

CORRESPONDENCE.

MICRASTER PRÆCURSOR, ROWE.

SIR,—Your reviewer of *The Stratigraphy of the Chalk of Hants* in the *March Geol. Mag.*, 1913, pp. 122–3, seems to have misunderstood my remarks on this species; at any rate, the views from which he appears to be dissenting are not views advocated or held by me. I should therefore like to restate the points I intended to raise.

In the first place it appears to me that Dr. Rowe's monograph in effect established that every individual of the species *M. præcursor* possesses two sets of characters, which have practically nothing in common. The first set embraces a large number of characters which the individual shares with all specimens, not only of *M. præcursor*, but also of *M. cor-testudinarium* (and sometimes other species also) from the same horizon; these characters are therefore of great zonal value, but no specific value. The second set embraces a small number of characters which enable *M. præcursor* to be distinguished from its nearest ally, *M. cor-testudinarium*. As neither of these species is confined to a single zone, this second set of characters are not strictly of any zonal value; i.e., a record of *M. præcursor* does not identify the zone, but it only tells you that you are in one of two or (under Dr. Rowe's zonal classification) three zones. To put it briefly, the assemblage of individuals defined as the species *M. præcursor* has no zonal value; the individuals have, through characters which are not specific, great zonal value. (I did not expressly affirm the latter proposition because I regarded it as established beyond dispute; but your reviewer seems to have failed to perceive that the two propositions are quite independent, and to have assumed that a challenge of the general view on one must necessarily be a challenge of the general view on the other.)

Secondly, on examining the characters by which *M. præcursor* is to be distinguished from *M. cor-testudinarium* they appear to consist substantially of shape variations in a particular direction, that of the proportion between length and breadth, with concurrent variations in minor features necessarily affected by variation in general shape. That is to say, the species *M. præcursor* is based almost entirely upon shape variations, while the prime object of Dr. Rowe's monograph was to prove that shape variations were not a valid basis for species of *Micraster*. This seems to indicate that *M. præcursor* is not specifically separable from *M. cor-testudinarium* as defined by Dr. Rowe, but that they are two sections of a single species which obviously must be known as *M. cor-testudinarium*, and that *præcursor* should be suppressed as a specific name. This does not in the least prejudice the zonal value of the individuals hitherto comprised in the species *M. præcursor*.

Thirdly, it is legitimate to inquire whether the *præcursor* section of the species *M. cor-testudinarium* is a natural one, for which '*præcursor*' can usefully be retained as a varietal or other subsidiary name. It seems to me that if it is a natural section, the dividing-line employed by Dr. Rowe ought to occupy the lowest, or nearly the lowest, point in a curve of frequency plotted for the various proportions

between length and breadth in a large and representative series. I very much doubt whether this would be found to be the case.

Your reviewer tends to beg these questions by treating of the "group of *Micraster præcursor*". This phrase would, of course, be a well-recognized one to denote several allied species, among which *M. præcursor* is prominent. That may be the sense in which he uses it, but probably it is not so, for in that case his criticism would not be relevant to my remarks, as I only challenged one species, not several. I suspect that the phrase is current, and was used by your reviewer, to designate just the assemblage which Dr. Rowe named *M. præcursor*; and that the vague word 'group' has been added to a term which can only legitimately denote a species owing to a sub-conscious feeling that the assemblage in question is not satisfactory as a species. If so, the use of this expression tends to confirm my views; but in any case it is in itself so ambiguous that its use without a definition of its scope, for the time being, is to be deprecated.

R. M. BRYDONE.

27 TWYFORD MANSIONS, W.
August 16, 1913.

THE DIVISION OF THE UPPER CHALK.

SIR,—With respect to the scientific points raised by Mr. Brydone, they have really little to do with the division of the Upper Chalk into two stages. He only concerns himself with the line of division between his two zones of *Offaster pilula* and *Actinocamax quadratus*. The main question is this—suppose French geologists are right in believing that there are two faunas of stage-value in the comprehensive Senonian of d'Orbigny, where do we find the most convenient plane of division between them? At present they draw the line at the top of the zone of *Marsupites*; I gave reasons for drawing it at the top of a higher zone, that of *Placenticerus bidorsatum* and *Inoceramus lingua*, which though recognized has not yet been fully examined and defined in France.

This latter zone must be more or less coextensive with Mr. Brydone's zone of *Offaster pilula*, and if he can substantiate his zone and his upper limit of it throughout the South of England, it should also be applicable to the Paris Basin, and may eventually become the plane of division between a restricted Senonian and a Campanian stage, as suggested by me last year: that is the real point which requires further investigation.

Meanwhile I am quite prepared to agree with Mr. Brydone that the Yorkshire Upper Chalk is so decidedly North German in its affinities that its nomenclature should be North German rather than Anglo-Parisian. Let the discussion of the subject be limited at present to the Anglo-Parisian region, but here a caveat must be entered. It is well known that the species which go by the names of *A. granulatus* and *A. quadratus* are connected by a number of intermediate forms, and that Mr. Rowe regards the one as the lineal ancestor of the other. Mr. Brydone will have to define exactly what he means by *A. quadratus* and what he regards as the distinction