Studia Antiqua et Archaeologica XVIII, 2012, 93-113

COPING WITH THE LANDSCAPE: SUBSISTENCE STRATEGIES OF LATE BRONZE AGE COMMUNITIES WITHIN THE BÂRLAD BASIN, EASTERN ROMANIA[1]

ELENA VIERU[2]

Keywords: the Bârlad Basin, Late Bronze Age, landscape, opportinities and constraints, strategies

Abstract: *The article is a sequence of a wider research concerning Late Bronze Age habitat in the basin of the Bârlad river (Eastern part of Romania). Though there are known few similar papers, the novelty of this one is given by the detailed analysis, whose main result is obtaining a wider perspective on a less studied region. The starting point is the database that recorded the Noua culture's sites from the specified region. From the purpuses of this article, I emphasise the identification of strategies used by Late Bronze Age communities to adapt to the peculiarities of the studied region.*

Rezumat: *Articolul reprezintă o secvenţă a unei cercetări mai vaste axate pe analiza habitatului în perioada Bronzului târziu în bazinul râului Bârlad. Deşi sunt cunoscute studii similare, noutatea acestui demers constă în aprofundarea analizei (şi prin utilizarea unor metode preluate din alte domenii) precum şi realizarea unei imagini asupra unei regiuni mai puţin cercetate din această perspectivă. Baza analizei a constituit-o catalogul descoperirilor care a înregistrat situri ale culturii Noua în spaţiul menţionat. Dintre finalităţile lucrării se evidenţiază cea care vizează strategiile utilizate de comunităţile Bronzului târziu pentru a se plia pe particularităţile regiunii studiate.*

Introduction

One of the basic missions of a culture is to generate behaviours compatible with survival[3]. According to this idea the individuals are able to survive if they adapt to the peculiarities of the inhabited region through

---

[1] This topic was subject to a paper presented, in a similar form, at the 17th Annual Meeting of the EAA (section: Environmental Archaeology: the Interaction of Natural Science and Archaeology) held in Oslo, Norway during 14th-18th September 2011.

[2] "Alexandru Ioan Cuza" University of Iaşi, ella_vieru@yahoo.com.

[3] LAYTON, UCKO 1999, 8.

culture, which amplifies the individuals' capacities to transform and manipulate the environment[4]. Moreover, the life of a community is not limited to the settlement[5]. Thus, an analysis focused on the interaction communities-environment has the potential to reveal possible ways in which Late Bronze Age human groups responded to the constraints and the opportunities offered by the Bârlad Basin.

Aims and methods

The present paper is divided into two major parts: the first consists in describing the main geographical features while the second section focuses on the impact of these peculiarities on individuals living.

Delimiting the study area and defining the geographical background is the beginning point of this study. That is why this work examines at first evidence about the geographic, geomorphological, hydrologic and climatological framework. Moreover, it looks in particularly at the avantages and disadvantages of this region's traits for human groups. In order to do so, it was necessary to realise a wide database using data from archaeological literature, supplemented by the ones from my own research. It comprises currently c. 285 sites, out of which less than half are considered to be settlements.

The distribution of the sites in the Bârlad basin has the potential to shed light on aspects of the relationship between individuals and environment (which looks in particularly at the settlement locations in order to understand its advantages for human groups), which is the subject to the second part of this study.

I. The physical landscape and actual perceptions

At the beginning of the Late Bronze Age, the communities of Noua culture occupied a significant area, limited eastward by Dniestr river, westward by the Apuseni Mt., to the north by Northern Carpathians and

[4] LAYTON, UCKO 1999, 10.
[5] DARWILL 1999, 108.

the southern limit is given by the Siret-Prut confluence point (Fig. 1/a)[6]. The studied region is limited only to a small part of this important territorial framework: the basin of Bârlad river, located in the Eastern part of Romania. The area we focus upon is the south-western component of the Moldavian Plateau, which is not limited to west by the Pruth river, but continues in the north-pontic region with Codru Bâcului Hills[7].

a) The geographical peculiarities of the region

Within this territorial framework, one can distinguish three main altitudinal levels. It is a transition area from higher hills (around 400 m) in the north to mounds (around 300 m) in the middle zone and to plain landscape (250 m→11 m) in the southern end (Fig. 1/b). As surface rocks, there are mainly clay, sand and limestone (in the northern half) and pebble, sand and loess in the rest[8]. The area is very poor in metal resources, available being the wood, fauna and flora elements and the mentioned rocks[9]. Taking into account that the chronological framework is the end of the Bronze Age, when bronze metallurgy reached its climax, the lack of raw metal resources must have been a serious constraint of the environment and also a challenge for this small-scale communities.

b) Hidrography and paleo-hidrography

Despite the fact that the study area seems rich in water supplies, the lack of rainfall can often lead to the drying up or to the frost of these small rivers (Fig. 2)[10]. Moreover, the analysis of the phreatic and depth aquifer indicated that the Bârlad basin is also poor in water supplies. The main quantity of water, 65-75%, comes from rainfall and only 25-35 % from the underground supplies[11]. So, although in the central region of the Bârlad Basin there are substantial water supplies, these are too deep to

[6] VULPE 2001, 281.
[7] CHICIDEANU 2011, 17.
[8] UNGUREANU 1993, 89.
[9] MUTIHAC, STRATULAT, FECHET 2007, 29.
[10] ROŞU 1983, 98-99.
[11] PANTAZICĂ, APĂVĂLOAIE 1972, 26.

generate springs. So, as this resource was essential for subsistence, and because the droughts are frequent in this region[12], the most suitable areas, rich in springs and water supplies, were the lowlands.

