

of the species was named by pointing out that the species cannot stand; but all true workers in natural history, who know the extreme difficulty of a complicated synonymy, will recognize the absolute necessity of preventing such complication in all cases where it is possible.

I am, Gentlemen,
Yours obediently,
JOHN J. QUELCH.

XXX.—*The Branched and Unbranched Forms of the Freshwater Sponges considered generally.* By H. J. CARTER, F.R.S. &c.

ACCORDING to my own actual experience as well as that of others, there are two distinct forms assumed by the freshwater sponges of England, viz. one stipitate, long-branched, and of a brown colour, and the other sessile, spreading, unbranched, and of a light fawn-colour when dry. The former has been called "*Spongilla lacustris*," and the latter "*Spongilla fluviatilis*;" but as they both grow in still as well as running water (that is, in lakes and docks as well as rivers) they were more or less confounded, until Lieberkühn definitively settled the differences between them, by pointing out that the former was characterized by the presence of a little, spined, curved acerate; and the latter by an amphidisk or birotulate spicule.

That the branched species was recognized as such by the earliest authority on *Spongilla*, viz. Plukenet, in 1696, is known by his having used the term "*ramosissima*" in his description ('*Almagestum Botanicum*,' p. 356); while Lamarck, in 1816 (*An. sans Vertèbres*, t. ii. p. 100), changed this to "*ramosa*," instancing at the same time Plukenet's representation "t. 112. fig. 3," and Esper's "t. 23A" as illustrations of the species. Esper's "tab. 23" represents undoubtedly, under the name of "*Spongia lacustris*," the branched form of the freshwater sponge which we call "*Spongilla lacustris*" at the present day.

It is true that Lamouroux, in 1816 ('*Hist. des Polypiers flexibles*,' Engl. transl. 1824, p. 147), introduced the name "*Ephydatia*" (ἐφυδάτιος, of the water) for the freshwater sponges; but as Lamarck used that of "*Spongilla*" about the same time for the same organisms in his '*Hist. des An. sans Vertèbres*,' without any allusion to Lamouroux's term,

it may fairly be assumed that when the second volume of this great work was printed (viz. in the month of March 1816), Lamouroux's appellation had not been generally accepted, if, indeed, known or published.

Clear, however, as all this would appear to be, the confusion to which I have alluded extends down to 1842, when Johnston published his work on the 'British Sponges,' wherein he not only puts Esper's representation under his "*Spongilla fluviatilis*" (p. 159), but in his diagnosis of *Spongilla lacustris* never mentions any thing about branching; while the printed report of the "Joint Standing Committee on the Impurity of the Boston Water-supply" (Document 143—1881) contains an excellent illustration of the branched freshwater sponge of North America (viz. *Spongilla lacustris*, Potts), under which is the name "*Spongilla fluviatilis*." How far this may be owing to Johnston's mistake, which obtains in his illustration (pl. xviii.), as well as in his description, I am not able to say.

So much for the branched forms of the freshwater sponges of Europe and the United States. We have now to add *Uruguayia corallioides* from South America, and *Lubomirskia baicalensis* from Lake Baikal, in Central Asia, all the rest being, so far as I know, unbranched, sessile, spreading, plane, lobate, or rendered irregular on the surface by more or less projecting processes, but not all fawn-colour.

As regards *Spongilla lacustris*, Dr. W. Dybowski (Mém. de l'Acad. Imp. d. Sc. St. Pétersbourg, 1882, t. xxx. no. 10, pp. 6, 7) not only enumerates seventeen places in Russia where it has been found, but includes among them the "Pachabicha-See," at the S.W. extremity of Lake Baikal, from whence his brother brought back a branched ("baumförmige") specimen charged with statoblasts ("gemmulæ"); at the same time that he brought back the branched specimen of *Spongia baicalensis*, Pallas, which Dr. Dybowski has described, represented, and made the type of a new genus under the name of "*Lubomirskia*," calling the species "*L. baicalensis*" (*op. cit.* 1880, t. xxvii. p. 11, Taf. i. fig. 1), in which he found no statoblasts ("Gemmulæ habe ich niemals gefunden," p. 16), any more than in any of his sessile species of this genus and their varieties (*op. et loc. cit.*).

It is worthy of remark, however, that where the specimen of *Spongilla lacustris* was found, another species, which he has described, illustrated, and named "*Spongilla sibirica*" (*op. cit.* t. xxx. no. 10, p. 10), was obtained bearing statoblasts, seeing that it is identical with that obtained from the Schuylkill River, in Pennsylvania, by Prof. Leidy, and named by

him "*Spongilla fragilis*;" as also by the late Mr. J. K. Lord at Lake Osogoos, in the Cascade Mountains of British Columbia, but hitherto in no other part of the world. That *Spongilla sibirica* is *Spongilla fragilis*, Leidy, is not only shown by the description, but confirmed by the characteristic, polygonal cell-structure among the statoblast spicules represented in the illustrations (Taf. iii. figs. 12 a and 12 b).

Then as regards *Uruguaya corallioides*, I have before stated that, under the most careful examination of several large specimens not a trace of a statoblast has as yet been found, so that (also as before stated) it becomes questionable whether it is ever propagated by statoblasts or not, seeing that the sexual as well as the statoblast means may take place in *Spongilla*, as pointed out by Lieberkühn in his *Spongilla erinaceus*, so far back as 1856 (Archiv f. Anat. Physiologie &c. Heft iv. p. 405, Taf. xv.).

