PALEOPROTEROZOIC TERRANES IN THE BRAZILIAN SHIELD: CRUSTAL EVOLUTION AND METALLOGENY

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RESUMO: Most of the Pre-Cambrian terranes of the Brazilian Shield formed during the Paleoproterozoic Era (2.5 to 1.6 Ga) in response to a variety of rock-forming processes operating in accretionary and collisional orogenies and in taphrogenic events. Siderian rocks (2.5-2.3 Ga) are present as limited granite-greenstone assemblages in the Amazonian Craton (AC); in extension-related (taphrogenic) sequences from several areas, such as dike swarms, mafic-ultramafic complexes, intraplate granite-syenite suites and possibly in cratonic covers; and in accretionary/collisional orogens of the São Francisco Craton (SFC); in high-grade complexes within the Rio de la Plata Craton; and in the basement of the Neoproterozoic Borborema, Brasília and Mantiqueira belts. Little is known about the metallogeny of this period. The Rhyacian (2.3-2.05 Ga) witnessed the most voluminous crustal growth in Brazil, which is loosely termed as, and/or confused with, the Transamazonian cycle. The rocks occur in major accretionary (±collisional) belts within the AC and SFC, in more or less preserved cratonic fragments (São Luís, Luiz Alves), and as discontinuous and reworked blocks in the basement of Mesoproterozoic and Neoproterozoic mobile belts. TTG and arc-related magmatic suites, metasedimentary and metavolcano-sedimentary (~greenstone belts) sequences are the main rock associations. At the end of the period, widespread mantle input, probably following collision events (and often high-grade metamorphism), is recorded by several mafic-ultramafic complexes, alkaline rocks and mantle-derived granitoids. In response to large crustal growth, metallogenic events were also expressive. About one third of the orogenic gold, and world-class sedimentary iron deposits were deposited in Rhyacian metavolcano-sedimentary sequences, rivaling the Archean greenstone belts, whereas Sn-Ta deposits formed in association with S-type granites and chromite deposits occur in mafic-ultramafic complexes towards the end of the period. Gold-bearing placer deposits apparently formed in rift and/or foreland basins in the beginning and at the end of the Rhyacian. The Orosirian (2.05-1.80 Ga) evolution differs from the preceding and following periods. In the AC, Tapajós-Parima is a long, predominantly plutono-volcano (accretionary?) belt, whose evolution is highly debatable. A striking feature of this belt is the recurrent felsic (±intermediate) volcanism that took place in three or four episodes (more or less coeval with collision plutonism in the northern portion of the belt) and that culminated with the formation of the large Uatumã LIP, with coeval as A-type granites occurring in the eastern AC. In the SFC, the collisional Contendas-Mirante belt was followed by granitic magmatism. Mantle manifestations include chromitite- and Fe-Ti-V-bearing mafic-ultramafic complexes, uraniferous syenite and the intrusion of the first carbonatite complex in South America. The siliciclastic, Au-U-diamond-bearing Roraima basin establishes as the first large cratonic cover in the AC. The polymetallic (intrusion-related? IOCG?), and Au-PGE mineralizations in Carajás; gold in Tapajós and Alta Floresta; and Sn-F-REE-I associated with anorogenic granites are important metallogenic characteristics of the Orosirian period. The Statherian (1.80-1.55 Ga) is characterized by the accretionary Rondonia-Juruena belt in the AC, including volcano-sedimentary successions hosting polymetallic mineralization, and by widespread anorogenic/taphrogenic events, which are represented by felsic magmatism, continental and marine sedimentary basins (Espinhaço), and the intrusion of felsic to mafic dikes.

KEYWORDS: CRUSTAL EVOLUTION, PALEOPROTEROZOIC, METALLOGENESIS