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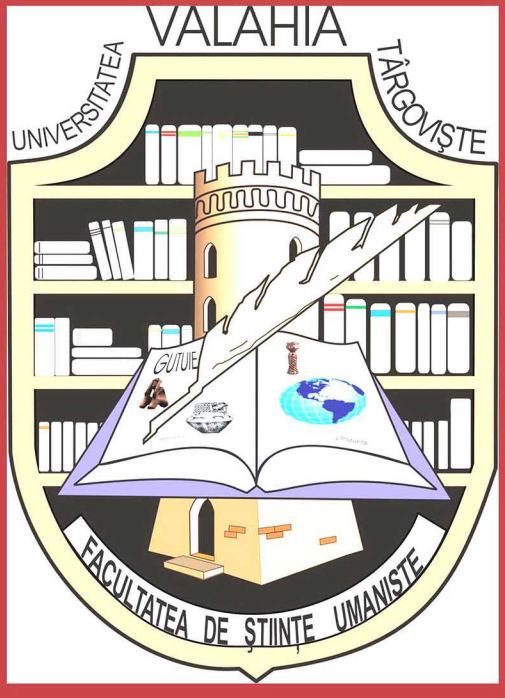

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Improving research results through analytical power

Preliminary data on the child's tomb discovered in the Paleolithic site of Cosăuţi (Republic of Moldova)

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Abstact: *Preliminary data on the child's tomb discovered in the Paleolithic site of Cosăuţi (Republic of Moldova).* The study presents an exceptional anthropological discovery made in 1987 in the upper paleolithic site from Cosăuţi by Ilie Borziac. Due to unfavorable circumstances, the child's tomb remained properly unexploited scientific until present. Are given the preliminary results obtained by interdisciplinary research team formed especially for conservation and investigation the child's tomb from Cosăuţi.

Key words: Child's tomb, Cosăuţi, Moldova, Upper Paleolithic, conservation, anthropological analysis.

The Paleolithic site of Cosăuţi, located at about 500 m northwest of the homonym village on the bank of the Dniester River, in the northeastern part of the Republic of Moldova (Fig. 1), has won a meritorious place within the study of the prehistory of the European space and within the international archeology due to the relentless efforts made by the regretted colleague Ilie Borziac (1948-2010). Discovered in 1978, the archeological site was systematically researched during the period 1981-1997, providing remarkable archeological finds, reflected in artifacts of special value, both artistically and in terms of symbolic and spiritual meaning.

Together with the settlement of Mitoc-Malul Galben, the one of Cosăuţi can be quoted among the few Paleolithic settlements of the east-European area where interdisciplinary, complex and systematic archeological researches were carried out. Results obtained here contributed to the understanding of the evolution of the human communities and of the habitat at the end of the Upper Paleolithic.

Unfortunately the early death of Ilie Borziac left the results of the archeological researches unpublished within a monographic volume, many of the discoveries made here remaining without a proper scientific valorization. Among these, the identification, in 1987, of a child's tomb, a unique find within this geographic area.

According to the excavation report of that year, written in Russian, submitted by Ilie Borziac and registered under no. 201108 - inv. no. 265 at the Archeological Archive, which is nowadays preserved within the National History and Archeology Museum of Moldova, the author of the research would mention that the tomb was identified in square K1, the upper part of the skull

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being at the depth of 872 cm compared to the zero level of the settlement.

In the same report, Ilie Borziac also noted that the tomb is connected to Layer 2B (layer which is also dated through C14), more exact the rounded stain-shaped agglomeration, with the traces of a hearth in the middles, interpreted as a habitation complex (dwelling). The tomb was located in the northern part of this complex, at a depth 7-10cm smaller than the one of Layer 2B, but without having the possibility of identifying clearly the traces of a pit. The cultural remains of Layer 2B (small animal bones, flint items, charcoals) fully covered the surface above the skeleton. In the southern part of square K1, in the hypothetic location of the basin and leg bones, the culture layer was slightly colored in red, through very fine ochre particles, fact that determined the author of the discovery state that ocher would have been spread above the tomb.

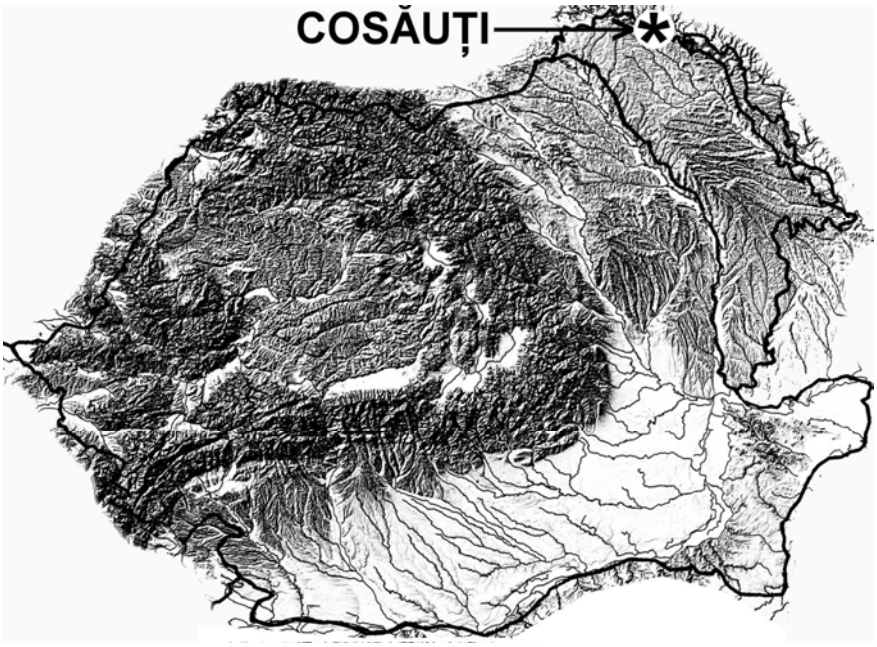

Fig.1 - Map with location of archaeological site from Cosăuţi.

The skeleton was partially researched, being unveiled in the upper part, in the area of the skull, arm bones and at the level of the thorax. The author of the report also noted that during the process of coming to light phalanges of the right hand were dislocated and possibly the knees were partly touches when digging the culture layer, as they had an upper location. The bones of the basin and of the feet were not unveiled, the tomb being extracted *in situ*, for later research.

About the position of the body, the report specifies expressly the fact that the skull was northwest oriented and that it was initially thought that the position would be folded, lying on the right side, but the later cleaning brought to light the fact that the skeleton was lying on the back, with a slight turn to the left, and the face was directed towards the thorax. The bones of the right arm were lying along the skeleton, and the left arm was slightly bent from the elbow.

The author of the report also mentioned it was a child's tomb, probably *infans I*, mentioning the fact that the discovery was drawn and photographed, referring to the illustration annexed to the report (drawings 22-24 and photographs 26-28 of the report) (Fig. 2-6).

The discovery was announced by Ilie Borziac to the scientific community within the conference organized at Tashkent in 1988, dedicated to the celebration of 50 years since the discovery of the tomb in the cave Teshik Tash. In the short note published in the papers of the event*, the author

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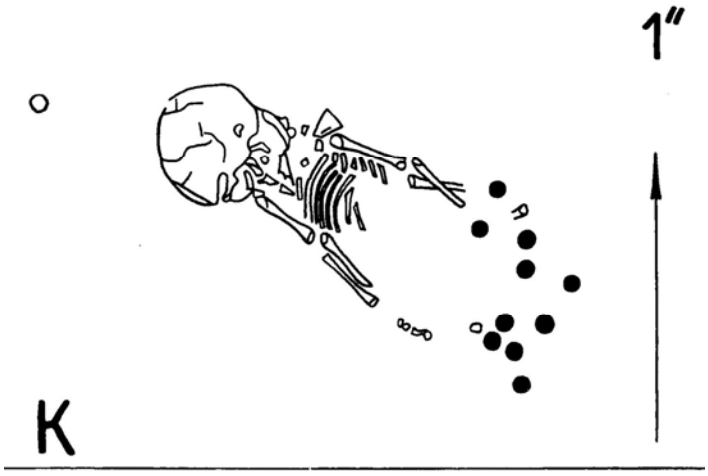

Fig. 2 - Child's tomb discovered at Cosăuţi. Drawing from excavation report submitted by Ilie Borziac (1987)

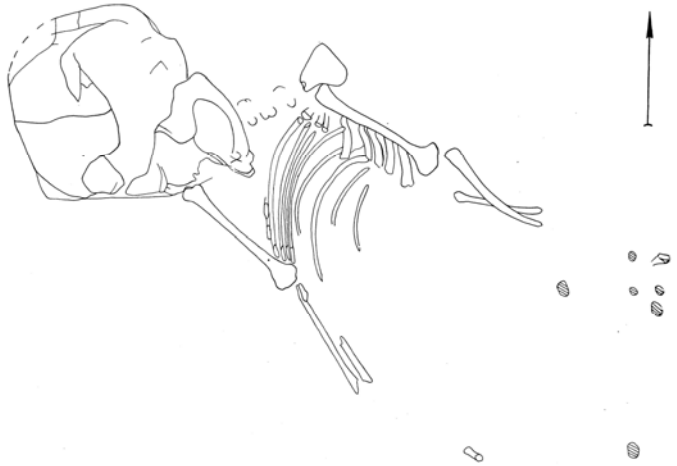

Fig. 3 - Child's tomb discovered at Cosăuţi. Drawing from excavation report submitted by Ilie Borziac (1987)

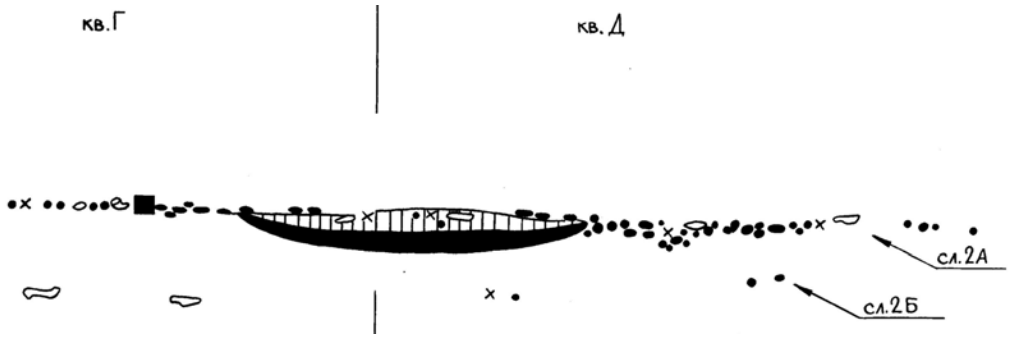

Fig. 4 - Child's tomb discovered at Cosăuţi. Drawing with stratigraphic section from excavation report submitted by Ilie Borziac (1987)

