
Where was the Iapetus Ocean born ?
Tectonics and paleogeography of the Precambrian-
Cambrian transition in Laurentia *

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PHILIP J. McCAUSLAND
*Department of Earth Science, University of
Western Ontario, London, ON, Canada N6A 5B7.*

During late Neoproterozoic, eastern Laurentia experienced widespread rift magmatism and clastic rift sedimentation that was succeeded in Early Cambrian by marine sedimentation which heralded the birth of Laurentia's Iapetan margin. Do these rift- to-drift events, however, mark the separation of continents and the birth of the Iapetus Ocean? Paleomagnetic evidence from Laurentia and the West Gondwana cratons in-

dicates that Amazonia, the oft-proposed conjugate margin to Laurentia, could not have been adjacent to eastern Laurentia during the margin's rift-drift transition at 550 to 535 Ma. Either another continent was the conjugate margin to Laurentia, or Laurentia already faced an open Iapetus Ocean at the time, with the ca. 550 Ma rifting marking the separation of one or several basement terranes. Some "peri-Laurentian" terranes have been identified, such as the Argentine Precordilleran terrane, which was derived from the Ouachita margin of Laurentia in the Early Cambrian, and the Dashwoods block in western Newfoundland, which may have separated from Laurentia only to have been re-accreted during the closure of the Iapetus Ocean. If late Neoproterozoic rifting represents the separation of basement terranes from Laurentia, then the timing, paleogeography, and even definition of the birth of the Iapetus Ocean is an open question. Assuming that the ca. 1000 Ma Grenvillian collisional relationship between Amazonia and eastern Laurentia is correct, the opening of the Iapetus Ocean between Laurentia and West Gondwana is only constrained to have happened between ca. 920 Ma post-Grenville extension and the onset of ca. 570 Ma voluminous rift magmatism. It is possible that the Iapetus Ocean dates from earlier, ca. 750 Ma rift magmatism in eastern Laurentia, and that its early history may now be recorded in terranes rather than in its presumed bordering continents.