ISOTOPIC INVESTIGATIONS IN THE AREA OF THE TUNGUSKA CATASTROPHE IN 1908 YEAR. E.M. Kolesnikov, Geology Faculty of Moscow State University, 119899 Moscow, USSR.

The hypotheses of the annihilation and thermonuclear character of the Tunguska explosion have been tested by measuring inductive ^{39}Ar radioactivity from K and Ca in rocks and soil under the explosion epicentrum (1). This method has much more sensitivity to determine local neutron flow than ^{14}C analysis method at the tree rings does (2). ^{39}Ar was not detected though its estimated radioactivity was expected to be 100 times higher than the radiometrical plant sensitivity (0,01 dpm). These results testify against the nuclear nature of the Tunguska explosion.

The contents of 11 elements in the ultrasmall quantity of matter ($\sim 10^{-6}$ g) of the silicate microspherules isolated from "catastrophe" (including the increase of 1908 year) peat layer at the explosion site were measured by method of neutron activation analysis (3). It was demonstrated the enrichment of microspherules by light and volatile elements (Al, Na, Zn, Cs) and the impoverishment by more heavy and hard volatile ones (Fe, Co, Sc). It was shown that the microspherules were not the product of differentiation of the terrestrial soil or of an ordinary meteorite material. These results correlate qualitatively with the findings of Golenetskii S.P., Stepanok V.V. and Kolesnikov E.M. (4) on bed-by-bed chemical peat analysis. Sharp enrichment of the "catastrophe" peat layer by volatile elements it seems to be due to the presence of cometary matter. The material of anomalous composition (rich in Sn, Sb, Au, Ag) was found too in the Camp Century ice core by P.A. La Violette (5).

It was demonstrated that Pb isotopic content in "catastrophe" peat layer had more ^{204}Pb, ^{207}Pb, ^{208}Pb than ^{206}Pb as compared with Pb isotopic content of other peat layers and common Pb in this area (6). The results of other authors show the presence of the same Pb component in some meteorite.

In order to determine the presence of cometary matter we offer to do bed-by-bed isotopic analysis of H_2,C,N_2,S and other light elements in the peat and tree layers (7). H_2 has to possess the most striking description because of strong variations of cosmic H_2 isotopic content as compared with the terrestrial one. In the peat column taken by the author at the Ostraya hill area in three "nearcatastrophe" layers it was determined small increasing of isotopic ^{13}C content ($^{13}C_{PDB}$=+0,86±0,29%) and on the contrary lightening of isotopic H_2 composition (D_{SMOW}=-15±5%) as compared with other peat layers. Isotopic C effect in the peat layer is confirmed also for the North peatbog. Observed isotopic changes are not accounted for by climatic changes or other physico-chemical reasons. They seem to be related to preservation in the peat of matter resembling carbonaceous chondrites of the C1 type or more probably of cometary matter enriched much more in volatile elements.

As to data on isotopic C composition in the C1 type chondrites the overall quantity of supposed cosmic C fallen on the peat surface is estimated at $\leqslant$ 60000 tons ($\leqslant$6% from supposed mass of Tunguska comet - 1 million tons).

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