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Late Pleistocene History of the River Valleys of the East European Plain's center

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Large meandering palaeochannels (macromeanders) are found in the river valleys of the East European Plain. Channel parameters of such macromeanders are few times larger than the recent ones of the same rivers. Such macromeanders are widespread in the temperate climate zone of the Northern Hemisphere. Formation of these macromeanders is usually associated with Late Glacial (the end of MIS 2). The main aim of our study was the reconstruction of the river valleys' development of the Central part of the East European Plain and establishing of the absolute chronology of the large paleochannels formation in this region. Few key sites were studied in the river valleys of the Central part of the East European Plain. Hand and mechanical coring, examination of natural and human-made exposures, sampling for different types of analysis, geomorphological descriptions and topographic profiling were done during the fieldworks on the key sites. Radiocarbon and OSL dating, grain-size and spore-pollen analysis were done in the laboratories.

Data analysis shows the following results and conclusions. The alternation of high and low river runoff was typical for the valleys of the study region in the end of the Late Pleistocene. This led to the alternation of river incision and aggradation in the valleys. About 30-35(40) ka ago there was epoch of rivers incision. High runoff is proposed as the reason of this incision. Before LGM rivers had already been incised down deeper than the modern levels. LGM time (20-23 ka ago) was characterized by cryoaridic conditions, low runoff and accumulation in the river valleys. Not only alluvial, but also aeolian accumulation in the river valleys was characteristic for this period. In that time aeolian covers and aprons few meters thick were formed in river valleys (mostly on the terraces' surfaces). After LGM the high runoff epoch started, which was dated 12-19 ka ago. In that time large meandering palaeochannels (macromeanders) and modern wide high floodplains were formed in the river valleys. These macromeanders were formed under conditions of extremely high spring discharges in severe climate conditions. Our data shows that this epoch of high runoff was interrupted by a short low runoff period (~15-16 ka ago). So, the Late Pleistocene epoch of high floods and large paleochannels formation had two periods – about 17-19 ka and 12-15 ka ago. Runoff in the Holocene became lower than in the Late Pleistocene, channel parameters decreased.