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OPENING OF SOUTH ATLANTIC
Subaerial volcanism and twin salt basins

C. Cramez (1) and M. P. A. Jackson (2)
(1) Total SA, 24 Cours Michelet, La DÚfense 10, 92069 Paris La DÚfense, France
(2) Bureau Economic Geology, University of Texas, Austin, TX 78713, USA

The role of subaerial volcanism in the initial opening of the South Atlantic has generally been underestimated because these seaward-dipping reflectors can be seismically misinterpreted as rift-type basins.The subaerial volcanism had major effects on margin evolution by (1) laterally accreting new proto-oceanic crust against which Aptian evaporites pinched out basinwards; (2) spilitized basalts interacted with brines to create distinctive CaCl2-rich potash evaporites of hydrothermal origin. Opening of the South Atlantic was associated with the Parana-Etendeka plume, originally centered on the junction between present southeast Brazil and southwest Angola. The plume of upwelling asthenosphere heated, elevated, underplated, and stretched a dome of overlying lithosphere. Abundant gabbroic melts were emplaced as dike swarms and sills until continental crust finally separated. Neocomian flood basalts were extruded subaerially toward the continent across the distal rift basins. Vertical stacking of flows masks magnetic reversals, so this proto-oceanic type of basaltic crust is magnetically subdued. Thermal subsidence and eustatic rise lowered extrusive vents below sea level, environments became marine, and the spreading center became an oceanic ridge. Lava could no longer flood laterally. Marine incursions into shallow, irregular basins promoted local evaporite basins that gradually coalesced. In this scenario, the opposing Aptian salt basins of the South Atlantic were never contiguous but were separated by a volcanic spreading center. Distal evaporites could have accumulated directly on proto-oceanic basaltic crust manifested as seaward-dipping reflectors.