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Dr. Gert Woerheide

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On Teichonia

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the apices of the angles in each range, anterior and posterior, turned towards the cartilage-pit or umbo. The cartilage-pit is pyriform and oblique, its smaller or pointed extremity being placed immediately under the apex of the umbo, then expanding somewhat outwards and downwards into the cavity of the valve.

Dr. F. Roemer has given a figure of the interior of *N. gibbosa*, in the lately issued plates\* of his 'Lethæa Geognostica;' but I do not observe any trace of a cartilage-pit there represented. The specimen must have been faulty or of another species.

With regard to *Nuculana (Leda) attenuata*, Flem., the case is somewhat different; for, so far as I am aware, the hinge-structure of this species has never been minutely described, although it may have been referred to in general terms by several authors. The hinge (figs. 6 & 7) is similar to that of *N. gibbosa*, with its anterior and posterior teeth well developed. The teeth and sockets increase in size outwards from the cartilage-pit, which occupies the apex of the arch. The number of the teeth is considerable in *N. attenuata*: in one specimen I have counted twenty-three on the longer side of the shell; and even then the series was incomplete. In the left valve the teeth are produced inwards (*i. e.* towards the beak) and outwards (*i. e.* into the cavity of the shell) into projecting denticles; so that the interlocking of the two series must have been very complete and secure. I wish more particularly, however, to draw attention to the cartilage-pit (*a*, figs. 6 & 7), which is triangular with a rounded base, and inclined, in most specimens I have examined, a little obliquely towards the shorter side of the shell. Prof. McCoy notices the teeth of this shell in his description of it; but he appears to have been unable to satisfy himself as to the presence of a cartilage-pit †.

Collector—Mr. J. Bennie.

#### EXPLANATION OF PLATE I.

Fig. 1. *Entolium demissum*, Phillips, showing hinge-structure, after Quenstedt (Der Jura, Atlas, t. 48, f. 6).

Fig. 2. *Entolium aviculatum*, Swallow, valve with the elevated ears, after Meek (Hayden's Final Geol. Report on Nebraska, 1872, t. 9, f. 11, f).

Fig. 3. The same, opposite valve to fig. 2 (*loc. cit.* f. 11, g).

Fig. 4. *Entolium Sowerbii*, McCoy, valve with elevated ears; natural size.

Fig. 5. The same, opposite valve to fig. 4. The same letters refer to cor-

\* I. Theil, 1876, t. 44, f. 13, c.

† Brit. Pal. Foss. p. 512.

responding parts in figs. 1-5: *a*, cartilage-pit; *b, b*, sockets for insertion of cardinal margin of opposite valve; *c, c*, "teeth," or dental ridges; *d, d*, oblique diverging impressions.

Fig. 6. *Nuculana attenuata*, Fleming, interior of part of left valve; natural size. Roscobie Quarry, near Dumfermline; shale above the Roscobie Limestone, Lower Carboniferous Limestone group.

Fig. 7. The same, enlarged twice.

Fig. 8. *Nucula gibbosa*, Fleming, interior of left valve; natural size. Roscobie Quarry, as before.

Fig. 9. The same, enlarged twice. The same letters refer to corresponding parts in figs. 6-9: *a*, cartilage-pit; *b*, posterior teeth; *c*, anterior teeth.

I am indebted for the above excellent drawings to my colleague, Mr. B. N. Peach.

#### V.—On Teichonia, a new Family of Calcareous Sponges, with Descriptions of two Species. By H. J. CARTER, F.R.S. &c.

[Plate II.]

USUALLY the excretory canal-systems of the Calcispongiæ open into a common cavity, called by Dr. Bowerbank the "cloaca," which discharges itself at one or more apertures; hence such Calcispongiæ are tubular or sacciform respectively. But we should have a very imperfect idea of the Calcispongiæ if we assumed that this was invariably the case, as Hæckel appears to have done, and therefore has based his classification upon the sacciform character alone, as will be seen in the "General Observations" at the end of this communication; for there are some species which have no cloaca, but are muriform or foliate, and whose excretory canal-systems open directly upon the surface, of which the following descriptions may serve as illustrations.

Teichonellidæ (τείχος, a wall), new family.

Character. Vallate.

TEICHONELLA, nov. gen.

Generic characters. Vallate or foliate, without cloaca. Vents numerous, confined to the margin or general on one side of the lamina only; naked.

1. *Teichonella prolifera*, n. sp. (Pl. II. figs. 1-5.)

