

TERMINAL PROTEROZOIC PALAEOONTOLOGY AND STRATIGRAPHY OF CHINA

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The terminal Proterozoic system, corresponding to the Upper Sinian and the recently proposed Xilingian System, is widespread over the Yangtze Platform in South China. In its type region, the eastern Yangtze Gorges, the Xilingian consists of the Doushantuo - Dengying succession, which is essentially continuous, virtually unmetamorphosed, carbonate-dominant and richly fossiliferous. The lower boundary is placed at the contact between the underlying glaciogenic Nantuo Formation and the cap-dolomite in the base of the Doushantuo Formation. The upper boundary is automatically calibrated at the base of the overlying Cambrian, signaled by the first occurrence of diverse small skeletal fossils. Significant palaeontological discoveries include, in the Doushantuo stage, the Doushantuo assemblage of large and complex acanthomorphic acritarchs, the Miaohe and Lantian biotas of diverse multicellular algae and probable metazoans, and the Weng'an biota of extremely abundant, cellularly preserved algae and reported metazoan embryos and, in the Dengying stage, the Xilingxia and Gaojiashan biotas of the Ediacara-type body fossils, Cloudina and other biomineralized metazoan tubular fossils, trace fossils and megascopic algae. This succession clearly indicates that the Xilingian, estimated 680 - 570 (600 - 540) Ma, is an extraordinary period of earth history characterized by the early evolution of multicellular life towards the Cambrian explosion and by significant variations in global climate, sea level, oceanic isotopic chemistry and possibly tectonics. Therefore, it is strongly suggested that subdivision and global correlation of the terminal Proterozoic should be achieved by integrational stratigraphic research, with biostratigraphy as the principle approach.