Belief and Reality in Biostratigraphic Zonation

by J. G. JOHNSON

with 2 figures

Abstract. The morass of divergent opinions that exist about the nature of the biostratigraphic zone are largely the result of semantic difficulties. The concept of time, with respect to biostratigraphic zones, has been used in at least three different ways: 1) as the linear passage of time on earth, 2) as the rocks deposited during a given interval of time, and 3) as the time represented by rocks bearing certain fossils. Claims that the third is the same as the second and that the second is the same as the first result from uncritical assessments of reality.

Introduction

The American Declaration of Independence holds that “all men are created equal.” In a sense the statement is true; all men are born, grow old, and die, have certain basic organs, breathe air, eat, and eliminate. But, just as certainly, all men are not equal as individual persons. They are genetically varied in both physical and mental characteristics. So the statement “all men are created equal” is true or false depending on context. The same is true for the time significance of biostratigraphic zones. They serve to tell time in rocks; they are the principal tools of age dating and correlation. However, not all time-significant methods of referring to fossils, rocks, and time are equal.

Discussion

In the first half of this century, there was recognition of geologic time and time-rock units. Biostratigraphic zones were at the base of the time-rock hierarchy, as if age dating by fossils were the whole basis for understanding geologic time. The lack of accuracy inherent in biostratigraphic methods was minimized, ignored, or judged to be insignificant for two reasons, 1) because the facies-dependency of pelagic organisms (as ammonoids) was underestimated, and 2) because most geologic problems could then be solved by rough methods and approximate correlations.

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