Though most of the streams are short, with minimum flow during the winter, they flood their valleys during the spring mostly due to the (torrential) rainfall regime and the low inclines[13]; as a consequence, habitation in the proper valleys is not recommended[14]. According to the geomorphological studies carried out in the Bârlad basin, during the second half of the Holocene the size of the river-beds and paleo-meanders were 4-5 times bigger than today (Fig. 3)[15]. I believe this is another argument for the fact that river valleys were often flooded in the spring. The advantage of this process is that after flooding, the meadow vegetation was more abundand, therefore suitable for grazing[16].

c) Paleo-climate

The location of the Bârlad Basin near the Black Sea, but also in the proximity of the mountainous area, influenced the climate, which is continental-temperate, but with regional variations[17]. Within the territorial framework, two micro-climatic regions can be distiguished: the northern half with continental influences, and the southern part with steppe climatic elements[18]. The northern region is directly influenced by the Syberian anticyclone, so winters are longer (surpassing with 70 to 110 days the calendar winter) and the frost lasts about 160-200 days[19].

---

[12] It is known that this phenomena lasted, in some cases, to 60-100 days, especially in the steppe regions (ENCULESCU 1924, 43).
[13] ROŞU 1983, 97.
[14] RĂDOANE, RĂDOANE 2007, 9.
[15] RĂDOANE, RĂDOANE 2004, 13.
[16] Most vulnerable regions for flooding are the low levels of meadow (2-4 m), that nowadays remain around 15 days under water after flooding (PANTAZICĂ, APĂVĂLOAIE 1972, 28).
[17] ROŞU 1983, 81.
[18] ROŞU 1983, 81.
[19] PANTAZICĂ, SCHRAM 1964, 202.

Late Bronze Age covers the last part of Subboreal. Despite earlier beliefs, recents studies have shown that this climatic phase (Subboreal) was far from being constant, uniform, with warm, arid climate[20]. The pollen based-quantitative reconstructions of Holocene climate, using two pollen sequences from NW Romania, revealed short-termed climatic oscillations during this interval. One of the strongest occur during the XIIIth→XIth century B.C., when it could be seen a clear cooling interval, interpreted as a decline in all the climate parameters, excepting precipitation (Fig. 4)[21].

The climatic conditions in this territorial framework were not very suitable for habitation: the winter were long, with low termperatures (frequently under -30º C), so a large amount of supplies was required for humans and their livestock. The summer was no better, because of the increased probability of droughts; if this phenomenon occurred 2-3 years successively, this could have had dramatic consequences. Another interesting point which remains to be further deepen is the impact of these climatic changes that occurred at the end of the Bronze Age. Coincidence or not, this climatic cooling excursion overlapped the end of Noua culture. In this context, a question arises: did that represent a constraint of the environment that caused sudden behaviour, that resulted in a better respond to this new challenge? Did the gradually changing climatic parameters generate an organic adaptation[22]? It should not be overlooked the possibility that climate change may have been, to some extent, responsible for the cultural changes that marked the end of Noua culture.

d) The paleo-floristic spectrum

The analysis of the paleo-floristic spectrum indicates that the Bârlad basin is a transition region between two main ecological landscapes: central European in the northern part (forests of oak,

[20] TOMESCU 1998-2000, 267.
[21] FEURDEAN et alii 2008, 500.
[22] KUNA 1995, 49.

hornbeam and also some steppe elements)[23] and the forest-steppe and steppe in the southern part[24].

The ecological traits of the region influenced aspects of the everyday life, like the economic activities or the diet of the communities.

e) Soil types

The soil types and their fertility influenced the crop productivity. The studied region is located at the interference of two main soil regions: chernozem, suitable for different types of plants, with high potential fertility for cereals (in the steppe region from east and south-east, and also along the terraces of the rivers) and brown soil, suitable for forests and certain types of crops (in the central and north-western part)[25].

Preliminary concluding remarks

In this region from South-Eastern Europe, defined by some major geographical marks (Danube, Carpathian Mountains, Black Sea), the Basin of Bârlad river is an area of geographical, climatic and ecological transition from a plateau configuration to mountainous region (Eastern Carpathians) towards west and to plains (Romania Plain) in the southern part. It is not the most suitable area to live in: the rainfall is sometimes torrential, flooding, othertimes missing at all, causing drought, the water streams freeze or dry up. The continental climatic influences bring major thermic contrasts, with long, harsh winters, which is a major disadvantage for the communities and their livestocks. The region is also poor in metal resources, so important during the Bronze Age. The soil is predominantly brown, thus not very fertile and of low productivity for cereals.

In these circumstances, a questions arises: which were the responses of the Late Bronze Age communities to the constraints and the opportunities of this region?

[23] BĂCĂUANU et alii 1980, 137.
[24] ROŞU 1983, 136.
[25] BARBU 1987, 158-159.

To outline some possible answers, I have been following several main aspects: the occupation of certain landforms, the access to water supplies, the exposure, the ecological potential, possible ways of replacing the missing raw materials.

