

rank depended on maximum temperatures then the analytical data fit this simple explanation as well as they do the more complicated one proposed by Jones. It has the additional advantage that a quantitative test is possible if the rate of final subsidence and duration of deepest burial can be estimated.

H. WELLMAN.

GREYMOUTH,
NEW ZEALAND.
January, 1950.

COELOTEUTHIS AND SYNONYMOUS HOMONYMY AT GENERIC LEVEL

SIR,—Dr. Otto Haas recently pointed out in the *Journal of Paleontology* (1949, vol. 23, pp. 573–4) the theoretical possibility of synonymous homonyms (or homonymous synonyms). Still more recently, Dr. D. L. Frizzell, in the same *Journal* (1950, vol. 24, p. 117), has given actual examples of synonymous homonyms at specific level, though commenting that the independent proposal of two identical names for a genus would be an unusual phenomenon. It may therefore be of interest to draw attention to an instance with which I have long been familiar of synonymous homonymy—indeed, objectively synonymous homonymy—at the generic level.

The genus *Coeloteuthis* was proposed by Marcel Lissajous in “Toarcien des environs de Mâcon”, *Bull. de la Soc. d’Hist. Nat. de Mâcon*, 1906, p. 265. This paper is probably not in any library in England, but Professor Jean Goguel, of the Service de la Carte Géologique de la France, has found it for me in the library of the Société Géologique de France, and has kindly had made for me a typewritten copy of the part relating to belemnites. For our present purpose the essential statement is: “Genre COELOTEUTHIS nov. gen.” . . . “Le type de ce genre est *Belemnites excavatus* Phillips.” Further references to *Coeloteuthis* Lissajous were made in 1915 by Lissajous himself (“Quelques remarques sur les Bélemnites jurassiques”, *Bull. de la Soc. d’Hist. nat. de Mâcon*, 1915, p. 13, of which there is a reprint in the Department of Geology of the British Museum), and by P. Lemoine (*Revue critique de Paléozoologie*, 19th year, No. 4, 1915, p. 157).

In 1919, however, Professor E. Stolley (11. *Jahresbericht d. Niedersächsischen geol. Vereins zu Hannover*, 1919, pp. 37, 39) independently proposed the genus *Coeloteuthis*, with type species *Belemnites excavatus* Phillips. Perhaps the possibility of a subconscious recollection cannot be wholly excluded, but it seems more likely that Professor Stolley had not seen the relevant publications of Lissajous, probably not easily accessible in Germany at the best of times; moreover, unawareness of the 1915 publications might well have resulted from the interruption of free communication by the war of 1914–18. Whatever the explanation, the result is that *Coeloteuthis* Stolley is an objectively synonymous homonym of *Coeloteuthis* Lissajous.

Consideration of the synonymy of *Coeloteuthis* involves also the question of the relationship between *Coeloteuthis* Lissajous and *Clastoteuthis* Lang (*Quart. Journ. Geol. Soc.*, lxxxiv, 1928, pp. 196–7). The type species of *Clastoteuthis* is *C. abrupta*, of which the holotype, registered C28864, and various paratypes, are in the British Museum (Natural History). Dr. Lang considered *Coeloteuthis* and *Clastoteuthis* to be very different genera, referring them respectively to the Coeloteuthinae and Passaloteuthinae as delimited by Professor Naef (1922, *Die fossilen Tintenfische*, pp. 224, 229, 230); but Dr. Lang had not seen the type material of *Coeloteuthis excavata*. Phillips has described and figured (*Palaeont. Soc. Monog. Brit. Belemnitidae*, pp. 37–8, and pl. II, fig. 4) two syntypes of *Belemnites excavatus*. The original of fig. 4 S cannot, indeed, be found; judging from the figure, it is a non-median section liable to be misunderstood. In 1930, however, I succeeded in recognizing, in Oxford University Museum, the original of fig. 4 v, l, s', s'', which is hereby chosen as lectotype of the species. This specimen, since registered J1193, has

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 hitherto adopted.

LESLIE BAIRSTOW.

BRITISH MUSEUM (NATURAL HISTORY),
LONDON, S.W. 7.

26th April, 1950.

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.