GEOMORPHIC PROCESSES AND GEOARCHAEOLOGY

From Landscape Archaeology to Archaeotourism

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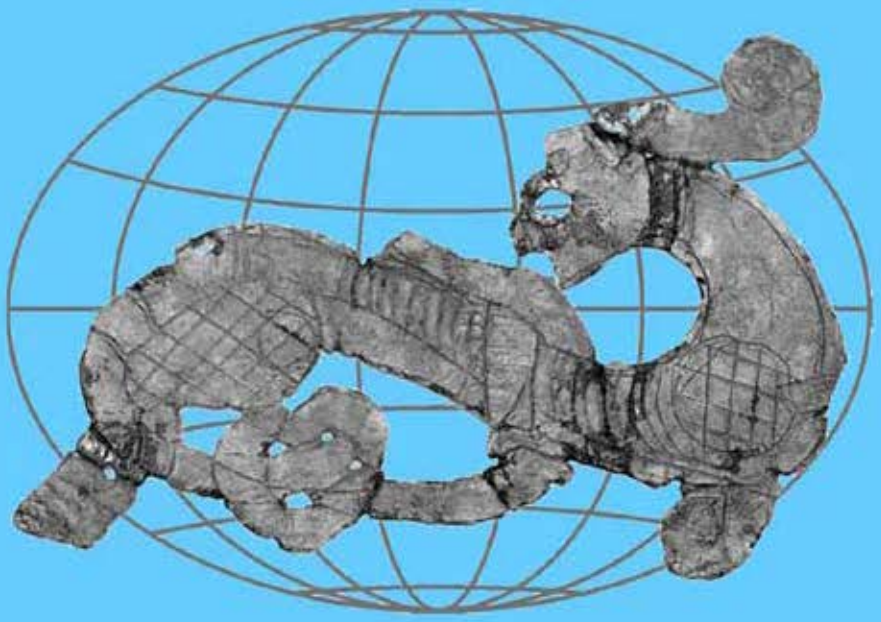

EXTENDED ABSTRACTS

abrasion material, products of the eruption of mud volcanoes. One of the main branches of the Kuban began to fall into the Sea of Azov. This rotation of the Kuban to the north is associated with tectonic movements. Deposit accumulation within the delta of the Kuban watercourses has gradually formed the peninsula. This is a natural event that has occurred, apparently, in the V century AD had a pernicious effect on commercial shipping and the economy of the cities located within the archipelago.

Thus, hazardous natural processes determined not only changes in landscapes of the past, but also could adversely affect the economic activities of ancient settlements.

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LANDSCAPE-DEPENDENT FUNCTIONAL ZONING OF THE EARLY MEDIEVAL GNEZDOVO SETTLEMENT ON THE UPPER DNIEPER RIVER FLOODPLAIN

Murasheva V.V. [1], Bronnikova M.A. [2], Panin A.V. [3]

[1] *State Historical Museum, Moscow, Russia, vmurasheva@mail.ru*

[2] *Institute of Geography, RAS, Moscow, Russia, mbmsh@mail.ru*

[3] *Faculty of Geography, Lomonosov Moscow State University, Moscow, Russia, a.v.panin@yandex.ru*

1. Gnezdovo archaeological complex (late IX – early XI centuries) is situated at the Western Russian border at about 13 km from one of most ancient Russian town Smolensk. It is known as one of the largest archaeological sites of the period of State formation in the Eastern Europe (corresponding to the Viking Age in Northern Europe) and a key-point on the famous route «from the Varangians to the Greeks». As early as at the beginning of 20th century two hill-forts bordered by extensive nonfortified settlements were fixed in association with about 4000 mounds. The monument scale and materials obtained after its study allow to compare it in terms of several criteria with such northern European proto-urban center as Birka and Hedeby.

The history of Gnezdovo studies commenced above 130 years ago. About 1000 mounds and about 7000 m^2 of settlement occupation deposit were studied. This allowed to conclude that Gnezdovo site could be attributed as ancient Smolensk, the latter being cited in early written sources. Gnezdovo was a civic centre and the largest center of handicraft and international trade. The population of Gnezdovo is characterized as polyethnic, with sufficient part of the Scandinavian incomers.

2. The whole archaelogical complex occupies different morphological elements of the Dnieper River valley. Our attention will be focused only on the part of the Gnezdovo archaeological site which lies on the floodplain area. The occupation deposits within the Dnieper floodplain was discovered only in 1996-1997. Nowadays this territory is completely unfit for stationary living and partly waterlogged. Excavations on the floodplain which started in 1999 had radically altered the existing concept of the site topography and the cultural layers informative value. It has been carried out an unexpected depth of Gnezdovo time layers covered by the Dnieper-river overbank alluvium deposited during springfloods. Alluvial layer overlaid occupation deposits and preserved them from mechanical disturbance.

3. Settlement development on the floodplain was dependend on local landscape much stronger than it did in other geomorphic positions. It was limited by the Dnieper river and its Svinets tributary and proximity to the river played important role in its functioning. Local landscapes have been altered greatly during the last millennium, so only the tight cooperation of archaeologists, geomorphologists and experts in paleopedology could be fruitful, especially in the problem of paleolandscape reconstruction as well as in field work methods (the hand-coring as the instrument of the occupation deposit depth determination and its preliminary characteristic).