II. People and places

The second part of this paper explores the possible interactions between Late Bronze Age communities and the inhabited environment. The starting idea of this analysis is that a settlement appears as a result of a community's predilection for a certain place, due to some advantages of the chosen setup. As a consequence, the study of sites distribution in relation to visible physical features has the potential to shed light on the reasons of Noua communities choices.

a) Communities preference for certain landforms

The database recorded so far around 285 Late Bronze Age sites in the Bârlad basin, out of which 180 are considered settlements. The distribution of all sites revealed clusters of settlements or "nests" (Fig. 5), but this can also be traced in another regions occupied by the communities of Noua culture[26].

Analysing the landforms on which Late Bronze Age settlements were established, I could trace sites density along the rivervalleys, on lowlands (low terraces, lowest slopes of the hills, small mounds in river valleys, even the higher levels from the valleys, around 4-6 m relative altitude), most of them with steppe elements. Generally, the relative altitude of the settlements vs. river valleys is smaller than 10 m (Fig. 6/a, b) and only occasionally exceeds this threshold (Fig. 6/c). The advantages of these places are: immediate access to water supplies and to strong springs (avoiding the risk of flooding[27]), productive soil (chernozem type), the availability of raw building materials (clay, pebble, wood). The rich pastures were stimulant for stock-breeding and agriculture. On the

[26] NICULICĂ 2006, 203.
[27] DRĂGOI 1979, 7.

contrary, these emplacements have the inconvenience that don't offer strong natural protection or visibility on the surrounding region.

The predilection for this specific physical features, though a feature of Noua culture, can be traced from the end of Middle Bronze Age (at settlements of the Monteoru culture: Pufeşti[28], Tercheşti[29], Cândeşti[30]), and, at a certain extent, at the beginning of Early Iron Age[31].

b) Location in relation to watercourses

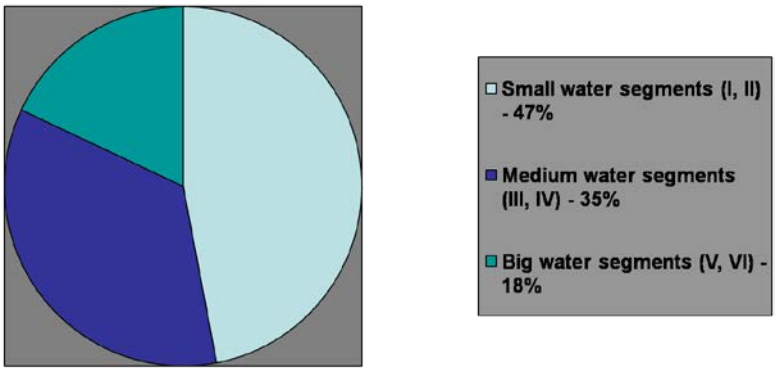
The analysis carried out reveals that around 72% of the identified settlements are less than 1,5 km far from a stream. So, this confirms the preference for locations very close to water streams[32], suitable for main economic activities: animal husbandry and, to a lesser extent, agriculture. If we regard these rivervalleys as pathways in a tripartite system (core-periphery-margin), then these communities are located in culturally permissive regions, permanently in contact with the dynamic cultural elements[33].

The settlements located near a confluence represent about 44 per cent of the sites examined. The advantage of this location is the access from three sides (mostly V, S, E) to water, and it provides natural protection in a certain degree. The confluences were points of hydrographic convergence, so they provided more water supplies[34]; if we accept that the river valleys were cultural pathways, then we can assess that confluences were places of cultural convergence.

In order to see if Noua communities preferred certain types of water segments, I applied the Horton-Strahler method to clasify the

[28] FLORESCU, NICU, RĂDULESCU 1971, 159-163. The authors of the investigations noted that the settlement has moved from the high plateau to the low slopes of the hill.
[29] FLORESCU, CONSTANTINESCU 1967, 297-299.
[30] FLORESCU, FLORESCU 1990, 51.
[31] LÁSZLÓ 1976, 59.
[32] This remark has been made since the first works on Noua culture settlements (PETRESCU-DÎMBOVIŢA 1953, 448; FLORESCU 1964, 146).
[33] BOLOHAN 2005, 169.
[34] DRĂGOI 1979, 32.

streams[35]. Therefore, in the Bârlad Basin there are 6 main water segments, first being the smallest tributary, and six being assigned to Bârlad river[36]. I did not analyze the settlements placed in confluences. From the 110 settlements, most of the were located near small and medium size water segments (as shown in the chart below) and only 19% near big size water parts (5th and 6th orders).



A possible interpretation to explain the avoidance of big streams is because of the high risk of flooding and also because the largest valleys were the most suitable ways for the "others" to come[37]. Still, it seems that defence was not their main concerne, because they had no kind of fortifications, nor did they choose naturally defended locations.

The analysis of settlement exposure indicated a suitable layout for most of them. Exposure, along with altitude and the slopes' angles, influences directly the intensity of solar radiation[38]. In 91%, the settlements have favourable exposure (they benefit of high values of the solar radiation, because the sunshines fall almost perpendicularly). These locations offer more heat, so necessary for people and their livestocks during long, cold winters. Also, this placement offers to the settlements

[35] STRAHLER 1973, 443.
[36] The length and water amount increase along with the number of the segment. STRAHLER 1973, 446.
[37] BOTZAN 1984, 149.
[38] LARION 2004, 18-19.

naturally protection against the cold air flow coming from the north during the winters.

c) The ecological landscape

The main features of the landscape were, more assuredly, considered when choosing a place to settle down. Though there aren't, so far, studies about the paleo-botanical evidence from LBA sites located in the Bârlad Basin[39], most likely agriculture was an important economic activity, as tools like sickles and grinders suggest[40]. These smale-scale communities had a mixed economy, stock-breeding vs. agriculture, where the second must have been subsidiary.