Unfortunately, I have nothing but dried specimens of *Uruguaya corallioides* in my possession, so have been obliged to have recourse to an indirect method of examining the sarcodic parts under the microscope, which, however, has yielded much more than might have been expected; for by softening minute fragments of the interior of a branch from two different specimens, through placing them for a few hours in liquor potassæ, and then, after they have been washed, examining them under a microscope, the sarcode is found to be abundantly charged with spherical cells of a light brown colour, which are granuliferous and nucleated, together with others that are less round. These, when the fragments have been stained with magenta-dye (red ink), become much more deeply coloured than the other parts of the sarcode, and after having been washed in water and mounted in glycerine, afford a preparation which can be deliberately examined at any time.

The granulifero-nucleated cells in their sharply delineated spherical form are from 3- to 4-6000ths inch in diameter, which being much larger than the spongozoa ("Geisselzellen"), and much smaller than the ampullaceous sacs ("Geisselkammern"), both of which are also present for comparison, shows that the former are spermatie cells or young ova, or both mixed together; but here the analysis ends for want of a wet-preserved specimen or more matured ova, if there be any present.

It is not improbable that hereafter *Uruguaya corallioides* may be found to propagate itself by ova alone; but then this can only be determined by inference, since Lieberkühn, as just mentioned, has shown that the freshwater sponges may be propagated by ova or statoblasts.

Lastly, there is the inference that these granuliferous cells (for the granules are very large, spherical, and sharply defined) may be spermatic *alone*, and that *Uruguay corallioides* may be nothing more than the male of a dioecious sponge; while it then becomes questionable whether a *male* form produces any statoblasts.

Miklucho-Maclay has long since given a series of illustrations (Mém. de l'Acad. Imp. de Sc. St. Pétersbourg, 1870, t. xv. no. 3, p. 1, Taf. 1), in which we find Pallas's *Spongia baicalensis* again represented (fig. 5); but here under the name of "*Veluspa polymorpha*, var. *baicalensis*" (p. 8), as derived from the marine form *Spongia oculata*, Pallas, of 1766, = *Chalina oculata*, Bk., of 1866, and the typical example of my order Rhaphidonemata; but although the least like of the branched freshwater sponges to *Chalina oculata* is *Spongilla lacustris*, it comes nearest in the form of its spicule, which is acerate, smooth, curved, fusiform, and sharp-pointed in both; while in *Lubomirskia baicalensis* it is spined, and in *Uruguay corallioides* not only microspined but much curved, cylindrical, and round at the ends. On the other hand, in the general form of the sponges themselves it is almost impossible to be more like *Chalina oculata* than are *Uruguay corallioides* and *Lubomirskia baicalensis*.

Still it is not what a sponge *may* have been, but what it *is*, that the student should chiefly concern himself about, and then it will be found inconvenient to put sponges bearing statoblasts with those which have none; hence my family Potamospongida is provisionally placed by itself at the end of my order Holorhaphidota, to which in texture *Spongilla* otherwise belongs. The typical form of the spicule in the Rhaphidonemata, just described, is identical with that of the Renierida, which is the first family of my Holorhaphidota; but the main support of the fibre in the former is the horny investment, while in the latter it is the axial core of spicules; thus the Rhaphidonemata are resilient and the Holorhaphidota may be crushed.

P.S.—Since the above was written, I have received (15th March) a packet from Dr. W. Dybowski (Niankow, near Novogrodek, in Minsk), in which he has kindly sent me copies respectively of his paper on the freshwater sponges of Russia, in the thirty-ninth vol. of the Imp. Acad. of Sc. above mentioned; of a notice of others sent to him by Prof. P. T. Stephanow, of the University of Kharkow, which he communicated to the Natural History Society of Dorpat in February 1883, among which is a new species from a little lake called

"Wielikœ," in the district of Lebeden, near Kharkow, for which he proposes the name of "*Dosilia Stephanowii*;" and, lastly, an illustrated copy of a description in Russian of this species &c., printed at Kharkow in 1884.

From the spicular illustrations of *Dosilia Stephanowii* in the latter (t. vii. fig. 1, *a-d*, which are neatly executed) it is evident that this species is closely allied to the mounted specimen of *Heteromeyenia repens*, Potts, which the latter kindly sent me, as the only exceptions are that the teeth of the disks in the birotules are not so claw-like or recurved, and the long spines of the flesh-spicules not inflated at the extremities, as in *H. repens*; but there are the same sparsely-spined skeletal spicules to be seen in both instances.

Thus another species of freshwater sponge analogous to *Meyenia plumosa* of Bombay and *Heteromeyenia repens* of Pennsylvania, if not to *M. Baileyi* also, has been found in Europe (*i. e.* in Southern Russia). As the skeletal spicule of *M. Baileyi* is not stated by Dr. Bowerbank to be spined, and the illustration is smooth (Proc. Zool. Soc. Nov. 1863, p. 13, pl. xxxviii. fig. 6, *a*), I cannot confidently affirm that in this respect also it accorded with that of *Dosilia Stephanowii*. In Mr. Potts's mounted specimen of *Heteromeyenia repens* (? *Meyenia Baileyi*) there are smooth as well as sparsely spined skeletal spicules present. Unfortunately there only exist the slides (three) of *M. Baileyi* in the British Museum for comparison; but this object has just (20th March, 1884) been kindly effected for me by Mr. S. O. Ridley, F.L.S., of the British Museum, who concludes his statement as follows, viz.:—"The specimens are nearly related, but, at the same time, it is not difficult to separate them under the microscope;" while I gather from the rest of his letter that the differences are hardly sufficient to constitute even a variety; hence it may be considered that Mr. Potts's and my conjectures respecting the identity of *Meyenia* (*Spongilla*, Bk.) *Baileyi* and *Heteromeyenia repens* are correct.

XXXI.—*Descriptions of five new Species of Heterocerous Lepidoptera from Yesso.* By ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

THE following species were recently selected from a collection sent home by Mr. Henry Pryer:—



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