

## GRAPTOLITES OF THE MOFFAT SHALES.

To the Editor of the GEOLOGICAL MAGAZINE.

SIR.—I shall be glad if you will afford me a portion of your space to reply to certain statements advanced by Mr. W. Carruthers, in his paper on the "Systematic position of the Graptolites, and their supposed Ovarian Vesicles," contained in the last number of your Journal. In the first place, Mr. Carruthers is of opinion, that the attachment of a supposed ovarian capsule to the stipe of *Graptolites Sedgwickii*, as figured by me (GEOL. MAG., Vol. III. Pl. XVII. Fig. 3), is a case of mere juxtaposition. It is very possible that this view may ultimately be proved to be correct, and one certainly would, *a priori*, and from analogy, be inclined to believe that the mucro should constitute the organ of attachment. On this point I do not feel justified in expressing any strong opinion; but I may remark, *en passant*, that I did not state that I had observed this apparent connexion in one specimen only. What I did state was, that I had never observed this phenomenon except in the case of *G. Sedgwickii*; and, in point of fact, I have seen it in three specimens of this Graptolite, though never in any other; and in the two, which I did not figure, the position of the mucro could not be made out.

It is undoubtedly true that in the majority of cases, there are no external indications, or scars, which could have been produced by the fall of a capsule. Still there *are* cases in which marks exist, which are possibly due to this cause. Thus, Hall has described pustuliform elevations at the bases of the cellulæ in *Graptolithus nitidus*, and in *G. divaricatus*, both *Didymograpsi*; and I have observed similar pustules, or, in some cases, pits, at the base of the cellulæ of *Didymograpsus anceps*, recently described by myself, from the Moffat shales. These may be the cicatrices of ovarian capsules, as vaguely hinted by Hall, but on this point I would be understood to express myself merely hypothetically, and with all due caution.

Then Mr. Carruthers concludes that the rounded and oval bodies, without an evident external mucro, which occur in numbers along with the perfect mucronate capsules, must have been mistaken by me for specimens of the small Brachiopod, the *Siphonotreta micula* of Mc Coy. On this point I can only say, that I have collected dozens of the *Siphonotreta*, in various localities in Dumfriesshire, and I have examined a most extensive suite of the rounded bodies in question, in every state of compression and preservation, and I can safely assert, that it is impossible that any palæontologist, possessed of ordinary powers of observation, should fall into an error so gross. I never met with any case in which there was the need of a moment's hesitation, and a careful examination will almost always detect the mucro, at some point or other, within the circumference of the capsule. I therefore repeat the assertion, that the rounded bodies are simply the bell-shaped mucronate capsules, compressed from above, downwards instead of laterally. In this view, I am fully supported by the authority of Prof. Harkness (than whom no one is more thoroughly acquainted with the Graptolitic rocks of

Dumfriesshire, and their contained fossils), who both examined my specimens, and himself collected a number, in a visit which he paid with me to Moffat last summer.

Leaving the subject of the ovarian capsules, Mr. Carruthers appears to think that the *Diplograpsus Whitfieldii* of Hall is identical with the *D. tricornis* described by himself. This, however, is certainly not the case, the two being distinguished, amongst other differences, by the obvious character that the former is provided with but a single mucronate radicle, whilst the latter is furnished with three. I have found *D. Whitfieldii* at Glenkiln Burn, in Dumfriesshire, but I am not aware of its occurrence having been noticed elsewhere.

It seems to me that Mr. Carruthers is likewise wrong in the assertion, that *Diplograpsus pristis*, Hisinger, is provided with spinose or mucronate cellules. I should speak more positively on this point, but I am not able to refer to the original figures by Hisinger, and can only judge from the various figures in Hall, and from McCoy's description. Certainly I have myself never seen a single specimen in which this was the case, and I should be inclined to suggest (not having seen the specimens upon which Mr. Carruthers has founded his statement), that he has probably mistaken for *D. pristis*, specimens of the *Diplograpsus quadri-mucronatus* of Hall. I have found this beautiful species not uncommonly in the Moffat shales, and when compressed in certain directions, it presents but a single row of spines, thus coming closely to resemble the ordinary form of *D. pristis*, and differing chiefly in the mucronate cellules.

I am, Sir, Yours, etc.,

HENRY ALLEYNE NICHOLSON.

EDINBURGH, February 6th, 1867.

#### MR. MAW, PROFESSOR JUKES, AND OTHERS ON DENUDATION.

To the Editor of the GEOLOGICAL MAGAZINE.

DEAR SIR,—Since the appearance of my articles on the origin of Escarpments and Valleys (GEOL. MAG. April and July 1865; Feb. and Sept. 1866), you have given insertion to an array of contributions more or less in favour of subaërial denudation. As I find a full reply would not come within any reasonable compass, in your Magazine, and as several observations have been made which render silence on my part no longer desirable, would you kindly find room for a few brief remarks.

*Planes of Marine Denudation.*—As on this point I have been misunderstood, permit me to remark that in asserting that the sea is not a levelling agent, I, of course, meant that the sea only planes down its bed to an extent proportionate to the amount of flat surface presented by the land at any given time. This planing down process is far from universal. It is nearly absent in Archipelagos, and on continuous coast-lines it requires a very slow, uniform, and unintermittent rise or fall of the land. Table-lands, with surrounding *declivities* or escarpments, are planes of marine denudation, and so are plains surrounded by *acclivities* or escarpments, unless a mere