There are known some studies about paleo-faunistic series from Noua sites. Though the small number of studies suggest that these preliminary remarks should be used with caution, some observations can be made still. The settlements located in steppe regions reveal small percentage of wild animal bones and this might be interpreted as remoteness from forested areas and also decreased interest for hunting, which, most likely, became a sporadic economic activity[41].

The poximity to water most likely influenced the diet of the individuals; though a small number of fishbones and shells were found, they might not illustrate the real situation, because the soil acidity led even to the poor conservation on human and animal bones[42].

d) Obtaining raw materials or replacing them?

The lack of metal resources from this area must have been a serious problem for Late Bronze Age communities. How did they respond to this challenge: importing raw materials and products or using lower

[39] There are known this kind of studies for Noua sites from Ukraine (Mahala, Sloboda Shiurezciy) that revealed an important number of carbonised grain seeds (SAVA, KAISER 2011, 461); a similar situation was recorded at Coslogeni settlement (PASHKEVICH 2003, 294).

[40] Considered tools used predominantly in agriculture (SCORPAN 1995, 85-86).

[41] CÂRCIUMARU 1996, 50.

[42] HAIMOVICI 1965, 362.

quality raw materials, but more available? Most likely, the individuals used both strategies. The number of the known bronze items (around 180) of this region is very small comparing to the situation from the neighbouring Transilvanian metallurgical centre. Most of them are needles and sickles, so we are not talking of an important amount of metal; a possible explanation for this situation is the lack of metal resources, but the cultural specific of Noua communities should not be ignored. But the placement of the Bârlad Basin between two important metallurgical centres (Transilvanian and north-pontic ones) and the available natural routes facilitated not only the circulation of people, but also of goods and technologies[43].

Still, the small number of bronz tools suggests that the individuals must have used another types of raw material. The osteological remains from the sites are around 60-65% of the entire archaeological evidence. Therefore, this was highly available for individuals, so they used it for different bone tools, which simetimes imitate bronze shapes. Another type of resource used, but almost impossible to trace, is the wood. Though there are not any dendroarchaeological studies linked to my theme, this regions is known for its wood industries from old times.

Recent approaches focused on the importance of salt for the prehistoric communities. Salt supply was necessary for communties specialized in stock-breeding (especially during winter), both for animals, their products, humans[44], but also for leather working[45]. Due to interdisciplinary recent projects, in the Moldavian Subcarpathians were discovered over 200 salt water springs; in the proximity of some of them prehistoric material was highlighted, Late Bronze Age included[46].

Final remarks

To conclude, the geographical, climatic and ecological features of the Bârlad Basin required the use of certain strategies which aimed for a

[43] BOLOHAN 2005, 161-174.
[44] GUIJARRO 2011, 123.
[45] NESTEROV 1993, 55-58.
[46] ALEXIANU et alii 2011, 7.

better adaptation of the communities to the region they lived in. But in order to adapt to the peculiarities of the landscape, they should have known them first, because inhabiting a place involves understanding that place due to earlier experiences. If we accept the Eastern origin of Noua culture (this means that it is more than a cultural fashion that travelled, but a progressive movement of people), another hypothesis arises: the communities adapted organically to the geographical particularities of the region, because they already had the experience of living in a similar geographical setting. The Moldavian Plateau ends at Dniestr, so the geographical settings are similar on the both sides of Pruth river. So, my hypothesis is that Noua communities progressively settled down in a region with specific geographical configuration, from which they had certain expectations on behalf of their previous experiences.

Their experience/tradition enriched and diversified as human groups infiltrated further west, where they met different geographical and cultural areas. The contact with this new realities generated new behaviours in order to adapt to the peculiarities of the "colonised" regions[47].

REFERENCES

ALEXIANU, M., WELLER, O., BRIGAND, R., CURCĂ, R. G., COTIUGĂ, V., MOGA, I. 2011. *Salt Springs in Today's Rural World. An Etnoarchaeological Approach in Moldavia (Romania)*, in: *Archaeology and Anthropology of Salt: A Diachronic Approach. Proceedings of the International Colloquium, 1-5 October 008, Al. I. Cuza University (Iaşi, Romania)*, M. ALEXIANU, O. WELLER, R.-G. CURCĂ (eds.), Oxford, 7-24.

Atlasul Republicii Socialiste România 1972, Bucharest, sheet V-1.

BARBU, N. 1987. *Geografia solurilor*, Iaşi.

[47] This work was supported by the the European Social Fund in Romania, under the responsibility of the Managing Authority for the Sectoral Operational Programme for Human Resources Development 2007-2013 [grant POSDRU/CPP 107/DMI 1.5/S/78342].

BĂCĂUANU, V., BARBU, N., PANTAZICĂ, M., UNGUREANU, AL., CHIRIAC, D. 1980. *Podişul Moldovei – natură, om, economie*, Bucureşti.

