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GLACIAL HISTORY OF THE RIO GRANDE DO SUL ARCH DURING THE LATE PALEOZOIC

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During the Gondwana glaciation the Rio Grande do Sul arch was the center of an ice mass that flowed radially toward the marine Paraná Basin. The paleogeographic evolution of the ice mass has been reconstructed on the basis of regional stratigraphic, sedimentological and paleontological data, as well as the orientation of glacial abrasion features and facies of glaciogenic deposits (Itararé Subgroup) preserved on and around the present shield. At its maximum expansion (Middle/Late Carboniferous-Early Permian), the northern termination of the terrestrially based ice mass extended as far as the southern margin of the basin, where it stabilized as a marine margin. At this stage, the glacier may have been of ice sheet dimensions and 2-3 km or more thick. The change in the basin configuration starting in the Early Permian resulted from subsidence to the south and uplift of its northwest flank. The consequent southward displacement of the basin margin led to a gradual marine encroachment of the Rio Grande do Sul arch and its stratigraphic onlapping by Itararé strata. These are represented mostly by glaciogenic sediments remobilized and redeposited in a glacial-marine environment. The ice sheet concomitantly receded eventually becoming restricted to the area of the present shield. During this time, radial flow of ice from the shield was mostly funneled through pre-glacial valleys. Itararé Subgroup strata preserved in the valleys comprise glacial-estuarine facies associations grading to terrestrial over the shield. The ice sheet collapsed and terminated in the late Early Permian.

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