

The Allerød in the Northwestern Black Sea region: Climate change and human adaptation

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Introduction

The crucial role of events that took place during the Allerød in the development of environmental conditions and human adaptation in the Northwestern Black Sea region repeatedly take the center of attention among natural scientists and archaeologists. In the region under study, this period traditionally is associated with global climate changes that influenced the dynamic of natural landscapes and caused a transformation in population demography, livelihood and subsistence strategy, and tool production. Basic trends in environmental dynamics across the Northwestern Pontic steppes during the Holocene were initiated at this time, and the main features of human adaptation to post-glacial environments (including basic trends in tool production strategies, subsistence systems, and mobile lifeways) also have their roots during the Allerød.

Peculiarities of paleogeography and human adaptation within the Northwestern Black Sea region allow us to distinguish two provinces of this region: one is connected with the territories lying between the Danube and Pivdenny Bug rivers, and the other is located around the Dnieper Rapids area.

Peculiarities of environment and human adaptation in the territory between the Danube and Pivdenny Bug rivers

In the climate history of the Northwestern Black Sea region, the Allerød is marked by the final disappearance of glacial conditions. Average temperatures of July were practically the same as now, average annual temperatures varied about 11-12° C (Artyushenko and Turlo, 1989: 85). As a result, the climate is defined as having been slightly colder but wetter than the conditions observed in this region nowadays (Veklich, 1987: 116; Gerasimenko, 1997: 18).

The Allerød landscape lying between the Danube and Pivdenny Bug rivers generally could be described as one close to meadow steppes. Herb bunchgrass steppes were spread across the upper parts of the relief and the watersheds; halophytic chenopodiaceous vegetation accompanied by wormwood and cereals absolutely dominated there (Artyushenko, 1970: fig. 13). Motley grasses were represented here by mesophilous Compositae (mostly, by Rosaceae and Ranunculaceae); in the Pivdenny Bug bottomland, typical aquatic vegetation (such as red-mace, water plantain, water lily, etc.) was also represented. Pine and birch forests with alder and spruce spread along the larger rivers and in ravines; smaller proportions of deciduous trees (such as oak, elm, and lime) were also typical for the Pivdenny Bug lower flow (Artyushenko, 1970: 49, 69; Pashkevich, 1981: 75).

Variability in landscape features traced against the distribution of different species of vegetation correlates with the particularities of faunal assemblages from the region under study. For example, in the third layer of the Volodymyrivka settlement, reindeer, typical representatives of forest fauna, are represented alongside steppe species (horse and steppe marmot) as well as glacial fauna (arctic fox and cave lion) (Chemysh, 1953: 89-95) (Table 1).

Species composition of the basic Northwestern Black Sea region vegetation and fauna let us assume that, due to overall rise in the productivity profile of plant superstructures (i.e., 'green parts': leaves, flowers, seeds, stalks, sprouts, etc.), general biomass density per unit of area was considerably higher during the Allerød than during previous phases of the Final Pleistocene. Nevertheless, it was hardly an important environmental phenomenon for the region's inhabitants, whose subsistence strategy remained bison hunting.

Table 1. Faunal remains from archaeological sites of the Northwestern Steppe region during the Allerød (Chernysh, 1953; Kolosov, 1964).

	Osokorovka industry			Anetivka Industry
	Osokorovka layer 3B	Yamburg	Osokorovka layers 2-3	Volodymyrivka layer 3
Bison (<i>Bison priscus</i>)	+	+	+	
Horse (<i>Equus caballus gmelini</i>)		+	+	?/3
Reindeer (<i>Rangifer tarandus</i>)		+	+	?/19
Fox (<i>Vulpes vulpes</i>)		+		
Wolf (<i>Canis lupus</i>)			+	
Brown bear (<i>Ursus arctos</i>)		+		
Cave lion (<i>Felis spelaea</i> Gold.)				1/1
Arctic fox (<i>Vulpes lagopus</i>)				?/3
Arctic fox or beaver			+	
Hare (<i>Lepus</i> sp.)		+		
Brown hare (<i>Lepus europaeus</i>)	+			
Marmot (<i>Marmota bobac</i>)				?/11
Hamster (<i>Citellus citellus</i>)			+	
Mollusks	+			

Numerator = minimal number of bones (MNB); denominator = minimal number of individuals; + = presence of bones.

