat. Anim. U.S.), in *The Fisheries and Fish Industr. U. S.* Sect. i. p. 843.

1242. ——. Sponge Culture in Florida. *Science*, ii. p. 213 (1883).

1243. **Rauff, H.** Ueber die Gattung *Hindia*, Dunc. *Sitzungsb. Niederrhein. Ges. Bonn* (1886).

[1244.] ——. On the Genus *Hindia*, Dunc. (Transl.) *Ann. M. N. H.* ser. 5, vol. xviii. pp. 169–179 (1886).

1245. **Ray, T.** Hist. plant. Tom. I. Londini (1686).

1246. ——. Synopsis meth. stirp. Britann. Londini (1690).

1247. ——. Hist. plant. Tom. II. Londini (1693).

1248. ——. Hist. plant. Tom. III. Londini (1704).

1249. **Reneaume, M. L.** *Spongia fluviatilis, ramosa, fragilis*, etc. *Hist. et Mém. Acad. Paris*, p. 231 (1714).

1250. **Rennes, A. J. M.** Des Éponges. Classification, préparation, commerce. 24 pp. Paris (1868).

1251. **Retzer, W.** Die deutschen Süsswasserschwämme. Tübingen, 1883.

1252. **Reuss, A. E.** Die Versteinerungen der böhmischen Kreideformation. 2 Abth. Stuttgart (1846).

1253. ——. Die Bryozoen, Anthozoen und Spongiarien des braunen Jura von Balin bei Krakau. *Denk. Ak. Wien*, Bd. xxiv. (1867).

1254. ——. Oberoligocäne Korallen aus Ungarn. 1870. *SB. Ak. Wien* (1870).

1255. **Rice, H. Y.** Sponges. *J. New York Micr. Soc.* vol. i. pp. 116–122 (1885).

1256. **Ridley, Stuart O.** On two cases of incorporation by Sponges of Spicules foreign to them. *J. L. S.* vol. xv. pp. 149–151 (1880).

1257. ——. On the genus *Plocamia*, Schmidt (*Dirrhopalum*), and on some other Sponges of the Order Echinonemata. *J. L. S.* vol. xv. pp. 476–487, 493–497 (1881).

1258. ——. Spongida collected during the Expedition of H.M.S. 'Alert' in the Straits of Magellan and on the Coast of Patagonia. *P. Z. S.* 1881, pp. 107–137 (1881).

1259. ——. Polyzoa, Cœlenterata, and Sponges of Franz-Joseph Land. *Ann. M. N. H.* ser 5, vol. vii. pp. 442–457 (1881).

1260. **Ridley, Stuart O.** Notes on Zoophytes and Sponges collected by Mr. F. Day on the East Coast of Scotland. *J. L. S.* vol. xviii. pp. 106–108 (1884).

1261. ——. Notes on Sponges, with description of a new species (*Chladochalina diffusa*). *Ann. M. N. H.* ser. 5, vol. xiv. pp. 183–187 (1884).

1262. ——. Spongiida. Report on the Zoological Collections made in the Indo-Pacific Ocean during the Voyage of H.M.S. 'Alert,' 1881–82, pp. 366 and 582. London (1884).

1263. ——. "Monaxonida," Preliminary Notice. Voyage of H.M.S. 'Challenger,' Narrative of the Cruise, vol. i. part 2, pp. 569 (1885).

1264. ——, and **Dendy, A.** On *Proteleia sollasii*, a new genus and species of monaxonid Sponge allied to *Polymastia*. *Ann. M. N. H.* ser. 5, vol. xviii. pp. 152–159 (1886). Compare no. 327.

1265. ——, ——. Preliminary Report on the Monaxonida collected by H.M.S. 'Challenger.' *Ann. M. N. H.* ser. 5, vol. xviii. pp. 325–351 (1886).

1266. ——, ——. Preliminary Report on the Monaxonida collected by H.M.S. 'Challenger.' *Ann. M. N. H.* ser. 5, vol. xviii. pp. 470–493 (1886).

1267. **Ringenberg, E. N. S.** New Fossils from the Four Groups of the Niagara Period of Western New York. *P. Ac. Philad.* 1884, p. 144 (1884).

1268. **Risso, A.** Hist. natur. des princ. product. de l'Europe mérid. et princip. de celles des envir. de Nice, etc. Vol. V. Paris et Strasbourg (1827).

1269. **Rivière, Em.** Faune des Invertébrés des Grottes de Mentax en Italie. *C. R.* tom. ciii. p. 94.

1270. **Roemer, C. F.** Die Versteinerungen des norddeutschen Oolithengebirges. Ein Nachtrag. (1839.)

1271. ——. Die Versteinerungen des norddeutschen Kreidegebirges. Lieferung I. Hannover (1840).

1272. ——. Die Versteinerungen des norddeutschen Kreidegebirges. Lieferung II. Hannover (1841).

1273. ——. Ueber eine neue Gattung *Blumenbachium*, König, und mehrere unzweifelhafte Spongien in Obersilurischen Kalkschichten der Grafschaft Decatur im Staate Tennessee in Nordamerika. (1848.)

1274. ——. Die silurische Fauna des westlichen Tennessee. Breslau (1860).

1275. ——. Die fossile Fauna der silurischen Diluvialgeschiebe von Sadewitz. Breslau (1861).

1276. ——. Die Spongitarien des norddeutschen Kreidegebirges. IV. *Pal.* vol. xiii. Cassel (1864).

1277. ——. Geologie von Oberschlesien. (1870.)

1278. ——. Lethæa Geognostica. 1 part. Lethæa Palæozoica. Atlas. Stuttgart (1876–1880).

1279. **Rondelet, G.** Fibri de Piscibus marinis. Lugduni (1553).

1280. ——. Universæ aquatilium Historiæ. Lugduni (1555).

1281. **Rose, C. B.** On the Anatomy of the Ventriculites of Mantell. *Mag. N. H.* vol. ii. p. 332 (1829).

1282. **Rosen, F.** Ueber die Natur der Stromatoporen und über die Erhaltung der Hornfaser der Spongien im fossilen Zustand. Dorpat (1867).

1283. **Rumph, G. E.** D'Amboinsche Rariteitkamer. Tom. vi. Amstelodami (1705).

1284. **Rutot, A.** Note sur la découverte de deux Spongiaires de l'étage Bruxellienne. *Ann. Soc. mal. Belg.* tom. ix. p. 75 (1874).

1285. **Ryder, J. A.** On the destructive nature of the Boring Sponge, with observations on its gemmules or eggs. *Amer. Nat.* vol. xiii. pp. 279–283 (1879).

1286. **Ryder, J. A.** On *Camarophysema*, a new type of Sponge. *Proc. U. S. Nat. Mus.* vol. iii. p. 269 (1880).

1287. ——. On *Camarophysema* a new type of Sponge. *Sm. Misc. Contrib.* vol. xxii. (1882).

1288. **Salter, J. W.** Memoirs of the Geological Survey of Great Britain. Geology of the neighbourhood of Edinburgh. (1861.)

1289. ——. On some new fossils from the Lingula Flags of Wales: *Protospongia fenestrata* and *Theca corrugata*. *J. G. Soc.* vol. xx. p. 238 (1864).

1290. **Sars, G. O.** On the Deep-sea Fauna of the Norwegian coast. *Vidensk.-Selsk. Förhandl.* 1868, p. 250 (1868).

1291. ——. On some Remarkable Forms of Animal Life from the Great Depths of the Norwegian coast. I. *Polyzoa, Conchifera, Cephalopoda, Annelida, Anthozoa, Spongiæ*. Partly from posthumous manuscripts of the late M. Sars. Christiana (1872). *University-Program* (1872).

1292. **Savini, J. C.** Description de l'Egypt. Iconographie. Paris (1810).

1293. **Schaffner.** Einige Bemerkungen über *Spongilla fluviatilis*. *Verh. Ver. Rheinl. Jahr.* Bd. xii. p. 29 (1855).

1294. **Scheuchzer, J. J.** Specimen lithogr. Helvet. Tiguri (1702).

1295. ——. Helvetiæ hist. natur. Theil 3. Zürich (1718).

1296. **Schlossberger, J. E.** Ueber die Unterscheidung des Fibroins von der Substanz des Badeschwammes. *Ber. Vers. Nat.* 34, p. 164 (1855).

1297. **Schlüter, Clemens.** Ueber die Spongitarien-Bänke der unteren Mukronaten und oberen Quadraten-Schichten, und über *Lepidospongia rugosa* insbesondere. *SB. Niederrhein. Ges. Bonn*, 1870, pp. 139–141 (1870).

1298. ——. Ueber die Spongitarien-Bänke der oberen Quadraten und unteren Mukronatenschichten des Münsterlandes. Bonn (1872).

1299. **Schmidt, Oscar.** Die Spongien des adriatischen Meeres. Leipzig (1862).

1300. ——. Supplement der Spongien des adriatischen Meeres, enthaltend die Histiologie und systematische Ergänzungen. Leipzig (1864).

1301. ——. Zweites Supplement der Spongien des Adriatischen Meeres. Enthaltend die Vergleichung der adriatischen und britischen Spongiengattungen. Leipzig (1866).

1302. ——. Vorläufiger Bericht über die Untersuchung der Bowerbank'schen Spongien. *SB. Ak. Wien*, Bd. liii. pp. 147–151 (1866).

1303. ——. Spongiologische Mittheilungen. *M. Schultze's Archiv*, Bd. iii. pp. 390–392 (1867).

1304. ——. Die Spongien der Küste von Algier. Mit Nachträgen zu den Spongien des adriatischen Meeres. [Drittes Supplement.] Leipzig (1868).

1305. ——. Vorläufige Mittheilungen über die Spongien der grönländischen Küste. *MT. Ver. Steierm.* Bd. ii. pp. 89–97 (1869).

1306. ——. Grundzüge einer Spongien-Fauna des atlantischen Gebietes. Leipzig, 1870.

1307. ——. Das natürliche System der Spongien. *MT. Ver. Steierm.* Bd. ii. pp. 261–269 (1870).

[1308.] ——. Grundzüge einer Spongien-Fauna des atlantischen Gebietes. (Ausz.) *Neues Jahrb. Mineral. Geol.* 1871, pp. 216–218 (1871).

1309. ——. Das natürliche System der Spongien. *Z. ges. Naturw.* Bd. xxxviii. pp. 155–157 (1871).

1310. ——. Ueber die Entwickelung der Kieselkörper bei Spongien. *Z. ges. Naturw.* Bd. xl. p. 314 (1872).

1311. **Schmidt, Oscar.** Die auf der Pommeraniafahrt nach Arendal gefangenen Silicispongiæ. *Jahresber. d. Commiss. zur wiss. Untersuchung. d. deutschen Meere Kiel*, Bd. i. pp. 147, 148 (1873).

1312. ——. Die zweite deutsche Nordpolfahrt in 1869, 1870. *Spongien*, p. 429. Leipzig (1874).

1313. ——. Zoologische Ergebnisse der Nordseefahrt vom 21. Juli bis 9. September, 1872. *Spongien*, p. 115. Berlin (1875).

1314. ——. Spongien. *Ber. Comm. wiss Unters. deutsch. Meere*, ii. and iii. pp. 115–120 (1875).

[1315.] ——. Spongien. (Ausz.) *Z. ges. Naturw.* Bd. xii. pp. 173–181 (1875).

