

Quantifying the impacts of early diagenetic aragonite dissolution on the fossil record

Lesley Cherns^{1*} and V. Paul Wright^{1,2}

¹*Cardiff University, School of Earth and Ocean Sciences, Main Building, Park Place, Cardiff CF10 3YE, UK;* ²*BG Group, 100 Thames Valley Park, Reading RG6 1PT, UK*
e-mail: cherns@cardiff.ac.uk

**Corresponding author.*

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ABSTRACT

Quantitative analysis of rare skeletal Lagerstätten of Paleozoic–early Mesozoic ages indicates that early dissolution of aragonite has seriously skewed community structures. The consequences of this widespread diagenetic process effectively preclude accurate interpretation and reconstruction of many fossil faunas in shelf settings. Trophic and ecologic loss focuses on the shallow infaunal tier of burrowing bivalves and the epifaunal vagrant detritus-feeding tier represented by gastropods. Case studies of the Ordovician–Carboniferous suggest that sequences with apparently typical Sepkoski Paleozoic faunas dominated by brachiopods were originally molluscan-dominated and included significant infaunal components. Early Mesozoic faunas dominated by epifaunal and semi-infaunal bivalves are similarly severely skewed by loss of ecologic diversity. Molluscan biodiversity appears more strongly affected in Paleozoic times. Such lower-energy environments as lagoons and mid-to-outer carbonate ramp settings are especially prone to dissolution loss. It is perhaps important to question for such faunas whether trophic tiers are reduced or missing.