Exhausted by extremely intensive exploitation during the Last Glacial Maximum, the Northwestern Pontic steppes declined in suitability for further development during Final Glacial time. Population density in this region considerably decreased; only 1 settlement could be dated to this time span: Volodymyrivka, layer 3, where 4 accumulations of flint artifacts and fauna concentrated around poorly defined thin fireplaces were traced (Chernysh, 1953: 43-51). The flint assemblage of this layer preserves basic features typical of the Late Paleolithic Anetivka flint knapping tradition just as the local subsistence system remained stable and based upon collective hunting for large gregarious game. Nevertheless, one can observe a shift in the selection of hunted species: the bison of previous times was replaced by horse and reindeer, while the population specialized in bison hunting most probably moved to the north (Zaliznyak, 1981: 5-13).

Altered paleoenvironment and human adaptation in the Dnieper Rapids province

Available evidence gives insufficient information for a detailed reconstruction of the landscape and species composition of vegetation in the Dnieper Rapids province during the Allerød. Based on the general paleogeographic development in this area, it is possible to suggest that the climatic optimum of the Final Glacial was marked by the highest diversity in the resource base of the region, and the highest density of floral and faunal biomass per unit area in the steppe region. This is confirmed also by the presence within archaeological site faunal assemblages of typical steppe inhabitants (bison, horse, and hamster), species connected with semi-closed and closed biotopes (reindeer, bear, and beaver), as well as species with broad adaptive capacities (wolf, fox, and brown hare) (Kolosov, 1964: 42-49) (Table 1).

Such favorable environmental conditions contributed to the highest population concentrations within the Black Sea steppes. The pivotal archaeological site of this region is Osokorovka (layer 3b), which has been interpreted as a seasonal camp. Several roundish ground dwellings forming a circle were found there; their superstructures were woven with willow branches and coated with clay (Sapozhnikov and Sapozhnikova, 2002: 90). Fireplaces, flint artifacts, and faunal remains were recovered outside the structures (Telegin, 1980: 34). The degree of effort expended in the building and maintenance of such constructions allows the assumption that the dwelling structures were occupied during the cold season (Sapozhnikov and Sapozhnikova, 2002: 91). Hunted species and procurement technique did not change in comparison with the previous period; bison, reindeer, horse, and fur-bearing animals still remained the basic prey (Bibikova, 1985: 17-19).

Preservation of traditional subsistence practices and the creation of a relatively complex settlement system and dwelling structures based on them were most probably ensured by substantial intensification in tool production through transition to a technique using geometric inserts (Kolosov, 1964: 42-49). Peculiar high trapezoids, the earliest known among the geometric microliths in the Northwestern Black Sea steppe region, are found in the flint assemblage of Osokorovka, layer 3b; their interpretation as technological and chronological criteria for this period is the subject of sharp discussions (Boriskovskiy and Praslov, 1964; Telegin, 1982; Stanko and Svezhentsev, 1988).

A series of small short-term sites with analogous flint assemblages are found at a limited distance from Osokorovka: Yamburg, Kapustyana Balka, etc. These sites most probably reflect a system of living space exploration peculiar to the Dnieper Rapids area, which implies the existence of a rather stable base settlement that was connected with these short-term camps occupied by mobile groups in accordance with their livelihood needs. Such a settlement system indicates the existence of a concept of proper living space, which needs to be specially marked, exploited, and protected. The earliest collective burial in Eastern Europe, Voloskiy, could date back to the Allerød, and it could be interpreted as a marker for such a proper living space in the real geographic landscape as well as in the social memory of the Osokorovka population, the technological traditions of which most researchers tend to trace back to the local flint knapping techniques of previous times (Vorona Progon I, etc.) (Olenkovs'kiy, 1991: 184; Danilenko, 1955: 56-61).