1316. ——. Zur Orientirung über die Entwickelung der Spongien. *Z. wiss. Zool.* Bd. xxv. Supplem. 2, pp. 127–141 (1875).

1317. ——. Nochmals die Gastrula der Kalkschwämme. *Arch. mikr. Anat.* Bd. xii. pp. 551–556 (1876).

1318. ——. Das Larvenstadium von *Ascetta primordialis* und *Ascetta clathrus*. *Arch. mikr. Anat.* Bd. xiv. pp. 249–263 (1877).

1319. ——. Die Fibrillen der Spongiengattung *Filifera*, Lkhn. *Z. wiss. Zool.* Bd. xxx. pp. 661, 662 (1878).

1320. ——. Artikel Spongien in Brehm's Thierleben. (1878.)

1321. ——. Die Entodermbildung bei den Asconen durch Wanderzellen. *Ber. Vers. Nat. 50, München*, p. 173 (1878).

1322. ——. Die Spongien des Meerbusen von Mexico und des Caraibischen Meeres. 1 Hft. Jena (1879).

1323. ——. Die Fortsetzung meiner "Spongien des Meerbusen von Mexico." *Zool. Anz.* Bd. ii. pp. 379–380 (1879).

1324. ——. Die Spongien des Meerbusen von Mexico und des Caraibischen Meeres. 2 (Schluss-) Heft. Jena (1880).

1325. ——. Die Absonderung und die Auslese im Kampfe ums Dasein. *Kosmos*, Bd. iv. pp. 329–333 (1880).

1326. ——. Zusatz zu "Neue Cœlenteraten des Golfes von Neapel" von C. Keller. *Arch. mikr. Anat.* vol. xviii. p. 280 (1880).

1327. ——. Entstehung neuer Arten durch Verfall und Schwund älterer Merkmale. *Z. wiss. Zool.* Bd. xlii. pp. 639–647 (1885).

1328. **Schröter, J. S.** Beschreibung einer neuen Spongie des süssen Wassers (*Spongia canalium*). *Der Naturforscher*, Bd. xxiii. p. 149 (1788).

1329. **Schuffner, Oscar.** Beschreibung einiger neuer Kalkschwämme. *Jen. Z. Nat.* Bd. xi. pp. 403–433 (1877).

1330. **Schultze, Max.** Ueber eine merkwürdige Spongie (*Hyalonema*). *SB. rheinl. westf. naturw. Gesell.* Bd. xvii. pp. 67–69 (1860).

1331. ——. Sur l'éponge *Hyalonema*. *C. R.* tom. 50. pp. 792–793 (1860).

1332. ——. Ueber die Japanische Glassfaden-Spongie. *SB. rheinl. westf. naturw. Gesell.* Bd. xvii. p. 85 (1860).

1333. ——. Die Hyalonemen. Bonn (1860).

1334. ——. Ueber einen Schwamm mit Nadeln aus Hornsubstanz. *Verh. Ver. Rheinl.* 1865, p. 7.

1335. ——. Ueber *Hyalonema*. *Arch. mikr. Anat.* Bd. iii. pp. 206–214 (1867).

[1336.] ——. On *Hyalonema*. *Ann. M. N. H.* ser. 3, vol. xix. pp. 153–160 (1867).

1337. ——. Ueber *Poterion neptuni*. *SB. niederrhein. Ges. Bonn*, Bd. xxviii. pp. 15–16 (1871).

1338. ——. Einige ausgezeichnete Exemplare von Schwämmen. *SB. niederrhein. Ges. Bonn*, Bd. xxx. pp. 65–67 (1873).

1339. **Schulze, F. E.** Ueber den Bau und die Entwickelung von *Sycandra raphanus*, Haeckel. *Z. wiss. Zool.* Bd. xxv. Supplem. pp. 247–280 (1875).

1340. ——. Zur Entwickelungsgeschichte von *Sycandra*. *Z. wiss. Zool.* Bd. xxvii. pp. 486, 487 (1876).

1341. ——. Untersuchungen über den Bau und die Entwickelung der Spongien. II. Die Gattung *Halisarca*. *Z. wiss. Zool.* Bd. xxviii. pp. 1–48 (1877).

1342. ——. *Spongicola fistularis*, ein in Spongien wohnendes Hydrozoon. *Arch. mikr. Anat.* 1877, p. 795 (1877).

1343. ——. Untersuchungen über den Bau und die Entwickelung der Spongien. III. Die Familie der *Chondrosidæ*. *Z. wiss. Zool.* Bd. xxix. pp. 87–122 (1877).

[1344.] ——. Recherches sur l'organisation et le développement des Spongiaires, genre *Halisarca*. (Abstr.) *Arch. Z. expér.* tom. vi. pp. i–vi (1877).

1345. ——. Untersuchungen über den Bau und die Entwickelung der Spongien. IV. Die Familie der Aplysinidæ. *Z. wiss. Zool.* Bd. xxx. pp. 379–420 (1878).

1346. ——. Untersuchungen über den Bau und die Entwickelung der Spongien. V. Die Metamorphose von *Sycandra raphanus*. *Z. wiss. Zool.* Bd. xxxi. pp. 261–296 (1878).

[1347.] ——. Recherches sur l'anatomie et le développement des éponges; les métamorphoses de *Sycandra raphanus*. (Abstr.) *Arch. Z. expér.* tom. vii. pp. xxi–xxv (1878).

1348. ——. Untersuchungen über den Bau und die Entwickelung der Spongien. VI. Die Gattung *Spongelia*. *Z. wiss. Zool.* Bd. xxxii. pp. 117–157 (1878).

1349. ——. Untersuchungen über den Bau und die Entwickelung der Spongien. VII. Die Familie der Spongidæ. *Z. wiss. Zool.* Bd. xxxii. pp. 593–660 (1879).

1350. ——. Ueber die Bildung freischwebender Brutknospen bei einer Spongie, *Halisarca lobularis*. *Zool. Anz.* Bd. ii. pp. 636–641 (1879).

1351. ——. Untersuchungen über den Bau und die Entwickelung der Spongien. VIII. Die Gattung *Hircinia*, Nardo, und *Oligoceras*, n. g. *Z. wiss. Zool.* Bd. xxxiii. pp. 1–38 (1879).

1352. ——. Untersuchungen über den Bau und die Entwickelung der Spongien. IX. Die Plakiniden. *Z. wiss. Zool.* Bd. xxxiv. pp. 407–451 (1880).

[1353.] ——. On the Structure and Arrangement of the Soft Parts in *Euplectella aspergillum*. *T. R. Soc. Edinb.* vol. xxix. p. 661 (1880).

[1354.] ——. Sur la structure et la disposition des parties molles de l'*Euplectella aspergillum*. (Abstr.) *Arch. Z. expér.* tom. ix. Notes p. xxvii (1881).

1355. ——. Untersuchungen über den Bau und die Entwickelung der Spongien. X. *Cortieium candelabrum*, O. Schmidt. *Z. wiss. Zool.* Bd. xxxv. pp. 410–430 (1881).

1356. ——. Ueber den Badeschwamm. *MT. Ver. Steierm.* 1881, pp. xlviii–liii (1881).

1357. ——. Report on the Sponges. *P. R. Soc. Edinburgh*, vol. xi. (1882). (In Tizard and J. Murray's exploration of the Faroe Channel during the summer of 1880 &c.)

1358. ——. Ueber radiäre Symmetrie bei Spongien. *Ber. Vers. Nat. Eisenach*, p. 199 (1882).

1359. ——. Ueber radiäre Symmetrie bei Spongien. *Zool. Anz.* 1882, p. 532 (1882).

1360. ——. Der Badeschwamm. *Ill. d. Monatshefte*, 1882, pp. 188–210 (1882).

1361. ——. Ueber das Verwandtschaftsverhältnisse der Spongien zu den Choanoflagellaten. *SB. Ak. Berlin*, 1885, pp. 179–191 (1885).

[1362.] **Schulze, F. E.** Sur la rapport des Éponges avec le Choanoflagellatæ. (Abstr.) *Arch. Z. expér.* sér. 2, tom. iii. pp. xliv–xlvi (1885).

[1363.] ——. The relationship of Sponges to the Choanoflagellatæ. (Transl.) *Ann. M. N. H.* ser. 5, vol. xv. pp. 365–377 (1885).

1364. ——. Lebende Krusten von *Oscarella lobularis*, O. S., var. *cærulea* aus Triest mit in der Bildung begriffenen und bereits abgestossenen Brutkapseln. *SB. nat. Fr.* 1885, pp. 183–185 (1885).

1365. ——. The Hexactinellidæ. Narrative of the Voyage of H.M.S. 'Challenger,' vol. i. pp. 437–451 (1885).

[1366.] ——. Relationship of Sponges to Choanoflagellata. (Abstr.) *J. R. Micr. Soc.* ser. 2, vol. v. pp. 657–658 (1885).

[1367.] ——. Relationship between Sponges and Choanoflagellata. (Abstr.) *J. R. Micr. Soc.* ser. 2, vol. vi. pp. 455–456 (1886).

[1368.] ——. *Oscarella lobularis*, var. *cærulea*. (Abstr.) *J. R. Micr. Soc.* ser. 2, vol. vi. p. 457 (1886).

1369. ——. Ueber den Bau und das System der Hexactinelliden. *Abh. Ak. Berl.* (1886).

1370. **Schweigger, A. F.** Beobachtungen auf naturhistorischen Reisen. Berlin (1819).

1371. ——. Handbuch der Naturgeschichte skeletloser ungegliedeter Thiere. Leipzig (1820).

1372. **Seba, A.** Locupletissimi rerum Naturalium Thesauri accurata descripta. Amstelodami: 4 vols. (1734–1765).

1373. **Seely, H. M.** A new genus of Chazy Sponges, *Strephochetus*. *Am. J. Sci.* ser. 3, vol. xxx. p. 355 (1885).

1374. ——. The Genus *Strephochetus*; Distribution and Species. *Am. J. Sci.* ser. 3, vol. xxxii. p. 31 (1886).

1375. **Seguenza, G.** Le formaz. terziarie nella provincia di Regg. (Calabria). *Atti Ac. Rom.* (1880).

1376. **Selenka, Emil.** Ueber einige neue Schwämme aus der Südsee. *Z. wiss. Zool.* Bd. xvii. pp. 565–571 (1867).

1377. ——. Ueber einen Kieselschwamm von achtstrahligem Bau, und über Entwickelung der Schwammknospen. *Z. wiss. Zool.* Bd. xxxiii. pp. 467–476 (1879).

1378. **Semper, C.** Einige Worte über *Euplectella aspergillum*, Owen, und seine Bewohner. *Arch. f. Nat.* Bd. xxxiii. pp. 84–89 (1867).

[1379.] ——. A few words on *Euplectella aspergillum*, Owen, and its Inhabitants. *Ann. M. N. H.* ser. 4, vol. ii. pp. 26–30 (1868).

1380. ——. On *Hyalonema schultzei* and on *Eurete*. *Ann. M. N. H.* ser. 4, vol. ii. pp. 372, 373 (1868).

1381. ——. Einige neue Kieselschwämme der Philippinen; *Hyalonema schultzei*, n. sp., und *Eurete*, n. g. *Würzburg. Verhandl.* Bd. i. pp. xxix, xxx (1869).

1382. **Shaler, N. S.** On the occurrence of the genus *Beatricea* in Kentucky. *Am. Nat.* vol. xi. p. 628 (1877).

