been sent to me on loan through the kindness of Mr. J. M. Edmonds, of Oxford. It has the usual belemnite structure of radiating prismatic fibres and concentric growth-layers. Dr. F. C. Fraser, of the British Museum Zoological Department, has kindly had taken for me X-ray skiagrams, in one of which the profile of the infilled alveolus of this specimen can be faintly seen ; the alveolus proves to occupy more of the guard than is usual in *Clastoteuthis*, but less than authors have supposed it to occupy in *Coeloteuthis*. The apex of the alveolus is about 7 mm. from the apex of the guard and, as in the *Clastoteuthis* type-material, is fairly eccentric ; it is about 3·8 mm. from the nearest point on the venter and about 6·8 mm. from the nearest point on the dorsum. As compared with the type-material of *Clastoteuthis* the alveolar part of the guard tapers unusually rapidly, whilst the apical region seems to have been unusually short and blunt, even before the slight erosion of the apex that has accentuated its bluntness. I am satisfied, however, that although the lectotype of *Coeloteuthis excavata* is an extreme form it represents the same genus to which Dr. Lang later applied the name *Clastoteuthis*, and that this must therefore be considered a synonym of *Coeloteuthis*. Whether separate sub-families Coeloteuthinae and Passaloteuthinae should be recognized or not, there seems no justification for drawing a distinction between them on the basis hithrto adopted.

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PRE-CAMBRIAN FORMATIONS OF INDIA

SIR,—The very interesting letter on this subject by Sir Lewis Fermor (*Geol. Mag.*, lxxxvii, 1950, p. 140) raises a great many points for discussion, but as most of these will sooner or later be settled by the acquisition of appropriate data it would be out of place here to indulge in a lengthy expression of personal opinions. The essential difference between Sir Lewis and myself arises from the fact that I am trying to recognize Pre-Cambrian orogenic belts, and to date their closing stages from investigations of their radioactive minerals, whereas he is trying to correlate formations and sequences of formations : a very different proposition.

One point, however, calls for immediate attention, since it involves an error of fact which I regret having made and am glad to see corrected. Referring to my paper (*Geol. Mag.*, lxxxvi, 1949, p. 290), Sir Lewis writes : " The strike direction shown on Professor Holmes' map in Text-fig 1 marked ' Satpura Range ' does not represent any strike of the older rocks, as these are here covered by the Deccan Trap." Looking into the source of this mistake I find that I traced the position of the Satpura Range from the orographical map of India in *The Oxford Advanced Atlas* and then went on to assume that it also represented the position of the Pre-Cambrian rocks of the Satpura Range described by Crookshank (*Mem. Geol. Surv. India*, 56(2), 1936). Actually, the latter lie far to the east of the position marked on my map. It follows that on present evidence there is no proof that the Aravalli orogenic belt is older than the Satpura belt ; it could just as well be a continuation of the latter as of the Dharwar belt and, of course, it may be neither. Unfortunately, no radioactive mineral suitable for age determination has yet been recorded from the late Aravalli pegmatites.

While the Aravalli problem must remain unsolved for the present, that of the Nellore mica belt should soon be cleared up. A new analysis of Nellore samarskite by Professor P. B. Sarkar gives a crude age of 1760 m.y. and lead from this mineral is being isotopically analysed by Professor Nier. Work is also beginning on radioactive minerals from rocks belonging respectively to the Dharwar and Eastern Ghats belts. The results of the three investigations should make it possible to date these belts and also to show whether the Nellore pegmatites are of late Dharwar age or not.

In reference to the desirability—emphasized by Sir Lewis—of dating the Cuddapah System in its type area, I can only suggest an application of the helium method to a concentrate of black ores, such as titaniferous magnetite, separated from the post-Cuddapah dolerites (cf. Hurley and Goodman : *Bull. Geol. Soc. Am.*, 54, 1943, p. 305). It should not be overlooked that Dubey (*Nature*, 126, 1930, p. 807) applied the helium method to a basalt flow from the upper part of the Gwalior Series and obtained an " age " of about 500 m.y. Since the helium method yields only minimum ages, except for the feebly radioactive black ores, the Gwalior Series may reasonably be assigned to the Pre-Cambrian. It is worth noticing, however, that Dubey's work on the Whin Sill and the Cleveland Dyke, carried out by the same methods (Dubey and Holmes : *Nature*, 123, 1929, p. 794), gave " ages " that are only a little lower than those now regarded as most probable. This consideration supports the view that the Gwalior Series is more likely to be of late Pre-Cambrian age (say, 550–600 m.y.) than of Aravalli age (900 m.y. or more). The traditional correlation of Gwalior with Cuddapah is therefore at least consistent with the limited evidence available ; obviously, however, its validity remains to be proved. I hope to co-operate with Sir Lewis in making practical arrangements for carrying out the suggestion for settling the age of the Cuddapahs.

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BATHONIAN *VIVIPARUS*-LIKE GASTROPODS

SIR,—Dr. T. C. Yen's proposition of a new generic name *Bathonella* for *Viviparus*-like gastropods found in Bathonian rocks in England, Scotland, and France has given rise to an interesting controversy, to which Mr. Hugh Watson has been the latest contributor.[1] Two points are at issue. Did these gastropods live in fresh, brackish, or fully salt water ? Are they so completely indistinguishable from *Viviparus* that they could belong to no other genus, whatever their habitat ? It should be possible to answer the first question by considering all relevant evidence as to the conditions of formation of the deposits in which they are found, for it seems rather unreasonable to suggest that every occurrence is to be explained by transportation by rivers in flood or some such accident. Apart from their presence in the Sharp's Hill Beds of N. Oxfordshire, associated at one locality with marine shells, they have been found at several horizons and localities in the Great Estaurine Series of Skye. Mr. F. W. Anderson (who is convinced from familiarity in the field that the beds containing these shells are not of freshwater origin) has kindly sent me a full list of the occurrences in that island (apart from the one recorded in Dr. Yen's paper) and of the associated fossils. The list is summarized below ; the records are all Mr. Anderson's except for two published by Tate, whose generic determinations have been revised. The beds are cited in descending order.[2]

e. *Ostracod Limestones. Bathonella* has been found at seven localities, associated at one with *Protomiodon* spp. and " *Estheria* ", at a second with *Protomiodon* and ostracods, at a third with *Hydrobia praecursor* and " *Estheria* ", at a fourth with *Quenstedtia staffinensis*, ostracods and " *Estheria* ", at a fifth with ostracods and " *Estheria* ", and at the other two alone.

[1] *Geol. Mag.*, lxxxvii, 1950, 17–25.

[2] For a summary of the succession in Skye and a revision of the fossil determinations of previous authors, see F. W. Anderson and L. R. Cox, *Proc. R. Phys. Soc. Edinb.*, xxiii, (2), 1948, 103–122.