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CORRESPONDENCE

HILT'S LAW AND THE VOLATILE CONTENTS OF COAL SEAMS

SIR,—Jones (*Geol. Mag.*, lxxxvi, 1949) makes the primary assumption that the differences in the volatile contents of evenly spaced seams in any vertical sequence is the same irrespective of the ranks of the seams. The difference in volatile content of seams 1,000 feet apart is termed the "Hilt Rate". This assumption is based on a least squares study of short vertical sections in South Wales and in Kent that show a uniform rate of decrease to be slightly (but not significantly) more probable than more complex relationships that allow for a decrease in the Hilt Rate with depth and increasing rank. Having made the assumption that a uniform rate of decrease is normal, Jones is faced with explaining the low rates shown by high rank sections. This he does by assuming that pressure inhibits coal metamorphism. But in spite of the evidence from least squares, if pressure is important the Hilt rate cannot be uniform, but must decrease with depth. No other evidence exists that the rate of decrease of volatile matter with depth is constant, and indeed this simple relation does not agree with the available experimental results on the decomposition of coal with progressively increasing temperature at atmospheric pressure. An increase in pressure will no doubt cause the volatile contents at the corresponding temperatures to differ, but it is unlikely to make the relationship as simple as Jones assumed it to be. If the Hilt Rate is assumed to decrease with depth (and rank) no reason then exists for postulating that pressure inhibits coal metamorphism. It may well have the opposite effect. If the Hilt Rate varies with rank, metamorphic gradients in sections with different ranges of coal ranks cannot be directly compared by their Hilt Rates. In the Kent Coalfield, however, the ranges in ranks are similar and the differences are real, irrespective of what kind of rate of change with depth is accepted. Jones considers the differences to be related to differences in rates of subsidence during the final phase of sedimentation (sediments now eroded). With this I am in full agreement, but I cannot agree with Jones that the different Hilt Rates are due to diffusion of volatiles being so slow that diffusion was appreciably affected by these different rates of subsidence. If this were the case, the porosity of enclosing sediments should in general control coal rank. Coal lenses in sandstone should be of higher rank than those in mudstone; thin seams should be of higher rank than thick ones. I know of no evidence for this. As an alternative, I suggest that the final phase of sedimentation was so rapid that the sediments accumulated more rapidly than they were warmed up by the internal heat of the earth, and that this caused the iso-geotherms to be more widely spaced in the rapidly subsiding central part of the Kent geosyncline than at the margins. If coal

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.

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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