1383. **Sharpe, D.** On the age of the fossiliferous sands and gravels of Farringdon and its neighbourhood. *J. G. Soc.* vol. x. p. 176 (1854).

1384. **Sicard, Adien.** Études pratiques sur les madrépores et des éponges, présentées à la société de statistique de Marseille pendant l'année 1870. Marseille (1871).

1385. ——. Études pratiques sur la vitalité des jeunes éponges et leur croissance. Paris (1871).

1386. **Simanowitch, S.** Beiträge zur Kenntniss der Bryozoen des Essener Grünsandes. *Verh. naturw. Vereins*, 3 Folge, Bd. viii.

1387. **Sinzow, J.** On Calcareous Sponges from the Government of Saratow (Russian). (*Zapiski*) *New Russian Nat. Hist. Soc.* vol. vi. pp. 1–40 (1879).

1388. **Slack, H. J.** Venus's Flower-basket. *Intellectual Observer*, vol. xi. pp. 161–166 (1867).

1389. ——. The Nature of Sponges. *Pop. Sci. Review*, vol. xi. pp. 167–176 (1872).

1390. **Sloane, H.** Catal. Plant. Jamaic. Londini (1696).

1391. ——. Voyage to the islands Madera etc. Vol. i. London (1707).

1392. **Smith, J. Toulmin.** On the formation of the flints of the Upper Chalk. *Ann. M. N. H.* ser. 1, vol. xix. p. 1 (1847).

1393. ——. On the Ventriculidæ of the Chalk. *Ann. M. N. H.* vol. xx. p. 73 (1847).

1394. ——. On the Ventriculidæ of the Chalk. *Ann. M. N. H.* vol. xx. p. 176 (1847).

1395. ——. Classification. *Ann. M. N. H.* ser. 2, vol. i. p. 36 (1848).

1396. ——. Classification. *Ann. M. N. H.* ser. 2, vol. i. p. 203 (1848).

1397. ——. Classification. *Ann. M. N. H.* ser. 2, vol. i. p. 279 (1848).

1398. ——. Classification. *Ann. M. N. H.* ser. 2, vol. i. p. 352 (1848).

1399. **Smith, G. J.,** and **Harger, O.** Report on the Dredgings in the region of St. George's Banks. *Tr. Connecticut Ac. Sci.* vol. iii. p. 55 (1874).

1400. **Smith, W.** Strata identified by Organized Fossils. (1816.)

1401. **Solger, B.** Ueber einige der anatomischen Untersuchung zugängliche Lebensverscheinungen der Spongien. *Biol. Centralbl.* Bd. iii. pp. 227–235 (1883).

[1402.] ——. Vital Manifestations of Sponges. (Abstr.) *Am. Nat.* xviii. pp. 635–636 (1884).

1403. **Sollas, W. J.** On the Ventriculitæ of the Cambridge Upper Greensand. *J. G. Soc.* vol. xxix. pp. 63–76 (1873).

1404. ——. On the Coprolites of the Upper Greensand Formation and on Flints. *J. G. Soc.* vol. xxix. pp. 76–81 (1873).

1405. ——. On the Foraminifera and Sponges of the Cambridge Upper Greensand. *Geol. Mag.* vol. x. pp. 268–274 (1873).

1406. ——. On the Ventriculite Sponges. Dixon's *Geology of Sussex*, pp. 448–455 (1875).

1407. ——. On a new Hexactinellid Sponge (*Eubrochus clausus*). *Geol. Mag.* dec. ii. vol. iii. pp. 398–408 (1876).

1408. ——. On the Foraminifera and Sponges of the Cambridge Upper Greensand. *P. Cambridge Phil. Soc.* vol. ii. pp. 229–300 (1876).

1409. ——. On *Stauronema*, a new Genus of Fossil Hexactinellid Sponges, with a description of its two Species, *S. carteri* and *S. lobata*. *Ann. M. N. H.* ser. 4, vol. xix. pp. 1–26 (1877).

1410. ——. On the Changes produced in the Siliceous Skeletons of certain Spouges by the action of caustic potash. *Ann. M. N. H.* ser. 4, vol. xx. pp. 285–300 (1877).

1411. ——. On *Pharetrospongia strahani*, Sollas, a fossil Holorhaphidote Sponge from the Cambridge "Coprolite" bed. *J. G. Soc.* vol. xxxiii. pp. 242–255 (1877).

1412. ——. On the Structure and Affinities of the genus *Siphonia*. *J. G. Soc.* vol. xxxiii. pp. 790–834 (1877).

1413. ——. On two new and remarkable species of *Cliona*. *Ann. M. N. H.* ser. 5, vol. i. pp. 54–67 (1878).

1414. ——. On the Structure and Affinities of the genus *Catagma*. *Ann. M. N. H.* ser. 5, vol. ii. pp. 353–364 (1878).

1415. **Sollas, W. J.** On *Plectronella papillosa*, a new genus and species of Echinonematous Sponge. *Ann. M. N. H.* ser. 5, vol. iii. pp. 17–28 (1879).

1416. ——. Note on the Structure and Affinities of the genus *Catagma*. *Ann. M. N. H.* ser. 5, vol. iii. pp. 169–170 (1879).

1417. ——. On *Pharetronema zingiberis*, a new genus and species of Renierid Sponge. *Ann. M. N. H.* ser. 5, vol. iii. pp. 404–407 (1879).

1418. ——. On *Plocamia plena*, a new genus and species of Echinonematous Sponge. *Ann. M. N. H.* ser. 5, vol. iv. pp. 44–53 (1879).

1419. ——. Observations on *Dactylocalyx pumiceus* (Stutchbury), with a description of a new variety, *Dactylocalyx stutchburyi*. *J. R. Micr. Soc.* vol. ii. pp. 122–133 (1879).

1420. ——. On the replacement of Siliceous Skeletons by Carbonate of Lime. *Rep. Brit. Assoc.* 1879, vol. xlix. p. 350 (1879).

[1421.] ——. On the replacement of Siliceous Skeletons by Carbonate of Lime. (Abstr.) *J. R. Micr. Soc.* vol. iii. p. 282 (1880).

1422. ——. On the Structure and Life-history of a Sponge. *P. Bristol Nat. Soc.* new series, vol. iii. pp. 20–37 (1880).

1423. ——. The Sponge-fauna of Norway; a Report on the Rev. A. M. Norman's Collection of Sponges from the Norwegian Coast. *Ann. M. N. H.* ser. 5, vol. v. pp. 130–145 (1880).

1424. ——. The Sponge-fauna of Norway; a Report on the Rev. A. M. Norman's Collection of Sponges from the Norwegian Coast. *Ann. M. N. H.* ser. 5, vol. v. pp. 241–259 (1880).

1425. ——. The Sponge-fauna of Norway; a Report on the Rev. A. M. Norman's Collection of Sponges from the Norwegian Coast. *Ann. M. N. H.* ser. 5, vol. v. pp. 396–409 (1880).

1426. ——. On Flint Nodules from the Trimmingham Chalk. *Ann. M. N. H.* ser. 5, vol. vi. pp. 384–397 (1880).

1427. ——. On Flint Nodules from the Trimmingham Chalk. *Ann. M. N. H.* ser. 5, vol. vi. pp. 437–461 (1880).

1428. ——. On Sponge-spicules from the Chalk of Trimmingham, Norfolk. *Rep. Brit. Assoc.* pp. 586–587 (1880).

1429. ——. On the Structure and Affinities of the genus *Protospongia* (Salter). *J. G. Soc.* vol. xxxv. pp. 362–366 (1880).

1430. ——. On *Astroconia granti*, a new Lyssakine Hexactinellid from the Silurian Formation of Canada. *J. G. Soc.* vol. xxxvii. pp. 254–260 (1881).

1431. ——. On *Astroconia granti*, a new Lyssakine Hexactinellid from the Silurian Formation of Canada. *J. G. Soc.* vol. xxxvii. p. 480 (1881).

1432. ——. Note on the occurrence of Sponge-spicules in Chert from the Carboniferous Limestone of Ireland. *Ann. M. N. H.* ser. 5, vol. vii. pp. 141–143 (1881).

1433. ——. The Sponge-fauna of Norway; a Report on the Rev. A. M. Norman's Collection of Sponges from the Norwegian Coast. *Ann. M. N. H.* ser. 5, vol. ix. pp. 141–166 (1882).

1434. ——. The Sponge-fauna of Norway; a Report on the Rev. A. M. Norman's Collection of Sponges from the Norwegian Coast. *Ann. M. N. H.* ser. 5, vol. ix. pp. 426–453 (1882).

1435. ——. Sponges. *Cassell's Natural History*, vol. vi. pp. 312–331 (1882).

1436. ——. Description of Fossil Sponges from the Inferior Oolite and on some from the Great Oolite. *J. G. Soc.* vol. xxix. pp. 541–543 (1883).

1437. ——. The Estuaries of the Severn and its Tributaries. An inquiry into the nature and origin of Tidal Sediments and Alluvial Flats. *J. G. Soc.* vol. xxix. pp. 611–626 (1883).

1438. ——. On the origin of Freshwater Faunas. A study in Evolution. *Tr. R. Dublin Soc.* vol. iii. pp. 87–118 (1884).

[1439.] **Sollas, W. J.** On the origin of Freshwater Faunas. A study in Evolution. (Abstr.) *P. R. Dublin Soc.* 1884, pp. 238–240 (1884).

1440. ——. On the Development of *Halisarca lobularis*. *Q. J. Micr. Sci.* vol. xxiv. pp. 603–621 (1884).

[1441.] ——. On the Development of *Halisarca lobularis*. (Abstr.) *J. R. Micr. Soc.* vol. v. p. 73 (1884).

[1442.] ——. Le développement de *Halisarca lobularis*. (Extr.) *Arch. Zool. expér.* sér. 2, tom. iii. Notes, pp. xxvi–xxviii (1884).

1443. ——. On the Physical Characters of Calcareous and Siliceous Sponge-spicules and other structures. *P. Bristol Nat. Soc.* n. s. vol. iv. pp. 374–392.

1444. ——. On a Hexactinellid Sponge from the Gault and a Lithistid from the Lias of England. *P. R. Dublin Soc. Nat. Hist.* n. s. vol. iv. pp. 443–446.

1445. ——. On *Vetulina stalactites*, O. S., and the Skeleton of the Anomocladina. *P. R. Irish Ac.* ser. 2, vol. iv. pp. 486–492 (1885).

[1446.] ——. On *Vetulina stalactites*, O. S., and the Skeleton of the Anomocladina. (Abstr.) *J. R. Micr. Soc.* ser. 2, vol. v. p. 464 (1885).

1447. ——. Note on the Structure of the Skeleton in the Anomocladina. *Ann. M. N. H.* ser. 5, vol. xv. pp. 236–238 (1885).

1448. ——. A Classification of the Sponges. *Ann. M. N. H.* ser. 5, vol. xvi. p. 395 (1885).

[1449.] ——. Structure of the Skeleton in the Anomocladina. (Abstr.) *J. R. Micr. Soc.* ser. 2, vol. v. p. 465 (1885).

1450. ——. The Tetractinellida. Narrative of the voyage of H.M.S. 'Challenger,' vol. i. pp. 450–452 (1885).

1451. ——. Sponge-spicules. *P. R. Dublin Soc.* vol. iv. pp. 374–392 (1885).

