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Rodinia: Supercontinent's poster child or problem child?

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Earth's rock record extending from 1.7 to 0.75 Ga, that period encompassing the entire Rodinian supercontinent cycle and the latter part of Nuna cycle, and corresponding with Earth's Middle Age, is characterized by environmental, evolutionary and lithospheric stability that contrasts with the dramatic changes in preceding and succeeding eras. The period is marked by a paucity of passive margins, an absence of a significant Sr anomaly in the paleoseawater record or in the epsilon Hf(t) in detrital zircon, a lack of orogenic gold and volcanic-hosted massive sulfide deposits, and an absence of glacial deposits and of iron formations. In contrast, anorthosites and kindred bodies are well developed and major pulses of Mo and Cu mineralization, including the world's largest examples of these deposits, are features of this period. These trends are attributed to the combined effects of lithospheric behavior related to secular cooling of the mantle and a relatively stable continental assemblage that was initiated during assembly of the Nuna supercontinent by $\sim$1.7 Ga and continued until breakup of its closely related successor, Rodinia, around 0.75 Ga. The overall low abundance of passive margins within this timeframe is consistent with a stable continental configuration, which also provided a framework for environmental and evolutionary stability. A series of convergent margin accretionary orogens developed along the margin of the supercontinent as evidenced by rock sequences preserved in dispersed fragments in Australia, Antarctica, Amazonia, Baltica and Laurentia. Abundant anorthosites and related rocks developed inboard of the plate margin. Their temporal distribution appears to link with the secular cooling of the mantle in which the overlying continental lithosphere was then strong enough to be thickened, during either low angle subduction or post-subduction collision, and to support the emplacement of large plutons into the crust, yet the underlying mantle was still warm enough to result in widespread melting of the lower thickened crust.