LATE-QUATERNARY DILUVIAL FLOODSTREAMS IN THE MOUNTAINS OF ALTAI AND TUVA (PALEOGLACIOLOGICAL BASE, GEOLOGICAL EFFECT, LEVEL OF PROBLEM STUDY)

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The first russians works on geological and geomorphologic consequences of giant basin ice-dammed lakes outbursts in Altai were published some 20 years ago. Using the methods of quaternary geology, geomorphology and paleoglaciology, it was found that during glacial Pleistocene such lakes occupied all the intermontane depressions of the Altai-Sayany mountain region, reaching their maximums almost simultaneously with glacial expansion maximums. Using the methods of simulation, magnitudes of melt water volume from glaciers of lake basins mountain frames in late Würm were estimated. Finally it was ascertained that a melt water volume had been increasing simultaneously with a glaciation area, and, for example, in basin of the Upper Chuya - the greatest in Altai Chuya intramontane depression, had exceeded the nowadays thawed flow 30 times (Rudoy, 1981; Rudoy and others, 1989). Thus a full basin filling to the highest lake terraces level took no more than 100 years, and then its cataclysmic outflow. It took the ice-dammed lake of Kurai no more than 30 years to be filled. Filling duration of Hubsugul and Darhat late quaternary ice-dammed lakes was of the same order (Grosswald, 1987, 1999). It seems that a filling and catastrophic evacuation period of basin ice-dammed lakes for about a hundred years was common to all of Siberian mountain territories that is quite clear taking into consideration similar hydroclimatic and orographic conditions of the region nowadays and in Pleistocene alike.

Outbursts of ice-dammed lakes both in Altai and in Tuva produced powerful glacial superfloods (diluvial floodstreams) with flow discharge exceeding 10^6 m^3/s. The greatest flow power was determined for a Chuya-Kurai floodstream (about 13 thousand yeas ago), it's discharge was more than 18 million m^3/s (Rudoy, Baker, 1993; Grosswald, Rudoy, 1996).

These regular repeating deluges did a great destructive and accumulative work that resulted in fact that all main flowing valleys of Tuva and Altai (Upper Yenisei River, starting from outburst channels from Darhat basin and lower throughout Kyzyl Sity, Chulyshman, Biya, Katun, Chuya and Argut Rivers) appeared to be severely transformed relative to the initial ones. The surfaces deformed by diluvial floodstreams were called "scablands" by analogy with well-known territory of Channeled Scabland in North America. The territories of scablands, in the broad sense of the notion, were being formed by processes of diluvial destruction (erosion and evorsion) and diluvial akkumulation. The territory of Columbia basaltic plateau in America was named scabland (Channeled Scabland) by a floodstream discoverer J.H.Bretz primarily due to pioneer interpretation of diluvial forms destructive groups – coolie-channels, "kettle holes" and others. In Altai and in Tuva, on the contrary, the comprehension of true geological role of quaternary glaciers, gigantic ice-dammed lakes and their regular outbursts came with the discovery and research of diluvial accumulation forms – giant current ripple-marks and diluvial swells and terraces. By now such forms are determined in all valleys mentioned above.

International expeditions of the last decade showed that diluvial formations peculiar to mountain and plain regions of America and Eurasia must be characteristic of all territories that experienced a quaternary glaciation too. The results of these expeditions has greatly stimulated appearance of general scientific conclusions and the newest theories about role of quaternary ice-dammed lakes and seas and diluvial streams in Northern hemisphere on the whole (Grosswald, 1999; Ancient Floods..., 2002, Rudoy, 2002). The comprehension of principal appropriateness of diluvial processes on the Earth that has been reached in the end of the previous century resulted in much more detailed and argued interpretation of history of other planets surface development: Mars, in particular (Mars paleoglaciology and geomorphology, Komatsu, Baker, 1999; Rudoy, 1999).

This research was supported by the Russian Foundation of Fundamental Research, Grants №№ 97-05-65878 & 00-05-65115.

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