

IX.—FURTHER NOTE ON A POLYZOON FROM THE HIMALAYAS

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In a recent note on the Indian freshwater Polyzoa (*Journ. Asiat. Soc. Bengal*, 1907, p. 92) I referred specimens from Kumaon to Ridley's *Lophopus ledenfeldi*, basing my diagnosis chiefly on the form of the statoblast. Having recently had occasion to re-examine a collection of débris from the surface of the lake (Bhim Tal) in which the specimens were taken, I have found several statoblasts which evidently belong to the same species but differ in a remarkable manner from those already described, showing close affinities to Hyatt's *Pectinatella carteri*. As intermediate forms occur I see no reason to change my opinion as regards the specific or generic identity of the Himalayan species, but it will be as well to give a more detailed description in order to avoid possible confusion in the future.

The Polyzoon occurred in small, transparent patches on the leaves and stems of water-plants, the colonies being easily detached from their support and probably having the power of changing their position. The ectocyst had all the characters of that of *Lophopus*, being swollen and hyaline, filling up the spaces between the cavities in which the polypides are placed, and completely investing the whole colony. Its external layer consisted of "star-shaped" and circular cells closely resembling those figured by Ridley (*Journ. Linn. Soc., Zool.*, xx, pl. 2). Similar cells occur in *L. crystallinus*, the smaller kind being in both species rather sub-rectangular than "star-shaped," but having the corners more or less definitely produced and the shorter extremities irregularly sinuate. The polypides were arranged on one or both sides of a single longitudinal axis, the colony being as a rule much longer than broad; but probably the regularity of this arrangement disappears in older colonies. When the polypides were retracted the external surface of the colony was smooth but slightly lobate. The tentacles were relatively very long; in a specimen preserved in formol the longest measured 1.3 mm. by 0.03 mm.; they generally numbered about thirty but were sometimes fewer. The stomach was of a bright yellow colour and was rounded at its inferior extremity. The polypides were small, as also were the colonies; the latter measured about 3—5 mm. in length, 2—3 mm.

in breadth, and the same in vertical length. The cavities in which the polypides were contained terminated bluntly below. All the statoblasts found *in situ* were rounded or truncate at the extremities, one end being often blunter than the other. As a rule they bore no processes or projections of any sort, but the whole structure was slightly curved, so that the one face was convex, the other concave; the sides were not folded in towards either face; the annulus projected very little from the surface, and the whole structure was very thin.

In a few of the statoblasts still in position in the colonies a

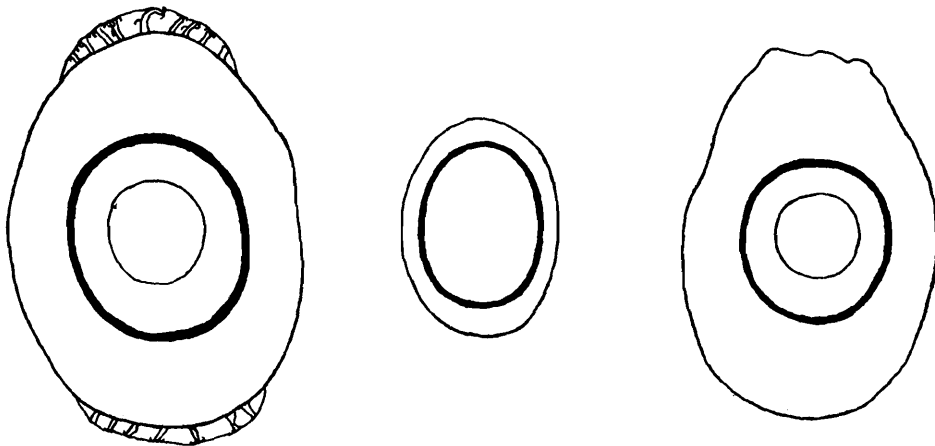


FIG. 1.

FIG. 3.

FIG. 2.

FIGS. 1 and 2 = statoblasts of *L. ledenfeldi* var. *himalayanus*, $\times 42$. FIG. 3 = statoblast of *P. punctata* from Calcutta (June), $\times 84$.

very careful examination has revealed a few short, truncate processes of the membrane joining together the valves at the extremities; but these processes are minute and have not a very definite form. The fact that their distal extremities are distinctly expanded proves that they have not been broken. The majority of the statoblasts taken on the surface of the lake were broken round the edges and especially at the ends; but a few were intact. Of these the majority were in the same condition as those still contained in the synœcium; but in a few cases processes similar to those already mentioned were found, while in one or two examples the processes were larger and better developed, although they always varied in size and number. The smallest were simply truncate and slightly expanded, but the larger ones bore at their free end a circle of minute, curved, blunt, relatively rather stout filaments, while the largest processes also bore one or two similar filaments arranged irregularly nearer the statoblasts. The processes were all flattened in the same plane as the statoblasts, and bent inwardly towards its concave face. The number of processes at the two ends of the statoblast was generally different; but in every case in which they were well developed they were arranged at either end in a graduated series, the largest in the middle and the smaller processes at either side, the largest occupying the extremity of the major axis of the valve.

