THE DUOLUN IMPACT CRATER, CHINA. Wu Siben, Institute of Mineral Deposits, Chinese Academy of Geological Sciences, Baiwanzhuang Road, Beijing, China.

The Duolun impact crater is located on the border between the Hebei province and the Inner-Mongolian province, at 42°3'N, 116°15'E, and has a 70-km diameter outlined by the Luan River, the Shandian River and their tributaries, which form a circle (Fig. 1).[1] The Duolun Crater is similar to the Manicouagan Crater, Canada, in size and geomorphological features.[2,3]

At the western part of this circle, the Heichengzi middling-size coal field has been found by drilling and consists of the Lower Cretaceous coal-bearing formation, which has no surface expression and has been covered by the Tertiary and Quaternary sediments at this peripheral trough. At the eastern part of the circle, the Meiyaogou coal deposit has also been found by drilling. According to the drilling data, the peripheral trough is more than 600 m in depth and up to 6 km in width.

The target rocks of the crater are as follows: granodiorite-porphyry, shale, siltstone, sandstone, limestone and the Upper Jurassic andesite, basalts, etc. The various impact melts are predominantly found at the surface of the crater, but relatively small masses of impact breccia have been identified.

According to the component of target rocks, the impact melts may be recognized as (1) melts originating from granodiorite-porphyry (in the melts, crystal clasts consist of quartz, feldspar and myrmekite, which is eutectic intergrowth of orthoclase and of quartz and is commonly recognized as a product of plutonic activity), and (2) melts originating from andesite (the crystal clasts consist of feldspar only in the melting rocks).

As the degree of impact fusion increases gradually, the quantity of crystal clasts decreases gradually, and the size of the crystal clasts becomes smaller and smaller, close to vanishing in the melts in which the matrix shows fluidal texture with schlieren and glassy globules.

The maskelynite, which displays isotropic optically and more refractive index than adjacent feldspar, has been found in the feldspar clast showing sieve texture. The transmission electron micrograph of shocked quartz with planar features in the Duolun Crater shows larger dislocation density, which is more than four times that (sample Lj-711-12-8)[4] in the Lappajarvi Crater, Finland.

The age of the Duolun Crater may be between the Jurassic period and the Cretaceous period, because one of the target rocks is the Upper Jurassic andesite, and the Lower Cretaceous coal-bearing formation occurs on the peripheral trough in the Duolun Crater.

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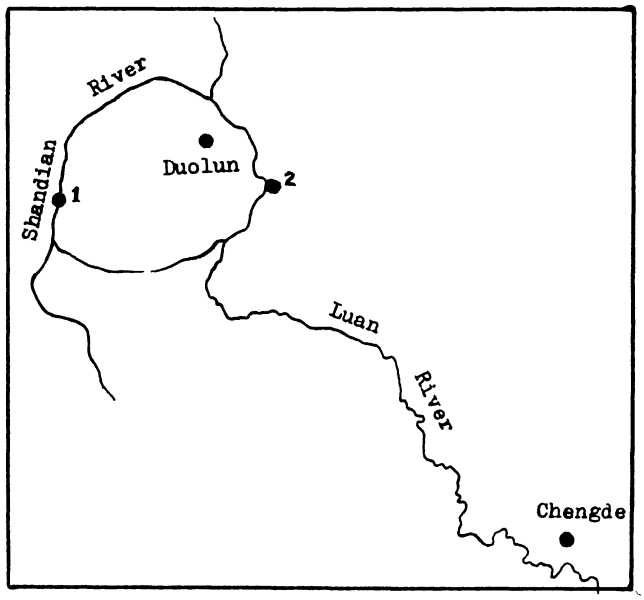

Fig. 1
(1 Heichengzi, 2 Meiyaogou)

Fig. 2. Shocked quartz, D51
(X18000)