Paleozoic Multiple Accretionary and Collisional Processes of the Beishan Orogenic Collage

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The Beishan orogenic collage is located in the southernmost part of the Altaids, and connects the Southern Tien Shan suture to the west with the Solonker suture to the east. The controversial orogen was previously regarded as early Paleozoic; this raises a serious problem when it is connected with the southern Altaids, which has been accepted as late Paleozoic or even early Mesozoic. This paper addresses this problem and reviews the tectonic units of the orogen. In a north-south section several arcs and ophiolitic mélanges are recognized and their ages are discussed in combination with recent high-resolution isotopic data and field relationships. These tectonic units were thrusted, imbricated and overprinted by strike-slip faulting in the Permian-Triassic, and the youngest strata involved in the deformation are Permian in age. Stitching plutons have a late Permian to Triassic age. The peaks of magmatic-metamorphic-tectonic activity, and paleomagnetic and paleogeographic data indicate that the Beishan orogenic collage evolved by development of several, early to mid-Paleozoic arcs in different parts of the Paleoasian ocean. The late Paleozoic collage is characterized by three active continental margins or island arcs that are separated by two ophiolitic mélanges. The northernmost active margin is represented by the Queershan arc, which may have lasted until the Permian. Shibanshan is the southernmost, subduction-related continental arc along the northern margin of the Dunhuang block. In the late Carboniferous to Permian the eastern end (promontory) of the Tarim craton probably collided with the Chinese eastern Tien Shan arc, forming a new active continental margin, which interacted with the Beishan late Paleozoic archipelago, generating a complicated subduction-accretionary orogen; this was probably the last phase in development of the long-lived Altaid accretionary orogen. This orogen bridges the gap between the western and eastern ends of the southern Altaids, and it generated considerable continental growth and metallogeny in Central Asia. The modern Timor-Australia collision zone with its many surrounding arcs is an appropriate analog for the Altaids in the late Paleozoic.