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SPECIAL ISSUE PATHWAYS OF
EVOLUTIONARY GEOGRAPHY 2.
PART 2. PROBLEMS OF PALAEOPEDELOGY,
GEOARCHAEOLOGY,
FLUVIAL GEOMORPHOLOGY

EDITORIAL

This special issue of the journal “Geomorfologiya” is the second volume of selected papers followed the 2nd International Conference “Pathways of Evolutionary Geography” (November 2021, Moscow) dedicated to the 90th anniversary of professor A.A. Velichko, the famous Russian geographer, who made a great contribution into the Quaternary science, geomorphology, soil science and studies of human-environment interaction in the past.

The special issue includes 15 papers grouped into two thematic chapters – problems of palaeopedology and geoarchaeology (put together as in most papers ancient soils were studied at archaeological sites), and problems of fluvial geomorphology. The papers highlight the main directions of evolutionary geography developed by A.A. Velichko and present the results of recent studies conducted in various regions of Eastern Europe, Western and Eastern Siberia.

The special issue begins with the paper by M.V. Bobrovsky and his co-authors who presented the detail reconstruction of the tree species composition in the Upper Volga River basin (Peno District, Tver Region) during the Early Iron Age (the Dyakovo culture) the Early Middle Ages inferred from soil charcoal and archaeological excavations. Authors demonstrated that the soil charcoal was the robust evidence of tree species occurrence in the study area in different periods and gave them a possibility for detail studies of vegetation history and human impact on forests.

The studies of M.A. Korkka and her co-authors were devoted to reconstruction of the Late Pleistocene paleoenvironment conditions (MIS 5-MIS 1) in vicinity of the Middle Paleolithic Khotylevo I sites, one of the largest Middle Paleolithic archaeological findings in Eastern Europe, located in the central part of the East European Plain (Bryansk region). Based on precise description of paleosol morphology and properties authors revealed short-term climatic fluctuations during the MIS 3. Authors determined a period of extracontinental semi-arid climate followed by more humid conditions appeared as paleosol sequenc-

es from Cambic Cryosol to Gleysol. The paper of F.G. Kurbanova with co-authors is also focused on paleosol studies at the archaeological complex in the centre of European Russia (Kursk region). The multi-proxy research included the detailed morphological description of the buried soils in the Gochevsky burial ground of Medieval age, grain size analysis, elemental composition and iron fraction measurements, micromorphological studies, pollen analysis and non-pollen palynomorphs identification. The obtained data showed the complex temporal dynamics of forest-steppe landscape in the region in X–XI centuries with short-term humid and wet phases, possibly, influenced on human migration in Eurasian steppe.

The intensive paleopedological studies of the last decades clearly demonstrate the importance of sedimentological approaches in paleogeography. M.P. Lebedeva with co-authors obtained the new data on the composition and properties of Khvalynian deposits and the evolution of soils in the Volga-Ural interfluvium using mineralogical and micromorphological analysis. The paper of M.V. Khmeleva and co-authors presented the preliminary results of studies of the loess-paleosol sequence of the Alchak-Sedlovina section (Crimea Peninsula).

Archaeological research and studies of human-environment interactions are the important issues in paleogeography that was denoted by A.A. Velichko, who devoted a lot attention to Paleolithic archaeological sites and environment conditions of human occupation. The time of appearance of anatomically modern humans (*Homo sapiens sapiens*) in the northeast of East European Plain and on the Urals was discussed by P.Yu. Pavlov. Based on archaeological materials from the Palaeolithic site Zaozer'e (35–31¹⁴C kyr BP) located in the North-East of East European plain in Upper Kama River basin, he revealed that modern humans probably reached the sub-arctic zone ca. 3–4 thousand years after their first appearance in the centre of the East European Plain.

