

the two postulates is not shown. To make the contrast effective the reference must be to three-dimensional spherical geometry (Riemann's) or to hyperbolic, and this is beyond the boy's scope; a curved surface is familiar, but "curved space" is not.

"(vi.) The new plan has over Euclid's an important psychological advantage. . . . A beginner does not readily appreciate the necessity of proving a converse; consequently the far-reaching significance of the assumption about parallels tends to be overlooked. This can hardly happen in the case of the postulate of similarity."

This argument the Committee has already demolished by pointing out that "at the age of fifteen a boy will be able to appreciate the need of an axiom and the distinction between direct and converse theorems." It looks as if for a moment the Committee had nodded, and confused the Fifth Form boy with the "beginner" in the Third.

Perhaps the workable compromise would be in the lower Forms to accept Euclid I. 4, 8, 26, 27-29 as known facts (as the Committee approves); to systematise the subsequent work on this basis in the Fifth (this is necessary as the minimum); further, still in the Fifth, to explore Euclid's theory of parallels and Book I. 8, 26, but still to retain Book I. 4 as an axiom (as of course Hilbert does); but to leave to the Sixth Form the exploration of the alternative method and the fundamental difficulty of congruence. For a Fifth Form, Euclid would be a very good text-book, not in all its details, but in its general order; our teachers at least ought to be thoroughly familiar with this first of all; discussion of alternatives would be both more interesting and more fruitful with this as a solid background.

Our Bookshelf.

Type Ammonites. By S. S. Buckman. Vol. 4. (Recd. in 11 parts.) Pp. 68 + 197 plates. (London: Wheldon and Wesley, Ltd., 1922-3.) 6s.

THIS publication, we are told, is concerned with the illustration of ammonites from the Jurassic strata of the British Isles. The present volume includes plates 269-422, good, bad, and indifferent, but in numbers a generous proportion of the whole. In a work entitled "Type Ammonites" the illustration of old and hitherto unfigured species is appropriate; but the publication of *Chalcedoniceras chalcedonicum*, for example, has yet to be justified, generically and specifically; and in the absence of descriptions, Galilæiceras, Galilæites, Galilæanus, and others, possibly from the same bed, may well be taken to be individual variations of one species.

There could scarcely be a sharper contrast than the parts now before us and the excellent first volume. Subscribers had been told that, beginning with volume iii., it was necessary to issue plates only and to discard the descriptive letterpress, but that the "necessary"

text would run consecutively. In volume iv., with the exception mentioned below, there is no such text, and without at least comparison with known forms, it is impossible to recognise such objects as the "*Ammonites bplex*" and "*Ammonites virgatus*" of plates 402A and B, given a new generic and specific name. The palæontologist who may use this work already knows that in the Portlandian, as in other rocks and road-heaps thereof, there may yet be found many mysterious types.

There is, in the last part, a "series of short diagnoses" relating to the family Macrocephalitidæ, which is intended to illustrate the method of working with regard to generic names. In the opinion of the reviewer sufficient condemnation of this method is contained in Mr. Buckman's concluding sentence: "The totals [of numerical values] therefore give the natural order."

All who are interested in the stratigraphy of the Jurassic, however, will welcome this volume, for it contains Part I. of Jurassic Chronology, comprising the Upper Oolites. This marks a very important advance in stratigraphical correlation; and, though found to be wrong in detail, will remain a monument to its author's genius. In view of recent criticisms of zonal palæontology, it cannot be emphasised too strongly that modern detailed work is not a mere splitting up of existing zones into minute subdivisions but an amplification of the very incompletely understood Jurassic record.

It seems to us contrary to all Mr. Buckman says in his chronology, to assume identity of the refigured ammonite of Langius (1708) with Sowerby's *Ammonites bucklandi*. His generic classification also cannot be accepted. The genus *Ammonites* s.s., dating from 1876, has for type *Ammonites bisulcatus*, Bruguière, and the first definite representation of this form is d'Orbigny's. At any rate, this has since been taken as lectotype of *Ammonites*, Bruguière emend. Meek. It would have been more profitable to clear up the confusion caused by Mr. Buckman's restriction of *Harpoceras* to *Ammonites falcifer*, and the reference of its genotype, namely, *Ammonites serpentinus*, to the new genus *Hildoceratoides*.

Atomtheorie des festen Zustandes (Dynamik der Kristallgitter). Von Max Born. Zweite Auflage. (Fortschritte der mathematischen Wissenschaften in Monographien, Heft 4.) Pp. vi + 527-789. (Leipzig und Berlin: B. G. Teubner, 1923.) 3s. 8d.

THE author produced his "Dynamik der Kristallgitter" in 1915 as one of the monographs of Blumenthal's "Fortschritte der mathematischen Wissenschaften." This led to an invitation to write an article for the *Mathematical Encyclopædia*. Before this could be carried out, Prof. Born had accumulated material for a second edition of his monograph; and as time did not allow of the performance of the double task, he produced the present work to do duty both as an article for the *Encyclopædia* and as a second edition of his earlier work. The "Dynamik" has been completely re-written and expanded from 122 to 260 pages.

The "Atomtheorie" is to all intents and purposes a new book, rather than a second edition of the old, though on the same lines. It has been adapted to encyclopædia purposes by the addition of a large