

FROM RODINIA TO GONDWANA, LATE PROTEROZOIC DEVELOPMENT OF THE METAMORPHIC CORE COMPLEXES IN THE EASTERN DESERT OF EGYPT

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A model of the development of the northern part of the eastern margin of West-Gondwana before and during the Pan-African orogeny is presented: At around 800 Ma, the orogenic cycle began with the breakup of Rodinia. Juvenile oceanic crust formed due to rift-related tectonics. Granitoids intruded into the rift shoulders. Amphibolites in metamorphic core complexes are remnants of old oceanic crust. Rifting also caused the formation of sedimentary basins. Between 660 and 640 Ma plate convergence caused compressional tectonics. The terrestrial sediments were integrated into an accretionary wedge. From 640 to 620 Ma the amphibolite-facies metamorphic cores rose to a crustal depth of approximately 10 km. Obduction and nappe emplacement of ophiolitic material began. Thus caused mylonitisation in the underlying metasediments and metagranitoids. At 614 the initiation of a transpressional regime under oblique convergence caused the intrusion of large bodies of magmatites and subsequent exhumation of the metamorphic cores. The uplift was probably due to an east-west buckling and to the intrusion of magmatic bodies. E-W compression caused sinistral strike-slip shear zones at the southwestern and northeastern margins of the metamorphic cores. At c. 590 Ma orogen-parallel extension caused low angle normal faults at the northern and southern margins of the domes. The ophiolitic cover was detached from the meta-granitoid and metasedimentary basement. Synorogenic granitoid material intruded into extension gashes. Latest events are brittle deformations and deposition of molasse-like sediments in subsidence basins along the axes of the orogen, in pull apart basins, or in foreland basins