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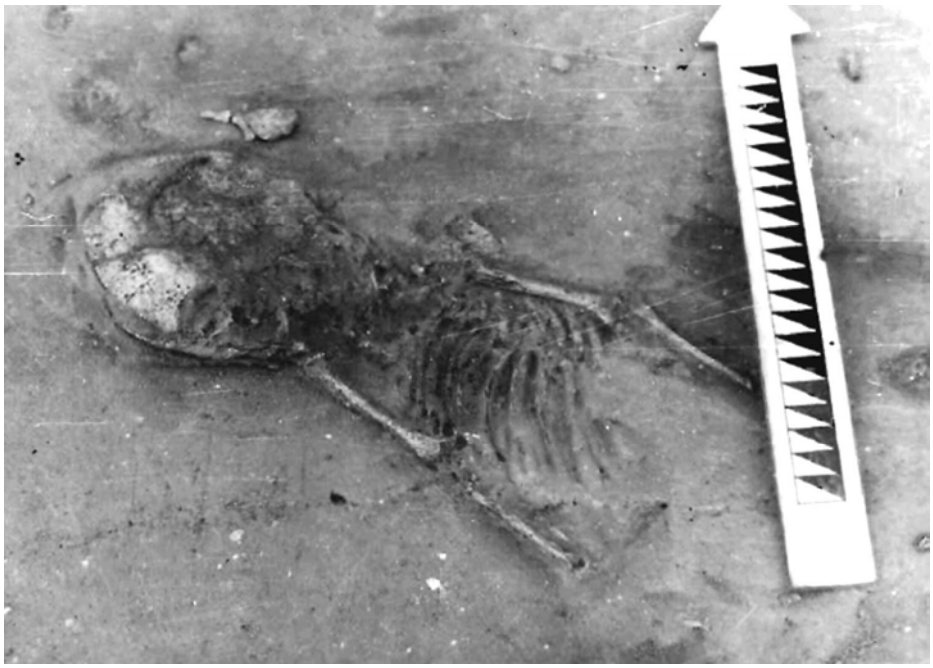

Fig. 5 - Child's tomb discovered at Cosăuţi. Photo from excavation report submitted by Ilie Borziac (1987).

Fig. 6 - Child's tomb discovered at Cosăuţi. Photo from excavation report submitted by Ilie Borziac (1987)

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repeats some of those highlighted in the report archaeological, making some clarifications on ages of cultural layers.

Later on, within the study entitled *Quelques données préalables sur l'habitat tardipaléolithique pluristratifié de Cosseoutsy*, published in 1991 in the volume edited by V.Chirica and D.Monah – *Le Paleolithique et le Neolithique de la Roumanie en context européen*, Ilie Borziac specified approximately the same elements as those contained in the initial report on the discovery, with the difference that the red ochre was indicated as a sure presence and with the mention that elements of the inventory were missing.

In the wide volume published in 2009, Pierre Noiret mentioned about this discovery at pages 252-253 that it would the tomb of *a male child, discovered at 17 cm under the level of Layer 2B*, taking over correctly the other information specified above, regarding the orientation, the position of its body or the intention for a detailed research through the *in situ* extraction.

Another note on this tomb is the one provided by Serghei Colavenco in 2010 contained in the wide volume *Istoria Moldovei*, at page 155. Having participated in the excavations of Cosăuţi of 1987, he mentioned the fact that the position of the skeleton was folded on the right side, above it red ocher being spread, advancing the hypothesis that its location at the extremity of the dwelling was due to the fact that, probably, in winter, the soil was frozen and did not allow digging too deeply. He also added the fact that this discovery has not been satisfactorily researched until then.

As Ilie Borziac would put down in his report of 1987, and also in the study of 1991, the tomb was extracted in the form of a monolith block (*in situ*) so to allow a later research. After discovery, the tomb was exhibited within the permanent exhibition of the History and Archeology Museum of Chişinău, being then withdrawn and temporarily stored in one of the working offices of the researchers, according to the information provided by Ion Tentiuc Ph D. Later on, it was moved to the underground level of the main building, in a room meant for the processing of the archeological material.

Fig.7 Detail of the Child's tomb discovered at Cosăuţi with dust and other materials that have accumulated over time (May 2012)

Paradoxically, for almost 25 years, this important archeological discovery, has not drawn the attention of the researchers in the field, remaining practically unknown, although the scientific potential thereof is huge, being a unique discovery in the east-European areal. In relation to

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the year of the discovery, the development of the methods of scientific investigation allow now a complex investigation hereof, but one should take into consideration the fact that the long period of time elapsed since the discovery, and the preservation conditions in which it was kept might have led to an irreversible decay thereof.

Many references were made to the potential of this discovery in the recent study regarding the anthropological Paleolithic finds on the territory of Romania and of the Republic of Moldova (M. Văleanu 2012, p. 25), in relation to another interesting subject for the scientific debate more precisely the matter of the transition from the Paleolithic to the Neolithic within the Carpathian – Dniestrian space. This discovery can represent an important link between the Paleolithic environment and the human communities of this area and those connected to the later Neolithic habitation of the region. With the occasion, the author of the study mentioned expressly the "delicate" matters pertaining to this important scientific heritage

Taking into account the links and the previous collaboration between researchers from Romania and those from the Republic of Moldova, attempts were made to try to create an interdisciplinary team for the study of this important find.

The sustained efforts resulted into the conclusion of a collaboration protocol between the National History and Archeology Museum of Moldova, the Institute of Cultural Heritage within the Academy of Sciences of the Republic of Moldova, "Al. I. Cuza" University in Iaşi and "Moldova" National Museum Complex of Iaşi, being made of a team of specialists formed of M. C. Văleanu, L. Bejenaru, V. Burlacu, S. Covalenco, C. Lacătuşu, I. Tentiuc. We should mention in this context the special support we received from Eugen Sava PhD, director of the National History and Archeology Museum of Moldova, and by colleague Aurel Zanoci PhD.

The main objective of the new team was to assure the best conditions for the conservation of the discovery. In this regard, mention should be made of the fact that a meticulous cleaning of the tomb was undertaken, removing the dust and other materials which were accumulated throughout time (Fig. 7). The loess in which the skeleton was incorporated as a result of the environmental conditions which led to the evaporation of water, acquired special hardness. Detachable bone fragments were picked from the geologic layer and stored in special bags (Fig. 8-9). The tomb was covered with a textile material, on top of which a wooden case for protection was placed.

Regarding the state of conservation of the skeleton, we can state that in the archeological level its condition until the moment of its discovery was rather good, taking into account on one side the age of its laying and on the other hand the deceased child's very young age and therefore the higher degree of bone immaturity. After the skeleton was extracted from the archeological level, although it remained in the initial position of the discovery in the middle of a considerable amount of sediment, bones turned very brittle during the 25 years of preservation, following the exposure conditions to the large differences of humidity and temperature. Also, comparing the photographs taken upon discovery with the current situation, we could notice the fact that certain bone fragments have not been preserved.

The skeleton was anthropologically only preliminarily examined, *in situ*, without extracting, cleaning and restoring the bones from the sediment (Fig. 6-9). The *in situ* skeleton appears in a folded position on the right side, some of its bones being covered by sediment and consequently inaccessible. In the current phase of the research, it was not possible to achieve the complete inventory of the skeleton elements, the corresponding measurements and neither were identified distinct taphonomic or paleopathologic signs.

Among the skull bones the mandible is missing, only the cranial calotte being better preserved with a longitudinal diameter (glabela-opistocranion) measured *in situ* of about 105 mm (fig. 9). From the vertebral column the thoracic vertebrae are visible and only impressions of the cervical ones. Several ribs also appear from the right side of the skeleton. We also have only few elements of the upper limbs skeleton: the right shoulder blade, the two humeruses, blades and impression of radius and of cubitus from both arms.

The age at the time of death, appreciated based on the maximal length of the humerus (right and left– an average of circa 69 mm), is the one of a new born – 6 months (M. Stloukal, M. Hanakova, 1978). The stature, appreciated on the

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basis of the maximal length of the same anatomic element, is of about 607 mm (E. P. Visser, 1998). It is not possible to tell the child's gender.

Regarding the dating of Layer 2B, in the report of 1987, Ilie Borziac mentioned expressly that it was dated using the C14 method. In the note published in 1988, he indicates two dates, 18200 ± (GIN – 4148) and 19.020 ± 925 (SOAN 2462). In the study published in 1991, was indicated only 19 020 ± 925 (SOAN 2462) obtained by V. A. Panytchev.

In the study published in 2003, the age of 16.620 ± 210 BP is indicated for Layer 2C, and 17.230 ± 140 BP for Layer 2A, data obtained at the laboratory of Groningen (P. Haessart *et al.*, 2003, fig.6-7).

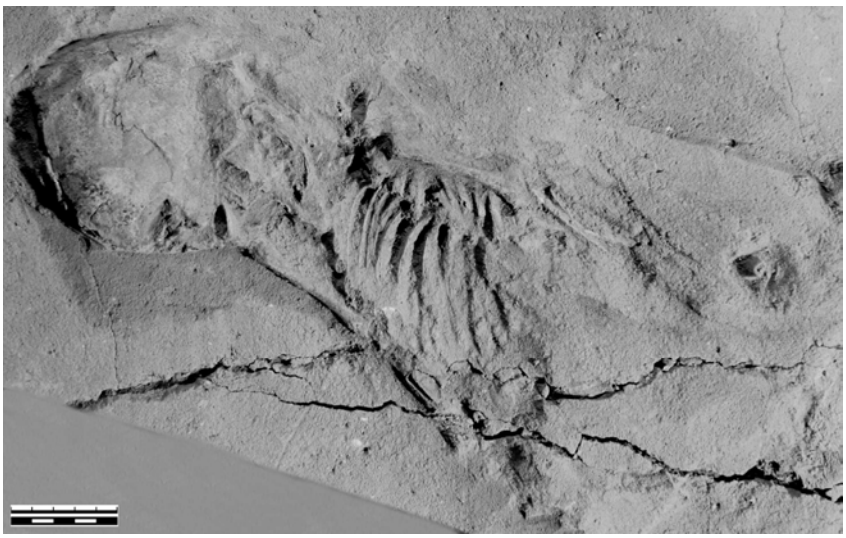

Fig.8 Child's tomb discovered at Cosăuţi after cleaning (May 2012)

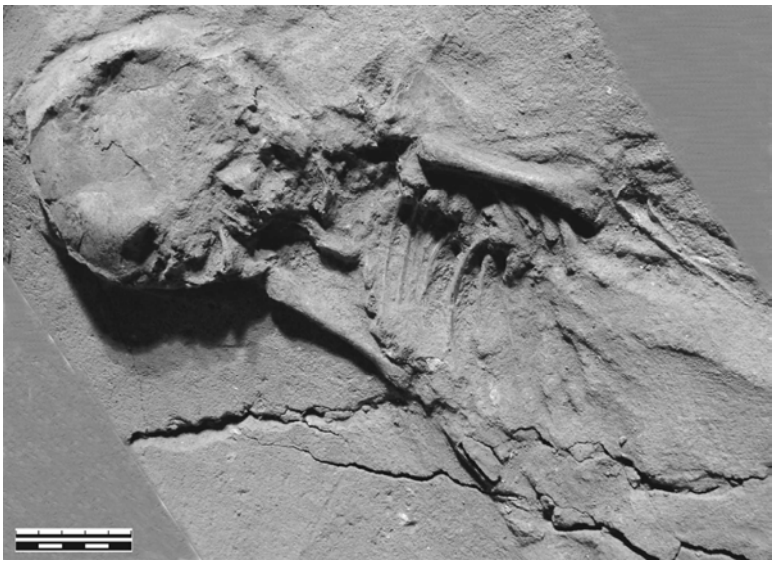

Fig.9 Child's tomb discovered at Cosăuţi after cleaning – detail (May 2012)

The discovery of the child's tomb of Cosăuţi sustains the similar discoveries dated to the European Upper Paleolithic. First of all, we would like to indicate the three child's tombs of Krems-

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Wachtberg (Austria) (T. Einwögerer *et al.* 2008, p. 15; M. Händel *et al.*, 2008, p. 187), but parallelisms can also be invoked to other similar finds such as those of Kostenki, Sungir or Lagar Velho, and last but not least La Grotte des Enfants (V. Formicola 2007, p. 448).

