

# The Balanced Billion

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There is a mid-Proterozoic stretch of Earth’s history (roughly 1.9–0.9 Ga) called, non-affectionately, the “Boring Billion”. The moniker was first inspired several decades ago by the apparent absence of any significant carbon isotope anomalies. Not only does this observation continue to hold true today, but other datasets from many facets of Earth dynamics during this time have been shown to be equally peculiar. Just a few examples include: the disappearance of iron formation, notable absences (of any large oxygenation events, phosphorites, or glacial and manganese deposits), and a billion year lag between the oldest known eukaryotes and the increasing eukaryotic diversity and their ecological importance taking hold. But the oddities of this billion years come not only from records of surface evolution and paleoenvironment, but even solid Earth records including metamorphic style (a lack of high-pressure conditions) and either absences (ophiolites) or abundances (anorthosites) of igneous geologic records. In direct contrast to an eon of ennui, Earth’s mid-Proterozoic tectonic record is anything but stagnant. The Grenvillian super-orogen is globally widespread and anomalously deeply eroded. Whether individual components of that orogenic system involve collisions between continents during Rodinia assembly or were produced by long-lived tectonic accretion remains to be determined.

In light of (i) the original evidence coming from a relatively stable carbon cycles, (ii) the souring over time of the non-flattering term “Boring Billion” and (iii) recent additional clues suggesting "balance" in mantle convection and Earth's rotation, we suggest a rebranding to the term the “Balanced Billion”. The first benefit of this change is that it circumvents the subjectivity of what is “boring” as well as the strawman argument used repeatedly in the literature and news media that a new discovery overturns what had previously been thought to be a boring interval. The second, more important benefit of this renaming is that it is not only better marketing but also potentially a more accurate reflection of Earth system processes during the peculiar time. Whether and (if so) why these variegated processes are related is a frontier for understanding the interconnectedness of the Earth system.