[1452.] ——. Sponge-spicules. (Abstr.) *J. R. Micr. Soc.* ser. 2, vol. vi. pp. 628–629 (1886).

1453. ——. Preliminary account of the Tetractinellid Sponges dredged by H.M.S. 'Challenger,' 1872–76.—Part I. The Choristida. *P. R. Dublin Soc.* vol. v. p. 177 (1886).

1454. ——. Note on the Artificial Deposition of Crystals of Calcite on Spicules of a Calcisponge. *P. R. Dublin Soc.* vol. v. p. 73 (1886).

1455. ——. A Classification of the Sponges. *P. R. Dublin Soc.* vol. v. p. 112 (1886).

[1456.] ——. A Classification of Sponges. (Abstr.) *J. R. Micr. Soc.* ser. 2, vol. vi. p. 630 (1886).

1457. ——. Letter on Dr. Heider's paper on *Oscarella lobularis*. *Zool. Anz.* Bd. ix. pp. 518–519 (1886).

1458. **Sorby, H. C.** On the Chromatological Relations of *Spongilla fluviatilis*. *Q. J. Micr. Sci.* new ser. vol. xv. pp. 47–52 (1875).

1459. **Sowerby, J.** British Miscellany. Vol. i. London (1804–1806).

1460. ——. Descriptive Notes respecting the Shells figured in plates 11–23 in Dr. Fitton's Strata below the Chalk. *Tr. Geol. Soc.* ser. 2, vol. iv. p. 335 (1836).

1461. **Stadeler.** Ueber Fibroin bei Spongien. *Ann. Chemie Physik*, tom. iii. (1860).

1462. **Stebbing, T. R. R.** On Parasites of Sponges. *Ann. M. N. H.* ser. 5, vol. ii. p. 427 (1878).

1463. **Steinmann, F.** Systematische Stellung der Pharetronen. *Neues Jahrb. Mineral. Geol.* Bd. i. p. 79 (1883).

1464. ——. Pharetronen-Studien. *Neues Jahrb. Mineral. Geol.* Bd. ii. pp. 139–191 (1884).

1465. **Steinmann, F.** Mikroskopische Thierreste aus dem deutschen Kohlenkalk. *Z. geol. Ges.* Bd. xxxii. pp. 394–400 (1881).

1466. **Stewart, C.** Elements of the Natural History of the Animal Kingdom. Edinburgh (1817).

1467. **Stewart, C.** On a new Sponge, *Tethyopsis columnifer*. *J. R. Micr. Soc.* n. s. vol. x. pp. 281–282 (1870).

1468. ——. On the Histology of *Grantia compressa*. *J. R. Micr. Soc.* vol. i. p. 560 (1882).

1469. ——. Nerve-cells in *Grantia*. Bell's 'Zoology,' p. 114 (1886).

1470. **Stimpson, William.** Notes on the "Glass Coral" of Japan (*Hyalonema mirabilis*). *Am. J. Sc.* ser. 2, vol. xxxv. pp. 458–459 (1863).

1471. **Strange, John.** An account of some very perfect and uncommon specimens of Spongiæ from the coast of Italy. *Phil. Tr.* vol. lx. p. 179 (1770).

1472. **Strickland, H. E.** On the mode of growth of *Halichondria suberea*. *Rep. Brit. Assoc.* (1853).

1473. **Studer.** Ueber Westafrikanische Thiere. *SB. nat. Fr.* 1878, pp. 137–138 (1878).

1474. ——. Spongien von Kerguelen. *Arch. f. Nat.* Bd. xlv. p. 119 (1879).

1475. ——. Beiträge zur Meeresfauna West-Africas. *Zool. Anz.* Bd. v. pp. 333–336 (1882).

1476. ——. Beiträge zur Meeresfauna West-Africas. *Zool. Anz.* Bd. v. pp. 351–356 (1882).

1477. **Stutchbury, S.** Description of a new Sponge from Barbadoes, *Dactylocalyx pumicea*. *P. Z. S.* 1841, p. 86 (1841).

1478. ——. Description of a new Sponge from Barbadoes. *Ann. M. N. H.* vol. ix. p. 504 (1842).

1479. **Suess, E.** Ueber fossile Hexactinelliden. *Verh. z.-b. Wien*, Bd. xii. p. 85 (1862).

1480. ——. On the existence of *Hyalonema* in a Fossil State. *Ann. M. N. H.* ser. 3, vol. xviii. pp. 404–405 (1866).

1481. **Tate, R.** On the correlation of the Cretaceous Formations of the North-east of Ireland. *J. G. Soc.* vol. xxi. (1865).

1482. **Templer, R. B.** *Hyalonema*. *Land and Water*, 1871, p. 219 (1871).

1483. **Templeton, J.** and **R.** Catalogue of Irish Rayed Animals. *Mag. Nat. Hist.* vol. ix. p. 466 (1836).

1484. **Thomson, C. Wyville.** On the "Glass-rope," *Hyalonema* (*H. sieboldi*). *Intellectual Observer*, vol. xi. pp. 81–94 (1867).

1485. ——. On the "Vitreous" Sponges. *Ann. M. N. H.* ser. 4, vol. i. pp. 114–132 (1868).

1486. ——. On *Holtenia*, a Genus of Vitreous Sponges. *Monthl. Micr. J.* vol. ii. pp. 107–109 (1869).

1487. ——. On the Depths of the Sea. *Ann. M. N. H.* ser. 4, vol. iv. p. 112 (1869)

1488. ——. On *Holtenia*, a Genus of Vitreous Sponges. *P. R. Soc.* vol. xviii. p. 284 (1869).

1489. ——. On *Holtenia*, a Genus of Vitreous Sponges. *Phil. Tr.* vol. clix. pp. 701–720 (1869).

[1490.] ——. On *Holtenia*, a Genus of Vitreous Sponges. (Abstr.) *Ann. M. N. H.* ser. 4, vol. iv. p. 284 (1869).

1491. ——. The Depths of the Sea. London (1873).

1492. ——. On Hexactinellids. *Nature*, vol. viii. p. 29 (1873).

1493. ——. On Hexactinellids. *Nature*, vol. viii. p. 248 (1873).

1494. **Thomson, C. Wyville.** The Voyage of the 'Challenger.' The Atlantic. London: 2 vols. (1877).

1495. **Thompson, D'Arcy.** Bibliography of Protozoa, Cœlenterata, Worms. (1883.)

1496. **Thoulet, T.** Sur les Spicules siliceux des éponges vivants. *C. R.* tom. xcviii. pp. 1000–1001 (1884).

[1497.] ——. Siliceous Spicules of Sponges. (Abstr.) *Am. J. Sci.* (3) vol. xxviii. p. 76.

1498. ——. On Siliceous Spicules of Sponges. (Abstr.) *J. R. Micr. Soc.* ser. 2, vol. iv. p. 757 (1884).

1499. **Thurmann, J.**, et **Etallon.** Lethæa Brunthrutana, ou études paléontologiques et stratigraphiques sur le Jura Bernois, et en particulier les environs de Brentini. *Nouveaux Mém. de la S. helvétique Sc. Nat.* 1859.

1500. **Tilesius, W. G.** Zwei verschiedene Species *Spongia villosa* und *ocellata* in einem Röhrenschwamme vereinigt. *Voigt's Magazin*, Bd. vi. p. 277 (1803).

1501. **Tournefort, J. P.** Institutiones rei herb. Vol. i. Parisiis (1700).

1502. **Trautschold, H.** Paläontologischer Nachtrag zu der Abhandlung des Fürsten P. Krapotkin über die geognostischen Verhältnisse des Kreises Meschtschowsk im Gouvernement Kaluga (*Siderospongia sirenis*). *Bull. Mosc.* tom. xlii. pt. 2, pp. 230–233 (1869).

1503. ——. Die Kreidefossilien Russlands (*Capulispongia*, *Porospongia*, *Chætetes*, *Placuntarion*). *Bull. Mosc.* vol. lii. pp. 332–349 (1877).

1504. ——. Ueber *Camerospongia auerbachi*, Eichw. *Z. geol. Ges.* Bd. xxx. pp. 225–228 (1878).

1505. **Trost, G.** Description d'un nouveau genre de fossil. *Mém. Soc. Géol. France*, tom. iii. (1838).

1506. **Turgot, E. F.** Mémoire instructif sur diverses curiosités d'histoire naturelle. Paris et Lyon (1758).

1507. **Turpin, P. J. F.** Rapport sur une note de M. F. Dujardin, relative à l'animalité des Spongilles. *C. R.* tom. vii. p. 556 (1838).

1508. **Turton, W.** General System of Nature. Vol. iv. London (1806).

1509. ——. British Fauna. Swansea (1807).

1510. **Uljanin, V.** Materialy dlia fanny Izernago moria Iswjestiä estest, Moskwa, vol. ix. part 1, p. 83 (1872).

1511. **Vahl, M.** Beskribelse af en ny Söe-svamp. *Skrivten Naturhist. Selsk.* Bd. ii. Heft. 2, 1793, p. 51 (1793).

1512. **Vaillant, Léon.** Note sur la vitalité d'une éponge de la famille des Corticates, la *Tethya lyncurium*, Lamarck. *C. R.* tom. lxviii. pp. 86–88 (1869).

1513. ——. Note sur la vitalité d'une éponge de la famille des Corticates, la *Tethya lyncurium*, Lamarck. *Ann. M. N. H.* ser. 4, vol. iii. p. 172 (1869).

1514. ——. Note sur la disposition des pores ou orifices afférents dans la *Cliona celata*, Grant. *C. R.* tom. lxx. pp. 41–43 (1870).

1515. ——. Note sur la disposition des pores ou orifices afférents dans la *Cliona celata*, Grant. *Ann. M. N. H.* ser. 4, vol. v. pp. 146–148 (1870).

1516. **Valenciennes, A.** Note sur les Spongiaires (*Ælythia*) envoyés des côtes de l'Altigne, par M. Albert Gaudry. *C. R.* tom. li. p. 579 (1860).

1517. **Vasseur, G.** Reproduction asexuelle de la *Leucosolenia botryoides* (*Ascandra variabilis*, Haeckel). *Arch. Z. expér.* tom. viii. pp. 59–66 (1879–80).

1518. **Vejdovsky, Fr.** Revisio Faunæ Bohemicæ. Pars 1. Die Süsswasserschwämme Böhmens. *Abh. kgl. Ges. Wiss.* Bd. xii. Prag (1883).

1519. ——. Prispevky k. známostem of honbách sladkovodnich. (Contributions to our Knowledge of Freshwater Sponges.) (Bohemian.) *SB. böhm. Ges.* 1883, pp. 19–31 (1883).

[1520.] ——. Contributions to the Knowledge of the Freshwater Sponges, with Remarks by H. J. Carter. (Transl.) *Ann. M. N. H.* ser. 5, vol. xiii. p. 96 (1884).

1521. ——. Bemerkungen über einige Süsswasserschwämme Böhmens. *SB. böhm. Ges.* 1884, p. 55 (1884).

[1522.] ——. Freshwater Sponges. (Abstr.) *J. R. Micr. Soc.* ser. 2, vol. iv. pp. 242–243 (1884).

1523. ——. Beobachtungen über Süsswasserschwämme. *SB. böhm. Ges.* 1884, pp. 167–172 (1885).

