

THE RISE OF METAZOANS: AN INTEGRATED GEOPHYSIOLOGICAL ANALYSIS OF THEIR HYDROTHERMAL VENT ENVIRONMENTS ON THE SOUTH CHINA (YANGTZE) PLATE.

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Neoproterozoic (Doushantuo-Dengying/Liuchapo Fms.) to Lowest Cambrian (Niutitang and equivalent Fms.) sequences within the deeper water facies belts on the South China Plate document hydrothermal vent mineralisation together with vestiges of bacterial mats and mass occurrences of organic carapaces of the arthropod *Perspicara* together with hexactinellid sponges. Preliminary analyses of Fe, Ni, Mo, As, Cr and PGE and of stable isotopes of ³⁴S and organogenic ¹³C have indicated localized dominance of hydrothermal venting along fissure fractures within the basal Cambrian Niutitang black shales over a distance of more than 1.600km extending from eastern Yunnan to Zhejiang Provinces. The associated mass occurrences of *Perspicara* and similar bivalve arthropods together with either autochthonous or parautochthonous hexactinellid sponge remains (in rare cases complete bodies) are interpreted as indicating an early metazoan vent community which may have persisted on chemoautotrophic nutrients and/or in symbiosis with anaerobic bacteria. This hydrothermal vent community is distinctly older than the Atdabanian Chengjiang Fossil Lagerstätte of Yunnan and may demonstrate an alternative trophic and ecological pathway to the largely heterotrophic metazoan-dominated Chengjiang, Kaili and Burgess communities. It is surmised that early automobile diplo- or triploblast communities had initially grazed upon chemoautotrophic bacterial mats during the Neoproterozoic without leaving locomotive trackways within or on sediment substrates because most of these organisms floated or were able to swim.