CORRESPONDENCE

THEORETICAL AND REAL STRATIGRAPHY

SIR,—Dr. Hedberg's recent paper (1965) is a valuable clarification of his point of view, but this paper, like others by Dr. Hedberg and like-minded colleagues, has an air of theory divorced from practical application. His emphasis on chronostratigraphy conveniently ignores the absence of any method of building a chronostratigraphic scale. He objects to any time-scale based on biozones but has nothing better to offer in its place. How can it be useful to recognize a "*Sonninia sowerbi Chronozone* . . . as a formal chronostratigraphic component of the Bajocian Stage, representing all rocks formed during the life-span of *Sonninia sowerbi*" ? The life-span of *Sonninia sowerbi* could only be discovered by collecting the remains of it from strata ; but limited preservation and collecting failure will almost certainly mean we shall not find its true life-span : we are left with a vertical range of *Sonninia sowerbi*, and that is surely some sort of biozone. The alternative methods to fossils for geochronology that Hedberg has offered on a previous occasion (1959, p. 682), such as tracing of bedding planes, ash flows, etc., can be used for local correlation, but hardly be used to build up a time-scale.

The recommendation by the British Mesozoic Committee that " the base of each stage should be regarded as fixed for all time . . . " without specifying what biozone forms the top of the underlying stage, is based on experience. For example, between the highest beds in the type Cenomanian at Le Mans, and the lowest beds in the type Turonian near Tours, there is at least one whole ammonite zone. In which stage would Dr. Hedberg place this zone ? We might agree that the type locality for the Cenomanian stage was badly chosen by d'Orbigny, and then introduce a new stage name for this body of strata : geological literature is littered with such names, forgotten by all but students in the type areas. It would be admirable to have a body of strata as an objective reference for the definition of a stage, but it assumes that one can find a section where deposition has been continuous. Even bio-stratigraphy is sufficiently sensitive to show that such conditions are unusual. The study of sedimentation suggests that it is rarely continuous over any appreciable geological time, and that breaks in sedimentation may leave no trace in the lithology of the rocks. All these difficulties can be avoided by only defining the base of each stage.

The stages and zones in general use are based on fossil correlation, inaccurate though this be. If one wants a chronostratigraphic scale independent of biostratigraphic limitations, it would be better not to use stage or zonal names at all : use absolute ages in years if you can. But it will be necessary to refine isotopic dating considerably, or develop a completely new method, to get anything more accurate than good fossils.

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