LeTourneau, P.M. and Olsen, P.E. (eds.), 2003, The Great Rift Valleys of Pangea in Eastern North America, Volume 2: Sedimentology, Stratigraphy, and Paleontology, Columbia University Press, p. 314-367.

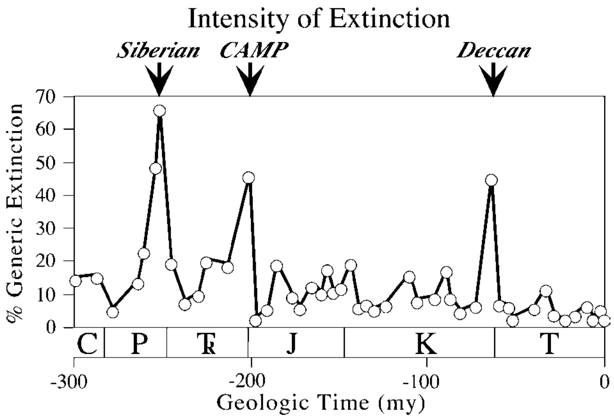

FIGURE 9.1 Extinction rate of "shelly" marine invertebrates through the Phanerozoic, showing the major continental LIPs. (Based on Sepkoski 1997, with timescale modified according to Kent and Olsen 1999)

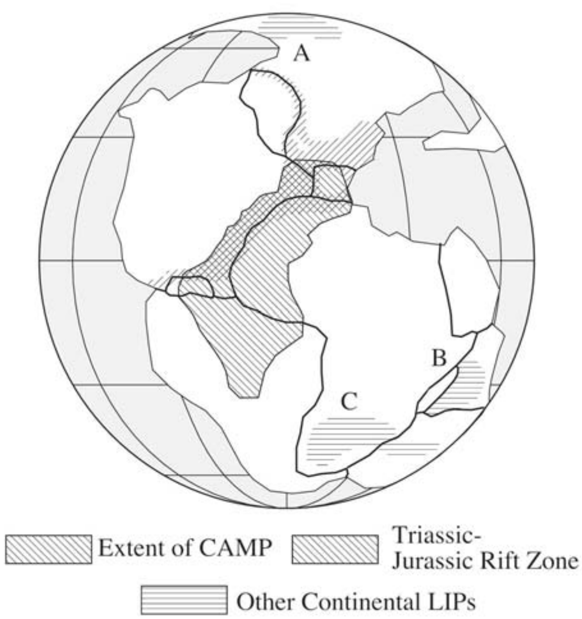

FIGURE 9.2 Distribution of the CAMP, Siberian Traps, and Deccan Traps with a Late Triassic plate configuration. (Based on Olsen 1999)

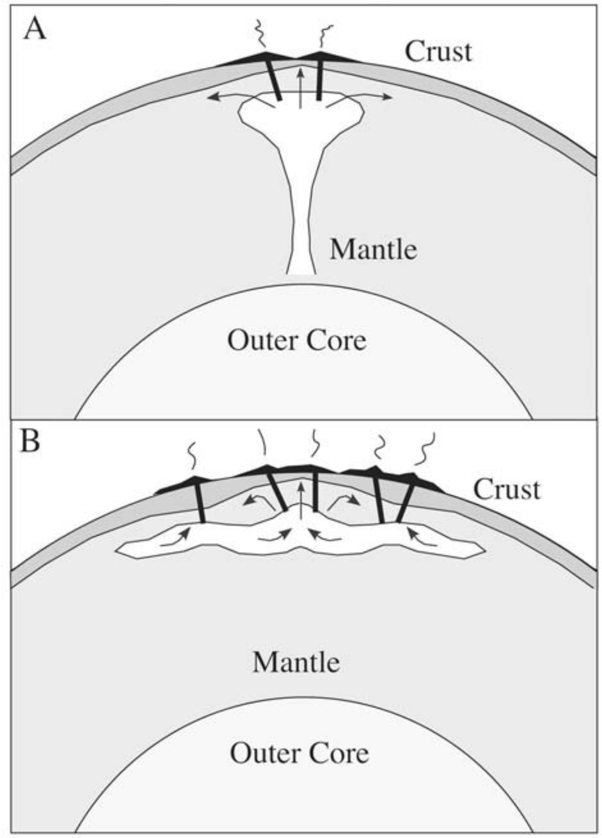

FIGURE 9.3 General geodynamic patterns envisioned for (*A*) the deep-mantle plume model and (*B*) the upper-mantle convection model. Note the more narrowly focused volcanism attributed to the plume model versus the wider-ranging volcanism from upper-mantle convection.

hypotheses that predict associated chemical, physical, dimensional, and temporal characteristics unique to each model (or, quite possibly, unique to some variant model yet to be realized).

In chapter 11, John H. Puffer places the CAMP flood basalts in a larger petrological context with various other continental flood basalt LIPs, including those of the Rodinian and pre-Rodinian continent, the Siberian Traps, the Karoo Province, the Deccan Traps, and the Columbia River Basalts. Surprisingly, CAMP basalts appear similar to arc volcanics, and Puffer concludes that global plate reorganization was the motive force behind the emplacement of the gigantic igneous province, unlike some other continental LIPs that may have been produced by hot spots. Paul C. Ragland, Vincent J. M. Salters, and William C. Parker (chapter 12) examine a massive database of major-oxide analyses from the southeastern U.S. portion of the CAMP and hypothesize that the observed chemical trends indicate melting at deeper levels toward the southwestern portion of the southeastern United States in an area of thicker crustal derivation of the magma from more "fertile" mantle influenced by a hot spot. The different models for origin of LIPs, especially the CAMP, make different prediction of the mechanism of emplacement though dikes. In chapter 13, Jelle Zeilinga de Boer, Richard E. Ernst, and Andrew G. Lindsey describe anisotropy of magnetic susceptibility (AMS) data from the northeastern United States that they conclude indicates northeasterly directed lateral flow in dikes. This flow would be more compatible with a southeastern United States mantle plume source than with any other mechanism.

McHone and Puffer (chapter 10) and Ragland and colleagues (chapter 12) also briefly discuss one of the largest and most critical unanswered questions about the CAMP: What is the relationship between the CAMP and the seaward-dipping reflectors off the eastern United States (Holbrook and Kelemen 1993; Talwani et al. 1995; Withjack, Schlische, and Olsen 1998)? This question, unlikely to be dealt with seriously without extensive scientific drilling (Olsen, Kent, and Raeside 1999), bears directly on the mechanism of supercontinent breakup, the origin of initial oceanic crust, and the magnitude of the CAMP and its environmental effects.

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