

The Tobosa and Marathon Basins & The Great American Carbonate Bank Robbery

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Within the southern circum-Laurentian carbonate bank a >1,000-km-long by 550-km-wide basin developed during Cambrian through medial Ordovician times. Not merely an embayment in the passive margin, the Marathon-Solitario basin (west Texas) was two-sided, with fully correlative platform carbonate successions on the southern margin, as well as on the north. The southern carbonate complex, with its homologous sponge-algal reef organisms, now constitutes the Cuyania terrane (the greater Precordillera) of western Argentina. The Marathon-Solitario basin and the Cuyania, with common fundamentals of Laurentian Mesoproterozoic (Grenvillian) basement, evolved together as evidenced by isotopic, litho-, bio-, and chronostratigraphic data, as well as by new high-precision paleomagnetic determinations. Ages, lead-isotopic and geochemical data for Cuyanian and west-central Texas crystalline basement rocks, particularly the Llano uplift and Pecos mafic complex, are markedly similar.

Faunas of the carbonate platform sequences that developed on both sides (*e.g.*, El Paso and Chica de Zonda) of the basin were essentially unique to the Laurentian Ouachita margin. The Marathon-Solitario basin received sediments from both north and south, including large olistoliths bearing shelf fauna; erosional gaps on the northern platform correlate with intervals of coarse carbonate detritus in the basin. Meter-scale igneous olistoliths, particularly of volcanic rocks (*e.g.*, trachyte, andesite), came from a southern source. Cuyania constituted the vanished early Paleozoic landmass of Llanoria, the long-sought southern source for volcanoclastic, metaigneous and metasedimentary detritus – most probably the Famatina eruptive complex and Western Sierras Pampeanas – in the Marathon sedimentary succession.

Extensional block faulting, variable carbonate platform and outer-shelf/slope sedimentation, and explosive volcanism characterized the Marathon-Solitario-Cuyania basin from Cambrian into medial Ordovician time. Stratigraphy and structures of the basin are consonant with plate reconstructions based upon new paleomagnetic data, which place southern Laurentia adjacent to Gondwana at low southern latitudes during that period. During the Caradoc, Cuyania moved beyond range of faunal exchange with Laurentia, and tholeiitic basalts with E-MORB characteristics were intruded into off-shelf turbidites down the length of the western Precordillera. The attenuated, thermally weakened Laurentian slab broke apart with continued right-oblique separation of Laurentia and Gondwana and Cuyania, the early Paleozoic Llanoria landmass departed with the southern megacontinent. U.S. domestic oil production closely follows the 1957 predictive curve of M. King Hubbert. Peak world oil production will follow suit. Meanwhile, oil demand, particularly from China and India, grows. Never has the world encountered an essential commodity which cannot respond to classic supply/demand pressures. Prices will rise significantly from present levels. Potential severe economic problems include double digit inflation coincident with large-scale fixed income retirement, disruptions to a decompartmentalized domestic financial system, and national security issues.