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Chelyabinsk fireball and Dyatlov pass tragedy

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The Chelyabinsk bolide as well as the Kunashak meteorite in 1949 (Fig. 3, black square) hit ground in tectonically peculiar place in the Ural Mountains. The main explosion was followed by a series of weaker bangs. The long Uralian fold belt (Pz) separates two subsectors (1 & 2, Fig. 1) of the Eurasian sector (1+2) of the Eastern hemisphere sectoral structure (Fig. 1). At the Pamirs-Hindukush massif (the "Pamirs' cross") meet four tectonic sectors of this structure: two opposite differently uplifted (Africa-Mediterranean ++ and Asian +) and separating them two opposite differently subsided (Eurasian – and Indooceanic - -). Tectonic bisectors divide the sectors into two differently tectonically elevated subsectors. The Ural Mountains is one of these bisectors dividing the somewhat risen East-European subsector and the relatively fallen West-Siberian one. Even more important is the sharp tectonic boundary between subsided Eurasian sector and uplifted Asian one (between 2 and 3, Fig. 1).

Fig. 3 shows distribution of electrophonic bolides over USSR [1]. Observations numbers are in circles. The total of 343 observations is distributed at relevant districts; accompanied meteorites were found only in 23-24 cases; in the chart are excluded background values of 1-2 observations per district. Two areas are obviously anomalous. These of the Urals, and the Eurasia-Asia sectoral contact (Novosibirsk – Yenisei R. – Tunguska). A location in the long Uralian belt is determined by its intersection with the Timan fold belt coming from the northwest (Fig. 3). The catastrophic Dyatlov pass where nine people mysteriously died at once occurs there (triangle in Fig. 3). Mancy aborigines know this place as deadly where killing white shining spheres appear. Moreover this belt intersection is well known among hunters for UFO as the Permian triangle (Fig. 2). They meet there to observe unusual atmospheric shining and other anomalous phenomena. In the Yenisei-Tunguska-Baikal region lightning balls appear regularly causing broken trees [2].

In conclusion, these two tectonically distinctive regions are famous by anomalously often appearance of bolides part of which is accompanied by meteorite falls. Out of 343 observations meteorites accompanied less than 10 %. Unclear remains a strange attraction of bolides by very pronounced tectonic features.

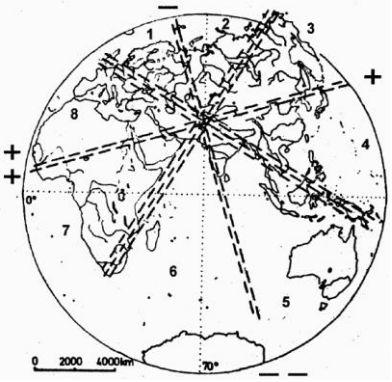

Fig. 1. The wave structure of the Eastern hemisphere. Thick lines – sector limits, thinner lines – subsector limits (explanations in text).

References: [1] Bronshten V.A., Grebennikov V.S., Rabunsky D.D. Catalogue of electrophonic bolides // Actual issues of meteoritics in Siberia. Novosibirsk: Nauka, 1988, 158-204 (In Russian). **[2]** Kochemasov G.G. Next bang in atmosphere over the Siberian taiga // "Planet Earth" system.-Moscow: LENAND, 2011.-514 pp (p. 155-156) (In Russian).

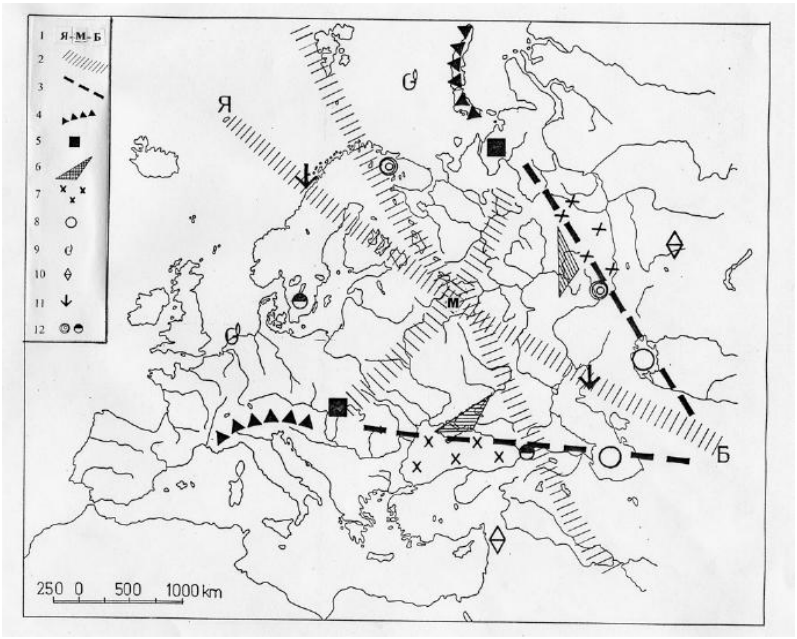

Fig. 2. Symmetric objects in the East-European craton and its surroundings. 1. NW line of symmetry traced from Yan-Mayen through Moscow to Badhyz. 2. Radial weakness zones. 3-4. Orogens. 5. Pechora and Pannonian basins. 6. Azov and Permian triangles. 7. Black Sea basin and the Paleogene of the "Anti-Black Sea". 8. Aral and South Caspian depressions. 9. Gas deposits: Shtockman and Groningen. 10. Kokchetav massif diamonds and showings of alluvial diamonds in Syria. 11. Mahlström whirlpool and the Tengyz "bottomless barrel". 12. Arkayim-Kargaly and Kolchida (Dioskuria), Southern Sweden – Vikings and the Kola Peninsula labyrinths.

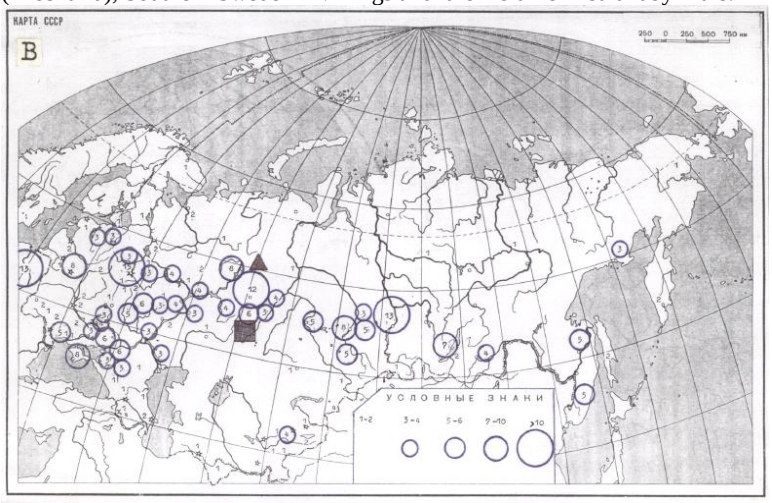

Fig. 3. Distribution of observed electrophonic bolides over the former USSR [1]. Number of bolids is in circles. Background values of 1-2 observations are excluded. Black square – Chelyabinsk and Kunashak meteorites; triangle – Dyatlov pass.