

CORRESPONDENCE.

SIR,—Your correspondent is very glad that Prof. Trueman¹ has found himself able to accept Dr. Robertson's determination of the horizon of the type specimen of *A. adamsi* in the Welsh succession, and is thus in a position to draw the conclusion that it is the same as that of *A. hindi* Wright, 1930, and *A. warei* Dix and Trueman, 1931. He is also relieved that Prof. Trueman has decided that the three species had better stand, for it is certain that the type of *A. adamsi* cannot be regarded as the type of either *A. hindi* or *A. warei*, since it lacks the essential features of these species, namely the curved lower margin and forward position of the maximum depth. It would appear now that it is probably an extreme form in the variational group from which *A. hindi* and *A. warei* come, and of which *A. hindi* is, in Lancashire and Staffordshire at any rate, the commonest and most distinctive member. It may be conceived of as a reversion towards *A. modiolaris*, which form, though possibly hybridized, extends upwards into the Similis-Pulchra Zone and, no doubt, enters into the make-up of several of the species of *Anthracozya* found in that Zone.

The writer is more doubtful regarding the distinctness of *A. warei* and *A. hindi* since *A. warei* is the smaller and is simulated by the early growth lines of *A. hindi*. It may be merely an immature form, but, in the interests of uniformity of nomenclature, he has recently (1938) made the suggestion that the term *A. hindi* should be applied to those specimens in which the ratio of height to length is greater than a half, and *A. warei* to those in which it is less. If this is not acceptable *A. hindi* has precedence, but since Prof. Trueman suggests that the three names should be retained, he gathers that it will be. The essential thing is that *A. adamsi*, being a quite exceptional form on its horizon, should not be regarded as embracing *A. hindi* and *A. warei*.

The Hindi Subzone thus stands, and as it is one of the most consistent in England, and lies at the top of the workable Coal Measures, it is very suitable it should bear Hind's name.

Prof. Trueman, however, takes exception to the use of the term subzone, and considers that to such horizons the word "band" is more applicable. The writer is afraid he cannot agree. The worth of a zone is not proportional to its thickness, in fact quite the reverse. It is proportional to the lateral constancy and distinctness of its zone-form. When he found some years ago, not entirely to his surprise, that the Subzones of Lancashire are traceable far afield, he refrained from elevating them to the status of zones, purely out of respectful admiration for the pioneer work of Davies and

¹ GEOL. MAG., Vol. LXXV, p. 459, 1938.

Trueman.¹ The Zones established by these writers are, however, lacking in definition, as zones averaging over 800 feet in thickness are liable to be. It has not for various reasons been possible to follow them laterally by means of their zonal forms alone. Prof. Trueman and his subsequent collaborators have made use of subsidiary forms for purposes of determination of horizon. Many of these are the subzonal forms used by the present writer, who is pleased that they should be found useful to others, but rather staggered by the suggestion that they are unworthy of subzonal rank.

The writer refrained for many years from claiming anything but a local significance for the subzonal forms of Lancashire, because he had no means of knowing that they held good over a wider field. Prof. Trueman and his collaborators, it is true, cited his species, but commonly in such fashion as to indicate that they had little zonal significance and ranged widely. They did not record the finding of the subzones, and in some of their identifications were clearly in error.

On the other hand, the writer made every effort to recognize Davies's and Trueman's Zones in Lancashire, but had to admit failure in certain instances. Thus he could not find *A. lenisulcata*, though he had something probably allied to it but of more restricted range. *Carbonicola ovalis* was extremely rare and thus quite useless as a zonal form. Prof. Trueman recognizes its rarity even in South Wales. *Anthracomya modiolaris* was good, and carries through everywhere as far as the writer has seen. It is a very useful major-zone form. He has completely failed to find *Carbonicola similis*. What he interprets as *A. pulchra*, and what Prof. Trueman apparently also regards as the same species, appears in Lancashire and Yorkshire just above the Modiolaris Zone, where *C. similis* should be. The Pulchra Zone thus shifts its base downward some 500 feet as it comes north. The strata above the Pulchra Zone of Davies and Trueman the writer has had little chance of examining.

It was clear, therefore, that the system of these workers had broken down to some extent in Lancashire, but one could recognize the fairly definite top and bottom of the Modiolaris Zone, the Ovalis Zone vaguely, a revised Pulchra Zone, with its base immediately above the Modiolaris, and at the top the incoming of forms comparable to *A. phillipsi*. This enabled him to bracket Davies's and Trueman's Zones outside his own Subzones, and so make some sort of broad comparison.

The writer's subzones were known at that date to have a definite local constancy, and value for correlation purposes, for distances of thirty to forty miles. The title Subzone, therefore, seemed peculiarly applicable to them. It was fortunately possible to determine approximately, though not in all cases by the presence

¹ Prof. Trueman thinks the writer has forgotten Mr. Davies. This is not so. He first heard of this work from Mr. Davies and out of the scores of references he has made to it he has, he believes, only once omitted Mr. Davies's name.

of the Zonal form, the subdivision which Davies and Trueman made, and so to leave the original scheme nearly intact. The writer yields place to no one in his admiration for their pioneer effort. It is to his profound regret that it now becomes apparent that Prof. Trueman thinks his and Mr. Davies's original Zones cannot be profitably subdivided.

On the publication of Messrs. Weir and Leitch's admirable paper on the Zones of Scotland it became clear that most of the Lancashire Subzones were recognizable in that country in their correct order, and that therefore a much closer correlation could be made than was possible with the scheme of Davies and Trueman. The writer, therefore, with the kind permission of Dr. Bailey, tried the Yorkshire succession and found that the same was true. He is now fairly well convinced that the Subzones are valid throughout the British Isles and, as the greater proportion of Davies's and Trueman's Zones in the Productive Measures have shown themselves to be unidentifiable, except by means of the subzonal fossils, he would suggest that the time has come for the recognition of the Subzones as Zones in the full sense of the term, and that any attempt to relegate them to the status of "bands" is entirely retrograde.

Prof. Trueman, however, complains of the changes recently made in the Subzonal boundaries. There have been no changes apart from further subdivision, and what is a system worth if it is not capable of improvement. It is little recommendation for the scheme of Messrs. Davies and Trueman that it has not been materially altered or improved since it first made its appearance in 1927, but the writer would not like to see their system wholly disappear, even though it is out of date, because its initiation was an admirable effort, and must have required much courage and confidence.

Prof. Trueman specifically states that he does not refer, in his discussion of *A. adamsi*, to the shells at the top of the Modiolaris Zone identified as *A. adamsi* by Messrs. Weir and Leitch, nor have the latter authors replied to the writer's challenge that these are closely allied to *A. modiolaris*. The Subzone in which they occur has been placed by Davies and Trueman in South Wales in the Modiolaris Zone, by Wray and Trueman in Yorkshire in the same Zone, but by Weir and Leitch in the Similis Zone. This seems more like changing the limits of Zones than anything of which the writer can be accused. However, it is Messrs. Weir and Leitch that have done it and not Prof. Trueman, and at any rate the position is clear, for the fossils are, in terms of the present classification, *A. modiolaris*, and not comparable with any higher species except possibly the abnormal *A. adamsi* s.s. as now defined, but a declaration by Prof. Trueman that he recognizes them as such would be welcome.

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