[1524.] ——. Observations on some Freshwater Sponges. (Transl.) *Ann. M. N. H.* ser. 5, vol. xv. pp. 13–18 (1885).

[1525.] ——. Observations on some Freshwater Sponges. (Abstr.) *J. R. Micr. Soc.* vol. v. p 255 (1885).

[1526.] ——. Observations on Freshwater Sponges. (Abstr.) *J. R. Micr. Soc.* vol. vi. p. 257 (1886).

1527. ——. Einiges über "*Spongilla glomerata*, N." *Zool. Anz.* Bd. ix. pp. 713–715 (1886).

1528. **Verrill, A. E.** Invertebrate Animals of Vineyard Sound. *Rep. U. S. Fish. Comm.* vol. i. 1871–72, pp. 740–745 (1871–72).

1529. ——. Report on the Condition of the Sea-Fisheries on the South Coast of New England in 1871 and 1872. Washington (1873).

1530. ——. Calcareous Sponges. *Proc. Amer. Assoc.* 1873, pp. 292–293 (1873).

1531. ——. Exploration of Casco Bay by the U.S. Fish Commission in 1873. *P. Amer. Assoc.* pp. 340–395 (1873).

1532. ——. On new Sponges from New England. *Am. J. Sci.* vol. vii. p. 501 (1874).

1533. ——. Note on Borings of a Sponge in Italian Marble (*Cliona*). *Am. J. Sci.* ser. 3, vol. xvi. p. 406 (1878).

1534. ——. Preliminary Check-list of the Marine Invertebrata of the Atlantic Coast from Cape Cod to the Gulf of St. Lawrence. *P. U. S. Nat. Mus.* (1879).

1535. ——. Recent Additions to the Marine Invertebrata of the North-eastern Coast of America &c.—Porifera. *P. U. S. Nat. Mus.* 1879, p. 204 (1879).

1536. ——. Notice of Recent Additions to the Marine Invertebrata of the North-eastern Coast of America, with descriptions of new Genera and Species and critical remarks on others. *P. U. S. Nat. Mus.* p. 165 (1880).

1537. **Vogt, C.** Lehrbuch der Geologie. 2 vols. (1866).

1538. ——. Sur les prétendus Organismes des Météorites. *C. R.* tom. xciii. 1881, pp. 1166–1168 (1881).

[1539.] ——. Sur les prétendus Organismes des Météorites. (Abstr.) *J. R. Micr. Soc.* vol. ii. pp. 176–178 (1882).

1540. **Volkmann, G. A.** Silesia subterranea. Leipzig, 1720.

1541. **Vosmaer, G. C. J.** The Sponges of the Leyden Museum.—I. The Family of the Desmacidinæ. *Notes Leyd. Mus.* vol. ii. pp. 99–164 (1880).

1542. ——. Aanteckeningen over *Leucandra aspera*, H. Bijdrage tot de kennis der Kalksponzen. Leiden (1880).

[1543.] **Vosmaer, G. C. J.** Aanteckeningen over *Leucandra aspera*. (Auszug.) *Tijdschr. Nederl. Dierk. Vereen.* vol. v. p. 144 (1880).

1544. ——. Eine spongiologische Bibliographie. *Zool. Anz.* Bd. iii. p. 478 (1880).

1545. ——. Versuch einer spongiologischen Stenografie. *Tijdschr. Nederl. Dierk. Vereen.* vol. v. (1881).

1546. ——. Ueber die Fortpflanzungsverhältnisse der Spongien. *Biol. Centralbl.* Bd. i. p. 103 (1881–82).

1547. ——. Report on the Sponges dredged up in the Arctic Sea by the 'Willem Barents' in the years 1878 and 1879. *Niederl. Arch. Zool.* Suppl. i. 58 pp. (1881–82).

1548. ——. Voorloopig berigt omtrent het ouderzoek aan de nederl. werktafel in het Zool. Stat. te Napels. *Nederl. Staatscourant.* (1881.)

1549. ——. Porifera. *Brown's Klassen und Ordnungen des Thierreichs*, Bd. ii. (1882–1886).

1550. ——. (Poléjaeff, N.) Ueber das Sperma und die Spermatogenese bei *Sycandra raphanus*, H. *Biol. Centralbl.* Bd. iii. pp. 180–181 (1883).

1551. ——. Studies on Sponges. I. On *Velinæ gracilis*. *MT. z. Stat. Neapel*, Bd. iv. pp. 437–447 (1883).

1552. ——. Referate über v. Lendenfeld's Aplysinidæ. *Biol. Centralbl.* Bd. iii. p. 695 (1883).

1553. ——. Ueber Nassanow's *Clione*. *Biol. Centralbl.* p. 768 (1883).

1554. ——. Ueber Vejdovsky's Süsswasserschwämme. *D. Litt. Zeit.* p. 1776 (1883).

1555. ——. Ueber seine und Poléjaeff's Untersuchungen über Kalkschwämme. *Biol. Centralbl.* Bd. iv. pp. 241–244 (1884).

[1556.] ——. On a new genus of Sponges (*Velinea*). (Abstr.) *J. R. Micr. Soc.* ser. 2, vol. iv. p. 243 (1884).

1557. ——. Studies on Sponges, II.–IV.—II. On the supposed difference between *Leucandra crambessa*, H., and *aspera* (O. S.), H. III. On Haeckel's entogastric Septa. IV. On the Relation between certain Monactinellidæ and Ceraospongiæ. *MT. z. Stat. Neap.* Bd. v. pp. 483–493 (1884).

1558. ——. Something about Scudder's 'Nomenclator Zoologicus.' *Zool. Anz.* Bd. viii. pp. 216–218 (1885).

1559. ——. The Sponges of the 'Willem Barents' Expedition of 1880 and 1881. *Bijdr. Dierk.* vol. xii. (1885).

[1560.] ——. Sponges of the 'Willem Barents' Expedition. (Abstr.) *J. R. Micr. Soc.* ser. 2, vol. v. p. 1013 (1885).

[1561.] ——. Studies on Sponges. (Abstr.) *J. R. Micr. Soc.* vol. v. p. 75 (1885).

1562. ——. Einige neuere Arbeiten über Schwämme. Refer. in *Biol. Centralbl.* Bd. vi. p. 181 (1886).

1563. ——. Einige neuere Arbeiten über Schwämme. *Biol. Centralbl.* Bd. vi. pp. 193–201 (1886).

1564. **Wallace, Samuel J.** On the "Geodes" of the Keokuk Formation and the Genus *Biopalla*, with some new Species. *Am. J. Sci.* ser. 3, vol. xv. pp. 366–370 (1878).

1565. **Walcott, C. D.** *Cyathophycus*. *Trans. Albany Instit.* vol. x. (1879).

1566. ——. On the nature of *Cyathophycus*. *Ann. M. N. H.* ser. 5, vol. viii. p. 459 (1881).

1567. ——. On the nature of *Cyathophycus*. *Am. J. Sci.* ser. 3, vol. xxii. pp. 394–395 (1881).

1568. **Waller, J. G.** On the so-called boring or burrowing Sponge, *Cliona celata*, Grant. *J. Quek. Club*, vol. ii. pp. 269–277 (1871).

1569. ——. Observations on the Freshwater Sponges. *J. Quek. Club*, vol. iii. pp. 42–48 (1872).

1570. ——. On a new British Sponge of the Genus *Microciona*. *Monthl. Micr. J.* vol. xviii. p. 261 (1872).

1571. ——. On a new British Sponge of the Genus *Microciona*. *J. Quek. Club*, vol. v. pp. 1–5 (1878).

1572. ——. On Variation in *Spongilla fluviatilis*. *J. Quek. Club*, vol. v. pp. 53–62 (1878).

1573. ——. On an Undescribed British Sponge of the Genus *Raphiodesma*, Bwk. (*R. minima*). *J. Quek. Micr. Club*, vol. vi. pp. 97–104 (1880).

1574. ——. On *Clione celata*.—Does the Sponge make the Burrow? *J. Quek. Club*, vol. vi. pp. 251–268 (1881).

[1575.] ——. On a newly-discovered British Sponge (*Hymeraphia forceps*). (Abstr.) *J. R. Micr. Soc.* ser. 2, vol. iii. p. 668 (1883).

1576. ——. On a newly-discovered British Sponge (*Hymeraphia forceps*). *J. Quek. Club*, ser. 2, vol. i. pp. 216–223 (1884).

1577. **Wallich, G.** On Sponges. *Pop. Sci. Rev.* vol. ii. pp. 374–378 (1878).

1578. ——. A Contribution to the Physical History of Flint. *Ann. M. N. H.* ser. 5, vol. v. p. 183 (1880).

1579. ——. A Contribution to the Physical History of the Cretaceous Flints. *J. G. Soc.* vol. xxxvii. p. 60 (1880).

1580. ——. On Siliceous Sponge-growth in the Cretaceous Ocean. *Ann. M. N. H.* ser. 5, vol. vii. pp. 261–263 (1881).

1581. **Wartman, B.** Von dem Fischbrod. *Naturf.* vol. xxi. (1785).

1582. ——. Von dem Fischbrod. *Naturf.* vol. xxii. (1787).

1583. **Weber, M.** Verslag over de zoölogische onderzoekingen gedurende de vierde reis der 'Willem Barents.' *Verslagen 4, tucht W. Barents*, pp. 101–140 (1881).

1584. **Webster, T.** On some new varieties of Fossil Alcyonia. *Trans. Geol. Soc.* vol. ii. pp. 377–387 (1814).

1585. **Weinland, D. T.** Ueber die in Meteoriten entdeckten Thierreste. Esslingen (1882).

1586. **Weltner, Wilh.** Beiträge zur Kenntniss der Spongien. (Inaug. Diss.) Freiburg, 1882.

1587. **Wetherell, W. T.** Note on a new Species of *Clionites*. *Ann. M. N. H.* ser. 2, vol. x. (1852).

1588. **White, C. A.** The enemies and parasites of the Oyster, past and present. *Science*, vol. iii. p. 618 (1884).

1589. **Whiteaves.** On Deep-Sea Sponges. *Am. J. Sci.* vol. vii. p. 211.

1590. **Whitfield, R. P.** Observations on the Structure of *Dictyophyton* and its affinities with certain Sponges. *Am. J. Sci.* ser. 3, vol. xxii. pp. 53–55 (1881).

1591. ——. On the nature of *Dictyophyton*; with a Note by J. W. Dawson. *Am. J. Sci.* ser. 3, vol. xxii. pp. 132, 133 (1881).

1592. ——. Observations on the Structure of *Dictyophyton* and its affinities with certain Sponges. *Ann. M. N. H.* ser. 5, vol. viii. pp. 167, 168 (1881).

1593. ——. On the nature of *Dictyophyton*. *Ann. M. N. H.* ser. 5, vol. viii. p. 237 (1881).

1594. ——. Remarks on *Dictyophyton*, and descriptions of new species of allied forms from the Keokuk Beds, at Crawfordsville, Ind. *Amer. Mus. Nat. Hist. Bull.* no. 1, pp. 10–20 (1882).

1595. **Wierzejski, A.** O razwoja pakôw gabek slodkowodnych europejskich tudziez o gat. *Spongilla fragilis*, Leidy (*S. sibirica*, Dyb.). (On the development of the gemmules of European Freshwater Sponges.) *Rozpr. i Spraw. Akad. umiej. af Krakowie*, tom. xii. p. 239 (1884).

