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G.H. Scott

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BIOSTRATIGRAPHY: INTERPRETATIONS OF OPPEL'S ZONES

G.H. Scott

GNS Science, P.O. Box 30368, Lower Hutt, New Zealand g.scott@gns.cri.nz Tel. +64 4 570 1444 Fax +64 4 570 4600

Abstract

Zones like those of Oppel and Hedberg's Oppel-Zone are commonly interpreted as rock units delimited temporally. A more restricted view is that they are rock units empirically defined by bioevents that occur in the same order in all sections. Methods used by Oppel and definitions proposed by Hedberg are reviewed to assess their adequacy for definition of biostratigraphic units and their ability to support temporal inferences. Although they are usually interpreted as chronostratigraphic units, Oppel defined his zones in stratigraphic space, without temporal reference. In contrast, Hedberg required that bioevents for his Oppel-Zone should be approximately isochronous across their distribution but provided no operational way to identify such bioevents. Neither author clearly indicated how boundaries should be defined. Recourse to a principle of biosynchroneity to support inferences that stratigraphically ordered bioevents are temporal markers conflicts with knowledge of the biogeographies of modern taxa. Evolutionary theory explains why some bioevents occur in the same stratigraphic order but does not support the inference that they are isochronous events. Since its inception biostratigraphy has focused on ordered classifications, like those