Calcisponge. Foliaceous, vertical, plicate, proliferous. Colour yellowish white. Lamina thick; margin round or ob-

tusely angular, convex or undulatory above (Pl. II. fig. 1, *a a a*), irregularly notched below, where the projecting parts may be expanded into pedal points of attachment (fig. 1, *e e*); surface uneven, interrupted here and there, on both sides, by a proliferous lamina, which originates from the upper margin, and may pass, after a short distance, insensibly into the surface of the parent lamina (fig. 1, *b b*), or grow into greater dimensions foliaceously or cactus-like (fig. 1, *c*). Pores invisible to the unassisted eye, scattered over the surface thickly and generally. Vents slightly marginated, naked (that is, without fringe round the mouth), arranged more or less in single line along the margin only (fig. 1, *d d d*, and fig. 2, *a a a*), variable in size, the largest about 1-48th inch in diameter and 1-8th inch apart. Internal structure minutely areolar, compact, traversed vertically by branched excretory canal-systems, which terminate respectively in the vents just mentioned (fig. 3, *a a*); largest canals, viz. those approaching the vents, about 1-32nd inch in diameter. Spicules of two forms, viz. triradial and quadriradial. Triradial of two sizes, viz. small (fig. 4, *a*) and large (fig. 4), both equiangulate and equiradial; rays straight, smooth, and sharp-pointed; the former, which is the staple spicule of the sponge, only one third of the size of the latter, which, although less numerous, is still plentifully distributed throughout the mass; ray of small triradial about 1-200th inch, that of the large one 1-50th inch long. Quadriradial also of two sizes, viz. small (fig. 4, *b*) and large (fig. 5); the former about the size of the small triradial, and confined to the excretory canals, where its fourth arm (fig. 4, *c*), instead of being straight and equal in size like the rest, is curved and smaller, projects into the excretory canal, and is turned towards the vent. Large quadriradial exceeding in size the large triradial of the mass, confined to the surface, where three of its rays are horizontal (fig. 5, *a*), equiangulate and equiradial, while the fourth or shaft (fig. 5, *b*) is much smaller and vertical; large rays smooth, sharp-pointed, and slightly curved inwards, applied to the surface of the sponge; fourth or small ray straight, smooth, and sharp-pointed, projecting into the interior; large quadriradiates most plentiful over the upper part of the lamina, where their centres are frequently not more than 1-180th inch apart, and, presenting a dark colour from the light passing into the fourth arm, may be easily mistaken for the pores, from which, however, they may be distinguished by being larger and more or less triangular, while the pores are smaller and round. Size of entire specimen (fig. 1)  $3\frac{1}{2} \times 2\frac{1}{4} \times 1$  inches; length of margin of largest lamina (fig. 1,

*a a a*), which is more or less plicate, about 6 inches; average thickness of lamina 1-6th inch.

*Hab.* Marine. Mode of growth (that, is whether pendent or erect) unknown.

*Loc.* Australia, Freemantle.

*Obs.* The specimen represented in figure 1 has been in the British Museum for many years, as indicated by the "register number," viz. "46. 8. 19. 101;" and other fragments of the same species, from Freemantle, in Australia, have been found among the late Dr. Bowerbank's collection of sponges, which has been purchased by the Trustees of the British Museum, one of which, chiefly to show the vents and excretory canal-systems respectively, is represented in figs. 2 and 3. It is by far the largest Calcisponge on record, and its spiculation so like that of *Leuconia Johnstonii*, Cart., = *Leucandra*, Haeckel, as, at first sight, to appear identical. The large quadriradial whose horizontal rays are tessellated in among the surface-structure, while the fourth or vertical one projects into the interior of the sponge, undoubtedly adds greatly to the strength of the exterior. In its compressed vallate character, proliferous growth, and marginal apertures it is identical with many of the siliceous sponges, although the latter are, of course, much larger. The spicules vary in size below the measurements above mentioned.

## 2. *Teichonella labyrinthica*, n. sp. (Pl. II. figs. 6-9.)

Calcisponge. Subglobular, foliate, somewhat compressed; consisting of a short, thick, round stem (fig. 6, *d*), expanded into a mass of more or less vertical laminae (fig. 6, *a a a*), which are so folded together, backwards and forwards, in and out, as to make it difficult to say whether the whole does not belong to one and the same lamina. Colour now greyish white. Surface of lamina even on both sides; margin thin, round, sinuous, following the plication, here and there everted. Pores invisible to the unassisted eye, confined to one side of the lamina (fig. 6, *b*). Vents uniformly spread over the other side, about 1-360th inch in diameter and 1-180th inch apart (fig. 6, *c*); the latter on the inner, and the former on the outer side respectively, where the lamina is folded upon itself and in contact (fig. 8). Internal structure minutely areolar, columnar (fig. 8, *d d d*), vertical to the sides of the lamina, which varies from 1-16th to 1-12th inch in thickness, thinning towards the margin. Columnar structure formed by aggregation of the straight arms of the triradial spicules (fig. 10, *a*) into cylinders (fig. 9, *c*), which, traversing the areolar sarcodæ, pass directly from the pores on one (fig. 9, *a*)

