

EVOLUTION OF THE NORTH CHINA CRATON: A RE-EVALUATION

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The structural grain of the North China Craton is dominated by north-northeast to northeast-trending faults and a similar pattern is reflected in the regional Bouguer gravity data. An examination of geothermobarometric data suggests that two of these fault systems define major crustal boundaries, which roughly correspond with the limits of a 300 km wide zone where there is a marked westward steepening of the Bouguer gravity anomaly from -10 to -100 mgal. To the east of the Jianping-Kaifeng-Xinyang fault system, the craton is composed essentially of Archaean TTG gneisses with minor amounts of supracrustal rocks, with a history extending back to ~3.8 Ga. P-T-t determinations reveal that metamorphic rocks from a variety of domains in the eastern block are characterised by anticlockwise paths, interpreted to reflect underplating and intrusion of mantle-derived mafic magmas. The western part of the North China Craton is delimited to the east by the Duolun-Datong-Lishi-Huashan fault system. This portion of the craton can be subdivided into several domains which are likewise characterised by Archaean TTG gneisses and mafic granulites, also with anticlockwise P-T-t paths. It differs from the eastern portion in being overlain and interleaved by Palaeoproterozoic khondalites and intruded by S-type granitoids. Between the two major fault systems is a central zone that is composed of late Archaean TTG gneisses and granitoids, interleaved with abundant supracrustal rocks. The largest outcrop is the composite Hengshan-Fuping-Wutai Domain which reveals a cross-section through a late Archaean arc-complex. The high-grade Hengshan and Fuping gneisses represent deep crustal portions of the arc whereas the lower grade Wutai Complex represents the upper crustal component, dominated by calc-alkaline volcanism. These segments were dismembered and tectonically interleaved during the Palaeoproterozoic at ~1.9-1.8 Ga as a result of collision of the eastern and western blocks, resulting in the amalgamation of the North China Craton.