Conclusions

The dynamics of the demographic and subsistence systems of populations in the Northwestern Black Sea region during the Allerød were caused, in many aspects, by the difficult ecological and demographic situation in this region during the previous period, complicated by the relatively rapid climate changes of the Final Glacial. Average demographic capacity of the Northwestern Pontic steppes decreased, nevertheless, its consequences were different for populations within two basic provinces of the region under study.

Populations in territories lying between the Danube and Pivdennyi Bug rivers under the influences of global climate changes tended to find new territories suitable for continuation of their traditional lifeways. Nevertheless, only part of them moved to the north: the survival of the Anetivka industry without principal transformation of their tool production technique based on retouched blades in the Preboreal and Boreal periods of the Holocene indicates that they managed to find suitable adaptive solutions during the Allerød.

A totally different adaptation was achieved at that time by populations of the Dnieper Rapids province, which was characterized by the most favorable environmental conditions for hunter-gatherers, i.e., climatically mild and rich with field resources. Exploration of this region was based on a peculiar clustered settlement system implying rather stable and long-lasting connections at a base camp with regular movements marked by short-term stops in remote parts of the living territory. The functioning of such a system was enabled by intensification and simplification of tool production techniques through transition to the use of microlithic geometric inserts.

References

- Artyushenko, A.T., 1970. Rastitel'nost' lesostepi i stepi Ukrainy v chetvertichnom periode [Vegetation of Forest-Steppe and Steppe Ukraine in the Quaternary]. "Naukova dumka," Kiev. (In Russian)
- Artyushenko, A.T., and Turlo, S.I., 1989. Izmeneniya rastitel'nosti i klimata territorii Ukrainy v pleistotsene [Changes in vegetation and climate of the territory of Ukraine during the Pleistocene]. In Velichko, A.A., (ed.), *Paleoklimaty i oledeneniya v Pleistotsen [Paleoclimates and Glaciations in the Pleistocene]*. "Nauka," Moscow, pp. 81-86. (In Russian)
- Bibikova, V.I., 1985. Okhotnichiy promysel v paleolite i mezolite Sevemogo Prichemomor'ia [Hunting in the Paleolithic and Mesolithic of the Northwestern Black Sea region], *Kratkie soobshchenia Insituta Arkheologii Akademii nauk SSSR [Short Reports of the Institute of Archaeology of the Academy of Sciences of the USSR]* 181: 17-19. (In Russian)

