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The Butana Region of Central Sudan: Sahara Craton or Arabian-Nubian Shield?

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The Butana region lies 250 km south east of Khartoum and is one of the few exposures of Proterozoic basement in Central Sudan. The area is characterized by a flat surface and isolated basement exposures. Various authors have allocated the region to part of the Arabian-Nubian Shield or to part of the reworked Sahara Craton. Although the area is indeed located in the rough region of this transition, little information exists on the details of the basement geology in Butana. Field work indicates that the geology of the study area is similar to the other parts of the Arabian-Nubian Shield. The area consists of low-grade metavolcanic rocks (arc assemblage), pre- and syn-tectonic granitic intrusions. In particular the presence of serpentinites, ophiolitic metagabbro and high-grade metamorphic rocks may identify it as part of the Arabian-Nubian Shield. The main metamorphic foliation trend in the low-grade rocks is northeast-southwest with steep foliation plains and sub-horizontal lineation. In the high-grade rocks, at least three deformation phases were observed in the field. D_1 associates with northeast-southwest foliation planes and D_2 associates with high temperature folding mechanism which gave the high-grade rocks domal pattern. While D_3 is a faulting phase with brittle features. The peak metamorphism most probably occurred after the D_2 as indicated by the migmatic features. Geochronological work is in progress in order to identify uniquely if the region should be allocated to the Arabian-Nubian Shield or the Sahara Craton.