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LATE PRECAMBRIAN AULACOGENS OF THE NORTH CHINA CRATON.

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According to tectonic styles the Precambrian evolution history of the North China craton may be subdivided into four stages: (1) Archean consolidation in 3.5-2.5 Ga, (2) Early Proterozoic rifting in 2.5-1.8 Ga, (3) Late Precambrian aulacogen in 1.8-0.8 Ga and (4) Platform regime after 0.8 Ga.

In the Late Precambrian aulacogen stage of the North China craton there were two main aulacogens, Yanliao and Zhongtiao (Y and Z), developed in Middle Proterozoic time with an age 1.8-1.0 Ga. Their NE trend made themselves to meet together in the central part of the craton and build up one great Y-Z aulacogen throughout the craton.

The Yanliao aulacogen which lies to the east of Beijing is filled up with 10 km thick shallow water sandstone, shale and carbonate sedimentary sequence, with a few thin layers of andesite in alkaline composition in its low part and with thick red conglomerate at its bottom. The synsedimentary active tectonic regime of the faulted boundaries of the aulacogen is indicated by the aboundant breccia of the physical weathering products with convincing paleogeomorphological elements at the bottom of each transgressive sequence. The subsidence of the Y-Z aulacogen was parallel to the compensation of the sedimentation there (Qian, 1980). The Zhongtiao aulacogen which lies in the south of the craton is filled up with 10 km thick volcano-sedimentary formation in which the low part in 5 km thick comprises mostly andesite-rhyolite alkaline volcanic rocks with a few thin layers of basalt and the upper part consists of sandstone-shale and carbonate sedimentary rocks. This volcanic assemblage limited by NE trending sharply faulted boundaries links the coeval metamorphosed volcanic sequence in E-W trending Qinling belt to the south of the craton to form together a triangular outline in its thickness isopach map. The geochemistry of the volcanic rocks in the Zhongtiao aulacogen shows that they are shoshonite series or alkaline series of Coombs trend and straddle trend with Kennedy trend defined by Miyashiro. The increasing of K becomes much fast than the increasing of Na in the case of SiO_2 higher than 68 %, and the $^{87}Sr/^{86}Sr$ initial ratio is high enough in 0.7125 or more in the bottom of this volcanic rock series. So, these volcanic rocks not seem to be the products of differentiation with partial melting of the preexisting continental crust, and on the contrary the acid affinity of this series might be directly produced by the anatexis of the continental crust in the early evolution of the aulacogen stage. In dealing with the metamorphosed volcanic sequence, the coeval in the Qinling belt, it comprises bimodel non-alkalic basalt or tholeiitic basalt and and calc-alkalic rhyolite rocks, which show that in early time of Middle Proterozoe the Qinling mobile belt with the Zhongtiao aulacogen began to rifting and joined together to form a tripple junction. It might be asked how was the Late Precambrian history of the southern boundary of the craton. In fact

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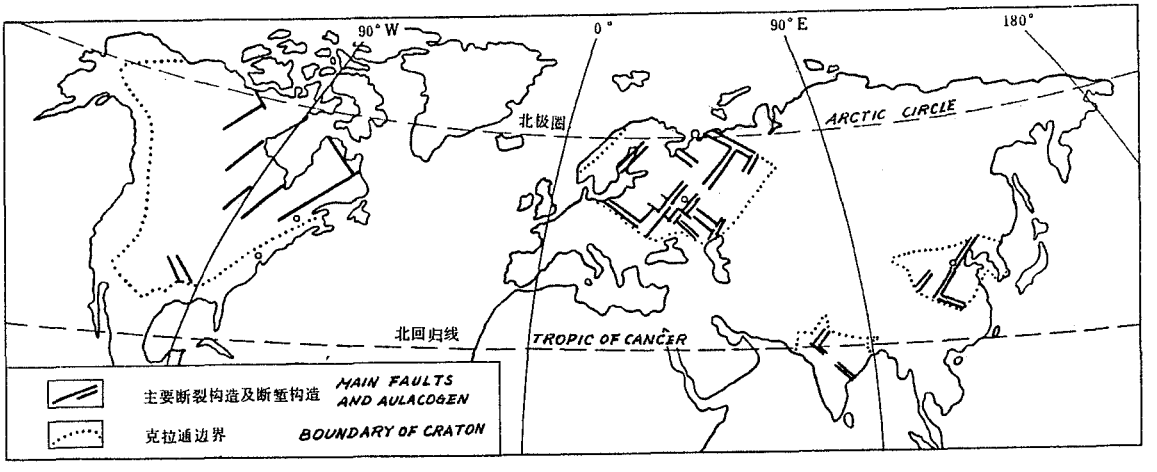
it was a new birth boundary in Early Proterozoic, because the Qinling mobile belt immediately cut the Early Proterozoic tectonic trend and structural elements of the craton which reseasonably extended far to the south of the present North China craton in Early Proterozoe (Qian, 1982; Sun et al, 1980; Tectonic map, 1983).

The Guyuan buried aulacogen is the other NE trending one determined by geophysical exploration and drilling in an oil field in the southwest of the craton. The north Anhui aulacogen extends in WNW direction in the south of the craton in the age of 1.0-0.8 Ga and is unconformably overlain by Cambrian. It is filled up with about 5 km thick shallow water sandstone, shale and carbonate sedimentary sequence with a thin layer of andesite in a limited area.

In the northern hemisphere or Laurasia, the Late Precambrian aulacogens in comparative tectonics have many similarities in their evolution history. The Russian platform shows that there are the Late Precambrian Riphean aulacogens (1.8-1.0 Ga) in regular NE and NW trending throughout the platform, even the form or outline of the platform is of following these trends (Aksenov et al, 1978). The Archean Superior province in the Canadian shield also has rectangular form, limited by the NE and NW lineaments bordering on the Proterozoic Churchill province and the Grenville, perhaps the Southern province as well (Burke, 1980). In addition, the Late Precambrian Aravalli aulacogen of Gondwana in India also extends in the NE direction. (Fig)



Discussion. Consequently, some quentions can be asked from the comparison of the evolution of the coeval Late Precambrian aulacogens:

1) What is the implication does the regularity of the tectonic trending of the Late Precambrian aulacogens. Are they Late Precambrian tectonic trends. If so, for what reason the unifying tectonic trends are maintained so far. Do they appear occasionally or in regularity.
2) Did the lithosphere on the earth be undergone a worldwide expansion in Late Precambrian in the process of cratonitization. Is it a background of the tectonic origin causing the Late Precambrian stage of aulacogen.

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