1596. ——. Ogabkach lodnowodhych galicygskich. (Freshwater Sponges of Galicia.) *Spraw. korn. fizyogr. Akad. umiej. Krakowie*, tom. xix. (1885).

1597. ——. Le développement des gemmules des éponges d'eau douce d'Europe. *Arch. Slav. Biol.* t. i. fasc. 1, pp. 26–47 (1886).

[1598.] ——. Les Éponges d'eau douce de Galicie. (Abstr.) *Arch. Slav. Biol.* vol. ii. pp. 37–40.

1599. **Williamson, W. C.** The Common Freshwater Sponge (*Spongilla fluviatilis*). *Pop. Sci. Review*, vol. vii. pp. 1–9 (1868).

1600. **Willemoës-Suhm, R. v.** Biologische Beobachtungen über niedere Meeresthiere. II. Ueber einen jungen Kalkschwamm. *Z. wiss. Zool.* Bd. xxi. p. 382 (1871).

1601. ——. Briefe von der 'Challenger' Expedition. *Z. wiss. Zool.* Bd. xxv. pp. xxv–xxvi (1875).

1602. **Wizesniowski, A.** (Systematic position of Sponges according to Marshall.) *Wszechswiat*, tom. iv. p. 563 (1885).

1603. **Woodward, S.** Outline of the Geology of Norfolk. (1833.)

1604. **Wotton, E.** De differentiis animalium. Libri 10. Parisiis, 1552.

1605. **Wright, E. P.** Note on *Hyalonema*, Gray. *Ann. M. N. H.* ser. 4, vol. ii. p. 320 (1868).

1606. ——. Notes on Deep-sea Dredging off the Coast of Portugal. *Ann. M. N. H.* ser. 4, vol. ii. p. 423 (1868).

1607. ——. Notes on Irish Sponges.—I. A List of the Species. *Proc. Roy. Irish Acad.* vol. x. pp. 221–228 (1870).

1608. ——. Notes on Sponges.—1. On *Hyalonema mirabilis*, Gray. 2. On *Aphrocallistes bocagei*, sp. nov. 3. On a new Genus and Species of Deep-sea Sponge (*Wyvillethomsonia wallichii*). *Q. J. Micr. Sci.* n. s. vol. x. pp. 1–9 (1870).

1609. ——. On Hexactinellids. *Q. J. Micr. Sci.* n. s. vol. xvii. pp. 1–4 (1870).

1610. ——. On Hexactinellids. *Q. J. Micr. Sci.* n. s. vol. xvii. pp. 8–9 (1870).

1611. ——. Report on the Structure and Mode of Life of *Hyalonema lusitanica*, Bocage. *Proc. Roy. Irish Acad.* n. s. vol. i. pp. 549–552, 1873 (1875).

1612. ——. On *Kallispongia*. *Proc. Roy. Irish Acad.* n. s. vol. ii. pp. 113–116 (1876).

1613. ——. On a new Genus and Species of Sponge (*Kallispongia archeri*). *Proc. Roy. Irish Acad.* n. s. vol. ii. pp. 754–756, 1876 (1877).

1614. ——. On Siliceous Sponges. *Q. J. Micr. Sci.* vol. xxiv. p. 370 (1877).

1615. ——. On a new Genus and Species of Sponge (*Alemo seychellensis*) with supposed heteromorphic zooids. *T. R. Irish Ac.* vol. xxviii. pp. 13–20 (1881).

1616. **Wright, J.** A List of the Cretaceous Microzoa of the North of Ireland. *Belfast Nat. Hist. Field-Club Report* (1873–74).

1617. **Young J., Armstrong, J.,** and **Robertson, J.** Catalogue of the Western Scottish Fossils. (1876.)

1618. ——, and **Young, J.** On a Carboniferous *Hyalonema* and other Sponges from Ayrshire. *Ann. M. N. H.* ser. 4, vol. xx. pp. 425–433 (1877).

1619. ——. On the occurrence of a Freshwater Sponge in the Purbeck Limestone (*Spongilla purbeckensis*). *Geol. Mag.* dec. ii. vol. v. pp. 220–221 (1878).

1620. **Zarecznaga, S.** Sprawozt. Komfissyogr. II. (1878.)

1621. **Zittel, K. A.** Aus der Urzeit. 2 vols.

1622. ——. Ueber *Cœloptychium*. Ein Beitrag zur Kenntniss der Organisation fossiler Spongien. *Abh. bayer. Ak.* vol. xii. pt. 3, pp. 1–80 (1876).

[1623.] ——. Ueber *Cœloptychium*. (Auszug.) *Jahrb. Mineral.* vol. xliv. pp. 578–579 (1876).

1624. ——. Untersuchungen fossiler Hexactinelliden. Mittheilung an Prof. H. B. Geinitz. *Neues Jahrb. Mineral. Geol.* 1876, p. 286 (1876).

1625. ——. Untersuchungen über fossile Spongien. *Z. geol. Ges.* Bd. xxviii. p. 631 (1876).

1626. ——. Studien über fossile Spongien. I. *Hexactinellidæ*. *Abh. bayer. Ak.* vol. xiii pt. 1, pp. 1–64 (1877).

1627. ——. Studies on Fossil Sponges. I. *Hexactinellidæ*. *Ann. M. N. H.* ser. 4, vol. xx. pp. 257–273 (1877).

1628. ——. Studies on Fossil Sponges. I. *Hexactinellidæ*. *Ann. M. N. H.* ser. 4, vol. xx. pp. 405–424 (1877).

1629. ——. Studies on Fossil Sponges. I. *Hexactinellidæ*. *Ann. M. N. H.* ser. 4, vol. xx. pp. 501–517 (1877).

1630. ——. Ueber Untersuchung der Spongien. Mittheilungen an Prof. H. B. Geinitz. *Neues Jahrb. Mineral. Geol.* 1877, p. 77 (1877)

1631. ——. Beiträge zur Systematik der fossilen Spongien. *Neues Jahrb. Mineral. Geol.* (1877).

1632. ——. Studien über fossile Spongien. *Jahrb. Mineral.* p. 337 (1877).

1633. ——. Studien über fossile Spongien. *Jahrb. Mineral.* p. 705 (1877).

1634. ——. Ueber Untersuchung der Spongien. Mittheilungen an Prof. H. B. Geinitz. *Neues Jahrb. Mineral. Geol.* 1877, p. 709 (1877).

1635. ——. Zur Stammesgeschichte der Spongien. Festschrift zum Jubileum des Prof. von Siebold. 20 pp. München (1878).

1636. ——. Beiträge zur Systematik der fossilen Spongien. II. *Lithistidæ*, *Neues Jahrb. Mineral. Geol.* 1878, pp. 561–618 (1878).

1637. ——. Handbuch der Paläontologie. 1 Band. München (1879).

1638. ——. Ueber Jura Spongien. Mittheilungen an Prof. H. B. Geinitz. *Neues Jahrb. Mineral. Geol.* (1878).

1639. ——. Studien über fossile Spongien. II. *Lithistidæ*. *Abh. bayer. Ak.* vol. xiii. pt. 1, pp. 65–154 (1878).

1640. ——. Studies on Fossil Sponges. II. *Lithistidæ*. *Ann. M. N. H.* ser. 5, vol. ii. pp. 113–135 (1878).

1641. ——. Studies on Fossil Sponges. II. *Lithistidæ*. *Ann. M. N. H.* ser. 5, vol. ii. pp. 235–248 (1878).

1642. ——. Studies on Fossil Sponges. II. *Lithistidæ*. *Ann. M. N. H.* ser. 5, vol. ii. pp. 324–341 (1878).

1643. ——. Studies on Fossil Sponges. II. *Lithistidæ*. *Ann. M. N. H.* ser. 5, vol. ii. pp. 385–394 (1878).

1644. ——. Studies on Fossil Sponges. II. *Lithistidæ*. *Ann. M. N. H.* ser. 5, vol. ii. pp. 467–482 (1878).

1645. ——. Studien über fossile Spongien. III. *Monactinellidæ*, *Tetractinellidæ*, und *Calcispongiæ*. *Abh. bayer. Ak.* vol. xiii. pt. 2, pp. 1–48 (1879).

1646. ——. Studies on Fossil Sponges. III. *Monactinellidæ*; IV. *Tetractinellidæ*; V. *Calcispongiæ*. *Ann. M. N. H.* ser. 5, vol. iii. pp. 304–313 (1879).

1647. ——. Beiträge zur Systematik der fossilen Spongien. *Neues Jahrb. Mineral. Geol.* 1879, pp. 1–40 (1879).

1648. **Zittel, K. A.** Studies on Fossil Sponges. V. *Calcispongiæ*. *Ann. M. N. H.* ser. 5, vol. iii. pp. 364–379 (1879).

1649. ——. Studies on Fossil Sponges. V. *Calcispongiæ*. *Ann. M. N. H.* ser. 5, vol. iv. pp. 61–73 (1879).

1650. ——. Studies on Fossil Sponges. V. *Calcispongiæ*. *Ann. M. N. H.* ser. 5, vol. iv. pp. 120–135 (1879).

1651. ——. Notizen über fossile Spongien. *Neues Jahrb. Mineral. Geol.* 1882, pp. 203–204 (1882).

1652. ——. Ueber *Astylospongidæ* und *Anomocladina*. *Jahrb. Mineral.* 1884, ii. pp. 75–80.

[1653.] ——. On *Astylospongia* and *Anomocladina*. (Transl.) *Ann. M. N. H.* ser. 5, vol. xiv. pp. 271–276 (1884).

1654. **Zoholka, C.** Ueber *Isoraphinia texta*, Rœm. sp., und *Scytalia pertusa*, Reuss, sp., aus der Umgebung von Raudnitz an der Elbe, Böhmen. *SB. Ak. Wien*, Bd. iv. pp. 647–652 (1886).

LIST OF THE PRINCIPAL ABBREVIATIONS USED IN THE LIST OF PUBLICATIONS.

Abh. Ak. Berl.—Abhandlungen der königlichen preussischen Akademie der Wissenschaften zu Berlin.

Abh. bayer. Ak.—Abhandlungen der mathematisch-physikalischen Classe der k bayerischen Akademie der Wissenschaften. (München.)

Abh. kgl. Ges. Wiss. Prag.—Abhandlungen der königlichen Gesellschaft der Wissenschaften zu Prag.

Actes Soc. Jura. d'Emul. Porren.—Actes de la Société Jurassienne d'Emulation. (Porrentruy.)

Act. Soc. Lin. Bordeaux.—Actes de la Société Linnéenne de Bordeaux.

Am. J. Sci.—American Journal of Science and Art. (New Haven.)

Am. Micr. J.—American Monthly Microscopical Journal. (New York.)

Am. Nat.—American Naturalist.

Ann. Chemie Physik.—Annales de Chemie et Physique.

Ann. du Mus.—Annales du Muséum d'histoire Naturelle de Paris.

Ann. Lyceum N. H. New York.—Annals of the Lyceum of Natural History of New York.

Ann. M. N. H.—Annals and Magazine of Natural History. (London.)

Ann. of Philos.—Annals of Philosophy, or Magazine of Chemistry, Mineralogy, &c. (London.)

Ann. regno Lomb.-Venet.—Annali di Scienze regno Lombardo-Venetiana.

Ann. Sci. Nat.—Annales des Sciences Naturelles. (Paris.)

