



Holocene floodplain evolution of the Danube in Budapest (Hungary) based on geoarchaeological and geomorphological researches of two archaeological sites

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Two archaeological excavations were studied along the river Danube in Budapest. The dynamics and chronology of Holocene floodplain evolution in this area have been established through sedimentological and soil analysis of 26 samples and archaeological dating. The research comprises geomorphological mapping of the sites' wider area, GIS modelling to assess flood-hazard areas and the study of old maps and historical sources.

Both excavations are located along the right bank of the Danube near the present river shore. The two study areas represent two different geomorphological settings and sedimentary features and two different ways of floodplain evolution over almost the same period of time. The first one (225 Királyok Street) located at the north part of the city is surrounded by wide terraced alluvial plains, while the other one (2 Fő Street) is situated in the middle of the capital at the foot of the Buda-Hill's steep slope on a narrow terrace surface.

The extensive territory of the excavation at Királyok St. has been scarcely populated in the past and is still endangered by high floods today. Depending on the fluvial, morphological and climatic conditions there were favourable and unfavourable periods for inhabitation. Sediments vary from the Danube's Late Pleistocene terrace deposits through the early Holocene lake sediments and the Early Bronze Age sand sheets to the recent alluvial deposits.

The geomorphological evolution of the excavation area at Fő St. was predominantly driven by fluvial processes before the early Bronze Age, after which the Buda Hill's slope deposits played an increasingly important role in sedimentation. This long term geomorphological process was interrupted by the simultaneous occurrence of a high flood and an intensive slope erosion event in the Middle Bronze Age. The area was repeatedly inhabited throughout the Bronze Age; the intensive land use is confirmed by the high phosphorus content and increased erosion.

The Holocene floodplain evolution can also be divided into shorter periods with a significant variability of incision or aggradation processes, fluctuation in sediment supply and periods of more frequent and longer lasting high-flood events.

The floods' discharge and characteristics basically determine the floodplain evolution and the feasibility of human land use and inhabitation. The geomorphological and sedimentological features at the same time reveal the environmental and climatic changes, the natural and anthropogenic geomorphological processes and events.