- Boriskovskiy, P.I., and Praslov, N.D., 1964. Paleolit basseyna Dnepra i Priazov'ia [Paleolithic of the Dnieper River and Azov Sea Basins]. "Nauka," Moscow. (In Russian)
- Chemys, A.P., 1953. Vladimirovskaya paleoliticheskaya stoyanka [The Vladimirovka Paleolithic site]. *Bulleten Komissii po izucheniyu chetvertichnogo perioda [Bulletin of the Commission for Quaternary Period Studies]* 17: 43-51. (In Russian)
- Danilenko, V.N., 1955. Voloshskiy epipaleoliticheskiy mogilnik [The Voloshskiy Epipaleolithic collective burial]. *Sovetskaya etnographia [Soviet Ethnography]* 3: 56-61. (In Russian)
- Gerasimenko, N.P., 1997. Prirodnaya sreda obitania cheloveka na yugo-vostoke Ukrainy v pozdnelednikovye i golotsene (po materialam paleogeograficheskogo izucheniya arkhologicheskikh pamyatnikov) [The natural environment of human beings on the Southeast of Ukraine in the Final Glacial and Holocene (based on the data of paleogeographic studies from archaeological sites)]. *Arkheologicheskii almanah [Archaeological Almanac]* 6: 3-64. (In Russian)
- Kolosov, Yu.G., 1964. Nekotorye pozdnepleoliticheskie stoyanki porozhistoy chasti Dnepra (Osokorovka, Dubovaya Balka, Yamburg) [Some Late Paleolithic sites of the Dnieper Rapids zone (Osokorovka, Dubovaya Balka, Yamburg)]. In Boriskovskiy, P.I., and Praslov, N.D. (eds.), *Svod arkheologicheskikh pamyatnikov [Collection of Archaeological Sites]* A-I-5, pp. 42-49. (In Russian)
- Olenkovskiy, N.P., 1991. *Pozdnyy paleolit i mezolit Nizhnego Dnepra [Late Paleolithic and Mesolithic of the Lower Dnieper]*, Redaktsionno-izdatel'skii otdel upravleniya po pečati, Kherson. (In Russian)
- Pashkevich, G.A., 1981. Dinamika rastitelnogo pokrova Severo-Zapadnogo Prichemomor'ya v golotsene i ego izmeneniya pod vliyaniem cheloveka [Dynamics of vegetation in the Northwestern Black Sea region in the Holocene and its changes under human influence]. In Sidorenko, A.V. (ed.), *Antropogennyye faktory v istorii razvitiya sovremennykh ekosistem [Anthropogenic Factors of Contemporary Ecosystem Development]*. "Nauka," Moscow, pp. 74-87. (In Russian)
- Sapozhnikov, I.V., and Sapozhnikova, G.V., 2002. Pizniopaleoliticheskiye gospodarsko-pobutovyye komplekсы ta zhytla stepovoy Ukrainy [Late Paleolithic livelihood complexes and dwellings of Steppe Ukraine]. In Zaliznyak, L.L. (ed.), *Kam'iana doba Ukrainy [Stone Age of Ukraine]*, "Shlyakh," Kyiv, pp. 82-95. (In Ukrainian)
- Stanko, V.N., and Svezhentsev, Yu.S., 1988. Hronologiya i periodizatsiya pozdnego paleolita i mezolita Severnogo Prichemomor'ya [Chronology and periodization of the Late Paleolithic and Mesolithic of the Northern Pontic region], *Bulleten Komissii po izucheniyu chetvertichnogo perioda [Bulletin of the Commission for Quaternary Period Studies]* 57: 116-120. (In Russian)
- Telegin, D.Ya., 1980. Izucheniye domostroitelstva i planirovaniya poseleniy mezoliticheskogo vremeni v Podneprov'e [Studies of house bulging and settlements structuring at the Mesolithic of the Dnieper river basin]. In Artemenko, I.I. (ed.), *Arkheologicheskie issledovaniya na Ukraine v 1978-1979 godakh [Archaeological Studies in Ukraine in 1978-1979]*. Tezisy XVIII konferentsii NA AN USSR, Dniepropetrovsk, pp. 34-35. (In Russian)
- Telegin, D.Ya., 1982. *Mezoliticheskiye pam'yatki Ukrainy [Mesolithic Sites of Ukraine]*. "Naukova dumka," Kyiv. (In Ukrainian)
- Veklich, M.F., 1987. *Problemy paleoklimatologii [Problems of Paleoclimatology]*. "Naukova dumka," Kiev. (In Russian)
- Zaliznyak, L.L., 1981. O geneticheskoy podosnove tatskenki-kudlaevskoy mezoliticheskoy kultury [On the origins of the Tatskenki-Kudlaevka Mesolithic culture]. In Artemenko, I.I. (ed.), *Drevnosti Srednego Podneprov'ia [Antiquities of the Middle Dnieper Basin]*, "Naukova dumka," Kiev, pp. 5-13. (In Russian)