

## Concepts of Paleozoic paleogeography in eastern and central North America

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Computerized basin modelling is modern technology which all too often suffers because the basic geologic information is incorrect or out-of-date, and the geologic interpretations and assumptions are wrong. The interrelationship between the Michigan and Appalachian Basins suffers from this malady. Development of successive carbonate margins throughout the Paleozoic occurred in conjunction with eastern continental margin tectonism. The result was progressive restriction of one or both of the basins. During the Cambro-Ordovician the Michigan Basin was bounded on the west by a carbonate margin which extended southeastward toward the continental margin. Basinal sediments in both basins were normal marine with only slight restriction in the Michigan Basin. Siliciclastic sedimentation finished this depositional cycle and was followed by subaerial exposure and erosion. During the late Middle Ordovician a carbonate margin across western Ohio isolated the Michigan Basin with the resultant deposition of sapropelic shales in its centre. At

the same time normal marine basinal sediments were deposited in the Appalachian Basin. Carbonate margins established in western Pennsylvania and western Ohio during the Silurian. A major sea-level drop resulted in total isolation of the Michigan Basin which subsequently converted to evaporite sedimentation. The Ohio Basin was subject to partially restricted marine sedimentation and the Appalachian Basin to more normal marine environments with siliciclastic input from east and northeast. Devonian sedimentation was characterized by normal marine sedimentation followed by evaporite sedimentation. The continued development of carbonate margins along apparent tectonic hinge lines and Precambrian basement rifted zones indicates that deep basement structure is a critical factor in the understanding of the development of these basins. This basin setting provides a model for application to other structural penetrations into the continental platform, such as the Reelfoot rift, and perhaps even the St. Lawrence River embayment.