BOLOHAN, N. 2005. *The Danube, Balkans, and Northern Aegean. Trade routes, influences and buffer zones in the Late Bronze Age,* in: Aegaeum 25, *EMPORIA. Aegeans in the Central and Eastern Mediterranean. Proceedings of the 10th International Aegean Conference/10e Rencontre égéenne internationale, Athens, Italian School of Archaeology, 14-18 April 2004*, LAFFINEUR, R. GRECO , E. (eds.), Liège-Austin, 161-174.

BOTZAN, M. 1984. *Apele în viaţa poporului român*, Bucureşti.

CÂRCIUMARU, M. 1996. *Paleoetnobotanica. Studii în preistoria şi protoistoria României (Istoria agriculturii din România)*, Iaşi.

DARWILL, T. 1999. *The historic environment, historic landscapes, and space-time-action models in landscape archaeology*, in UCKO, P. J., LAYTON, R. (eds.), *The Archaeology and Anthropology of Landscape. Shaping your landscape*, London-New York, 106-121.

DRĂGOI, C. 1979. *Apele din Moldova: studiu de geografie economică (Rezumatul tezei de doctorat)*, Iaşi.

ENCULESCU, P. 1924. *Zonele de vegetaţie lemnoasă din România în raport cu condiţiunile oro-hidrografice, climaterice, de sol şi de subsol*, I, Bucureşti.

FEURDEAN, A., KLOTZ, S., MOSBRUGGER, V., WOHLFARTH, B. 2008. *Pollen-based quantitative reconstruction of Holocene climate variability in NW Romania*, Palaeogeography, Paleaoclimatology, Palaeoecology 260, 494-504.

FLORESCU, A. C. 1964. *Contribuţii la cunoaşterea culturii Noua*, ArhMold 2-3, 143-216.

FLORESCU, M., CONSTANTINESCU, GHE. 1967. *Cercetări arheologice în aşezarea din epoca bronzului (cultura Monteoru) de la Tercheşti (r. Focşani, reg. Galaţi)*, SCIV 18, 2, 285-305.

FLORESCU, M., FLORESCU, A. C. 1990. *Unele observaţii cu privire la geneza culturii Noua în zonele de curbură ale Carpaţilor Răsăriteni*, ArhMold 13, 49-102.

FLORESCU, M., NICU, M., RĂDULESCU, GHE. 1971. *Cîteva date referitoare la fazele tîrzii ale culturii Monteoru în lumina cercetărilor de la Pufeşti*, MemAnt 3, 157-182.

GUIJARRO, J. J. 2011. *The Beginning of the Salt Exploitation in Spain: Thinking about the Salt Exploitation in the Iberian Peninsula during Prehistoric Times*, in: *Archaeology and Anthropology of Salt: A Diachronic Approach. Proceedings of the International Colloquium, 1-5 October 008, Al. I. Cuza University (Iaşi, Romania)*, M. ALEXIANU, O. WELLER, R.-G. CURCĂ (eds.), Oxford, 123-133.

HAIMOVICI, S. 1965. *Studiul particularităţilor morfologice ale scheletului unor animale domestice şi sălbatice descoperite în staţiunile epocii bronzului din România (Studiul paleofaunei din epoca bronzului)*, teză de doctorat, Iaşi.

SAVA, E., KAISER, E. 2011. *Poselenie s „zol'nikami" u sela Odaia-Mičurin, Respublika Moldova (Arheologhičeskie i estestvennonaučnîe issledovaniia)/Die Siedlung mit „Aschehügeln" beim dorf Odaia-Miciurin, Republik Moldova (Archäologische und naturwissenschaftliche Untersuchungen)*, Chişinău.

KUNA, M. 1995. *Pre-historic Prehistory*, in KUNA, M., VENCLOVÁ, N. (eds.). *Whither Archaeology. Papers in honour of Evžen Neustupný*, Praha, 43-51.

LARION, D. 2004. *Clima municipiului Vaslui*, Iaşi.

LÁSZLÓ, A. 1976. *Începuturile primei vârste a fierului pe teritoriul Moldovei – unele rezultate şi probleme*, CercIst 7, 57-76.

LAYTON, R., UCKO, P. J. 1999. *Introduction: gazing on the landscape and encountering the environment*, in: *The Archaeology and Anthropology of Landscape*, P. J. UCKO, R. LAYTON (eds.), London and New York.

MOTZOI-CHICIDEANU, I. 2011. *Obiceiuri funerare în epoca bronzului la Dunărea Mijlocie şi Inferioară*, I, II, Bucureşti.