4. There are two morphologically different parts of the floodplain: old floodplain with rather smooth topography but total relief of > 3 m, and young floodplain with rough ridge-and-hollow surface. Old floodplain was formed during a period of extremely high floods between 2.3-2.7 ka BP when older floodplain was strongly reworked by river erosion. Few Early-Mid-Holocene remnants which survived during this reworking are also included into the old floodplain area. Formation of this part of the floodplain had finished by 2.2-2.0 ka BP. The first Millennium A.D. was characterized by low flood activity rare or maybe no inund ation of the floodplain. This is obvious in particular from buried Albeluvisols (zonal soils which cannot be formed in conditions of regular seasonal inundation) related to that time and their remnants which are discovered under the floodplain habitation deposits. The second evidence of low intensity of seasonal inundation is a replacement of silts and clays with peaty gyttja in cores of sediments from oxbow lakes and an extinction of water plants from pollen spectra of these sediments. These changes testifies on paludification of oxbow-lakes due to restricted water supply and absence of seasonal floods in particular.

In the 9th c. AD, i.e. already in the second half of the low-flood period, the Gnezdovo settlement was founded and spread over the floodplain. The old floodplain area was covered by a 20 × 20- m net of 2-3 m deep hand cores, which permitted mapping of the habitation deposit. It was found that economic and dwelling activities were located on topmost not inundated areas of floodplain and blended well with local topography. The settlement existed till the 11th c. AD, and floodplain inundation resumed only about 13th c. AD. Therefore, changing hydrological regime was not a factor of either foundation or decline of the settlement.

The key question of the Gnezdovo landscape history is the position of the Dnieper River at the time of the settlement development. To find it a trench was excavated across the border of the old (occupied in Gnezdovo times) and young (post-settlement) floodplain segments. Characteristic slipping-down sedimentary textures were found that were most probably formed due to bank cutting by river channel. They were dated between 1.0-1.3 ka BP, which evidence that at Gnezdovo times the right river bank was located directly at the border between the two floodplain generations and right at the southern limit of the cultural layer expansion over the floodplain. The reconstruction of the Dnieper channel site at the IX-XI centuries obtained as a result of multi-disciplinary studies were completely confirmed during the archaeological excavation at the area of hypothetic beach zone of the ancient Dnieper channel. The southern edge of the settlement was spread to the river bank. No bank erosion during and after the settlement development was found, which means that no loss of the settlement area due to erosion has occurred. In the last millennium the river channel shifted southward eroding its left terrace bank and constructing the ridge-and-hollow young floodplain at its right bank.

5. The ancient landscape reconstruction allowed to make the archaeological field work more purposeful. During the fieldwork (1999-2011) four different function area were identified.

- «Manufacturing» area is situated near the Kamyshi lake and is characterized as a jewelry and forgery center having also some dwelling houses and household buildings. The location of manufacturing workshops connected with high-temperature processes is related to nearby water basins. The alternating record of those is dated back in the range of the second quarter of the 10^{th} century up to the border of the 10^{th}-11^{th} centuries.
- «Harbour» area at the north-east bank of the Bezdonka lake, wich probably was used as the inner harbor. The wooden planking supposedly could have been used as «hards» in the warf of the ancient Gnezdovo. The occupation deposits of this area as a whole could be dated back to the 10^{th} century.
- «Riverbank» area is located at the southern boundary of habitation deposites near the Dnepr ancient river channel bank within the «beach». The traces of different kind of river boat service (tar extraction and black-smith handicraft fire-places) were revealed. This area was probably used only seasonally as the numerous alluvial thin interlayers within the occupation deposit indicate the regular flooding of this territory. The studied features could be dated back in the range of the second quarter of the 10 century up to the border of the 10^{th}-11^{th} centuries.
- «Periphery» (near-terrace) area is located at the boundary of the flood-plain and the terrace. The evident traces of activity aimed at the development of low suitable for living territory were revealed, such as upfilled boggy mould and brushwood road construction. The remnants of dwelling houses were fixed within the area which was dated back to the beginning of the 11^{th} century representing the final stage of the settlement existence.

The stationary archaeological excavations revealed the evident landscape dependence in the development of the area by the population of the ancient Gnezdovo. Probably the whole settlement structure at the Dnepr floodplain was directed toward the river and connected in some way with the transeuropean river trade way.

prevent any bacterial decay which is a powerful contamination factor.

Here we tried to describe briefly the permafrost as a specific working environment for the field archaeology and show potential difficulties of survey, excavation, and radiocarbon dating of the sediments and cultural remains. It is well known that archaeologists normally deal with the traces of the permafrost that existed in the past such as cryoturbation, ice-wedge casts, cryogenic cracks etc. Observations made in 'live' permafrost conditions help better understanding of the processes that took place in the past during the formation of the frozen sediments and, which is even more important, understanding the effect caused by its thawing.

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CHARACTERISTICS OF THE GEOTOURISM DEVELOPMENT IN THE SMOLENSK REGION

Scherbakova S.A.

Smolensk University for the Humanities, Smolensk, Russia, kafedra_turizma@shu.ru

Nowadays geotourism is gaining more and more popularity and is developing very fast. As a kind of tourism geotourism is comparatively young. It can be called a modern one.

Geotourism is a journey with scientific, educational, entertaining, and other goals which is connected with geological and geographical natural objects [1].

Although this kind of tourism is rather well-known and wide-spread among professionals, only few tourists use it. Various problems of the geotourism development are discussed at geological conferences and congresses on the international, national and regional levels.

Geotourism is often regarded as a step towards ecotourism. This perception is quite understandable because one of the objectives of geotourism is not to do any harm to the environment and to enjoy the genuine beauty of various places. Respect for the local population plays an important role among the postulates of geotourism.

If tourists visit a particular place because of its uniqueness, it encourages and motivates local authorities to preserve this site. Proponents of geotourism claim that this