DEVOLUTION AND PUNCTUATED EQUILIBRIA

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Received September 28, 1983

Devolutionary theory (A. Meredith, 1982, J. Theor. Biol. 96:49-65) supplements other theories of macroevolution (E. Vrba, 1983, Sci. 221:387-389; D. Schindel, 1982, Paleobio. 8:340-353). Through devolution adaptively mediocre and constrained species are perpetuated, whereas incompetent species suffer Darwinian scarcity-extinction and competent but unrestrained species exhaust their niches and undergo success-extinction. Natural selection is value-free, works on the level of similar individuals, lacks foresight, and often leads to extinction. It is unnecessary to posit unrecorded environmental changes to account for the extinction of many well-adapted and abundant species, for such species may be expected to cause their own demise. Constrained species may be other-limited (e.g., predator-prey symbiotes, fortuitous environmental constraints), self-limited (e.g., territorial species), or both. Most self-limited species undergo radiation into a vacant niche (often left by the success-extinction of a previous species), adaptation to the niche, and exploitation to extinction. Such species may be very abundant and highly adapted immediately prior to an abrupt extinction; new species may reinhabit the vacated niche geologically instantaneously. Such a scenario would produce the punctuated pattern which some suggest is prevalent in the fossil record (S. Gould & N. Eldredge, 1977, Paleobio. 3:115-151; see also R. Schoch, 1983, Sci. 220:360).

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Evolutionary Theory 7: 68 (May, 1984)