

*The Phylogeny of the Docoglossa.*

By W. H. DALL.

In his concluding fasciculi, contributed to complete Troschel's classical 'Gebiss der Schnecken,' Dr. Johannes Thiele dissents very emphatically from some suggestions of mine in regard to the derivation of the true limpets, made many years ago. At that time it appeared to me that the Lepetidæ might represent the stem, somewhat degenerated, from which the Docoglossa were derived. While I attach, even in the present state of our knowledge, comparatively little importance to speculations of this kind, which can only be placed on a firm footing by extended embryological researches, it still seems to me that there is a solid basis for the hypothesis which I then suggested.

There can be little doubt that the early type of Gastropod gill was situated much as in *Fissurella*, on the "back of the neck" behind the head, and that it was constituted of a stem with lateral lamellæ. Originally paired and symmetrical, by circumstances incident to growth and torsion one gill of the pair has in most cases become aborted, though its "smelling organ" frequently remains, as in the limpets. There is also no doubt whatever that the protolimpet was derived from a form having a spiral shell. I have shown that *Propilidium* by its dentition is closely allied to *Lepeta*. Now *Propilidium* is said to have two gills, but certainly has at least one, of the type of *Acmæa*. It retains a spiral nucleus through life, though it is partly cut off by a small septum, which is never completed. Other Lepetidæ also show a spiral nucleus when very young, but it is cut off completely and lost later. These other, mostly deep- or cold-water forms, have lost their gills and eyes by degeneracy, and the principal teeth of the radula show a tendency to become cemented together, while in *Propilidium* they are more or less isolated. Now in the Acmæidæ and Patellidæ the nucleus is limpet-shaped from the beginning; the uncinæ teeth (well developed in *Lepeta*) are degenerate and often lost in the Acmæas, but appear again in the Patellas, not, however, with the individuality and completely chitinous nature which is found in the corresponding teeth of Lepetidæ. We find therefore in Lepetidæ the greatest number of archaic characters (somewhat masked by degeneration of other organs) which remain in any of the three groups, and, whether most ancient or not, so far as these characters go the Lepetidæ are nearest to the proto-limpet.

In my work on the 'Blake' mollusks (i. p. 436) I said that Acmæidæ of all the groups of Docoglossa is the most typical; that is, within the limits of that family are found assembled, sometimes in one and the same animal, the greatest number of organs which, taken singly, are characteristic of Docoglossa. This is strictly true; but Dr. Thiele



('Gebiss,' vol. ii. p. 340) has mistranslated me to the extent of saying that I have regarded the Acmæidæ as the most "primitive" group, in opposition to my earlier views, which is quite inaccurate. I have, in the 'Blake Gastropods' (pp. 436, 437), shown why the Patellidæ may reasonably be regarded as derived from Acmæidæ, the original ctenidia having been wholly lost. The row of lamellæ within the mantle-edge have taken up the branchial function, and in some species, as in *Ancistomesus*, become arborescent proliferations. The branchial cordon is occasional in Acmæidæ—I have seen it complete in *Scurria mesoleuca*; it is present, but incomplete, in the common *Lottia gigantea* of California; and, even if Dr. Thiele was correct in supposing that it was absent in *Scurria scurra*, there would still be no ground for his conclusion that its absence in the latter species indicates a failure of the grounds upon which I united in one group, as Proteobranchiata, the Acmæidæ and Patellidæ.

But there is excellent reason for believing Dr. Thiele to have been misled by an exceptionally contracted specimen of *Scurria scurra* and to be entirely wrong in his conclusion that the species is without a branchial cordon. The latter is figured and described by d'Orbigny from living specimens (Am. MÉR. p. 478, pl. lxiv. figs. 11-14). I have seen sketches by Couthouy made from life fully confirming d'Orbigny, and, lastly, I have seen, but do not now remember where, an alcoholic specimen which showed them clearly. Dr. Thiele's specimen only appeared "etwas wulstig," somewhat puffed up, in the place where the cordon should be; but there can be no doubt that this puffing up simply represented the alcoholically-contracted lamellæ of the cordon, rendered indistinct by improper preparation.

