LAKE SEDIMENTS OF THE NORTHERN ALTAI AS AN INFORMATION SOURCE ABOUT CLIMATE ALTERATIONS DURING PLEISTOCENE AND HOLOCENE IN THE SOUTH OF WESTERN SIBERIA

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Detailed field works on the territory of the northern area of medium and low mountains in the Altai discovered over 50 lakes of various geneses with their total area of 530 km^2 and water volume of 17 km^3, which are dated back to Pleistocene and Holocene. Most of the lake depressions are dry at present. These lakes have been classified, among them evorsional lakes and dammed lakes group are of the greatest palaeoglaciologic interest. Formation of the evorsional lake depressions is associated with evorsional and cavitational activity of Late-Würm floodstreams in the Katun River valley (the well-known examples are the survived lakes within the evorsional-cavitational depressions of Manzherok and Aja, which were formed behind the side ridges and within valley extensions in the counter-stream zones with vast stationary whirlpools). Among the lakes belonging to the dammed group, diluvial-, ice- and collapse-dammed ones as well as flood-blocked lakes are of much information.

Diluvial-dammed lakes developed at the mouths of all tributaries of the main valleys of cataclysmic outthrows of giant ice-dammed lakes out of the intermontainous basins in the Central and South-eastern Altai (Chuya, Kuray, Ujmon and other basins) due to blocking of the tributary outflows with diluvial masses thrown down by the superfloods.

In the depressions of most diluvial-dammed lakes there are sediments which have been bio- and rhythmostragraphically analyzed. Some samples for radiocarbon dating have been selected according to most of them. The structure of the lake diluvial-dammed units reflects the sequence of the lake-glacial events in the Altai highlands and alterations in the climate conditions in the north of the Altai and in the south of Western Siberia for the dated chronological intervals. And the absolute datings proper of various bunches of these sediments point at the time of cataclysmic outbursts out of the basinal ice-dammed lakes and at their number. The correctness of the reconstructions gained is checked according to the data received by the analysis of bottom sediments from other lake territories.

On the whole, about 17 thousand years ago the air temperature of the northern part of the Altai hardly differed from the contemporary ones in the Chuya basin (-5°C and lower degrees – the average annual and the average perennial marks, and +3.8°C – the average one in July) with, however, much higher humidity which possibly exceeds the contemporary marks. The landscape-climatic zone limits went down apparently not less than by 1000 m. The average annual temperatures in Late Drias were by 4°C lower than modern ones, and the snow-line depression was on the average not less than 600-650 m. The stage glacier expansions on the background of the general degradation were of a surge character. The basinal ice-dammed lakes burst out into the highlands. There was not less than 5 floodstreams in the Bia River valley, and in the Katun River valley – not less than 6 ones, four of the superfloods which occurred in the valleys being synchronous. The earliest floodstream in the Katun River valley is dated back to the initial stages of the Würm glacier, the next one (the second one for the Katun and the first one for the Bia) occurred about 45 thousand years ago, the third floodstream for the Katun was about 20 thousand years ago, the fourth one for the Katun and the second one for the Bia – about 17 thousand

years ago, the fifth for the Katun and the third one for the Bia 16190-13220 years ago and the last (the sixth and the fourth ones accordingly) – at the end of the Middle Drias. The maximal floodstream discharges gained by means of the HEC-2 programme were about 18^6 m^3ps (Baker, Benito, Rudoy, 1993). The maximal floodstream discharges gained by means of the HEC-RAS 3.0 for the pre-mouth area of the Chuya River valley were 8^6 - 12^6 m^3ps (Herget, Agatz, 2003).