to the vents on the other side of the lamina (fig. 9, *b*), communicating on their way with the areolar cavities of the sarcode in which the spongozoa are situated. Spicules of two kinds, viz. triradiate and linear. Triradiates of one form only (fig. 10), consisting of one long straight ray (fig. 10, *a*), about 1-120th inch in length, terminated by two shorter curved ones nearly at right angles to it (fig. 10, *b*); the long ray bundled with its like, forming the wall of the cylinder, while the two others project in opposite directions into the cavities of the neighbouring cylinders respectively, which the wall separates, their points turned towards the vents (fig. 9, *c*). Linear spicules minute (fig. 11), consisting of a slightly undulated shaft, about 1-200th inch long, obtusely pointed at the inner, and spear-pointed at the outer end—that is, slightly inflated before the termination (fig. 11, *a*),—disposed in tufts so as to give a minutely villous surface to each side (fig. 9, *a, b*), indicated by a white line added to the columnar structure, which is thickest on the vent-side, where these spicules are twice the length of those on the pore-side (fig. 9, *b*). Size of entire specimen 2 inches long,  $1\frac{1}{2}$  inch high, and  $\frac{1}{4}$  inch thick.

*Hab.* Marine. Mode of growth (that is, whether pendent or erect) unknown.

*Loc.* Australia, Freemantle.

*Obs.* This specimen (figs. 6, 7) is in the collection to which I have alluded, and is second only in size to *Teichonella prolifera*, the foregoing species. In spiculation and in the structure of the lamina it is closely allied to *Grantia compressa*, Fleming, = *Sycandra*, Haeckel, also in the foliation, which here is like the convolute æstivation of a flower-bud (fig. 7). *Grantia compressa* itself often occurs in a foliated form, like the twisted leaves of a book.

#### GENERAL OBSERVATIONS.

It is impossible now to do any thing in the Calcispongiæ without reference to Haeckel's work on them, entitled 'Die Kalkschwämme' (1872, in 3 vols., one of which is the Atlas), so complete in every respect does this appear to be. Thus the whole of the Calcispongiæ are divided into three great families, viz. :—1. Ascones: Grantien mit Lochcanälen; 2. Leucones: Grantien mit Astcanälen; and 3. Sycones: Grantien mit Strahlcanälen," illustrated respectively by diagrams in the Atlas (Tafn. 20, 40, and 60). Complete, however, as this appears to be, it is somewhat laughable that the self-constituted author of 'The History of Creation' should have omitted a whole family of these sponges, viz. that which I

have just described; but such is the case, and therefore I have ventured, as a mere wanderer in this unknown field, at least to me, to make the addition. No one can deny that the illustrations of Haeckel's work are beautifully executed, and, although rendered more attractive by being magnified and accompanied by much diagram, still it would be difficult to place before the student any thing more impressive and useful. But when we come to detail, this is distorted to suit the theory: thus when we find the cilia of the "gastrula" or embryo, which are the paddles by which it progresses, reversed, and the new being made to go with its nether or obtuse end foremost in search of a place for fixation and further growth, it will be only necessary to watch the embryo under such circumstances, and its future development, to see that the author of 'The History of Creation' has been imaginative. But, unfortunately, this does not rest here; for then comes the difficulty of knowing how far this imagination may have extended (that is, how much may be true and how much due to fancy) in the 'Kalkschwämme.'

"Fronti nulla fides."

As yet I only know of two species of Calcispongiæ that belong to the family Teichonellidæ; and they are remarkable for their large size and peculiar mode of growth respectively. Hitherto only sac-like forms have been recorded; and these find analogous ones among the siliceous sponges; but now we have analogous ones also to the muriform, proliferous, and foliate siliceous sponges. It is not at all uncommon to find a siliceous sponge assuming first the form of a fan, then that of a clam-shell, with the vents on the concave surface, then curving round still more until the opposite sides meet and, lastly, uniting grow together so as to form a vase-shaped sponge, which, but for the mouth being expanded instead of contracted, would represent the sacciform shape of the calcareous sponges; while the structure being the same, *Teichonella labyrinthica* would, with a contracted mouth, under the same series of changes, become *Grantia compressa*. Probably time will add more species to the family of Teichonellidæ, each of which may possess a different form from those mentioned.

#### EXPLANATION OF PLATE II.

*Fig. 1.* *Teichonella prolifera*, n. sp., lateral view, natural size: *a a a*, largest lamina; *b b*, proliferous laminae commencing; *c*, the same, of greater dimensions; *d d d*, vents and upper margin of laminae; *e e*, pedal points of attachment.

*Fig. 2.* The same, upper view, natural size, to show, *a a a*, margin of lamina and vents.

