

Fig. 10. The same, two of the sigmoid spicules, greatly magnified, as seen with a quarter-of-an-inch compound power, showing the spines on their shafts and extremities respectively: *a*, sigmoid form; *b*, circular form. Size about 1-400th of an inch long, and about 1-12000th of an inch thick.

N.B. These spicules have a double sigmoid or spiral curve, consisting of about two turns of the spire altogether, but so different individually that it is only here and there that a true sigmoid form is seen, the rest presenting a curvilinear one like a fragment of a circle (*b*); yet they are all contort, and could not be made to lie *flat* on a plane surface.

Fig. 11. *Trachya pernucleata*, n. gen. et sp., dried state, half the specimen, natural size, upper surface: *a*, oscule.

Fig. 12. The same, portion of upper surface, greatly magnified, to show:—*a*, the depressions in which the pores are situated; *b*, the ridges between them formed by the projecting points of the large and small spicules, which have been broken off, as indicated by the black circular dots.

Fig. 13. The same, diagram to show the relation of the large to the small spicules, and their vertical arrangement so as to form a hard crust on the upper surface: *a a*, large spicules; *b b*, small spicules.

Fig. 14. The same, horizontal view of vertical section of corresponding half of fig. 11, natural size, showing internal structure composed of:—*a a*, nuclear or radiating groups of spicules; *b*, cavities of canal-system; *c*, group of oscules in a depression in the lower surface.

This section also shows the dark-grey colour of the upper portion passing into the lighter one of the under surface.

Fig. 15. The same, whorl or radiating group of large spicules, much magnified, to show their superficial arrangement on the under surface of this sponge, and the comparative absence of the small spicule.

Fig. 16. The same, the large and small spicules, relatively magnified: *a*, large spicule, stout, straight, smooth, fusiform, acerate; *b*, real length, about 1-18th of an inch, greatest thickness about 3-1800ths of an inch; *c*, largest size of small spicule, straight, smooth, fusiform, acuate (that is, needle-shaped or pointed at one end and obtuse at the other). Size about 1-60th of an inch long by about 1-1800th of an inch in its greatest transverse diameter.

XVI.—*Notice of a new Vitreous Sponge*, *Pheronema* (*Holtenia*) *Grayi*. By W. SAVILLE KENT, F.Z.S., F.R.M.S., of the Geological Department, British Museum.

THE recent dredging-expedition of the yacht 'Norna,' owner and commander Mr. Marshall Hall, F.G.S., in which I had the pleasure of being associated with Mr. Edw. Fielding, resulted in our obtaining, off Setubal, in addition to many other most interesting organisms, a vitreous sponge closely allied to *Holtenia Carpenteri*, Wyv. Thomson. At the time of taking it I strongly suspected it to be identical with

that form; but subsequent examination and reference to the paper describing the species, and the institution of comparisons between our specimens and those placed in the British Museum, have led me to believe that it is necessary to establish a specific distinction between them.

Giving here a brief notice of the principal differences which seem to warrant their specific separation, I reserve fuller particulars for a future more general report.

These distinctions are, that, in the first place, relative to the external contour of the sponge-body, *Pheronema* (*Holtenia*) *Grayi* (I dedicate this species to my kind friend Dr. J. E. Gray, to whom I am indebted for many suggestions regarding its specific individuality) is always more or less globose, or even in the form of a depressed sphere, the axis of the transverse diameter being the longest, and not subcylindrical as is generally the case in *Holtenia Carpenteri*. The large oscular orifice, again, is frequently funnel-shaped, expanding outwards, instead of being cylindrical as in the last-named species. The spicules of the fringe bounding the margin of this oscular cavity are also generally shorter and more closely set than in *H. Carpenteri*; and the external wall of the upper portion of the sponge, instead of having rigid spicules projecting throughout its surface, as described of *H. Carpenteri*, has generally a smooth area to the extent of one-fifth or one-fourth of its surface, from which point the rigid spicula now commence and occur in moderate abundance for the next inch or so. Such are the principal points of external difference which would arrest the attention of the most ordinary observer.

Fully recognizing, however, the insufficiency of the characters afforded by external contour alone in the discrimination of species susceptible of so wide an amount of variation as the representatives of the Porifera, I should have felt much diffidence in proposing a new specific name for the form here introduced, had there not also been a corresponding difference in the characters of the spicules of which the sponge-body is composed. In this respect I have found, upon examination, that, besides the numerous forms figured and referred to by Prof. Wyville Thomson in his description of *H. Carpenteri*, in the 'Philosophical Transactions' for 1869, there are, associated with other long delicate forms (inclusive of those with adpressed spines) which enter into the composition of the fringe surrounding the osculum, many having a simple pin-head termination (spinulate, Bowerbank), and also others long, attenuate, and entirely and erectly spined (spines short and erect), characters sufficiently important in themselves for the recognition of a species. The spicules of the sarcodæ of

the second type (Wyv. Thomson), simple, stylate, slightly fusiform spicules having the shaft covered with delicate adpressed spines, appear also to be much more abundant in this species than in *Holtenia Carpenteri*.

In conclusion, a word of explanation is necessary for the generic title I have adopted here for this species, in place of that of *Holtenia*.

