

Late Triassic Terrestrial Biotas and the Rise of Dinosaurs, Thursday 8:30

**IMPLICATIONS OF THE NEWARK BASIN ASTROCHRONOLOGY AND
GEOMAGNETIC POLARITY TIME SCALE (NBAGPTS) FOR THE TEMPO AND
MODE OF THE EARLY DIVERSIFICATION OF THE DINOSAURIA**
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The NBAGPTS established a high-resolution framework for the Late Triassic and Early Jurassic. Paleomagnetic correlations to marine sections suggested that the stage- (age-) level correlations of continental sequences were off by as much as ~10 Ma. Not kindly viewed

by many biostratigraphers, new published U-Pb ages from marine and continental sections nonetheless have shown that these marine correlations and the associated astrochronology are accurate. Published magnetic polarity stratigraphies and new radiometric dates from the Chinle Grp., Glen Canyon Grp., Fleming Fjord Fm., and Ischigualasto Fm keyed into the NBAGPTS point to the following. 1, there are no unequivocal Carnian age dinosaurs. 2, the 20-Ma-long Norian Age was characterized by a slow increase in saurischian diversity with no definitive evidence of ornithischians. 3, there was profound Late Triassic provinciality with tropical and subtropical communities apparently lacking dinosaurian herbivores with their ecological vicars being diverse crurotarsian and non-dinosaurian Dinosauriformes; in contrast, small and large herbivorous sauropodomorph dinosaurs were abundant in the high latitudes of both hemispheres. 4, a testable case can be made that the classic Chinle-, Germanic- and Los Colorados-type assemblages persisted to the time of the late Rhaetian marine extinctions. 5, that the distinct genus-level faunal transition and associated floral change traditionally correlated with the marine Carnian-Norian is in fact mid-Norian in age and within published error estimates of the age of the Manicouagan impact. 6, that the end-Triassic marine invertebrate extinctions were contemporaneous with the extinctions on land. Finally 7, compared to Triassic communities, Hettangian and Sinemurian age terrestrial communities were nearly globally homogenous and of low diversity in all meanings of the word excepting perhaps species number. A significant lesson that can be derived from the NBAGPTS is that the emerging picture of dinosaur diversification is complex and surprising and that biostratigraphically independent geochronologies need to be developed in each of the faunally important areas.