- Fig. 3. The same, and same specimen, lateral view of vertical section, natural size, to show:—*a a*, excretory canal-systems and vents; *b b*, pedal points of attachment rounded off by attrition. Diagram.
- Fig. 4. The same, large triradiate spicule of general structure: *a*, small triradiate; *b*, small quadriradiate spicule; *c*, curved or fourth arm.
- Fig. 5. The same, large quadriradiate spicule of surface: *a*, horizontal or curved arms; *b*, vertical arm or shaft.
- Fig. 6. *Teichonella labyrinthica*, n. sp., lateral view, natural size: *a a a*, lamina; *b*, pore-side; *c*, vent-side; *d*, pedal point of attachment rounded off by attrition.
- Fig. 7. The same, upper view, to show the interfoliation of the lamina.
- Fig. 8. The same, to show:—*a*, pore-side; *b*, portion excised to show vents and internal structure of lamina; *c c*, vent-side; *d d*, vertical sections of lamina, to show cylindrical structure. Diagram.
- Fig. 9. The same, portion of internal or cylindrical structure, much magnified, to show:—*a*, pore-margin; *b*, vent-margin; *c*, cylindrical canals with curved arms of triradiate spicules projecting into them.
- Fig. 10. The same, triradiate spicule: *a*, long and straight arm forming, by aggregation, the walls of the cylinders respectively; *b b*, shorter curved arms projecting into the cylinders.
- Fig. 11. The same, linear spiculo, relatively magnified: *d*, the same, much more magnified, to show the form.

N.B.—The spicules of both species are relatively magnified and on the same scale.

VI.—On the Dascillidæ of New Zealand. By D. SHARP, Honorary Member of the New-Zealand Institute.

In this paper I have attempted to present a little knowledge about the species from New Zealand of one of the unattractive, and therefore comparatively little-known, families of Coleoptera. I have drawn up in a brief manner characteristics of twenty-eight species, all of them up to the present time unknown to naturalists; and I have, moreover, made a tolerably careful study of their structure, so as to offer what I hope will prove to be a successful introduction to their classification. I have arranged them in eight groups, or genera, for six of which I have coined new names, viz. *Byrrhodes*, *Cyprobius*, *Cyphanus*, *Veronatus*, *Mesocyphon*, and *Cyphotelus*; for the species of the two other groups I have used names already known to naturalists, viz. *Cyphon* for a dozen of obscure species which I cannot find to differ in their structure from numerous similar species inhabiting Europe and North America, and *Atopida*, which was applied by Adam White to the only species of the family which has, previous to this paper, been made known from New Zealand. As regards

White's species, *Atopida castanea*, I may remark that I have not described it in my paper, because all I know about it is, that the specimen of it existing in our national collection is distinct from any of the species I have myself been able to obtain for study; and that from its facies I judge it will prove to be sufficiently similar in its structure to the species I have called *Atopida* to allow its being classed with them in a first synthesis.

Out of these eight groups of New-Zealand species, five, viz. *Byrrhodes*, *Cyprobius*, *Cyphanus*, *Atopida*, and *Veronatus*, are connected together by a peculiarity in the structure of their head. This peculiarity is the existence of a deep fossa, extending downwards and inwards from the point of insertion of the antenna, and reaching as far as the extreme base of the stipe of the maxilla. This character has not yet been observed in any other than these New-Zealand species; and it naturally binds them together into a group, which may be placed between the *Dascilliens* and *Cyphoniens* of Mulsant\*. *Cyphotelus*, another of the eight groups, is as yet only represented by a single species, which has not, I think, at present any near ally; it also may be classed between the *Dascilliens* and *Cyphoniens*; but it must not be joined in the same second synthesis with the *Atopida* allies. A seventh, *Mesocyphon*, may perhaps be classed actually with Mulsant's *Cyphoniens*; for though it does not quite agree with the characters he assigns to that group, it is so closely connected with the species of *Cyphon* which form the remaining New-Zealand group, that I do not think it can be disconnected from them except by an unnatural classification.

There can be little doubt that, when other localities of New Zealand are carefully examined, the number of species of the family occurring there will be doubled or trebled.

The species of Dascillidæ now known from all parts of the world are about 230 in number; and about fifty of these are from the European region, while another fifty are from the North-American province. Very little is known yet of Australian or Chilian species of the family; and it is therefore not worth while to attempt to reply at present to the interesting question, which suggests itself, as to what part of the world it is in which the nearest allies of these New-Zealand Dascillidæ are found. In fact all of a more general kind than the above considerations that can just now be said with advantage amounts to about this, that New Zealand is probably positively richer in these beetles than either the European or the

\* Hist. Nat. des Coléoptères de France, "Brévicollés," 1865.