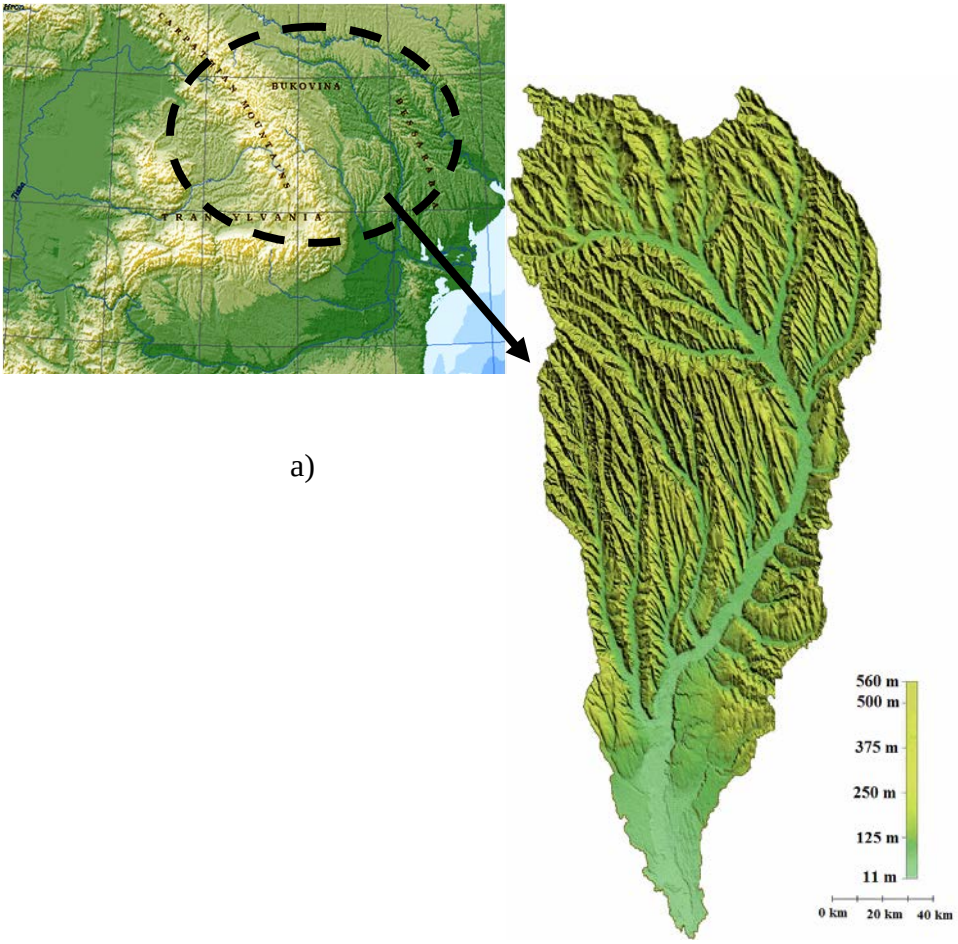
MUTIHAC, V., STRATULAT, M. I., FECHET, R. M. 2007. *Geologia României*, Bucureşti.

NESTEROV, V. 1993. *Blănurile de vânat. Recoltare, conservare, argăsire şi tăbăcire*, Bucureşti.

NICULICĂ, B. P. 2006. *Epoca mijlocie şi târzie a bronzului în Podişul Sucevei*, teză de doctorat, Iaşi.

PANTAZICĂ, M., APĂVĂLOAIE, M. 1972. *Rezervele de apă din bazinul Bârladului*, AŞUI, secţ. II, XVIII, 19-30.

PANTAZICĂ, M., SCHRAM, M. 1964. *Contribuţii la cunoaşterea regimului de îngheţ al râurilor din bazinul Bârladului,* St. cerc. Geogr. Ins. Ped. Bacău, 201-207.
PASHKEVICH, G. 2003. *Palaeoethnobotanical Evidence of Agriculture in the Steppe and the Forest-steppe of East Europe in the Late Neolithic and Bronze Age*, in: *Prehistoric Steppe adaptation and the horse*, M. LEVINE, C. RENFREW, K. BOYLE (eds.), Cambridge, 287-297.
PETRESCU-DÎMBOVIŢA, M. 1953. *Contribuţii la problema sfârşitului epocii bronzului şi începutului epocii fierului în Moldova*, SCIV IV, 3-4, 443-486.
RĂDOANE, M., RĂDOANE, N. 2004. *Morfologia albiei râului Bârlad şi variabilitatea depozitelor actuale*, Revista de geomorfologie 4-5, 85-98.
RĂDOANE, M., RĂDOANE, N. 2007. *Răspunsul unei albii adâncite în roci coezive la acţiunea factorilor de control naturali şi antropici*, Studii şi cercetări de geografie, LIII-LIV, 1-13.
ROŞU, AL. 1983. *Geografia fizică a României*, Bucureşti.
SCORPAN, C. 1995. *Terminologie arheologică selectivă. Tezaur de termeni*, I, Bucureşti.
STRAHLER, A. N. 1973. *Geografia fizică*, Bucureşti.
TOMESCU, M. 1998-2000. *Holocenul – date cronologice şi climatice*, CA XI, I, 235-270.
UNGUREANU, AL. 1993. *Geografia podişurilor şi câmpiilor României*, Iaşi.
VULPE, AL. 2001. *Epoca metalelor*, in PETRESCU-DÎMBOVIŢA, M., VULPE, AL. (eds.), *Istoria Românilor*, I. *Moştenirea timpurilor îndepărtate* (coord. M. P), Bucureşti, 212-294.



a)

b)

Figure 1. a) Region inhabited by Late Bronze Age (Noua culture) communities ; b) Location of the study area and the physical background (after Maria Rădoane, Nicolae Rădoane, 2007, fig. 1)

