TETRAPOD EVOLUTION AND EXTINCTION ON PANGEA DURING THE PERMIAN-TRIASSIC INTERVAL

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Tetrapod evolution across Pangea took place in five distinct phases during the Late Carboniferous, Permian, Triassic and Early Jurassic: (1) pelycosaur phase of the Late Carboniferous-Middle Permian characterized by temnospondyls, microsaurs, anthracosaurs, seymouriamorphs, cotylosaurs and diverse pelycosaurs with approximately equal numbers of amphibians and reptiles; (2) dinocephalian phase of the Middle-Late Permian in which faunas were dominated by therapsid reptiles, mostly dinocephalians and early anomodonts; (3) dicynodont phase of the Late Permian-Middle Triassic, in which therapsid-dominated faunas of dicynodontids and carnivorous therapsids coexisted with an increasing diversty of archosaurs; (4) thecodont phase of the Middle Triassic-Late Triassic, in which archosaur-dominated faunas were characterized by numerous thecodonts, included the last dicynodontids and encompassed the first turtles, crocodiles, pterosaurs, dinosaurs and mammals; and (5) dinosaur phase of the Late Triassic-Early Jurassic, during which dinosaurs rapidly diversified to fill all the niches of large and small terrestrial carnivores and herbivores. These successive phases of tetrapod evolution (they could also be called chronofaunas, dynasties, complexes or empires) overlap each other temporally and thus succeed each other as complex reorganizations of the tetrapod fauna of detectable duration. Extinctions punctuate some of the phases (especially at the beginning Late Permian, beginning Triassic, within Early Triassic and end Triassic) but do not change the overall character of the dominant tetrapods of the phase. The key signal in tetrapod evolution during the Pangean interval thus seems to be the origination, diversification and persistence of the dominant tetrapod groups, not the noise provided by the extinctions, which perturb but do not fundamentally alter the tetrapod fauna.