The tomb of Cosăuţi clearly denotes the voluntary deposition and the existence of religious manifestations pertaining to this gesture, through the presence of red ocher. Together with these manifestations, the adult's tombs of the European Gravettian which show connections pertaining to social structuring, shall constitute, in fact, the background for the following major social revolution that is neolithisation (O. Bar-Yosef 2002, p. 379). For this reason, the child's tomb of Cosăuţi must also be analyzed in the context of the prefiguration of the behaviors of the next phase, the Neolithic.

Or, in this context the discovery of Cosăuţi shows its real scientific potential, as it provides the opportunity of investigating the effective support of the cultural transmissions, represented by man.

Still, the task of the team created for the research of the child's tomb of Cosăuţi is a difficult one, to identify the most adequate means of scientific investigations thereof, taking into account its current situation and its possible deterioration in the 25 years since discovery. Given the fact that at present it has been assured the best passive conservation conditions, taking a decision on the manner of investigation must be the subject of a rigorous analysis.

*

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Note

*In the papers of the event, Проблемы взаимосвязи природы и общества в каменном веке в Средней Азии: докл. конф., посвящ 50-летию открытия погребения в гроте Тешик-Таш, Ташкент, 1988, the note is published on pages 14-16 and is entitled *Детское погребение на многослойной позднепалеолитичеокой стоянке Косочщ на среднем Днестре*. In volume published in1991, I. Borziac indicated another title for this note, with reference to page 18. In his reference list in Homage volume published in 2008, is given another title for this paper, with reference to page 34-40.

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Abstract: Characteristics of the environment in the Moldavian Sub-Carpathians during the evolution of the Cucuteni culture. The present study attempts a general reconstruction of the natural environment (with all of its components – relief, climate, hydrography, soils, flora, fauna and natural resources) from the Moldavian Sub-Carpathians during the Cucuteni culture evolution (4600-3500 BC), corresponding to the Atlantic geoclimate period. Our approach stands on credible results of pluridisciplinary archaeological researches supplemented by other informations such as geological, geographical and biological. The study also presents informations concerning the general characteristics of the human communities from the mentioned area and period, acoording to the latest scientific researches. The conditions from the Moldavian Sub-Carpathians (which differ from the rest of the areas inhabited by the Cucuteni populations) allowed the human communities of this civilization to live and accomplish various economic activities; but then the capacity of these populations to adapt to the natural environment and a good use of the natural resources influenced the large period of evolution and the high degree of development, characteristic to the Cucuteni culture.

Keywords: Moldavian Subcarpathians, Atlantic period, Chalcolithic, Cucuteni culture, environment, habitat.

Introduction

Pour se faire une image véridique sur les rapports entre les communautés humaines et l'environnement durant la période d'évolution de la culture Cucuteni dans les Sous-Carpates de la Moldavie, notre démarche se propose de reconstituer l'environnement dans sa totalité, sur base des résultats valides des recherches archéologiques entreprises le long du temps, corroborés à des données géologiques, géographiques et biologiques de cette époque-là. Toutefois, nous envisageons de mettre aussi en valeur des informations concernant les caractéristiques générales de l'habitation dans l'espace géographique et la période étudiés.

Habitat

On peut remarquer généralement dans la zone des Sous-Carpates de la Moldavie une densité importante des habitations et par suite de la population durant toute la période d'évolution de la civilisation concernée, à la différence des Sous-Carpates de la Curbure et celles de Transylvanie, dont l'habitation a été moins consistente (Ş. Cucoş, 1999, p. 229, fig. 1; D. Monah, Ş. Cucoş, 1985, p. 199-202, fig. 1-4; D. Popovici, 2000, fig. 2, 4, 5, 7, 10, 12, 13;). Ceci pourrait s'expliquer par la nature du relief, plus fragmenté, des Sous-Carpates de Odorhei et Homoroade, ainsi que de celles de Vrancea, y compris par l'absence des territoires étendus qui permettent les exploits agricoles, à la différence des Sous-Carpates de la Moldavie, où il y a trois dépressions vastes et bien distinctes (Dépressions de Neamț ou Ozana - Topoliţa – la plus typique aire dépressionnaire des Sous-Carpates de la Roumanie – de Cracău - Bistriţa et de Tazlău - Caşin – la plus étendue dépression des Sous-Carpates de la Roumanie) qui ont constitué depuis toujours des régions favorables à l'habitation humaine (V. Tufescu, 1966, p. 81, 91, 108).

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Ainsi que l'on sait, les établissements cucuténiennes ont été fondés généralement sur les terrasses des rivières (surtout dans celles inférieures des artères hidrographiques plus petites), mottes, collines, interfleuves, prés ou îlots, aux altitudes différentes, suivant des facteurs indispensables, tels la proximité des cours d'eau et des sources des matières premières ou encore d'un terrain propice à l'exploitation agricole, ainsi que la possibilité de se défendre lors des agressions éventuelles de la part d'autres communautés humaines ou des attaques des animaux sauvages (Ş. Cucoş, 1999, p. 25, 26; D. Boghian, 2004, p. 57; S. Marinescu-Bîlcu, 1997, p. 165; 2000, p. 321, 322; D. Monah, 1992, p. 392, 393; D. Monah, Ş. Cucoş, 1985, p. 41, 42; M. Petrescu-Dîmboviţa, 2009, p. 27; D. Popovici, 2000, p. 33).

En fait, l'habitation humaine se rapporte en principal aux zones à relief plat, situées à l'abrit des inondations, où les communautés concernées fondaient leurs habitations, disposant des terrains destinés à l'agriculture, alors que les zones à relief plus encliné (touchées par glissements de terrain) et les plaines bordant les cours d'eau des artères hydrographiques (souvent inondées) étaient occupées par de la végétation spontanée et des espèces faunistiques correspondantes.

Par rapport au stade actuel des recherches archéologiques il n'y a pas à exclure la possibilité que les investigations ultérieures mènent à la découverte de nouvelles habitations, dont le nombre ne pourrait pas pour autant changer l'image d'ensemble de l'habitat de la culture Cucuteni des Sous-Carpates de la Moldavie. Cependant on a la conviction qu'une meilleure estimation du nombre et de la densité des établissements, y compris de la population concernée, sera possible grâce à un encadrement plus précis – dans une période ou autre de l'évolution de cette civilisation – d'un nombre plus élevé des stations archéologiques restées incertaines à cet égard et assez nombreuses à présent.

Le long de la période millénaire d'évolution de cette civilisation dans la zone des Sous-Carpates de la Moldavie l'environnement a subi une série de changements importants, dus en principal aux facteurs naturels (notamment climatiques) et moins à ceux anthropiques (défrichages et / ou déforestations, causés par la croissance démographique entraînant à son tour des besoins accrus de la population), ces derniers à même d'accelerer le déclanchement des premiers et d'augmenter leur effet. Il s'agit des différences significatives entre les dépressions des Sous-Carpates de la Moldavie en raison des caractéristiques de l'environnement et de leur degré d'anthropisation.

Limites et composantes

Aux côtés des Sous-Carpates de la Courbure, les Sous-Carpates de la Moldavie constituent une partie composante des Sous-Carpates Orientales. Ceux-ci sont delimitées au nord par la Valée de la Moldavie, au sud par la Valée de Trotuş, à l'est du Couloir de Siret et à l'ouest prendre contact aux Carpates Orientales. Ils connaissent à leur tour une sous-division en trois autres unités, telles: les Sous-Carpates de Neamţ, au nord, comprenant la Dépression de Neamţ, les Collines Pleşului, Boiştea et Corni; les Sous-Carpates de Bistriţa, au centre, composées de la Dépression Cracău - Bistriţa, les Collines Mărgineni et Runcu; les Sous-Carpates de Trotuş, au sud, composées de la Dépression Tazlău - Caşin et la Colline Pietricica de Bacău (L. Badea *et al.*, 1983, 1992; V. Tufescu, 1966).

Relief

Le relief prédominant représente la composante physico-géographique moins touchée par les facteurs naturels et anthropiques.

En fait, les seuls transformations, peu rélevantes pour autant, en sont les glissements de terrain engendrés par les précipitations abondantes, corroborés parfois aux défrichages produits par les communautés humaines, dans des zones plus habitées, ayant un nombre accru et une densité plus grandes des établissements et par conséquent de leur population, soit le long de toute la période d'évolution de la culture Cucuteni, soit d'une certaine phase (en général phase A et / ou phase B), ainsi qu'au cadre des Dépressions de Cracău - Bistriţa et Tazlău - Caşin, excluant pourtant la Dépression de Neamţ (Ozana - Topoliţa) (Ş. Cucoş, 1999, p. 229, fig. 1; D. Monah, Ş. Cucoş, 1985, p. 199-202, fig. 1-4; D. Popovici, 2000, p. 295, fig. 2-14).

Des transformations plus significatives se sont produites dans les terrasses inférieures, les prés et les îlots subis à l'érosion par les artères hydrographiques de leur proximité, vu que pendant l'Atlantique les précipitations étaient plus significatives qu'au présent, y compris les volumes et les débits des rivières. Cela pourrait représenter l'une des raisons pour lesquelles les établissements étaient fondés notamment dans les terrasses inférieures des artères hydrographiques secondaires, juste pour les mettre à l'abrit des inondations et de l'érosion.

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En même temps, certaines modifications mineures des formes de relief sur lesquelles étaient érigés les établissements cucuténiens ainsi que les éventuelles fortifications auraient pu survenir suite à des travaux d'aménagement de ceux-ci, en vue de stabiliser les habitations (nivellations, tassements ou même des aménagements des versants).

Climat

Le climat constitue, par le biais de ses composantes (températures, précipitations, vents) le facteur naturel entraînant les plus importants effets sur l'environnement ainsi que sur les communautés humaines cucuténiennes de la zone des Sous-Carpates de la Moldavie.

Dans notre démarche de réconstitution du climat dans l'espace et la période concernés nous utiliserons le plus ancien et connu schéma climatique de l'Holocène, proposé à la fin du XIX-ème siècle par Axel Blytt et Rutger Sernander (M. Cârciumaru, 1996, p. 18; C. Horaicu, 1999, p. 134, 135; M. Tomescu, 2000, p. 239, 240).