The studies of environmental changes during the Palaeolithic are continued by articles of Sedov et al. and Sycheva et al. S.N. Sedov and his co-authors proved that the paleosol-sedimentary sequences encountered at the Upper Palaeolithic archaeological sites within the central part of the East European Plain indicated the short-term climatic fluctuations, similar ones revealed from Greenland ice core proxy. Detailed research and dating of paleosols at the archaeological

sites of Kostenki and Divnogorie gave rise to the compound correlation scheme which covers the second half of MIS 3 and MIS 2. The study of S.A. Sycheva with co-authors was focused on the local stratigraphy and palaeoecology of the Upper Palaeolithic site Divnogorie-1. Using paleopedological approach authors traced a shift from the Late Glacial paleoenvironments to the Holocene.

The Late Holocene of soil evolution in the forest-steppe and steppe zones of the East European Plain were described in the paper of Chendev et al. They realized a comparative analysis of chernozems buried under the mounds of the Srubnaya culture (Late Bronze age) and their earlier and later analogues. Authors demonstrated biochemical transformations of the soil profiles and compared them with Holocene climatic changes. The interesting results of paleosol studies at the Eneolithic – Late Bronze Age archaeological site Yamgort in West Siberia (Yamalo-Nenets Autonomous Area) are presented in the paper by L.N. Plekhanova and co-authors.

The second chapter of this special issue devoted to the problems of fluvial geomorphology is prefaced by the paper of E.V. Lebedeva about the gas-hydrothermal activities and their impact on river valleys in geothermal zones. She argued that solfataric gases outputs, mud volcanic manifestations and mineralized thermal waters contribute to the formation of various specific landforms on slopes and bottoms of river valleys in the areas of modern volcanism.

The structure of the floodplain in Moksha River valley (middle Oka River basin) as a key to the understanding of the evolution of river valleys during the Late Pleistocene was discussed in the paper of E.Yu. Matlakhova and V.Yu. Ukraintsev. Authors using geomorphological and lithological analysis, and radiocarbon AMS-dating reconstructed the main stages of the Moksha River valley development during the Late Pleistocene and Pleistocene/Holocene transition.

The new data of the Late Pleistocene and Holocene sedimentation and development of the Lower Lena River valley were presented in the paper of S.A. Pravkin and D.Yu. Bolshiyarov. Based on field

observations, sedimentological descriptions, radiocarbon and IR-OSL dating of alluvial deposits, they proved that the floodplain and first terraces in the Lower Lena River valley was caused by sea level fluctuations at the end of Late Pleistocene and in the Holocene. Authors showed that the glaciations of Verkhoyansk Ridge could not influence to configuration of the Lena River valley as mountain glaciers had not rich the Lena River since the end of the Middle Pleistocene. The novel materials of floodplain formation in the Selenga River basin were presented in the paper of Yu.V. Ryzhov and co-authors. Authors focused on the structure and age of floodplain alluvium of the main levels of floodplain, morphology of the Selenga River valley, dynamics of water discharge, structural and tectonic conditions of the river basin during the Holocene. Authors determined the event of a sharp change in the lithological composition of deposits as high floods at 3.8–3.4 kyr BP.

An advantage of the radiocaesium method for investigation of soil losses due to erosion in the periglacial area of the Upper Oka River basin were presented in the paper of L.N. Trofimev and her co-authors. They discussed the influence of paleocryogenic polygonal-block microrelief of the study area to caesium-137 distribution in soil cover.

The evolution of the upstream part of the Volga River was discussed in the paper of A.O. Utkina and A.V. Panin. Authors suggested the new mechanism of formation and age of the Plyos and Tutayev incision valleys during MIS 2 and tested it using geomorphological observation, luminescence dating and modelling approach.

The papers presented in the special issue cover a broad range of scientific problems, methodological approaches and study regions with a focus on evolutionary geography, geomorphology, palaeopedology and geoarchaeology. The guest Editor expresses deep gratitude to all the many authors, who submitted their novel interesting results and valuable discussions to the current volume, thus helping in closing some gaps in knowledge and indicating directions for future work.

E. Yu. Novenko, guest editor