Ann. Soc. géol. Nord.—Annales de la Société géologique du Nord. (Lille.)

Ann. Soc. mal. Belg.—Annales de la Société malacologique de Belgique. (Brussels.)

Annual Rep. State Cabinet Nat. Hist. New York.—Annual Report of the Regents University of New York on the condition of the State Cabinet. (New York.)

Arb. nat. Ges. Univ. Charkow.—Arbeiten der naturforschenden Gesellschaft der Universität Charkow. (Charkow.)

Arb. Petersb. Ges.—Arbeiten der St. Petersburger naturforschenden Gesellschaft.

Arb. z. Inst. Wien.—Arbeiten aus dem zoologischen Institute der Universität Wien. (Vienna.)

Arch. Anat. Phys.—Archiv für Anatomie und Physiologie. (Liepzig.)

Arch. f. Nat.—Archiv für Naturgeschichte. (Berlin &c.)

Arch. mikr. Anat.—Archiv für mikroskopische Anatomie. (Bonn.)

Arch. Néerl.—Archives Néerlandaises des Sciences exactes et naturelles. (The Hague.)

Arch. nouv. Mus.—Archives nouvelles du Muséum. (Paris.)

Arch. Sci. Nat.—Archives des Sciences Naturelles. (Paris.)

Arch. Slav. Biol.—Archives Slaves de Biologie.

Arch. Ver. Mecklenburg.—Archiv des Vereins der Freunde der Naturgeschichte in Mecklenburg. (Neu Brandenburg.)

Arch. Z. expér.—Archives de Zoologie expérimentale et générale. (Paris.)

Assoc. franç. Av. Sci.—Association français pour l'avancement des Sciences. (Paris.)

Atti Ac. Rom.—Atti della R. Accademia delle Scienze. (Rome).

Atti Ist. Venet.—Atti dell' I. R. Istituto Veneto di Scienze, Lettere ed Arti. (Venice.)

Atti Soc. Ital.—Atti della Società Italiana di Scienze naturali. (Modena &c.)

Atti Soc. Tosc.—Atti della Società Toscana di Scienze naturali, residente in Pisa.

Beitr. balt. Wochens.—Beiträge zur baltischen Wochenschrift.

Belfast Nat. Hist. Field-Club Report.—Reports of the Belfast Natural-History Field-Club.

Ber. Com. wiss. Unters. deutsch. Meere, Kiel.—Bericht der Commission zur Untersuchung der deutschen Meere. (Kiel.)

Ber. Vers. Nat.—Amtlicher Bericht deutscher Naturforscher und Ärzte.

Berl. Monatsh.—Berliner Monatshefte.

Bibl. Hautes Etud.—Bibliothèque de l'école des Hautes Études. (Paris.)

Bih. Sv. Ak. Handl.—Bihang till Kongl. Svenska Vetenskaps-Akademiens Handlingar. (Stockholm.)

Bijdr. Dierk.—Bijdragen tot de Dierkunde. (Amsterdam.)

Biol. Centralbl.—Biologisches Centralblatt. (Erlangen.)

Brit. Mus.—British Museum Catalogue. (London.)

Bull. Ac. Belg.—Bulletin de l'Académie Royale des Sciences de Belgique. (Brussels.)

Bull. Ac. Pétersb.—Bulletin de la classe physico-mathématique de l'Académie Impériale des Sciences de St. Pétersbourg.

Bull. Am. Mus. Nat. Hist.—Bulletin of the American Museum of Natural History. (New York.)

Bull. Buff. Nat. Club.—Bulletin of the Buffalo Naturalists' Club. (Buffalo, N. Y.)

Bull. Mosc.—Bulletin de la Société Impériale des Naturalistes de Moscou.

Bull. Mus. C. Z.—Bulletin of the Museum of Comparative Zoology. (Cambridge, U.S.A.)

Bull. Scient.—Bulletin Scientifique du département du Nord.

Bull. Soc. Acclim.—Bulletin de la Société d'Acclimatation. (Paris.)

Bull. Soc. Adriat.—Bulletin de la Société Adriatique.

Bull. Soc. Linn. Normandie.—Bulletin de la Société Linnéenne de Normandie. (Caen.)

Bull. Soc. Géol.—Bulletin de la Société géologique de France. (Paris.)

Bull. Soc. Vaudoise.—Bull. de la Société Vaudoise.

Bull. Soc. Sci. Nat. Neuchâtel.—Bulletin de la Société des Sciences Naturelles. (Neuchâtel.)

Bull. Soc. Zool. Fr.—Bulletin de la Société Zoologique de France. (Paris.)

Canadian Nat. and Geol.—Canadian Naturalist and Geologist.

Can. Nat.—Canadian Naturalist.

Centralbl. med. Wiss.—Centralblatt für die medicinischen Wissenschaften. (Berlin.)

Comm. Akad. Petropol.—Commentarii Academiæ Scientiarum Imperialis Petropolitanæ. Académie Impériale des Sciences. (Petersburg.)

C. R.—Comptes rendus des Séances hebdomadaires de l'Académie des Sciences. (Paris.)

C. R. Soc. Biol.—Comptes rendus des Séances et Mémoires de la Société de Biologie. (Paris.)

Denk. Ak. Wien.—Denkschriften der k. Akademie der Wissenschaften zu Wien. (Vienna.)

Dictionnaires Sci. Nat.—Dictionnaires des Sciences Naturelles. (Paris.)

D. Litt. Zeit.—Deutsche Litteratur Zeitung.

Edinb. New Phil. Journ.—Edinburgh New Philosophical Journal. (Edinburgh.)

Edinb. Phil. Journ.—Edinburgh Philosophical Journal. (Edinburgh.)

Encyclop. méth.—Encyclopédie méthodique des sciences. (Paris.)

Féruss. Bull. Sc. Nat.—Bulletin des Sciences Naturelles et de Géologie publié par M. le Baron de Férussac. (Paris.)

Fror. Notizen.—Notizen aus dem Gebeite der Natur- und Heilkunde (Froriep). (Erfurt.)

Geol. Mag.—Geological Magazine. (London.)

Geol. Surv. Canada.—Geological Survey of Canada.

Gr. Arch. mikr. Anat.—Grenacher's Archiv für mikroskopisch Anatomie.

Hist. Berw. Nat. Club.—Berwickshire Naturalists' Club.

Hist. et Mém. Acad. Paris.—Histoires et Mémoires de l'Académie des Sciences. (Paris.)

Ill. d. Monatshefte.—Illustrierte deutsche Monatshefte.

J. Ac. Philad.—Journal of the Academy of Natural Sciences, Philadelphia.

Jahrb. Mineral.—Jahrbuch für Mineralogie, Geognosie, Geologie, &c. (Stuttgart.)

J. Bombay Branch R. Asiatic Soc.—Journal of the Bombay Branch of the Royal Asiatic Society.

JB. schles. Ges.—Jahresberichte des schlesischen Gesellschaft für vaterländische Cultur. (Breslau.)

JB. schlesw. Gesell.—Jahresbericht der naturwissenschaftlichen Gesellschaft in Schleswig.

J. Chim. expérim.—Journal de la Chimie expérimentale.

J. Cincinnati Soc. Nat. Hist.—Journal of the Cincinnati Society of Natural History.

J. d. Zool.—Journal de Zoologie. (Paris.)

Jen. Z. Nat.—Jenaische Zeitschrift für Naturwissenschaften, herausgegeben von der medicinisch-naturwissenschaftlichen Gesellschaft zu Jena.

J. G. Soc.—Quarterly Journal of the Geological Society. (London.)

JH. Ver. Württ.—Jahreshefte des Vereins für vaterländische Naturkunde in Württemburg. (Stuttgart.)

J. l'Anat. Phys.—Journal de l'Anatomie et de la Physiologie. (Paris.)

J. L. S.—Journal of the Linnean Society (Zoology). (London.)

J. Microgr.—Journal de Micrographie. (Paris.)

J. N. York Micr. Soc.—Journal of the New York Microscopical Society.

J. of Conch.—Journal of Conchology.

J. prakt. Chem.—Journal für praktische Chemie. (Leipzig.)

J. Quek. Club.—Journal of the Quekett Microscopical Club. (London.)

J. R. Micr. Soc.—Journal of the Royal Microscopical Society. (London.)

J. Sci. Lisb.—Jornal de Sciencias da Academia de Lisboa. (Lisbon.)

Kgl. Svenska Vetensk.-Akad. Handlingar.—Kongliga Svenska Vetenskaps-Aakademiens Handlingar. (Stockholm.)

L'Institut.—L'Institut de France.

Mag. N. H.—Magazine of Natural History (Charlesworth). (London.)

Mag. Zool. Bot.—Magazine of Zoology and Botany. (London.)

Manual of Nat. Hist. &c. of Greenland.—Manual of the Natural History of Greenland.

Math.-nat. Ber. Ungarn.—Berichte des Ungarischen mathematisch-naturwissenschaftlichen Gesellschaft.

MB. Ak. Berl.—Monatsberichte der k. preussischen Akademie der Wissenschaften zu Berlin.

Meddel. af Soc. pro Fauna et Flora Fennica.—Meddelingen af Societat pro Fauna et Flora Fennica.

Mél. Biol. Pétersb.—Mélanges Biologiques tirés du Bulletin de la classe physico-mathématique de l'Académie Imp. des Sciences de St. Pétersbourg.

Mém. Ac. Pétersb.—Mémoires de l'Académie impériale des Sciences de St. Pétersbourg.

Mém. Acad. Sci. Paris.—Mémoires de l'Académie des Sciences. (Paris.)

Mem. Acc. Tor.—Memorie della Reale Accademia delle Scienze. (Turin.)

Mem. Bost. Soc.—Memoirs of the Boston Society of Natural History.

Mém. d. Mus.—Mémoires du Muséum d'Histoire Naturelle. (Paris.)

Mém. Soc. Géol. France.—Mémoires de la Société Géologique de France.

Mém. Soc. Helvétique Sci. Nat.—Mémoires de la Société Helvétique des Sciences Naturelles. (Lausanne.)

Mém. Soc. Hist. Nat. Paris.—Mémoires de la Société des Sciences Naturelles de France. (Paris.)

Mém. Soc. Imp. Sci. Nat. Cherbourg.—Mémoires de la Société des Sciences Naturelles. (Cherbourg.)

Mém. Soc. Jura. d'Emul. Départ. du Doubs.—Mémoires de la Société Jurassienne d'Emulation Département du Doubs.

Mém. Soc. nouv. Russ.—Mémoires de la Société nouvelle de la Russie.

Mem. Wern. Soc.—Memoirs of the Wernerian Natural-History Society. (Edinburgh.)

Micr. J.—The Microscopical Journal and Structural Record. (London.)

Monthl. Micr. J.—Monthly Microscopical Journal. (London.)

Morph. Jahrb.—Morphologisches Jahrbuch: eine Zeitschrift für Anatomie und Entwickelungsgeschichte. (Leipzig.)

MT. Ges. Bern.—Mittheilungen der naturforschenden Gesellschaft in Bern.

MT. JB. geol. Anst. Budapest.—Mittheilungen aus dem Jahrbuche der königlich-ungarischen geologischen Anstalt. Budapest.

MT. Mus. Dresden.—Mittheilungen aus dem k. zoologischen Museum zu Dresden.

MT. Ver. Stcierm.—Mittheilungen des naturwissenschaftlichen Vereins für Steiermark. (Graz.)