Conformément à celui-ci, la culture de Cucuteni aurait évolué pendant l'Atlantique (période divisée en deux ou même trois parties couvrant en fait presque tout le néo-énéolithique roumain), qui – sur base des limites chronologiques proposées le long du temps par les professionnels – se serait dévelopée au cours de 3000-3500 ans à peu près, entre 8000/7500-4700/4500 BP (R.S. Bradley, 1999, p. 14, fig. 2.2; P. Dolukhanov, 1997, p. 298; A. Ferdière, 2010, p. 10; K.V. Kremenetskiy, 1991, p. 174; K.V. Kremenetski, 1997, p. 282; N. Volontir, 1990, p. 66, 67) ou 5500-2600/2250 BC (M. Cârciumaru, 1996, p. 18; G. Davidescu, 1999, p. 74).

Durant cet intervalle de temps ont eu lieu des réchauffements et refroidissements successifs, avec des périodes plus humides ou sèches (chacune de quelques centaines d'ans), relevés tant par les données palinologiques et paléo-faunistiques que par la mesure des variations existentes le long du temps de l'isothope ^{14}C de l'atmosphère et de la concentration de l'isothope ^{18}O de la calotte glaciaire ainsi que des isothopes ^{16}O et ^{18}O des sédiments des mers et des océans.

On estime qu'un tel intervalle de réchauffement général du climat aurait été compris entre 5050-3050 BC (comprenant l'entière période d'évolution de la culture Cucuteni – N.D.A.), avec pourtant une période de refroidissement comprise entre 3850-2950 BC (à partir de l'étape Cucuteni B – N.D.A.), ce qui a culminé vers 3350 BC (peu de temps après que cette civilisation touche à sa fin – N.D.A.). Toutefois, il semble que vers l'année 4050 BC (fin de la phase Cucuteni A et début de la phase Cucuteni A-B – N.D.A.) la plus haute pression atmosphérique aurait été centrée jusqu'à 40º-45º de latitude Nord (tout près de la limite Sud de la zone cucuténienne – N.D.A.), ce qui aurait déterminé dans cette zone un régime climatique riche en précipitations notamment en été (M. Cârciumaru, 1982, p. 469, 470, 472, 473; 1996, p. 25-27). Cette dernière hypothese suppose à son tour que dans la même période un maximum des températures soit atteint.

Les oscillations climatiques de l'Atantique ont été rélevées aussi bien gràce aux variations de la limite supérieure de la végétation forestière, de la limite inférieure des glaciers et du niveau des lacs glaciaires des certaines régions européennes (M. Tomescu, 2000, p. 253-269).

Ces recherches ont mis en évidence au point de vue des températures pour la période d'évolution de la culture Cucuteni des intervalles avec des étés plus longs et chauds entre 5150-4500 BC (pendant la culture Précucuteni et le début de la phase Cucuteni A – N.D.A.), 4450-4350 BC (première partie de la phase Cucuteni A – N.D.A.) et 4100-3650 BC (phase Cucuteni A-B et première moitié de la phase Cucuteni B – N.D.A.), ainsi que des étés plus courts et frais entre 3650-3250 BC (deuxième partie de la phase Cucuteni B et après – N.D.A.), alors que au point de vue des précipitations il y a eu des étés plus secs entre 5150-4600 BC (pendant la culture Précucuteni – N.D.A.) et 4050-3750 BC (phase Cucuteni A-B et début de la phase Cucuteni B – N.D.A.) et plus humides entre 4500-4050 BC (phase Cucuteni A – N.D.A.) (M. Tomescu, 2000, p. 268, 270).

Vu ceci, on pourrait dresser un tableau approximatif du climat général pour la période d'évolution de la culture Cucuteni.

Ainsi, entre 5150-4600/4500 BC, pendant la culture Précucuteni et le début de la phase Cucuteni A, aurait existé un climat en général chaleureux et sec. Cela suivi entre 4500/4450-4100/4050 BC, durant la plus grande partie de la phase Cucuteni A, d'un intervalle de temps caracterisé par un climat plus chaud (avec, probablement, un maxim des températures, suite de l'existence jusqu'a 40º-45º latitude Nord du maximum de la pression atmosphérique de la periode concernée) et beaucoup plus humide. Ultérieurement, entre 4100/4050-3850/3650 BC,

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durant la phase Cucuteni A-B et début ou même première partie de la phase Cucuteni B, un climat chaud et sec se serait installé de nouveau, similaire probablement au premier y mentionné. Enfin, entre 3850/3650-3250/2950 BC, dès le début de la phase Cucuteni B ou au moins de sa deuxième partie un refroidissement climatique serait survenu ainsi qu'une aridité, ce qui aurait persisté même après la fin de cette civilisation, avec un maximum vers 3350 BC.

Donc, pendant le complexe culturel Precucuteni-Cucuteni-Tripolye, quatre séquences climatiques importantes se seraient déroulées, avec des répercussions au cours du temps (parues probablement à des intervalles de dixaines ans) tant sur l'environnement que sur les communautés humaines.

Au cadre des Sous-Carpates de la Moldavie, le climat se caractérisait par des temperatures moyennes plus basses et précipitations moyennes plus élevées par rapport aux valeurs moyennes spécifiques à la zone entière occupée par les communautés humaines de cette civilisation.

Ainsi, ce n'est pas par hasard, selon nous, que ces séquences correspondent chronologiquement en grande partie aux pricipales périodes d'évolution de cette civilisation. Une telle réalité confirme le fait que l'environement, notamment par sa composante climatique, a eu une influence importante sur le comportement des communautés humaines cucuténiennes, ce qui a eu des conséquences directes sur leur vie matérielle et spirituelle.

Compte tenu du tableau climatique contouré en dessus, on peut considérer que pendant l'Atlantique, dans la plus grande partie de l'intervalle de temps correspondant à l'évolution du complexe culturel Précucuteni-Cucuteni-Tripolye (culture Précucuteni, phases Cucuteni A et A-B, ainsi que début ou encore première partie de la phase Cucuteni B), il y avait un climat plus chauds et humide, similaire à celui sous-tropical de nos jours existant dans la zone méditerranéenne (le Sud de l'Europe continentale). A ce point de vue, l'apogée a été atteinte vers 4050 BC (fin de la phase Cucuteni A et début de la phase Cucuteni A-B – N.D.A.), quand, en raison de l'existence du centre de la pression atmosphérique maximale jusqu'à 40º-45º latitude Nord (M. Cârciumaru, 1982, p. 473; 1996, p. 26, 27) (c'est-a-dire tout près de la limite Sud de la zone de cette civilisation – N.D.A.). Mais après, le long de la phase Cucuteni B (dès son début ou au moins de sa deuxième partie), il y a eu un important changement climatique, c'est-à-dire un refroidissement par rapport aux périodes antérieures dont les minimums ont été enregistrés vers 3350 BC (M. Cârciumaru, 1982, p. 469; 1996, p. 25).

Pour soutenir l'existence à un moment donné dans cette zone d'un climat sous-tropical (méditéranéen) il faut tenir compte de toute une série de découvertes de nature archéobotaniques et archéozoologiques d'espèces de plantes et d'animaux termophiles.

Le refroidissement ultérieur, menant à l'existence dans cette zone, vers la fin de l'Alantique, d'un climat relativement ressemblable à celui tempéré-continental actuel, est confirmé également par la composition de la végétation qui, vers 3050 BC s'avère être similaire à celle de l'époque actuelle (C. Rădulescu *et al.*, 2001, p. 33). De même, notre opinion et que, durant cette periode, la faune était elle aussi ressemblable à celle actuelle.

Hydrographie

La zone cucuténienne des Sous-Carpates de la Moldavie a joui d'un riche réseau hydrographique, dont les origines se retrouvent dans les Carpates Orientales, qui est tributaire au Danube. Les principales artères hydrographiques sont: Suceava, Moldova, Bistriţa, Tazlău et Trotuş, aux quelles on ajoute la plupart des affluents, dont certains à des cours interrompus.

Il est hors doute que les artères hydrographiques ont eu un rôle très important dans la vie des communautes humaines (y compris celles cucuténiennes), tout comme certaines formes de relief caractéristiques (terrasses, prés, îlots), en représentant en fait l'un des facteurs de premier rang à tenir compte lors de la fondation des établissements (D. Boghian, 2004, p. 57; Ş. Cucoş, 1999, p. 25, 26; S. Marinescu-Bîlcu, 1997, p. 165; 2000, p. 321, 322; D. Monah, 1992, p. 392, 393; D. Monah, Ş. Cucoş, 1985, p. 41, 42; M. Petrescu-Dîmboviţa, 2009, p. 27; D. Popovici, 2000, p. 33).

A part l'eau indispensable la vie, les cours d'eau constituaient des ressources naturelles importantes de nature ichtiologique et malacologique (malheureuseemnt peu exploitées lors des recherches archéologiques et dont les restes sont en nombre très réduit). Des lits des rivières on utilisait les différentes catégories de roches dans les construction ou notamment dans la fabrication des artefactes. De même, à la proximité des artères hydrographiques il y avaient des terrains favorables à l'agriculture, des sols plus fertiles, tout comme une variété de la

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flore et faune, ce qui pourrait être bien utile aux communautes humaines cucuténiennes.

Ainsi, on constate que deux des dépressions des Sous-Carpates de la Moldavie (Cracău - Bistrița et Tazlău - Caşin), constituant aussi des importantes aires de confluence, étaient bien peuplées au cours de la période d'évolution de la culture Cucuteni, en raison des conditions de vie favorables aux communautés humaines (Ş. Cucoş, 1999, p. 229, fig. 1; D. Monah, Ş. Cucoş, 1985, p. 179-181, 199-202, fig. 1-4; D. Popovici, 2000, p. 295, fig. 2, 3, 6, 8, 10, 11, 14).

Comme déjà dit, durant l'Atlantique, sur le fond d'un climat plus humide que celui actuel, les grandes quantités de précipitations ont mené à une hausse considérable des débits et volumes des artères hydrographiques, ce qui provoquit souvent des inondations. Dans telles circonstances, les processus intensifs d'érosion, transport et accumulation étaient de nature à modifier aussi les zones limitrophes, y compris les terrasses, les prés, les îlots sur lesquels étaient installés les établissements cucuténiens.

Cependant, il se peut que les lits larges des rivières, par où coulent actuellement des eaux peu impressionantes, ainsi que toute une série d'artefactes découvertes – comme les monoxiles (en fait rien que des ambarcations en miniature), des poids provenant des filets de pêche ou bien des harpons et des hameçons de canne à pêche – constituent autant de preuves de l'existence à cette epoque-là des artères hydrographiques importantes comme débit et volume d'eau.

Sols

Celles-ci représent premièrement un facteur d'équilibre de l'environnement, notamment par la couche végétale recouvrant leur partie supérieure. Au cadre de la zone cucuténien des Sous-Carpates de la Moldavie les sols étaient bien divers, en raison à la fois de la variété de la structure litologique, formes de relief, climat et faune, auxquels on ajoute, certes, les facteurs anthropiques.