Many of the minor details in which Dr. Thiele's observations differ from mine may be reasonably explained by the variation which is exhibited by individuals; and my chief criticism upon what is, in the main, a praiseworthy and useful work is that Dr. Thiele has failed to take account of this factor, which more extensive experience with the radula of a single species would have undoubtedly revealed to him. The result has been, not only has he estimated too highly the constancy of minor details of the radula in single species, but he has made an excessive number of so-called "generic" distinctions, the names of which in many cases will simply enlarge our catalogues of synonyms.

In conclusion, I may point out that the relations of the radula in *Lepetella* to that of *Lepeta*, &c., offer additional reasons for thinking that the Lepetidæ are of the limpets those most nearly allied to normal or more usual types of Gastropods, and also that the similarity of the shell of the Silurian *Tryblidium* to that of some recent limpets (*Olana* &c.) by no means authorizes us to conclude that the soft parts of *Tryblidium* were also similar to those of recent Patellidæ. Indeed, when the almost incalculable length of time intervening between our days and the Silurian is considered, together



with the similarity of recent limpet shells which are secreted by widely different animals, it is almost inconceivable that the Silurian form should have any closely allied recent representative. The rhythmical manner in which the adductor scars of *Tryblidium* are arranged in pairs clearly indicates a peculiar disposition of the organs, which might indeed have paralleled in some particulars the organization of some of the Chitons of that ancient time.

For the rest, many of the ancient limpets are represented by shells which might well have belonged to *Lepeta* or *Acmæa*, yet of the relations of which, as in the case of many recent limpets, we are not permitted to arrive at any dogmatic opinion for want of the requisite data, a deficiency which, in the case of the fossils, must remain for ever unsupplied.—*Proc. Acad. Nat. Sci. Philad.* 1893, p. 285.

*On the Occurrence of Arion lusitanicus, Mab., in the British Isles, and Descriptions of Four new Varieties.* By WALTER E. COLLINGE, Mason College, Birmingham.

Through the kindness of Mr. H. Burnley Rathborne, of Dublin, I have recently received some specimens of this interesting species of *Arion*, collected at Bevihenen, Bantry Bay, Ireland.

Dr. Scharff, in his work upon the Irish slugs \*, mentions a variety of *A. empiricorum*, Fér., in which the retractor muscles "are attached quite close to the receptaculum and the upper portion of the oviduct;" this, I have previously stated †, I consider to be *A. lusitanicus*, Mab. Some months ago I examined specimens from Ireland and compared them with continental examples, and felt sure that I was correct in assigning the former to this species. I hope shortly to obtain further supplies of material, and will then describe in more detail the anatomy. References to the anatomy &c. are given by Pollonera ‡, Simroth §, and myself ||.

Whilst recording this interesting addition to the fauna of the British Isles I take the opportunity of describing four new colour variations.

*Rufescens*, var. nov.

Whole of body a dark red. Sides of body bandless. Sent with type by Mr. Rathborne.

*Nigrescens*, var. nov.

Described from a black specimen sent with type by Mr. Rathborne. I would, however, suggest that the name should include all

\* Trans. Roy. Dublin Soc. 1891, ser. 2, vol. iv. p. 539.

† 'The Conchologist,' 1893, vol. ii. p. 7.

‡ Atti Acc. Sci. di Torino, 1889, pp. 405, 406, pl. ix. figs. 1-6; also Boll. d. Mus. Zool. ed Anat. comp. Torino, 1890, vol. v. no. 87.

§ Die Nachtschnecken d. Port. Fauna, 1891.

|| 'The Conchologist,' 1892, vol. ii. p. 116.



Dall, William Healey. 1893. "The phylogeny of the Docoglossa." *The Annals and magazine of natural history; zoology, botany, and geology* 12, 412–414.

<https://doi.org/10.1080/00222939308677643>.

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