GEODYNAMICS & TECTONOPHYSICS

PUBLISHED BY THE INSTITUTE OF THE EARTH'S CRUST
SIBERIAN BRANCH OF RUSSIAN ACADEMY OF SCIENCES

2017 VOLUME 8 ISSUE 3 PAGES 449–450 ISSN 2078-502X

https://doi.org/10.5800/GT-2017-8-3-0259

Proceedings of the Second Russia–China International Meeting on the Central Asian Orogenic Belt (September 6–12, 2017, Irkutsk, Russia)

FORMATION AND EVOLUTION OF THE DUNHUANG BLOCK

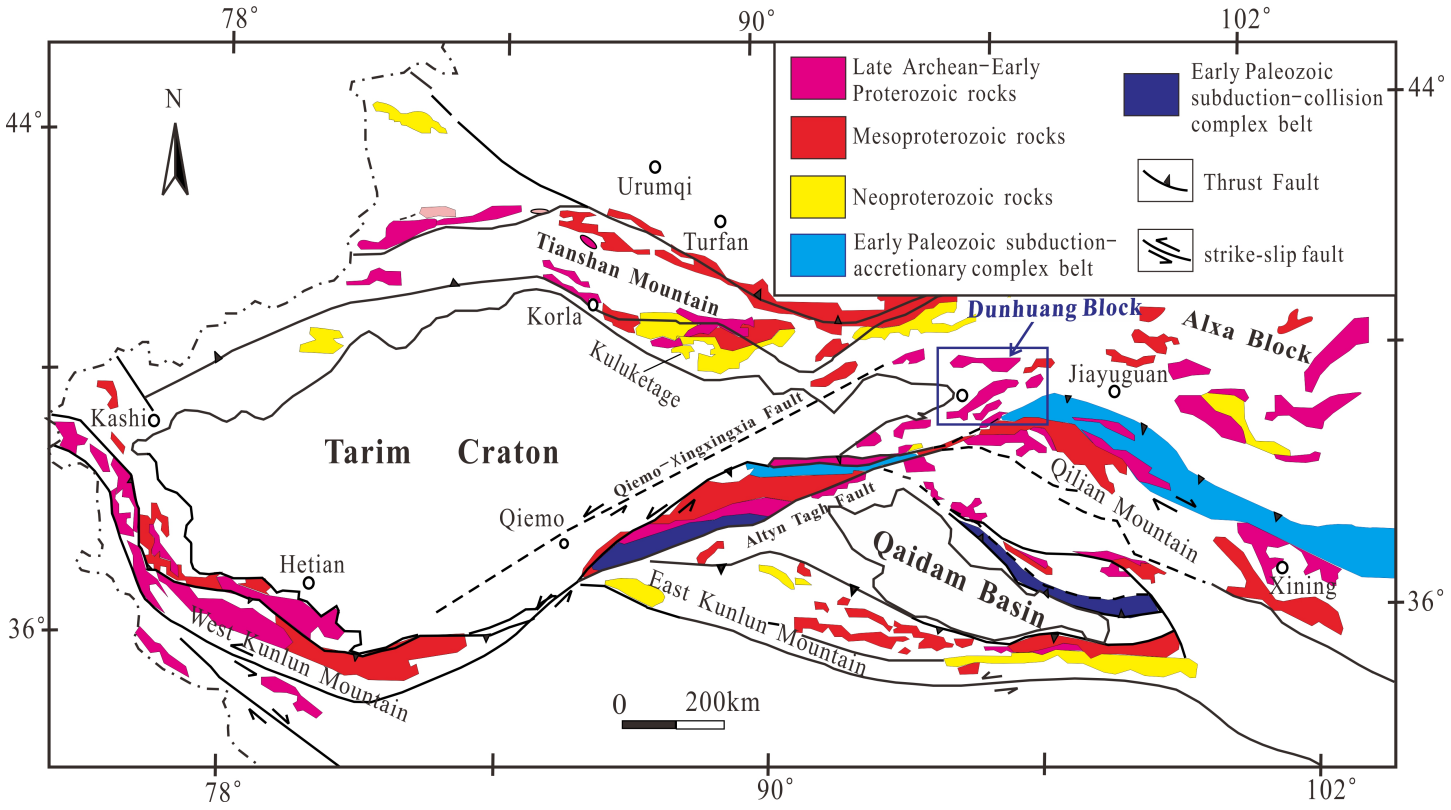
Chunrong Diwu, Jianghao Yan, Xiang Liu

State Key Laboratory of Continental Dynamics, Department of Geology, Northwest University, Xi'an 710069, China

For citation: *Diwu C., Yan J., Liu X.*, 2017. Formation and evolution of the Dunhuang Block. *Geodynamics & Tectonophysics* 8 (3), 449–450. doi:10.5800/GT-2017-8-3-0259.

Dunhang Block is located between the North China and the Tarim Cratons (Figure). It is bounded by the Beishan Orogenic Belt to the north and Altyn Tagh Orogenic Belt to the south, respectively; in the west the Qiemo-Xingxingxia fault separates the block from Tarim Craton, and in the east the Altyn Tagh Fault separates it from the Alxa block of western part of the North China Craton. Although Archean-Paleoproterozoic basement rocks, which are referred to as Milan Complex, exposed along the Northern Altyn Tagh Orogenic Belt, some researchers suggested that their rock associations, metamorphisms and evolutionary history present obviously different with those of the Dunhuang Complex in Dunhuang region, Gansu Provence, thus the Milan Complex should be excluded from the Dunhuang Block, and is considered as basement rocks of the southwestern Tarim Craton.

The Dunhuang Complex is mostly covered by desert, their limited rocks were roughly northwest-southwest trending exposed. According extensive field investigation, and available metamorphic, geochemical and geochronological data, the exposed rocks in Dunhuang Block can be divided into two distinct rocks associations: the Precambrian basement rocks and Paleozoic Central Asian Orogenic Belt (COAB)-related rocks. The former is traditionally referred to the Dunhuang complex, consists predominantly of TTG gneisses, amphibolites, granulites and sedimentary rocks, and considered



Simplified geological map of the Dunhuang Complex and its adjacent areas.

to have been mainly formed Archean-Paleoproterozoic in age; whereas, the latter almost distributed over the whole block, composed of a variety of granitoid rocks and sedimentary or volcanic sequences, parts of them were metamorphosed to amphibolite-granulite facies at early Paleozoic, they are interpreted to generated during the COAB evolution through continuous subduction-accretion and closure the long-lived Paleo-Asian Ocean. Moreover, it is noteworthy that the Paleozoic COAB-related rocks are spatially in direct contact with the Precambrian basement rocks, which resulted in a spatial mixture of each other in most cases.

The Hf isotopic compositions in zircons suggest that the NeoArchean (2.8–2.5 Ga) tectonothermal events in the Dunhuang Block were mainly involved in the reworking of the Paleoarchean rocks and growth of the new crust. the Paleoproterozoic rocks (~2.0–1.8 Ga) are mainly partial melting of Archean rocks. While the early Paleozoic (440–362 Ma) tectonothermal events are likely related to the COAB, which were produced by variable mixing of juvenile materials with older crust.

Combined with available data, we suggested that the Dunhuang Block has formed to be a unified crystalline basement during the early Precambrian (prior to 1.78 Ga). Since it is located in margin region of a certain craton; alternatively, it is an independent small block, the block was strongly influenced and modified by the subduction and collision of the Paleozoic CAOB, and became one of part of the CAOB. But anyhow, the Dunhuang Block is shouldn't considered as an independent orogenic belt.