La réconstitution des sols dans l'espace et au cours de la période de temps concernés s'appuie notamment sur la corroboration avec les autres conditions de milieu envisagées au-dessus et moins sur les recherches archéologiques interdisciplinaires effectuées afin de mettre en évidence des sols reliques, presque absents.

Dans notre démarche on va se rapporter au système roumain de classification des sols, élaboré en 1980, structuré par classes (en nombre de 10) et types (au total 39), les anciens dénominations antérieurement utilisées étant pourtant équivalents (N. Florea *et al.*, 1983, p. 501-504, 506-521, 524, 525, fig. 8, 9).

Bien développés étaient les sols de forêts (bruns et grisâtres, d'une fertilité moyenne en général – N.D.A.), la végétation forestière occupant des surfaces étendues, notamment des terrains plus enclinés, dans les interfleuves ou le long des plus importants artères hydrographiques.

Le facteur naturel ayant la plus grande influence sur les sols est sans doute celui climatique, à travers les sécheresses et encore les inondations, ces dernières provoquées par les glissements de terrain et la lévigation (conduisant à l'apparition des dits sols involués, tronqués ou colluvionnés) (N. Florea *et al.*, 1983, p. 504, 524, 525) – de fertilité réduite, avec des conséquences importantes sur la couche végétale d'en haut.

L'impact anthropique sur le plan pédologique se produisait dans les régions habitées, son envergure étant différente suivant le nombre et la densité des établissements et par suite de leurs populations. Ainsi, les changements pédologiques étaient-ils dépendantes des défrichements (par incendie, cas où la cendre en résultée agissait comme agent d'engrais), suivie ou non des déforestations, des cultures agricoles, pâturages, champs en jachère (cas où il y avait la possibilité de mettre au feu les champs, toujours pour assurer une meilleure fertilisation des sols, estompée pour autant par la destruction des microorganismes existant dans leur partie supérieure) ou même des effectifs d'animaux domestiques possédés par les communautés humaines.

Le labourage assez superficiel concernant seulement la partie supérieure des sols provoquait une diminution rapide de leur fertilisation vers la surface, ce qui imposait par suite une période de repos d'environ 15-30 ans, suivant le degré de diminution de la fertilisation (V. A. Kruts, 1989, p. 124).

Bien que la fertilisation représentait certainement un facteur essentiel pour les cultures agricoles, à notre avis les principaux éléments naturels dont les communautés humaines cucuténiennes tenaiant compte pour l'aménagement des terrains occupés étaient le degré d'enclinaison du relief et le risque d'inondations.

Pour le moment on ne dispose que d'une seule information sur un sol relique depuis Poduri (Cucuteni A et B) (Fig. 1), là où les recherches pédologiques ont mis en relief une telle formation d'une épaisseur d'environ 0,90 m, située en haut du dépôt anthropique d'une

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hauteur de 4,40 m sur le *tell* emplacé dans la Micro-dépression de Tazlăul Sărat. Celui-ci … *se retrouve* à *la transition du brun mésobasique* (brun eumésobasique – N.D.A.) *vers le brun luvique* (podzolique – N.D.A.), *formé durant l'Atlantique*, d'une bonne fertilisation, propice à la culture des céréales (G. Lupaşcu *et al.*, 1987, p. 246). Donc, le sol relique de Poduri, de couleur brune, semble-t-il, d'une texture généralement moyenne et fertilité moyenne (humus – 2-4/5%; pH – 5-7/7,5) aurait appartenu soit à la classe de cambisols, soit à celle des argiluvisols (N. Florea *et al.*, 1983, p. 502, 510-513, 520, 521, fig. 8.1, 3, 4). D'ailleurs, d'après nous, de tels sols étaient bien représentés dans la zone des Sous-Carpates de la Moldavie, là où il y avaient des conditions de milieu favorables à leur formation et développement.

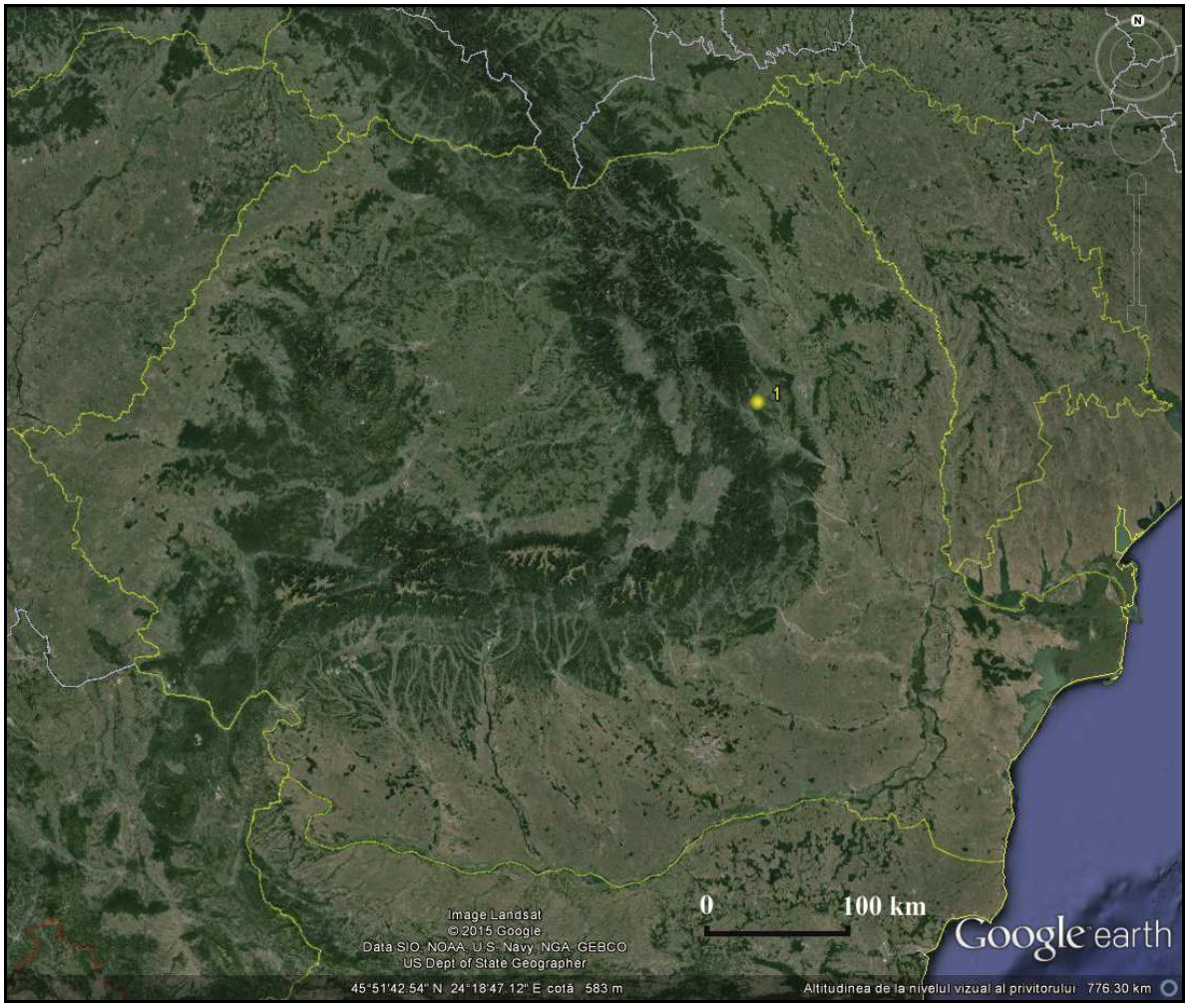

Fig. 1 – Etablissement bénéficiant des recherches pédologiques („cercle"):
1 – Poduri (Cucuteni A et B)

Flore

La végétation spontanée de la zone cucuténienne des Sous-Carpates de la Moldavie présentait une grande variété, étant donné la diversité des autres facteurs de milieu y présents.

Une répartition par zones de la flore existante sur le territoire actuel de la Roumaine (et donc de celui des Sous-Carpates de la Moldavie occupé durant l'énéolithique par la culture Cucuteni – N.D.A.) durant l'Holocène a été réalisé par Emil Pop en 1933, qui partageait les diagrammes sporo-polliniques en phases forestières … *suivant l'espèce ou les espèces dominantes le long du temps*. Ainsi, le Boréal, l'Atlantique et la première partie du Sous-Boréal correspondaient à … *la phase de l'épicéa commun avec du noisetier et du chêne mixte dans les montagnes (du noisetier avec du chêne sur les collines)* (M. Cârciumaru, 1996, p. 20; I. Donisă, 1993, p. 243; M. Tomescu, 2000, p. 245).

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Dans l'Atlantique deux périodes de végétation ont été pourtant identifiées, à savoir: *la sous-phase du noisetier* ... (lorsqu'on enregistre un maximum absolu du noisetier avec de la chêne mixte et de l'épicéa) à son début, suivie de … *la sous-phase des épicéas* ... (caractérisée par un maximum absolu de l'épicéa, une prédominance modérate du chêne mixte et du noisetier, ainsi que par l'apparition du charme, du sapin et de l'hêtre, ce dernier allant être très répandu vers la fin de cette période) (I. Donisă, 1993, p. 243).

Quant à la chêne mixte (*Quercetum mixtum*), il semble que, à l'est des Carpates Orientales elle était composée en particulier de l'orme (*Ulmus*), du tilleu (*Tilia*) et du chêne (*Quercus*), dans cet ordre précis (M. Cârciumaru, 1996, p. 20).

Les oscillations climatiques enregistrées au cours du temps ont influencé directement la limite supérieure des forêts, qui durant l'Atlantique se situait à la valeur la plus élevée de toute la période de l'Atlantique, à savoir jusqu'à environ 2000 m d'altitude, autrement dit de 400 m plus en haut que de nos jours, quand la limite en est à 1600 m d'altitude, similaire à celle du Boréal et du Sous-Atlantique (I. Donisă, 1993, p. 245).