In accordance with the recognized laws of priority, that generic or specific name of an animal or plant must be retained under which the organism was first described (pre-Linnæan ones alone excepted); and the question is, has any sponge sharing the same generic characters been described and named previously to Prof. Wyv. Thomson's creation of the genus *Holtenia*? The description of a form from Santa Cruz by Prof. Leidy, (evidently overlooked by the founder of the genus *Holtenia*), seems to warrant my supposition that it has. The first reference made to this specimen was by Dr. Leidy, at the meeting of the Academy of Natural Sciences of Philadelphia, in March 1860, when, in calling the attention of the members to a specimen of *Hyalonema mirabile* just received from Japan, he expresses his conviction that the twisted coil of siliceous spicula belongs to a sponge, and adds, "This latter view is apparently confirmed by a specimen of a sponge in the cabinet of the Academy, from Santa Cruz, presented by the late Dr. Griffith. This sponge is an oblong oval mass, about four inches long, surmounted at one extremity with a corona of twisted cords of siliceous spicula [equivalent to the fascicles forming the beard in *H. Carpenteri*] about two inches in length. These spicula are very similar in structure to those of the *Hyalonema*, merely differing in size."

Subsequently, and previously to Prof. W. Thomson's creation and description of the genus *Holtenia*, Dr. Leidy recognized the necessity of forming a new genus for the reception of the very remarkable sponge just referred to, and bestowed upon it the title of *Pheronema*, adding the following essential characteristics:—

"The body of the sponge is oblong-ovoidal, with the narrower end upwards. The upper extremity is conical, with a truncate apex, presenting a large circular orifice, and which forms the exit of the canal which descends into the axis of the sponge for almost half its depth, and which then appears to divide into several branches. Its surface exhibits an intricate interlacement of stellate siliceous spicula inclosing a tissue of finer spicula of the same character, the whole associated by the dried remains of the softer sponge-tissues.

"From the lower end of the sponge there projects a number

of distinct or separate tufts of siliceous spicula, two or three inches in length [in other specimens these tufts would probably be found much longer, this portion of the sponge being susceptible to a very great degree of variation in the amount of development, as is instanced in the specimens of *Pheronema Grayi* before me]. In the single specimen preserved there are fifteen of these tufts intact, and about ten orifices from whence as many additional tufts appear to have been extracted."

Comparing this description of *Pheronema* with that of *Holtenia*, W. Th., it is impossible not to be struck with the close affinity of these two forms, or, in fact, not to recognize that they cannot be made otherwise than generically identical. Hence I have considered it necessary to describe under the name of *Pheronema* the new species I here introduce, and add the following as a synopsis of the species of the same genus which have so far been established—a number which, in consequence of the increase of zeal in the prosecution of deep-sea dredging-expeditions which is now being displayed, we have every reason to hope is likely very shortly to be still further augmented.

Order VITREA, Wyv. Thom.

Genus PHERONEMA, Dr. Leidy.

Sp. 1. —, Leidy*.

Sp. 2. *Carpenteri*, (*Holtenia C.*) W. Th.

Sp. 3. *Grayi*, W. S. Kent.

The principal distinctive features of Dr. Leidy's species appear to be that the oscular region is produced in a truncate form, as in many of the old Greensand Siphonias, and that the fascicles of spicules forming the beard or rootlets of the sponge are shorter than in either of the other species—a character, however, hardly to be regarded as essential. Dr. Leidy does not particularize the characters of the smaller spicules belonging to the different regions of the sponge—though doubtless, on a closer examination, they would exhibit specific peculiarities.

The specimens of *Pheronema Grayi* obtained were taken in a depth of water varying from four to six hundred fathoms. The average measurements of these specimens are as follow:—

* I have not yet been able to find Dr. Leidy's original description, including the specific name, though I have searched through numerous American scientific publications in the libraries of the British Museum, the Royal, the Linnean, and the Zoological Societies. The one given above is taken from the 'Monthly Microscopical Journal' for June 1869.

Of the body-mass of the sponge, length and breadth from four to four and a half inches; the beard or anchoring rootlets from ten or twelve inches to upwards of two feet in length. Further details of the structure and affinities of this interesting production must be deferred for a future communication; but, before laying down my pen, I must not omit to acknowledge here how much I feel indebted to my friend Prof. Du Bocage, the eminent conservator of the Lisbon Museum, for the very kind and valuable assistance he rendered us in his anxiety that our expedition should not prove a fruitless one, by placing at our disposal so much of his valuable time, and by putting us in communication with the deep-sea fishermen in the neighbourhood of Setubal, through whose instrumentality *Hyalonema*, *Pheronema*, and many other of Ocean's loveliest productions were first demonstrated to be denizens of the Portuguese coasts.

BIBLIOGRAPHICAL NOTICE.

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“AND when the appointed end comes they lie not dishonoured in forgetfulness” (Xenophon) is the motto chosen for this work. It is more than probable that the motto is applicable to the contents of the book; it is decidedly true of great quantities of fossils, collected as curiosities, or even as objects of scientific research. Often they are laid aside, and, for want of appreciation, or of a full recognition of the group of living things to which they are naturally allied, they wait for explanation until they fall into the hands of those who know their scientific worth, or of those to whom the progress of biology opens up the previously unknown, giving them new clues to the exploration of the obscure and labyrinthic paths of nature in the past. As with antiquities that come to the hands of the uncultured, or that may have been collected in past times, when spurious history and faint interest in foregone peoples were inimical to research, so with fossils; they mean nothing to the peasant, and are mistaken by the partially educated and prejudiced many; and they may as well be left in trust of the earth for better times, or be stored in locked cabinets till knowledge brings the key. Of late years the advance of Natural History has been rapid. The structures of Reptiles and Birds have been greatly elucidated; and the remains of extinct creatures having reptilian and avian affinities have been brought out from the phosphate-diggings near Cambridge,



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