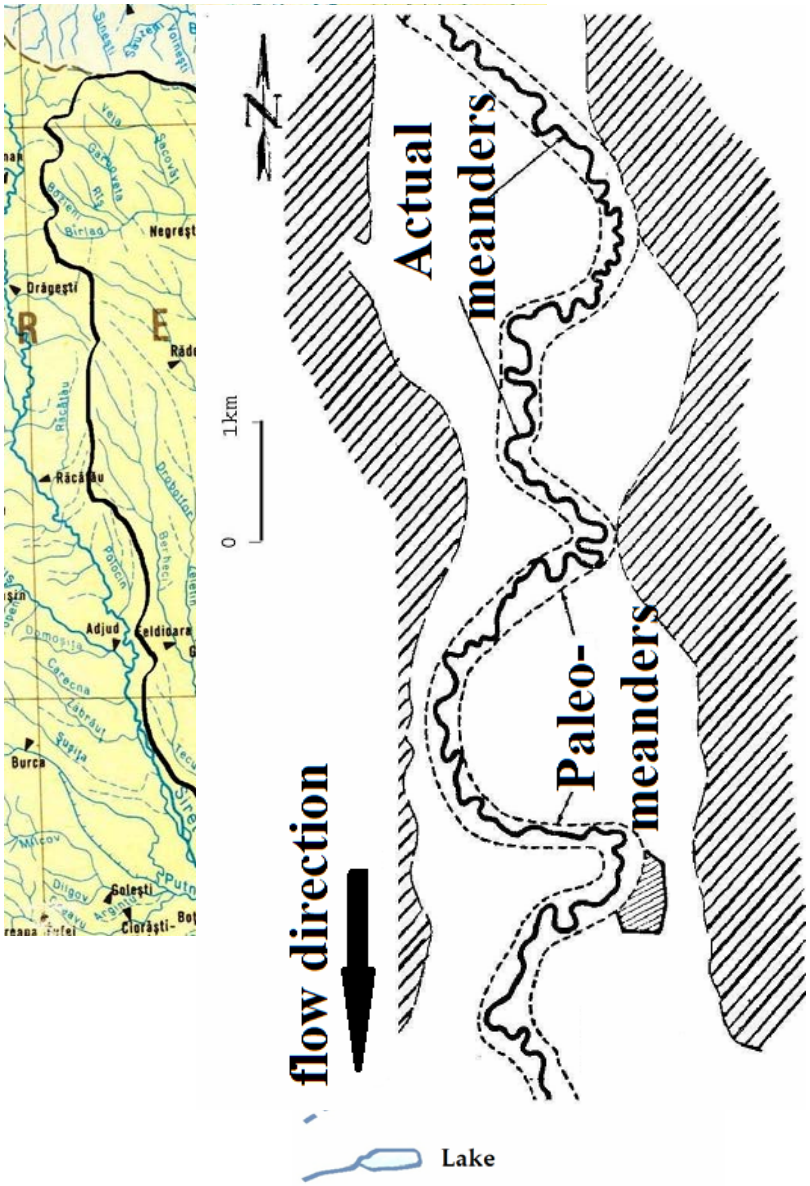


Figure 2. Map with main rivers from the Bârlad river's basin (after Atlasul Republicii Socialiste România 1972, sheet V-1)

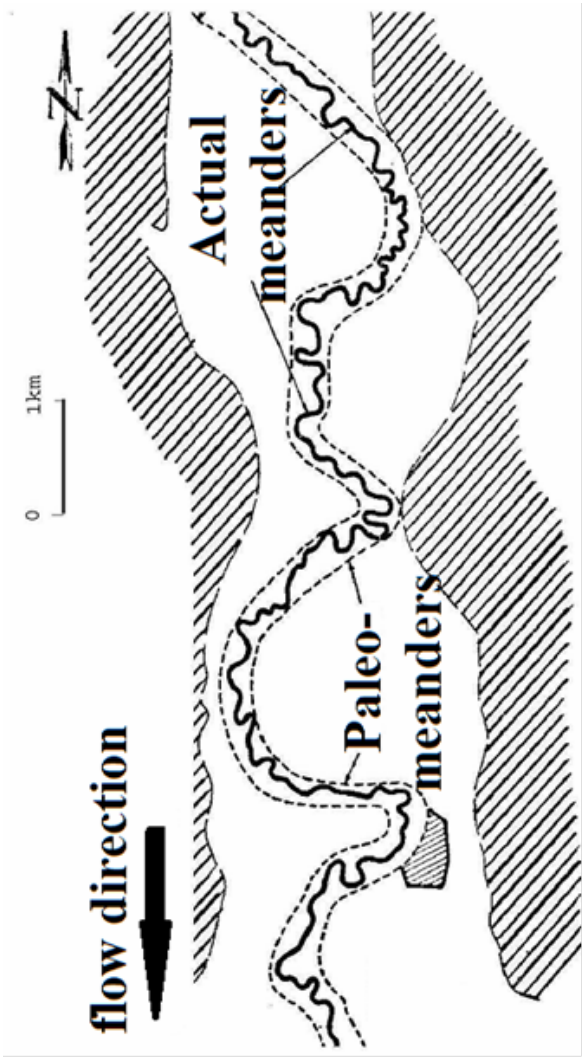
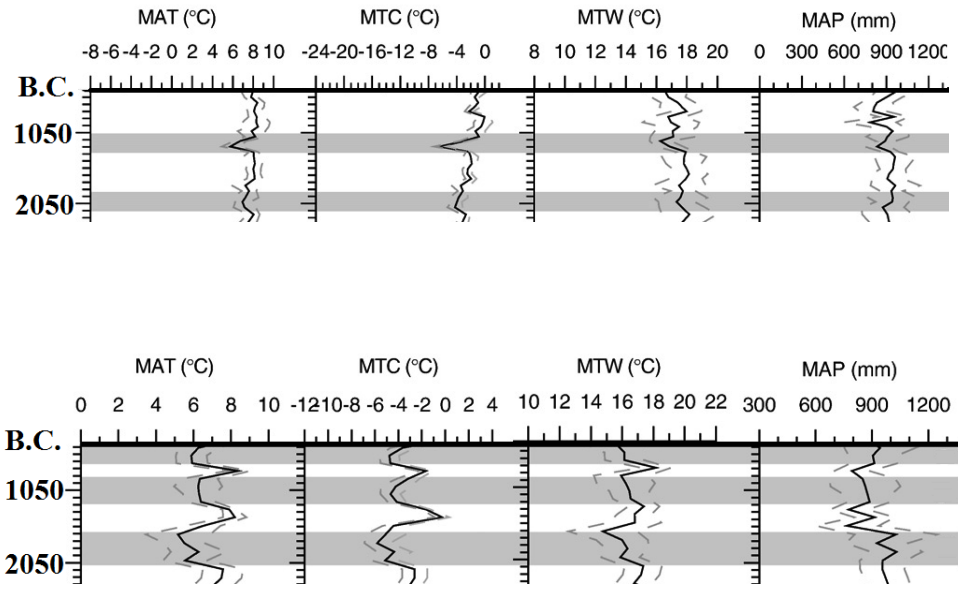