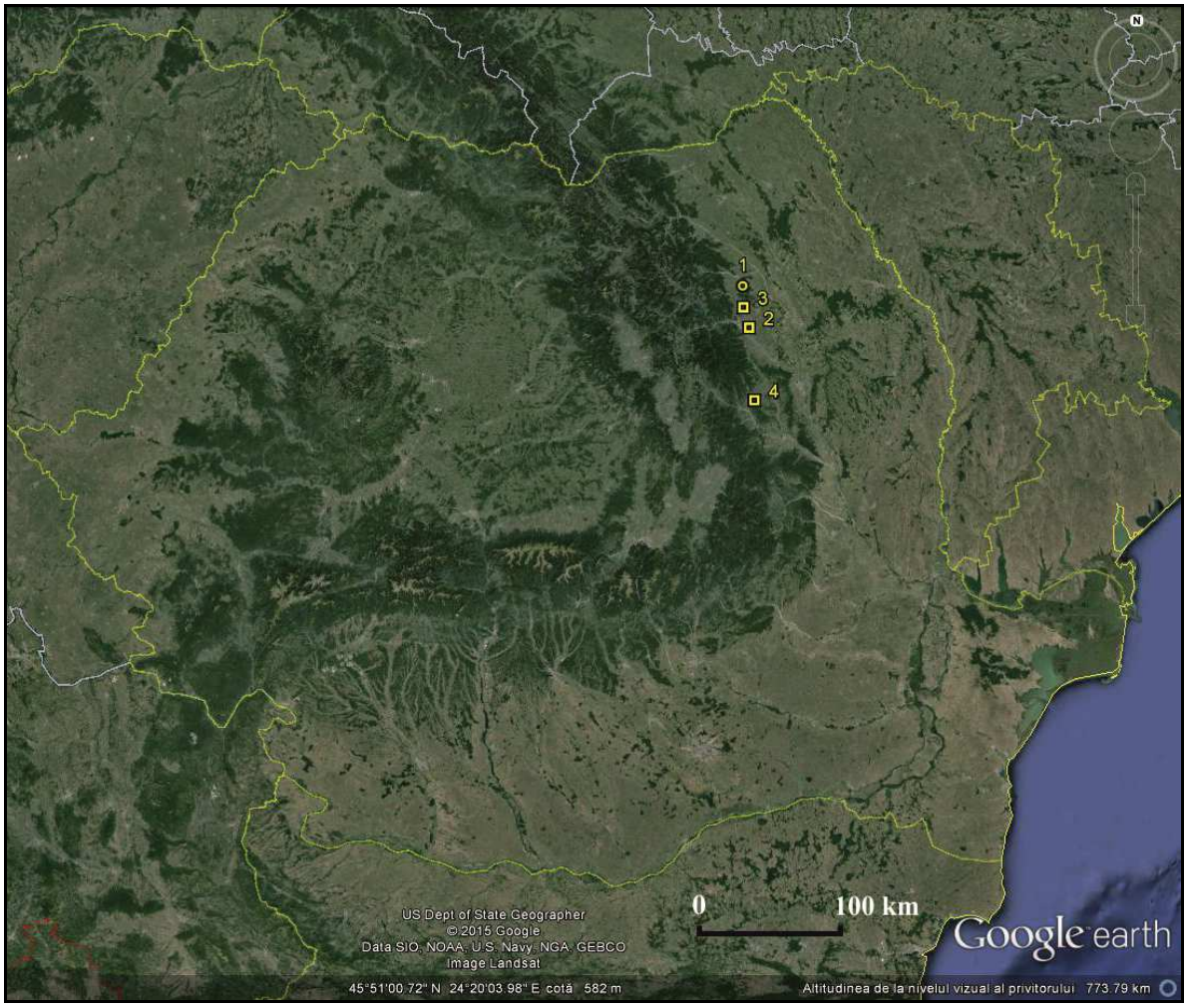

Fig. 2 – Etablissements bénéficiants des recherches archéobotaniques („cercle" – recherches palinologiques; „carré" – recherches carpologiques): 1 – Târpești (Cucuteni A); 2 – Izvoare (Cucuteni A); 3 – Bodești (Cucuteni A, A-B et B); 4 – Poduri (Cucuteni A et B)

Toute une série de données relatives au paysage de la zone des Sous-Carpates de la Moldavie nous est fournie par les recherches archéobotaniques (palinologiques et carpologiques) (Fig. 2) et archéozoologiques (Fig. 3) effectuées le long du temps dans ou aux alentours des établissements cucuténiens y situés.

En fait, la plus ample réconstitution de la

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flore de la zone cucuténienne provient depuis Poduri (Cucuteni A et B), au cadre du *tell* énéolithique situé dans la Micro-dépression de Tazlău-Cașin, par la découverte de la plus consistante quantité et diversité de macrorestes végétaux. Pendant l'évolution de la culture de Cucuteni ce territoire était occupé en grande mesure par les forêts de feuillus, avec la prédominance du hêtre (*Fagus sylvatica*), du chêne rouvre (*Quercus petraea*) et du charme (*Carpinus betulus*), tout comme l'érable sycomore (*Acer pseudoplatanus*), l'érable plat (*Acer platanoides*), l'érable champêtre (*Acer campestre*), le tilleu (*Tilia cordata*), l'orme de montagne (*Ulmus montana*), le chêne pédonculé (*Quercus robur*), ou bien celle du prunier (*Prunus spinosa*), cerisier (*Cerasus avium*), pommier (*Malus silvestris*) ou poirier (*Pyrus pyraster*). Les plaines bordant les cours d'eau était peuplées du saule blanc (*Salix alba*), du peuplier alb (*Populus alba*) et de l'osier (*Salix fragilis*). Les arbrisseaux étaient représéntés des noisetiers (*Corylus avellana*), du sureau (*Sambucus nigra*), du rouget (*Crataegus monogyna*), du cornouillet (*Cornus mas*) et de l'églantier (*Rosa canina*). En outre, il y avaient des arbrisseaux d'argusier (*Hypophae rhamnoides*), de framboisier (*Rubus idaeus*), du mûrier (*Rubus caesius*) etc. Dans les marécages on rencontrait le roseau (*Phragmites australis*).

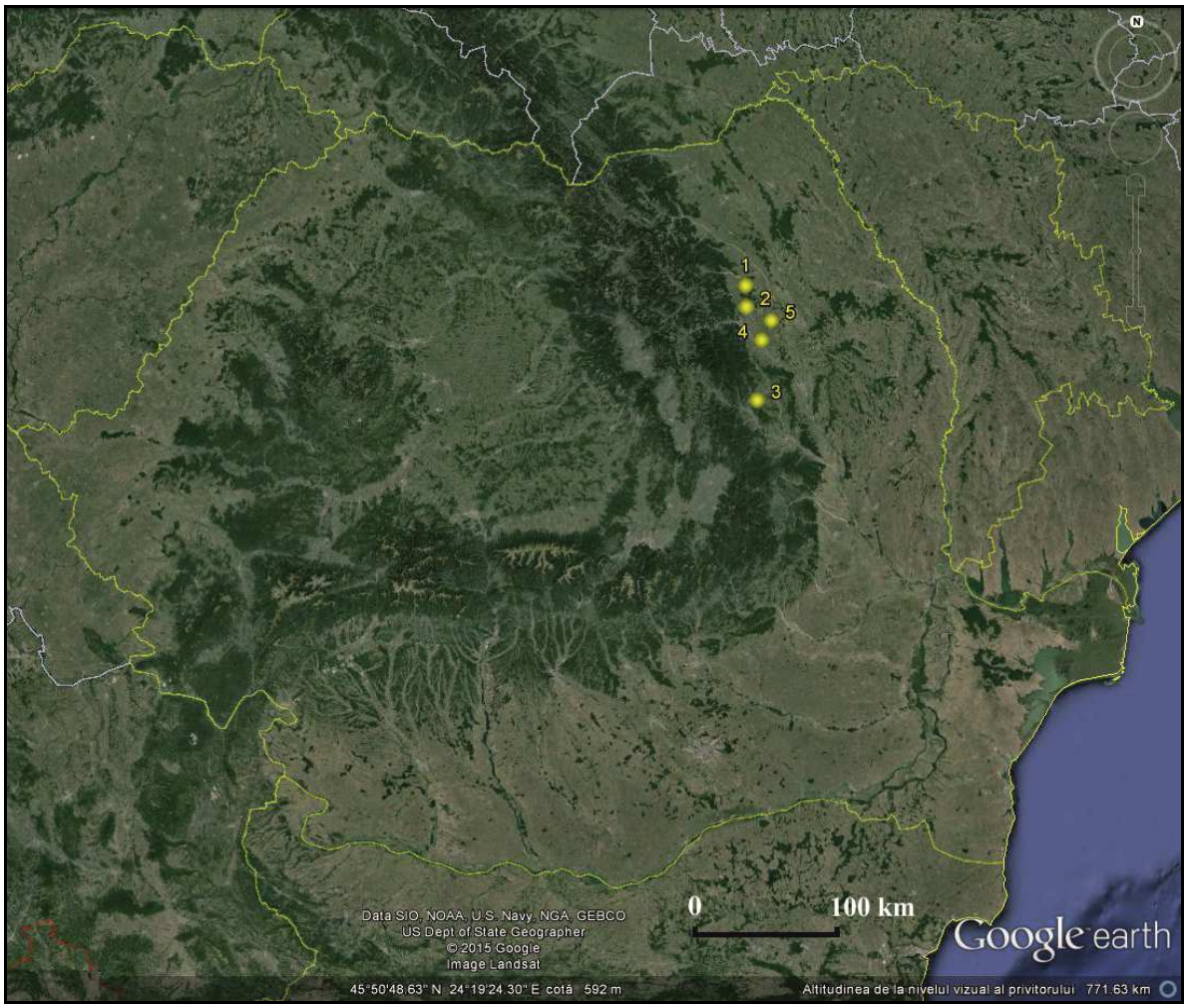

Fig. 3 – Etablissements bénéficiants des recherches archéozoologiques („cercle"):
1 – Târpești (Cucuteni A); 2 – Bodești (Cucuteni A, A-B et B); 3 – Poduri (Cucuteni A et B);
4 – Traian (Cucuteni A-B); 5 – Ghelăiești (Cucuteni B)

En même temps, il y a à supposer l'existence d'un bon nombre d'espèces de champignons, tels les morilles (*Morchella esculenta*), les pézizes orangées (*Peziza aurantia*), la girolle (*Cantharellus cibarius*), le pleurote (*Pleurotus ostreatus*), l'armillaire couleur de miel (*Armillaria mellea*), la russule charbonnière (*Russula cyanoxantha*), le lactaire poivré

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(*Lactarius piperatus*), le clitocybe anisé (*Clitocybe odorata*), les champêtres (*Agaricus campestris*), la truffe blanche (*Tuber aestivum*) et noire (*Tuber melanosporum*) (F. Monah, D. Monah, 2008, p. 50).

Considérés les traits communs de l'environnement existant dans les trois aires dépressionnaires, à savoir celles de Neamţ (Ozana - Topoliţa), de Cracău - Bistriţa et de Tazlău - Caşin (V. Tufescu, 1966, p. 81-87, 91-97, 108-111, 119-128, 220-224), il y a des raisons à croire que le paysage du territoire de Poduri pourrait se retrouver dans tout l'espace des Sous-Carpates de la Moldavie.

