

EVOLUTION OF NEOPROTEROZOIC TERRANES IN THE BRAZILIAN SHIELD

Monica Heilbron¹

1-Tektos Research Group, Rio de Janeiro State University (UERJ)

From the Neoproterozoic to the Early Cambrian the Brazilian shield records diachronic geological events that shaped the present configuration of cratonic blocks and intervening large areas of mobile belts. The amalgamation of different pieces including older cratonic blocks, microcontinents and magmatic arcs occurred preferentially in Ediacaran to Early Cambrian time.

At the margins of the cratonic blocks, the Tonian period is marked by the development of passive margin sequences, with clear provenance from these blocks. The record of the Statherian and Calymmian extensional phases are present in these successions. Metabasic rocks and bimodal magmatic associations of ca. 1.0 to 0.90 Ga attest the beginning of the extensional phases that result of the development of the Neoproterozoic rift to passive margin sequences. Few available geochronology data indicates renewed extensional tectonic periods of basin magmatism (780-740 Ma WPB/MORB and 660 Ma ophiolites), suggesting development until the Cryogenian to Early Ediacaran. Glacial deposits and cap carbonates have been described in many belts and intracratonic basins. The minimum depositional ages are constrained by the Brasiliano metamorphic overprint between 650 to 595 Ma, in most of the belts.

At the same time Tonian intraoceanic arcs, which evolved to more mature arcs in time, start to development in the intervening oceanic spaces, indicating convergent plate limits outboard of the cratonic fragments and their passive margins. The oldest and more primitive arc systems developed in the São Gabriel, Ribeira and Brasília belts. Most of them evolved to cordilleran settings during the Cryogenian and the Ediacaran until 620 Ma. This period is also marked by the development of cordilleran arcs in most of the belts, pointing out the progressive closing of the intervening oceanic spaces. Because of the deep erosion level of most of the belts, few volcanic rocks or fore arc successions were described until now, but some Neoproterozoic sequences clearly show provenance from the arc systems, and most of them are regarded as former back arc to Japan sea type marginal basins.

The Brasiliano Event marked the collision these different pieces finally shaping the Western Segment of Gondwana. The advance on U-Pb geochronology in the last 15 years indicates that collision episodes are quite diachronic in the different belts that make up the Brazilian shield. Relicts of the oldest Tonian to Cryogenian metamorphic episodes were described at the Northern Brasília belt, São Gabriel and Southern Ribeira belt. Nevertheless, the most important collision episodes are 650-620 Ma, 620-595, 605-565 Ma and 550-510 Ma. In the same time, passive margin basins continue to develop at the peripheral belts.

The late Ediacaran to Early Cambrian collisions are recorded in the Paraguai-belt and easternmost Ribeira belt, coeval with the development of contemporary basins, some interpreted as foreland to successor basins, but others with clearly rift to sag affinities maybe related to the transmission of far field stresses. Bimodal or felsic magmatism where detected in some of them.

Finally, the transition to a stable platform is marked by late Cambrian to Early Ordovician transtensional shear zones and bimodal magmatism.

PALAVRAS-CHAVE: NEOPROTEROZOIC, WESTERN GONDWANA, TECTONIC EVOLUTION