As a rule the processes at one end were larger than those at the other. I have not seen more than nine or less than three processes together. Each series was enveloped in a delicate membrane. The central capsule of the statoblast was almost circular and occupied a considerable area as compared with the air-cells, being relatively larger, so far as can be judged from Carter's figure (*Ann. Mag. Nat. Hist.* (3), iii, p. 341, pl. 8, 1859), than that of Hyatt's Indian species. The colour of the capsule was dark brown, the air-cells being yellowish. Rousselet (*Journ. Quekett Microsc. Club*, 1904, p. 49) has lately placed *Pectinatella carteri*, which was found by Carter in Bombay, in a new genus (*Lophopodella*) created for an East African species, *L. thomasi*; Carter having originally assigned the former to the genus *Lophopus*. One of the most important characters of Rousselet's new genus, and indeed the only one on which he had to rely as regards the Indian species, was the nature of the processes at the extremities of the statoblast; but the absence of these processes from some statoblasts of the Himalayan species and their presence on others, forms a good ground for keeping both this species and the Bombay one in the genus to which Carter assigned the latter.

The Himalayan form agrees in every other respect with definitions of *Lophopus*; but Carter states that the specimens he found in Bombay did not have, as far as he could see, the syncœcium extending to the base of the colony. Unless or until fresh specimens are found which prove divergent from the genus in other respects, I would therefore call the species *Lophopus carteri* (Hyatt). Statoblasts agreeing with Carter's description have been found in East Africa and it may therefore be expected that the species, having a wide range, will be rediscovered before very long. The Himalayan statoblasts differ from those from Bombay in the irregularity or absence of the terminal processes and the relatively greater size of the central capsule, while the syncœcium of the colony appears to be more highly developed. I think it will be well to name the Kumaon form *Lophopus ledenfeldi* var. *himalayanus*, as it differs from the typical Australian variety in the following points: (a) the tentacles are not so numerous; (b) the statoblast is more irregular in outline; (c) the central capsule is almost circular instead of being rather elongate; and (d) terminal processes bearing curled, blunt hooks sometimes occur on the statoblasts. Another seemingly important difference, namely, the relatively poor development of the ectocyst in the type specimen, may very well be artificial, for structures of the kind, however carefully they may be preserved, invariably shrink in spirit. The fact that the colony described from Australia was more complex and larger than those I found in Bhim Tal, may be simply a question of age or nutrition.

Rousselet (*op. cit.*) has proposed to put *L. ledenfeldi* in Julien's genus *Hyalinella*, the status of which is very doubtful, my own opinion being that it is unnecessary to separate this genus from *Plumatella*. If Kraepelin (*Deutschen Süßwasser-Bryozoen*,

1887) is right, as I believe him to be, in regarding the forms constituting *Hyalinella* as synonyms of *Plumatella punctata*, Hancock, Rousselet's proposal is open to very grave objections. One of the most characteristic differences between *Lophopus* and *Plumatella* is the comparatively large size of the statoblasts of the former. This is well illustrated by the following table:—

FREE STATOBLASTS.

	Length.	Breadth.
1. <i>Plumatella princeps</i> , Kraepelin = same author's "emarginata, Reihe"	0.36—0.37 mm.	0.2—0.3 mm.
2. <i>Plumatella polymorpha</i> , Kraepelin = same author's "repens, Reihe"	0.214—0.53 ,,	0.2—0.413 ,,
3. <i>Plumatella philippinensis</i> , Kraepelin	0.4—0.471 ,,	0.2—0.413 ,,
4. <i>Plumatella javanica</i> , Kraepelin	0.347—0.420 ,,	0.2—0.260 ,,
5. <i>Plumatella punctata</i> , Hancock	0.4—0.54 ,,	0.27—0.41 ,,
6. <i>Lophopus crystallinus</i> (Pallas)	1—1.3 ,,	0.6—0.7 ,,
7. <i>Lophopus ledenfeldi</i> , Ridley.	0.85—0.95 ,,	0.7 ,,
8. <i>Lophopus ledenfeldi</i> var. <i>indica</i> , var. nov.	0.9—1.1 ,,	0.5—0.6 ,,
9. <i>Lophopus carteri</i> (Hyatt)	(approx.) 0.8 ,,	(approx.) 0.63 ,,
10. <i>Lophopus jheringi</i> , Meissner	1 ,,	0.8 ,,

For the figures as regards species 1, 2, 3, 5 and 6 I am indebted to Kraepelin's *Deutschen Süßwasser-Bryozoen*, and as regards 4 to the same author's account of a new species in *Mitt. Naturh. Museum Hamburg*, xxiii, p. 146; the measurements of the statoblast of the typical *L. ledenfeldi* are taken from Ridley's original description, those of that of *L. carteri* deduced from Carter's figure, and those of *L. jheringi* derived from Meissner's description in the *Sitzb. Nat. Freund. Berlin*, 1892, p. 260. *P. punctata* is not uncommon in Calcutta and its statoblasts here are generally smaller than those from Europe, although their form and proportions agree well with Kraepelin's figures. I have been unable to detect in the ectocyst of this species any trace of the cells characteristic of that of *Lophopus*.

I take the opportunity to note a description of a new Asiatic freshwater Polyzoon, viz., *Pectinatella davenporti*, Oka, described from Japan in the *Zoologische Anzeiger*, vol. xxxi, No. 23, May, 1907. It is noteworthy that in the genus *Pectinatella* one species (*P. magnifica*, Leidy, from America and Europe) has hooked processes on the statoblast; one (*P. davenporti*, Oka, from Japan) has simple processes, while the third (*P. gelatinosa*, Oka, also from Japan) lacks processes altogether.