D'ailleurs, l'analyse sporo-pollinique depuis Târpeşti (Cucuteni A), établissement situé dans la Dépression de Neamţ (Ozana - Topoliţa), vient confirmer en grande mesure le conspecte floristique depuis Poduri. La végétation ligneuse se distingue par la prédominance des bois de feuillus, composés d'orme (*Ulmus*), du tilleul (*Tilia*), du chêne (*Quercus*), du hêtre (*Fagus*), du charme (*Carpinus*), du charme (*Carpinus*), de l'érable (*Acer*) et du bouleau (*Betula*), alors que dans les plaines bordant les cours d'eaux il y avaient surtout de l'aulne (*Alnus*) ou du saule (*Salix*). Certes, les espèces de résineux étaient elles aussi représentées par l'épicéa (*Picea*), le sapin (*Abies*), le pin (*Pinus*). Parmi les arbrisseaux on distingue le noisetier (*Corylus*). La végétation herbacée (*Asteraceae*, *Cyperaceae*, *Alismataceae*, *Ranunculaceae*, *Saxifragaceae*, *Chenopodiaceae*, *Polygonaceae* etc.) était également bien représentée. Dans les marécages il y avait le roseau (*Typha latifolia* / *Typha angustifolia* – 26%) (M. Cârciumaru, 1996, p. 121, fig. 50, 51; S. Marinescu-Bîlcu *et alii*, 1981, p. 21, 30; 1985, p. 654, 665).

Les recherches archéobotaniques depuis Izvoare (Cucuteni A) et Bodeşti (Cucuteni A, A-B et B), les deux situées dans les Sous-Carpates de la Moldavie ont mis en évidence la présence aux environs de ces établissements de certains arbrisseaux, tel le noisetier (*Corylus avellana*) (R. Vulpe, 1957, p. 263) et le corne (*Cornus mas*) (M. Cârciumaru, 1996, p. 87, pl. XVII/6).

Il paraît que certaines espèces de plantes à haute valeur nutritive, caractéristiques de la lisière du bois, tel le noisetier (*Corylus avellana*), le corne (*Cornus mas*), le pommier (*Malus sylvestris*), le poirier (*Pyrus pyraster*), le prunier (*Prunus spinosa*) etc., aient été protégées par les communautés humaines cucuténiennes, préoccupées de créer un milieu propice à leur croissance (F. Monah, D. Monah, 2008, p. 131).

L'existence d'un côté des massifs forestiers dominés par les bois de feuillus dans le territoire des Sous-Carpates de la Moldavie, ainsi que de la végétation spécifique aux plaines bordants les cours d'eaux et de l'autre côté des espaces ouvertes entre les deux premiers et les établissements – occupés probablement des terres agricoles des communautés humaines concernées, est prouvée également par les spectres faunistiques découverts à Târpeşti (Cucuteni A), Poduri (Cucuteni A) (R. Cavaleriu, L. Bejenaru, 2009, p. 190) et Traian (Cucuteni A-B), dans ce dernier cas les restes ostéologiques provenus des animaux sauvages étant supérieurs en nombre à ceux des animaux domestiques (C. Bem, 2007, p. 220), ce qui pourrait souligner le rôle principal de la chasse par rapport à l'élevage.

Concernant les résultats des recherches palinologiques depuis Târpeşti (Cucuteni A), on constate au cadre de l'habitation cucuténienne une baisse du pollen d'arbre jusqu'à 10-15% et inversement une présence significative de celui de céréales (*Cerealia*), de 17,3%. Cette réalité du paysage peut s'expliquer par l'existence, à cette époque-là, d'un climat plus aride (M. Cârciumaru, 1996, p. 121, fig. 50, 51; S. Marinescu-Bîlcu *et al.*, 1981, p. 21, 30; 1985, p. 654, 665) (correspondant en fait à l'intervalle 5150-4600/4500 BC, plus chaud et plus sec, durant la période d'évolution de la culture Précucuteni et début de la phase Cucuteni A – N.D.A.). Mais alors, la distance existante entre le forêt et l'établissement se doit au facteur climatique (comme déjà mentionné antérieurement) et moins aux défrichements pratiqués par les communautés humaines cucuténiennes; par suite le territoire entre l'établissement et le forêt était occupé par des terres agricoles, fait indiqué par le pourcentage élevé du pollen de céréales y remarqué.

Grâce aux recherches archéologiques interdisciplinaires effectuées au cadre des établissements cucuténiens indiqués antérieurement on pourrait procéder à la réconstitution générale du paysage dans les Sous-Carpates de la Moldavie, au cours de la période cucuténienne. Celui-ci était donc dominé par des massifs forestiers de feuillus, composés en particulier des chêne mixtes (*Quercetum mixtum*), avec une présence importante du noisetier (*Corylus*) et plus réduite des résineux, en particulier de l'épicéa (*Picea*) et du sapin (*Abies*) – ces derniers se retrouvant tant au niveau de l'altitude basse des zones

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dépressionaires (caracterisées par inversions climatiques et floristiques, tout comme les dépressions montagneuses), que dans les plaines bordant les cours d'eau les plus importants, comme c'est le cas du pin (*Pinus*). La végétation herbacée était aussi bien représentée. Dans les marécages, dont la fréquence s'explique par les grandes quantités de précipitation, y compris débits et volumes d'eau, il y avaient le roseau commun (*Phragmites*) et la massette (*Typha*). Les surfaces occupées par les différentes espèces floristiques variaient, s'elargissant ou se restreignant suivant notamment les changements climatiques survenus au cours de la période d'évolution de la culture Cucuteni. Ainsi, au début de la phase Cucuteni A, la région forestiere était-elle plus restreinte, reliée à l'existence à cette époque-là d'un climat chaud et sec, alors que, ultérieurement, le long de la plus grande partie de la même période et du début de la phase Cucuteni A-B, caracterisée par un climat chaud et humide, se produise un élargissement des forêts, suivie d'une nouvelle restreinte des forêts qui aurait eu lieu le long de la phase Cucuteni A-B et même début de la première partie de la phase Cucuteni B, lorsque le climat était probablement assez ressemblable au premier cité, ce qui allait se poursuivre jusqu'à la fin de cette civilisation, suite à l'existance d'un climat froid et sec.

Le long de toute l'évolution de la culture Cucuteni, vu la croissance démographique explosive qui engendrait des besoins accrus en ressources en bois, des défrichements étaient pratiqués au voisinage des établissements, ce qui a produit par suite une limitation des forêts par rapport aux endroits habités, entre lesquels se sont interposées les terres agricoles des populations concernées.

Végétation sagittale et rudérale

L'existence et l'étendue de la végétation sagittale et rudérale est étroitement liée au processus d'anthropisation de l'environnement. Celle-ci est moins présente dans les zones inhabitées ou faiblement habitées et plus fréquente dans les régions caractérisées par un nombre et une densité considérables des établissements et de la population. Les espèces floristiques sagittales se mêlaient des cultures agricoles (certaines spécifiques aux céréales, d'autres aux légumineux, en empêchant ainsi leur pousse optimale, alors que celles rudérales se retrouvaient généralement à l'intérieur ou aux alentours des établissements, près des terres agricoles (cultivées ou occupées par prairies ou champs jachères).

Les recherches archéobotaniques entreprises le long du temps au cadre des établissements cucuténiens (Fig. 2) ont mis en evidence un nombre élevé d'espèces de plantes sagittales et rudérales (M. Cârciumaru, 1996, 202 p., 30 tab., XXI, pl., 60 fig.; F. Monah, D. Monah, 1997, p. 297-316, tab. 1-5; 2002, p. 293-304, tab. 1, 2; 2008, 214 p., 12 tab., 56 fig.), ainsi qu'un degré élevé de pureté des échantillons de macrorestes végétaux, dominés par les restes de plantes à valeur nutritive, cultivées ou cueillies. Cela souligne tant un changement fréquent des terres cultivées, qu'une sélection de celles-ci, en vue d'éliminer les bruyères. Cet aspect nous amène à la conclusion qu'on a affaire, au sein des communautés humaines cucuténiennes, avec un processus de cultivation sélective des plantes, au cadre des échantillons destinés à l'ensemensement, car on écartait à la fois les fruits et les graines involués ou fragmentés, fait confirmé ultérieurement par les recherches entreprises à Poduri (Cucuteni A et B) (F. Monah, D. Monah, 2008, p. 52, 187, 188).

Faune

Les espèces faunistiques au sein de la zone cucuténienne des Sous-Carpates de la Moldavie, fortement reliees aux autres composantes de nature physique et geographique, ont été affectées en principal par les changements climatiques et de végétation et moins du processus d'anthropisation (défrichements, châsse, apparition du paysage agricole et des établissements). On note pourtant la présence durant les trois phases d'évolution de la culture de mêmes espèces d'animaux, probablement les seuls lieux de diffusion de celles-ci étant plus ou moins variés le long du temps.

Certes, outre les espèces d'animaux sauvages identifiés par le biais des recherches archéozoologiques dans l'espace et la période de temps étudiés, dont la plupart est représentée par les mammifères (moins les poissons ou les oiseaux), il y avaient aussi d'autres espèces faunistiques, de petites dimensions, qui manquant d'intérêt alimentaire ou utilitaire n'étaient pas chassées ou capturées. D'autres n'ont pas pu être determinées en raison d'état de conservation des matériels ostéologiques. En général il s'agit des restes de mammifères chassés pour des raisons alimentaires ou encore utilitaires, surtout des herbivores de grande taille. Les carnivores offraient en particulier des

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produits secondaires (tels les fourrures et les os), moins de la viande, vu leur fréquence réduite parmi le matériel faunistique au sein des établissements, fait qui pourrait s'expliquer par le danger qu'elles représentaient en fait pour ces communautés humaines. Il n'y a pas a exclure ni l'abandon, partiel ou total, des os de ces derniers à même l'endroit de chasse, les seules transportés jusqu'à l'établissement étant la fourrure ou la viande (S. Haimovici, 1987, p. 160).

Les recherches archéozoologiques (Fig. 3) permettant la réconstitution de la faune des Sous-Carpates de la Moldavie ont été réalisées sur des échantillions ostéologiques provenant depuis Bodeşti (Cucuteni A, A-B et B) (C. Matasă, 1946, p. 42), Târpeşti (Cucuteni A) (R. Cavaleriu, L. Bejenaru, 2009, p. 56, 57, tab. 3; S. Marinescu-Bîlcu *et al.*, 1981, p. 21; 1985, p. 654; O. Necrasov, M. Ştirbu, 1971, p. 1304, 1306, tab. I, II; 1981, p. 178, 183, tab. 2), Poduri (Cucuteni A et B) (R. Cavaleriu, L. Bejenaru, 2009, p. 63, 111, tab. 20; L. Bejenaru *et al.*, 2009, p. 224-226, tab. 1-3; D. Monah *et al.*, 2003, p. 60; F. Oleniuc, 2010, p. 25-27, tab. 12), Traian (Cucuteni A-B) (C. Bem, 2007, p. 215-217; O. Necrasov, S. Haimovici, 1959 a, p. 217; 1959 b, p. 179-181, 184, tab. I-III; 1962, p. 261-264; 1970, p. 62, 63, tab. II; O. Necrasov, M. Ştirbu, 1971, p. 1304, 1307, tab. I, II) et Ghelăieşti (Cucuteni B) (S. Haimovici, 1999, p. 193, 194, a. 4; S. Haimovici, C. Stan, 1985, p. 693-695). Les mammifères attestés par le biais des déterminations sont: le cerf (*Cervus elaphus*), le daim (*Dama dama*), le sanglier (*Sus scrofa ferus*), l'ours brun (*Ursus arctos*), le lynx (*Lynx lynx*), le martre (*Martes martes*), le chat sauvage(*Felis silvestris*), le bison (*Bos priscus* / *Bos bubalus* ?), le blaireau (*Meles meles*), le loup (*Canis lupus*) et le renard (*Canis vulpes*), espèces rencontrées dans les régions boisées; le chevron (*Capreolus capreolus*), l'aurochs (*Bos primigenius*) et le lapin (*Lepus europeus*), vivant dans les lisières au pied des forêts; le cheval sauvage (*Equus przewalskii*), rencontré dans les espaces plus ouverts, avec de la végétation herbeuse; ainsi que le castor (*Castor fiber*), retrouvable dans les espaces avec humidité accentuée des alentours des artères hydrographiques.