MT. z. Stat. Neap.—Mittheilungen der zoologischen Station in Neapel. (Leipzig.)

Naturf.—Naturforscher.

Naturk. Verh. Utrecht.—Natuurkundige Verhandelingen Provinciaal Utregtsch Genootschap van Kunsten en Weteuschappen. (Utrecht.)

Natuurk. Tijdschrift voor Nederlandsch Indië.—Natuurkundig Tijdschrift voor Nederlandsch Indië. (Batavia.)

Nederl. Staatscourant.—Nederlandsch Staatscourant.

Neues Jahrb. Mineral. Geol.—Neues Jahrbuch für Mineralogie, Geologie und Petrefaktenkunde. (Heidelberg, Stuttgart, &c.)

New Russian Nat. Hist.—Transactions of the New Russian Society of Natural History. (Russian.)

New Z. J. Sci.—The New Zealand Journal of Sciences. (Dunedin.)

Niederl. Arch. Zool.—Niederländisches Archiv für Zoologie. (Haarlem.)

Nors. Vid. Selsk. Skrifter.—Kongliga Norske Videnskabers Selskabs Skrifter. (Trondjem.)

Notes Leyd. Mus.—Notes from the Royal Zoological Museum of the Netherlands at Leyden.

Nouveaux Mém. de la S. Helvétique Sc. Nat.—Nouveaux Mémoires de la Société Helvétique des Sciences Naturelles. (Lausanne.)

Nova Acta natur. curios.—Nova Acta naturæ curiosorum.

Nuovi Ann. Sci. nat.—Nuovi Annali delle Scienze naturali Bologna.

Öfv. Vet.-Ak. Förh.—Öfversigt af Kongl. Vetenskaps-Akademiens Förhandlingar. (Stockholm.)

P. Ac. Philad.—Proceedings of the Academy of Natural Sciences of Philadelphia.

Pal.—Paleontographica.

P. Am. Assoc.—Proceedings of the American Association.

P. Belf. Soc.—Proceedings of the Belfast Natural History and Philosophical Society.

P. Bost. Soc.—Proceedings of the Boston Society of Natural History.

P. Bristol Nat. Soc.—Proceedings of the Bristol Natural History Society.

P. Cambridge Phil. Soc.—Proceedings of the Cambridge Philosophical Society.

P. Geol. Assoc.—Proceedings of the Geologists' Association.

Phil. Mag.—Philosophical Magazine. (London.)

Phil. Tr.—Philosophical Transactions of the Royal Society. (London.)

Pop. Sci. Review.—Popular Science Review.

P. Linn. Soc.—Proceedings of the Linnean Society of London.

P. Linn. Soc. N. S. W.—Proceedings of the Linnean Society of New South Wales. (Sydney.)

P. Liverp. Soc.—Proceedings of the Literary and Philosophical Society and Natural History Society of Liverpool.

P. Med. Soc. Edinburgh.—Proceedings of the Medical Society of Edinburgh.

P. R. Irish Ac.—Proceedings of the Royal Irish Academy. (Dublin.)

Proc. Lit. Liverpool.—Proceedings of the Literary and Philosophical Society of Liverpool.

Proc. Yorkshire Phil. Soc.—Proceedings of the Yorkshire Philosophical Society. (York.)

P. R. Soc.—Proceedings of the Royal Society. (London.)

P. R. Soc. Edinburgh.—Proceedings of the Royal Society of Edinburgh.

P. R. Soc. Tasm.—Papers and Proceedings and Reports of the Royal Society of Tasmania.

P. U. S. Nat. Mus.—Proceedings of the United States National Museum. (Washington.)

P. Z. S.—Proceedings of the Zoological Society. (London.)

Q. J. Micr. Sci.—Quarterly Journal of Microscopical Science. (London.)

Rendic. Accad. Sc. Napoli.—Rendiconti della R. Accademia delle Scienze di Napoli. (Naples.)

Rendic. Ist. Lomb.—Rendiconti del R. Istituto Lombardo di Scienze. (Milan.)

Rep. Brit. Assoc.—Reports of the British Association for the Advancement of Science.

Rep. R. Polytechnical Soc. Cornwall.—Reports of the Royal Polytechnical Society of Cornwall.

Rep. U. S. Fish Comm.—Report of the Commissioner, United States Commission of Fish and Fisheries. (Washington.)

Revue Zool.—Revue Zoologique. (Paris.)

Rozpr. i Spraw. Akad. umieg. af Krakowie.—Proceedings of the Cracow Academy.

SB. Ak. Berlin.—Sitzungsberichte der königlich-preussischen Akademie der Wissenschaften zu Berlin.

SB. Ak. Wien.—Sitzungsberichte der mathematisch-naturwissenschaftliche Classe der k. Akademie der Wissenschaften. (Vienna.)

SB. böhm. Ges.—Sitzungsberichte der k. böhmischen Gesellschaft der Wissenschaften. (Prague.)

SB. Dresden.—Sitzungsberichte der naturwissenschaftlichen Gesellschaft Isis in Dresden.

SB. Ges. Dorp.—Sitzungsberichte der Dorpater Naturforscher Gesellschaft. (Dorpat.)

SB. Ges. Leipzig.—Sitzungsberichte der königlich sächsischen Gesellschaft der Wissenschaften. (Leipzig.)

SB. nat. Fr.—Sitzungsberichte der Gesellschaft naturforschender Freunde zu Berlin.

SB. niederrhein. Ges.—Sitzungsberichte des niederrheinischen Gesellschaft für Natur- und Heilkunde. (Bonn.)

SB. Soc. Erlangen.—Sitzungsberichte der physikalisch-medicinischen Societät zu Erlangen.

Schrift. Dronth. Ges.—Schriften der Drontheimer Gesellschaft.

Schrift. Gesell. Bef. Naturwissens. Marburg.—Schriften der Gesellschaft zur Beförderung der Naturwissenschaften in Marburg.

Schr. Ges. Danz.—Schriften der naturforschenden Gesellschaft zu Danzig.

Sci. Gos.—Science Gossip.

Skrifter Naturhist. Selsk.—Det Kongelige Danske Videnskabernes Selskabs Skrifter. (Copenhagen.)

Sm. Misc. Coll.—Smithsonian Miscellaneous Collections. (Washington.)

Sm. Misc. Contrib.—Smithsonian Miscellaneous Contributions to Knowledge. (Washington.)

Soc. Philom. Paris.—Rapports Généraux des Travaux de la Société Philomatique. (Paris.)

Tijdschr. Nederl. Dierk. Vereen.—Tijdschrift der Nederlandsche Dierkundige Vereeniging. (Leiden.)

Todd's Cyclop. Anat.—Todd's Cyclopædia of Anatomy.

T. R. Irish Ac.—Transactions of the Royal Irish Academy. (Dublin.)

Tr. Albany Inst.—Transactions of the Albany Institute.

Tr. Birmingham Soc.—Transactions of the Birmingham Society.

Tr. Connecticut Ac. Sci.—Transactions of the Connecticut Academy of Science.

Tr. Devon. Assoc.—Report and Transactions of the Devonshire Association for the Advancement of Science, &c. (Plymouth.)

Tr. Geol. Soc.—Transactions of the Geological Society of London.

Tr. L. S.—Transactions of the Linnean Society of London.

Tr. Newbury District Field-Club.—Transactions of the Newbury District Field-Club.

Tr. new Russian N. H. Soc.—Transactions (Trapiski) of the new Russian Natural History Society.

Tr. North. Durh.—Natural History Transactions of Northumberland and Durham. (Newcastle-on-Tyne.)

Tr. R. Asiatic Soc. Japan.—Transactions of the Royal Asiatic Society. Japan Branch.

Tr. R. Dublin Soc.—Transactions of the Royal Society of Dublin.

Tr. R. Micr. Soc.—Transactions of the Royal Microscopical Society of London.

Tr. R. Soc. Edinb.—Transactions of the Royal Society of Edinburgh.

Tr. Tynes. N. Club.—Transactions of the Tyneside Naturalists' Field-Club. (Newcastle-upon-Tyne.)

Tr. Z. S.—Transactions of the Zoological Society of London.

Uebers. Arb. schles. Ges. Breslau.—Uebersicht der Arbeiten und Verhandlungen des schlesischen naturwissenschaftlichen Gesellschaft in Breslau.

Unters. Phys. Inst. Heidelb.—Untersuchungen aus dem physiologischen Institut der Universität Heidelberg.

Vergl. phys. Studien.—Vergleichend physiologische Studien.

Verh. d. Akad. Wetensch.—Verhandelingeu der Akademie van Wetenschappen.

Verh. geol. Reichsans.—Verhandlungen der k.-k. geologischen Reichsanstalt. (Vienna.)

Verh. naturf. Gesell. Zürich.—Verhandlungen der naturforschenden Gesellschaft in Zürich.

Verh. naturh. Ver. Heidelb.—Verhandlungen des naturhistorisch-medicinischen Vereins zu Heidelberg.

Verh. naturh. Ver. Rheinl.—Verhandlungen des naturhistorischen Vereins der preussischen Rheinlande und Westfalens. (Bonn.)

Verh. phys. Ges. Berlin.—Verhandlungen der physikalischen Gesellschaft zu Berlin.

Verh. phys.-med. Gesell. Würzb.—Verhandlungen der physikalisch-medicinischen Gesellschaft in Würzburg.

Verh. z.-b. Wien.—Verhandlungen der zoologisch-botanischen Gesellschaft in Wien. (Vienna.)

Würzb. naturw. Zeitschr.—Würzburger naturwissenschaftliche Zeitschrift.

Z. geol. Ges.—Zeitschrift der deutschen geologischen Gesellschaft. (Berlin.)

Z. ges. Naturw.—Zeitschrift für die gesammten Naturwissenschaften. (Berlin.)

Zool. Anz.—Zoologischer Anzeiger. (Leipzig.)

Zool. Jahrb.—Zoologische Jahrbücher. Zeitschrift für Systematik, Geographie und Biologie der Thiere. (Jena.)

Zool. Journ.—The Zoological Journal. (London.)

Z. wiss. Zool.—Zeitschrift für wissenschaftliche Zoologie. (Leipzig.)

3. On Indian Earthworms.—Part I. Preliminary Notice of Earthworms from the Nilgiris and Shevaroys. By Alfred Gibbs Bourne, D.Sc. (Lond.), F.L.S., Fell. Univ. Coll. Lond., Fell. Madras Univ., Professor of Biology in the Presidency College, Madras. (Communicated by Prof. Ray Lankester, F.Z.S.)

[Received November 16, 1886.]

When I commenced to find out what Earthworms were to be found here for the purposes of class-study, I was totally unprepared for the immense variety of forms which seem to occur in the country. I have at present examined a very few localities only, and as every locality yields new forms and I have already found more than twenty different species, all of which were hitherto unknown, the field may be pronounced to be fairly extensive.

I came across very few worms in my garden in Madras during the hot weather, but then I made no special search for them; those I did find belonged to the genus *Perichæta*, but seemed to be new species (I have since determined that they are new); I have found up to the present at least three species of *Perichæta* in Madras town, but have reserved them for subsequent description.

In May I went up to the Nilgiris for some weeks, and there I found numerous forms, and these always differed in different localities. In October I spent about a week on the Shevaroy Hills, and found in that short time five different forms, all markedly differing from those from the Nilgiris.