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The family *Productidæ*, as will be seen by referring to the table at the end, has been much better represented during the Permian period than was suspected a few years since: in short—of the four known genera, *Productus*, *Aulosteges*, *Strophalosia* and *Chonetes**—we are now acquainted with probably about sixteen Permian species. But what is most remarkable, not a single representative of the family has yet been found in deposits admitted as belonging to a system more recent than the Permian †. We must not, however, jump to the conclusion, that the family *Productidæ* became extinct at the expiration of the Permian period: there are extensive geographical areas in Asia, South America, Australia and other regions, where beds are developed containing representatives of the family; it is therefore advisable to wait until the exact, or at least the proximate age of the beds referred to be determined, before pronouncing that no *Productidæ* lived after the setting-in of the great secondary cycle.

[To be continued.]

XXII.—On *Scissurella crispata*. By WILLIAM CLARK, Esq.

To the Editors of the *Annals of Natural History*.

GENTLEMEN,

Norfolk Crescent, Bath, February 10, 1856.

THE memorandum and figure of Mr. Lucas Barrett, which have just appeared in the 'Annals,' vol. xvii. p. 206, N.S., relative to the animal of *Scissurella crispata*, is a valuable contribution to malacological science, as it furnishes data to determine with sufficient precision the natural position of this curious species, on which for many years the greatest contrariety of opinion has existed, and which has not been satisfactorily settled until the present time. And I will further remark, that this uncertainty will always prevail when genera are constituted on shell con-

* Mr. Davidson was the first to work out the affinities of *Chonetes*: he has proved by its reniform (or ovarian?) impressions, that it belongs to the family *Productidæ*. Vide Introduction to his 'Monograph of British Fossil Brachiopoda,' 1853. The figure which Mr. Davidson has given of the reniform impressions on the flat valve of a "new species of *Chonetes* from the Devonian beds of Néhou, in France," proves that this genus is more related to *Productus* than to *Strophalosia*, notwithstanding its possessing both teeth and an area. With regard to the so-called *Chonetes comoides*, its reniform impressions, when discovered, will doubtless settle the question whether it be a *Chonetes* or a *Strophalosia*.

† The so-called *Productus Leonhardi* (now the type of the genus *Koninckia*) from the Saliferous rocks of St. Cassian evidently does not belong to *Productidæ* (vide Woodward's excellent 'Manual of Mollusca,' p. 231). I suspect, however, that it belongs, or comes near, to the family *Davidsoniæ*, proposed in my Monograph (pp. 81 & 151).

siderations; and they can only be admitted to a provisional position to await the rectifications that may be required by the discovery of the animal architect. Conchological dispositions must ever be the mere arena for surmise and doubtful classification.

Mr. Barrett has not stated his views on the systematic place of *Scissurella*. Whether this has arisen from omission, doubt, or from the idea of this species having already been properly deposited, does not appear. My object is to supply some information on this point.

Mr. Barrett's figure is that of a decided Trochidan animal: this is evident from the ciliated tentacula and lateral vibracula, which latter organs are peculiar to the *Trochidae*; the four neck-lappets are composed of a lamina on each side, so deeply indented as to cause each to appear as two distinct processes; these appendages are the invariable concomitants of the *Trochi*.

Compare these points with the rough woodcut of the animal of *Trochus serpuloides* of Montagu, published in the 'Annals,' vol. viii. p. 45, N. S., and allowing a margin for specialty-variations, all the generic essentials of the Trochidan animal are incontestably apparent.

The late Professor Forbes is one of the naturalists who has, in his and Mr. Hanley's 'British Mollusca,' rightly placed this species with the *Trochidae*; but he acknowledges having adopted that position from some notes of Sars; he however speaks with doubt, and hopes the animal will be better known.

Mr. Barrett's discovery shows that the undoubted natural position of *Scissurella* is with the subdiscoidal section of the delicate minute *Trochi*; its congeners are the *Trochus serpuloides*, Mont., *T. Cutleriana*, mihi, and *T. nitens* of Philippi, all the animals of which were first discovered by me, and described as Trochidans. The operculum of these species is circular, with a subcentral nucleus and coarse spiral striæ; that of Mr. Barrett's *Scissurella* slightly differs. They are all mere films, and require a good lenticular power to distinguish accurately their form and sculpture.

The fissure in the centre of the outer margin of the shell of the *Scissurella* originates in the animal specialty of a prolongation of the points of the branchial organ to procure a more free access of the water, and which by its presence, for a time, interrupts at that particular point the testaceous exudation from the mantle, and thus produces a short fissure, which in progress of growth becomes obliterated in consequence of the branchial impediments to the action of the mantle being removed to a new portion of the shell, and in this manner a constant continuation of the fissure is effected. But surely this scission cannot be

considered of sufficient value to entitle the animal to represent a distinct Trochidan genus, and to nullify its indisputable generic essentials with the type, *Trochus*, in which we are of opinion it ought to be deposited, instead of burdening science with the new genus *Scissurella*.

There can be no species of *Scissurella* without an operculum, as its animal has now been proved to be a Trochidan, all of which are invariably operculated. When that appendage has escaped notice, it has probably been in consequence of the extreme tenuity of the fabric of its pellicle, and the want of proper optical power.

The ciliated lateral vibracula of the Trochidan animal vary from two to four on each side, but are usually three. They are frequently doubled up, and lie under the flap of the upper lobe of the foot; and, from their slenderness and change of position, are often difficult to detect. This remark is made to meet the possibility of the vibracula in Mr. Barrett's *Scissurella* turning out to be three on each side.

In conclusion I beg to observe, that malacologists are under great obligations to Mr. Barrett for having solved a long-desired question, and it would be well if other observers would imitate him. I will throw out a hint connected with the present inquiry by mentioning, that it is a great desideratum to obtain notes on the living *Trochus subcarinatus* of Montagu (*Adeorbis*, nonnull.), which I have in vain sought for during forty years, and the acquisition of which Professor Forbes particularly recommended to my attention.

It is impossible for a single naturalist, however diligent, to do everything and be everywhere; it is only by the many, seizing the opportunities in their respective localities, that science can be made acquainted with facts to elucidate the unsolved problems in natural history.

I am, Gentlemen,
Your most obedient Servant,
WILLIAM CLARK.

XXIII.—*Further Notices of Piedmontese Mollusca.*

By J. GWYN JEFFREYS, Esq., F.R.S.

Scissurella.—Having, in consequence of Mr. Barrett's description of the animal of *S. decussata*, D'Orb. (*crispata* of British authors), in the last number of the 'Annals,' placed under a microscope some *S. elegans*, containing the dried animals, I succeeded in detecting a circular operculum in three out of 145 specimens; and I have also examined the operculum in the Norwegian specimen dredged by Mr. MacAndrew. It resembles the operculum of *Trochus* (sub-genus