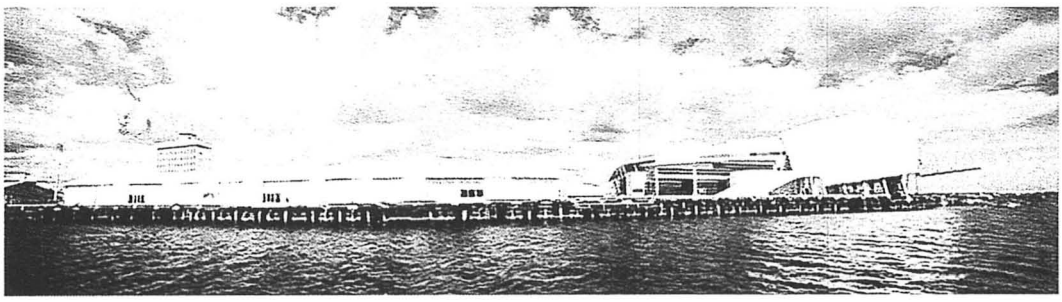

Supercontinents and Earth Evolution Symposium

Fremantle, Western Australia

26-30 September 2005

Maritime Museum, Victoria Quay

Hosted by the

Tectonics Special Research Centre
the Geological Society of Australia (WA Division)
and the Geological Survey of Western Australia
in collaboration with
the International Geological Correlation Program

Program and Abstracts

Geological Society of Australia Inc. - Abstracts, No. 81

PUBLISHED BY PROMACO CONVENTIONS PTY LTD

2005

RODINIA DESCENDANTS IN SOUTH AMERICA

Reinhardt A Fuck[1], Benjamin Bley de Brito Neves[2], Carlos Schobbenhaus[3]

[1]Universidade de Brasília, 70910-000, Brasília, Brazil (rfuck@unb.br)
[2]Universidade de São Paulo, 05508-080, São Paulo, Brazil
[3]Serviço Geológico do Brasil, 70830-030, Brasília, Brazil

Several reconstructions of Rodinia have been presented since the 1991 Hoffman seminal paper. In these proposals, insufficiency of data from South America have led workers to consider only the main cratonic blocks (Amazonia, São Francisco, Rio de La Plata) to have been derived from Rodinia fission.

We try to take into consideration all possible descendants of Rodinia, including continental blocks from shield areas (pre-Brasiliano and Brasiliano domains) and from the basement of Phanerozoic basins of the South American Platform, as well as basement inliers of the Andean Cordillera.

The main areas recording late Mesoproterozoic orogenic events in South America comprise the basement of the Andean Chain and adjacent areas, the southwestern part of the Amazon Craton, and several deeply reworked occurrences in the Brasiliano Borborema, Mantiqueira, and Tocantins provinces.

Within the northern Andes mountain belt granulite, orthogneiss and related rocks have been described in the Guajira, Sierra Nevada de Santa Marta, Santander, and Garzon blocks. High-grade metamorphism was dated at ca. 1.2-1.3 Ga and correlation with the Oaxacan Complex in S Mexico was suggested. In the central Andes, Proterozoic basement rocks appear in the Arequipa-Antofalla, Pampia, and Cuyania crustal blocks. Although rocks of Paleoproterozoic age are present, as in the Arequipa massif, available data suggest that these blocks were deformed and metamorphosed during the Mesoproterozoic. Cuyania is correlated with Grenville basement of eastern Laurentia.

Several Mesoproterozoic events were recognized in the SW Amazon Craton. Magmatic arc rocks are preserved in the Cachoeirinha rocks (1.52-1.55 Ga) and in the Santa Helena arc (1.42-1.45 Ga). Ca. 1.35 high-grade metamorphism is recorded in the Rondonian and San Ignacio domains, followed by ca. 1.1 orogenic activity in the Nova Brasilândia and Sunsas-Aguapeí belts.

Metavolcanic and metasedimentary rocks, orthogneiss and associated granites (1.0-0.95 Ga, Cariris Velhos Orogeny) form the Pajeú terrane within central Borborema Province. Similar ages were reported from the Riacho do Pontal Belt farther south. The Punta del Este terrane, within the Dom Feliciano Belt, Mantiqueira Province, Uruguay, bears gneiss and migmatite formed ca. 1.0 Ga, thought to be a small piece of the Namaqua province of the Kalahari Craton. The Falklands/Malvinas islands are thought to be a piece of the Natal province, attached to South America after Gondwana breakup.

Mesoproterozoic rift-related rocks are reported from the southern Ribeira Belt, Mantiqueira Province. Oceanic tholeiite and related metasedimentary rocks ca. 1.4 Ga compose the Serra do Itaberaba Group, São Paulo. Mafic volcanics (ca. 1,45 Ga) and metasedimentary units appear also in the Perau, Águas Claras, and Votuverava groups, Paraná. Bimodal volcanics, metasedimentary rocks, layered complexes, and granites (1.25-1.3 Ga) are part of the Goiás Massif, Brasília Belt, Tocantins Province. All these units were reworked during the Brasiliano orogeny.

Two additional groups of potential descendants of Rodinia have not been included in previous reconstructions. One includes cratonic blocks hidden below the major Phanerozoic sedimentary basins of Parnaíba (Parnaíba block, NE Brazil) and Paraná (Paranapanema block, SE Brazil). The second group comprises a number of minor blocks that have worked out as microplates and microcontinents during Brasiliano collage. Such basement inliers of the Neoproterozoic orogenic systems were deeply reworked. They include Central Ceará, Rio Grande do Norte, Moxotó, and Pernambuco-Alagoas (Borborema Province), Goiás, Rio Apa (Tocantins Province), Juiz de Fora, Cabo Frio, Curitiba, Luis Alves (Mantiqueira Province), and several others that were descended from the same ancestor of the major cratons. Brasiliano overprinting and granite plutonism have hampered recognition of their close geological relationships with the major cratons.