Figure 3. The relationship between current meanders and paleo-meanders – the valley of Bârlad river downstream of Muntenii de Jos commune, Vaslui county (after Maria Rădoane, Nicolae Rădoane, 2004, fig. 11)



Legend:
- MAT – mean annual temperature;
- MTC – temperature of the coldest month;
- MTW – temperature of the warmest month;
- MAP – mean annual precipitation;
- The black curve – mean values and the grey – maximum and minimum values;
- The grey horizontal bars – the time-interval of major short-term climatic changes.

Figure 4. The reconstruction of Late Bronze Age climate, using pollen profiles from Steregoiu (up) and Preluca Ţiganului (down) (Angelica Feurdean et allii, 2008, fig. 3; 4)

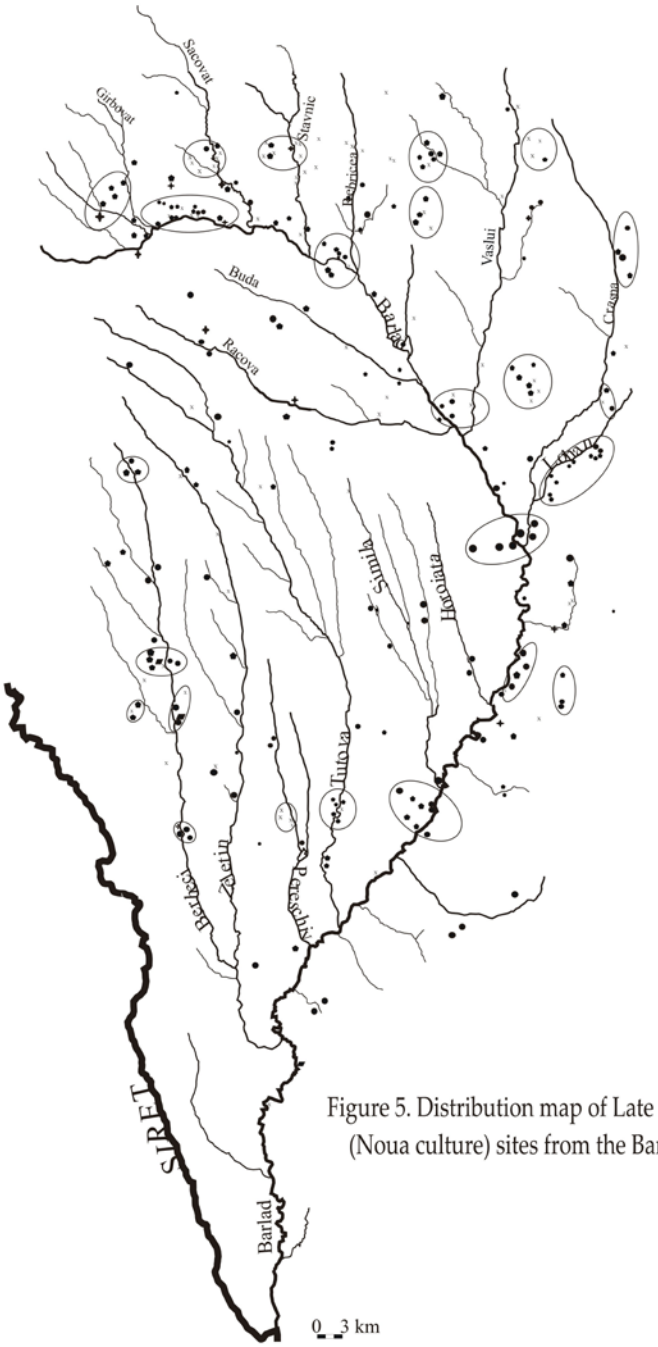


Figure 5. Distribution map of Late Bronze Age (Noua culture) sites from the Barlad Basin

a) Buhăieşti – *La Răşcanu*

b) Rateşu Cuzei – *La Chiuă*

c) Vultureşti – *Şanţul lui Racoviţă*

Figure 6. Noua settlements from Buhăieşti – *La Răşcanu,* Rateşu Cuzei - *La Chiuă* and Vultureşti – *Şanţul lui Racoviţă* (personal archive: the photos were taken from the rivers' banks)