

Slates in the walls of the magma reservoirs and vents and would be incorporated into the magma only in conditions of excess gas pressures such as might occur during periods of welded tuff formation.

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#### NEW NAME FOR LIAS AMMONITE

SIR,—Prof. R. Trümpy, of Zürich, has kindly called my attention to the fact that my Blue Lias ammonite, species, *Psiloceras (Caloceras) multicoatum* Donovan, 1952, p. 638, is homonymous with *Psiloceras (Caloceras) multicoatum* Brandes, 1912, p. 431, proposed for Quenstedt, 1883, pl. 1, fig. 12. I therefore propose *Psiloceras (Caloceras) bloomfieldense* nom. nov. for *P. (C.) multicoatum* Donovan, 1952, non Brandes, 1912, holotype to be the same specimen as for my earlier species, namely Geological Survey Museum no. 85017. The specific name is derived from Bloomfield Quarry, Farmborough, Somerset, the type locality.

#### REFERENCES

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DONOVAN, D. T. 1952. The Ammonites of the Blue Lias of the Bristol District, Part I, Psiloceratidae and Schlotheimidae, *Ann. Mag. Nat. Hist.*, ser. 12, v, 629–655.  
QUENSTEDT, F. A. 1883. *Die Ammoniten des Schwäbischen Jura*. Bd. I, part 1, Stuttgart.

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#### THE BOUNDARY BETWEEN MIDDLE AND UPPER JURASSIC

SIR,—Dr. Arkell's new book, *Jurassic Geology of the World* (1956), is a masterpiece in conception and execution, and all students of the Jurassic system will be indebted to his immense labours and to his clarity of exposition and synthesis, as well as to the publishers for a style of production worthy of this majestic undertaking. In a book where almost every detail and generalization is based on fact or common sense, it is all the more disturbing to find a statement that alters all established usage in Jurassic stratigraphy, and this without a word of satisfactory explanation or supporting stratigraphical evidence.

This statement is the inclusion of the Callovian stage in the Middle Jurassic (p. 8), a step taken, apparently, only so that the table of stages and zones on p. 7 may look neater, and in order to conform with the "priority" of von Buch's arrangement of 1839. It is quite inconsistent with the author's stated preference for "a compromise between priority, suitability and usage" (p. 8) and with his rejection (p. 7) of "ancient terms and meanings of before 1850"; in fact, from its very date, it cannot have been a grouping of stages or zones within the author's self-imposed terms of reference. As for priority, von Buch's scheme is inconsistent with that proposed in England by Conybeare and Phillips in 1822. It was, moreover, Oepel's considered opinion (1858, p. 821) that it should be replaced in England, France, and South-West Germany by a modified version of Conybeare and Phillips's scheme, which had been widely used up to that time and has been universally used ever since.

So far as Britain is concerned, the line dividing Middle and Upper Jurassic has always been taken at the base of the Kellaways Beds. It is true that this does not coincide with any stage-boundary, since the Upper Cornbrash is already of Callovian age, but the discrepancy in thickness of strata is trifling and the line has at least the merit of being a mappable boundary between formations which is recognizable over its whole outcrop and of being never markedly diachronous. The top of the Callovian, on the other hand, is only clearly marked in a part of Yorkshire and in one claypit in Buckinghamshire; elsewhere in England, and also in Skye, it lies within a uniform mass of Oxford Clay, and in Eastern Scotland within the arenaceous beds of Brora. It does not coincide with any formational boundary and nothing can be said in its favour that would justify overthrowing the traditional, factually-based boundary.

There may be some parts of the earth's surface where practical stratigraphers may find it more convenient to adopt the new line, but it does not appear from the book itself that these are many, and some of them lie in regions where the succession is as yet incompletely known. As regards the classic region of North-West Europe, it was surely out of regard for the geological facts that Opper, as already mentioned, after following von Buch's scheme all through his book, finally concluded that it was unworkable, and that a classification that could be consistently applied over the whole region demanded the inclusion of the Callovian in the Upper Jurassic.

The present writer cannot speak from personal experience outside his own country, where Dr. Arkell has himself hitherto always used the accepted classification, sometimes with cogent arguments in its favour (e.g., 1947, p. 66). Even in the book now discussed, he gives, perhaps unwittingly, strong arguments for placing the Bathonian and Callovian in separate groups of stages on grounds wider than those of local field-evidence, when he contrasts (pp. 609-10, 634-5, 639, 641) widespread marine regressions in the Bathonian with important transgressions in the Callovian. Moreover, his own published statements on ammonite-evolution (e.g. 1951, pp. 1-4) and on ammonite-migration in the present work (p. 610) show that there are sound palaeontological reasons for placing the Middle-Upper Jurassic boundary between the Bathonian and Callovian stages. It is thus difficult to understand the geological reasons that have prompted Dr. Arkell to change this well-established boundary, especially as he has not stated them. It is perhaps unwise to insist on the absolute validity of any stratigraphical boundary over too wide an area, as Opper himself observed (1858, p. 824), yet surely the Bathonian-Callovian line has better claims to be accepted as standard than the Callovian-Oxfordian one, on any just appraisal of the available evidence.

This protest is made with genuine concern, for Dr. Arkell is listened to with greater respect than he perhaps realizes in all his statements on Jurassic geology, and the time-lag in incorporating his work into teaching material is probably less than in most cases. His unique authority in this field can only be weakened, and the utility of his great book impaired, by unsupported classifications which his British colleagues, at least, will find it impractical to adopt.

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