Les dernières investigations de Poduri (Cucuteni B) ont mené aussi à la découverte de quelques restes ostéologiques de poissons, à savoir le carpe (*Cyprinus carpio*) et le barbeau (*Barbus barbus*) (F. Oleniuc, 2010, p. 25; F. Oleniuc, L. Bejenaru, 2010, p. 163, 164).

Les zones forestières importantes existantes dans la zone cucuténienne des Sous-Carpates de la Moldavie étaient dominées par des espèces d'animaux sauvages de forêt. Durant l'évolution de la culture Cucuteni, suite aux défrichements et dans les conditions d'un climat plus aride, celles-ci se restreignent et leur prévalence diminue au cadre des echantillons paléofaunistiques, alors que les espèces de lisière atteignent des espaces des plus étendues et sont de plus en plus mieux représentees au cadre de cette culture. Ainsi, on peut constater la podération élevée parmi les échantillons des mammifères herbiveures, suivie de celles carnivores, alors que les espèces aquatiques et les rongeurs sont peu représentés. Tel est le cas aussi des espèces d'oiseaux, poissons, gasteropodes ou lamellibranchiates (F. Oleniuc, 2010, p. 51).

Comme déjà rappelé, le traitement préférentiel montré par les communautés humaines face aux lisières des bois a favorisé la prolifération et la diffusion des espèces d'animaux sauvages qui préféraient ce biotope.

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Outre les restes faunistiques, des données concernant les différentes espèces d'animaux sauvages de la région et durant la période d'évolution de culture Cucuteni nous sont fournies par les représentations plastiques plus réalistes (figurines, protomes, peintures sur vases), à même de rendre aussi les détails anatomiques. Il y a pourtant des pièces plus stylisées ou même modelées de manière négligente, dépouvues d'éléments anatomiques distincts, qui s'avèrent donc indéterminables au niveau d'espèce.

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Ressources

Le cours du temps, la nature a constitué pour les communautés humaines une source inépuisable de ressources. Les matières premières telles le sel, le bois, les différentes types de roches et de métaux se retrouvaient plus ou moins dans la zone cucutenienne des Sous-Carpates de la Moldavie et ont été valorisées de mieux en mieux, ce qui vient prouver encore une fois l'adaptation excellente de ces communautés à leur environnement. Leur exploitation a été faite cependant de manière peu homogène au cadre de la région habitée, selon le nombre et la densité des établissements et de la population et par suite de leurs besoins.

Dans certaines circonstances, au voisinage

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des sources de matières premières, des établissements saisonières ont été même bâtis ou seulement de points d'exploitation de celles-ci (Fig. 4), comme dans le cas de Poduri (Cucuteni A) – *Pe Hăineală* (M. Alexianu *et al.*, 2007, p. 139; D. Monah *et al.*, 2003, p. 70, 72) et *În Fundătură* (M. Alexianu *et al.*, 1992, p. 164; 2007, p. 281, 291; M. Alexianu *et al.*, 2007, p. 139; D. Monah, 1991, p. 394; D. Monah *et alii*, 2003, p. 70, 72) –, Prohozeşti (Cucuteni B) (M. Alexianu *et al.*, 1992, p. 164; 2007, p. 281, 291; M. Alexianu *et al.*, 2007, p. 139; J. Chapman, D. Monah, 2007, p. 71-88; D. Monah, 1991, p. 394; D. Monah, G. Dumitroaia, 2007, p. 16, fig. 2; D. Monah *et al.*, 2003, p. 70, 71; D. Popovici, G. Trohani, 1984, p. 65), Valea Şoşii (Cucuteni B) (M. Alexianu *et al.*, 2007, p. 139; D. Monah, G. Dumitroaia, 2007, p. 16, fig. 2; D. Monah *et al.*, 2003, p. 70, 73; D. Popovici, A. Bujor, 1984, p. 45) et Lunca (Cucuteni A et B) (M. Alexianu *et al.*, 1992, p. 163; 2007, p. 281, 291; M. Alexianu *et al.*, 2007, p. 137; G. Dumitroaia, 1987, p. 255, 256, fig. 1/a; 1994, p. 8, 58, 61-66, fig. 1, 47-50; D. Monah, 1991, p. 393; 2008, p. 20, fig. 4; D. Monah, G. Dumitroaia, 2007, p. 18, 19, fig. 4), Ţolici (Cucuteni A et B) (G. Dumitroaia *et al.*, 2008, p. 205-207, 209-218, fig. 1, 2, 4-11; D. Monah, 2008, p. 28, 29, fig. 7) ou encore de Cucuieţi (Cucuteni A) (M. Alexianu *et al.*, 2007, p. 137; G. Dumitroaia, 2004, p. 435, 436; D. Monah, 2008, p. 23, fig. 5; D. Monah, G. Dumitroaia, 2007, p. 24, fig. 11; R. Munteanu *et al.*, 2007, p. 58, 59, 62-65, 69, fig. 1-3, 7-9).

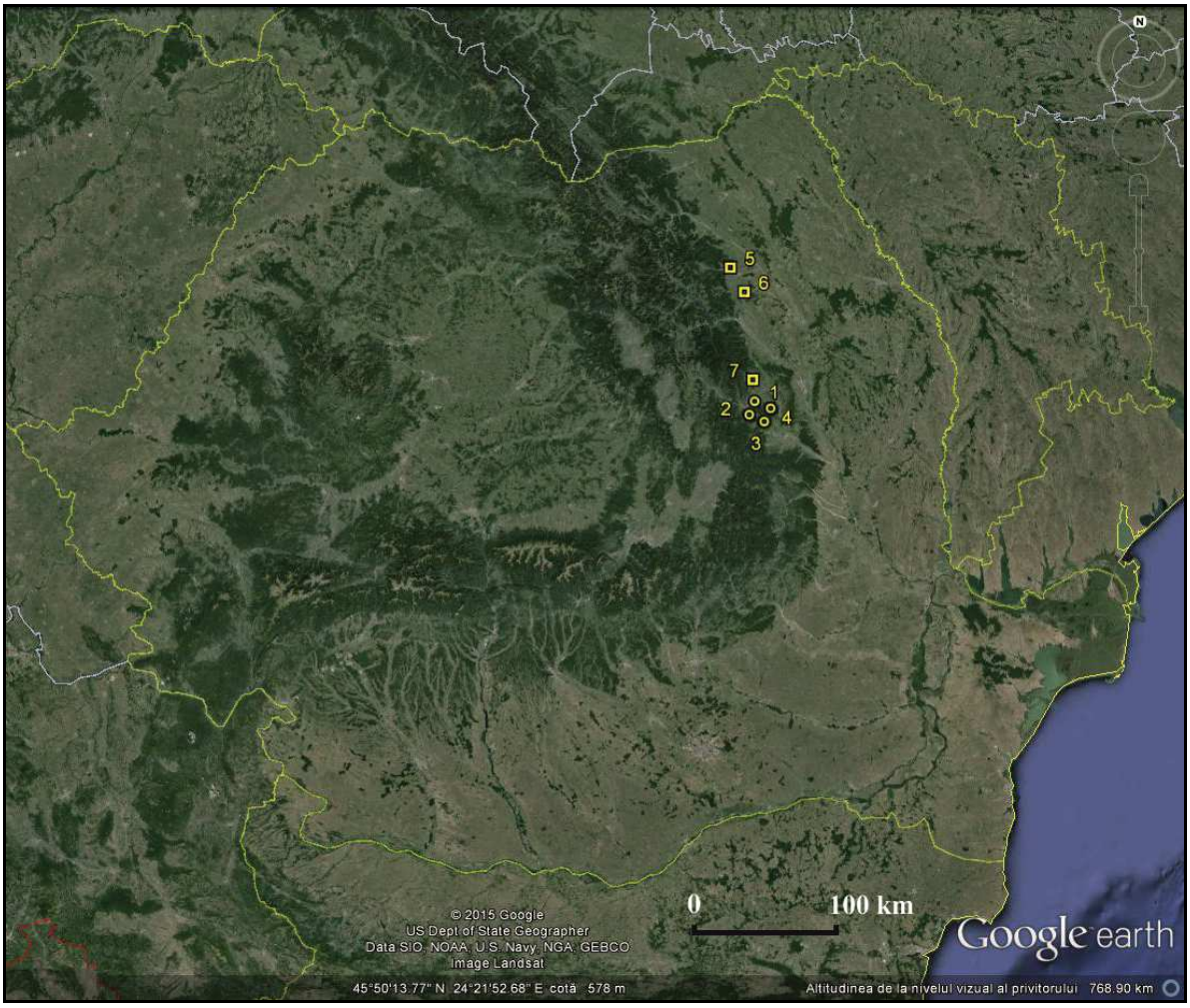

Fig. 4 – Etablissements saisonnières („cercle") et points d'exploitation du sel („carré"):
1 – Poduri-„Pe Hăineală" (Cucuteni A); 2 – Poduri-„În Fundătură" (Cucuteni A);
3 – Valea Şoşii (Cucuteni B); 4 – Prohozeşti (Cucuteni B);
5 – Lunca (Cucuteni A et B), 6 – Ţolici (Cucuteni A et B), 7 – Cucuieţi (Cucuteni A)

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Le bois constituait la plus importante source de matière première utilisée en constructions et, en même temps, le principal combustible (destiné au réchauffement, à la préparation de la nourriture, au brûlage de la céramique, fonte du métal ou bien à la recristallisation du sel). D'ailleurs, il a été utilisé-en quantités réduites, c'est vrai, pour la fabrication de divers outils, parrures, objets de culte ou support pour artéfactes, mais qui, à cause de leur périsabilité, ne se sont plus conservés.

Une partie importante des terres agricoles a été pourtant défrichée et / ou déforestée, par incendie et coupe (bois non valorisé, certes), pour que les terrains occupés auparavant par la forêt soient introduits dans le circuit agricole (F. Monah, D. Monah, 2008, p. 52).

Ces actions d'exploitation du bois (défrichements suivis ou non des déforestations afin d'obtenir de la matière première pour constructions, en tant que combustible ou terres agricoles) représente en fait la principale action de nature anhropique, ayant l'impact le plus significatif sur l'environnement.

Dans le cas des différentes catégories de roches (sédimentaires, tels les argiles, les sables, les silicolites (notamment des silex), grès, calcaires, tufs) (O. Cotoi, C. Grasu, 2000, p. 41-49, tab. 4), utilisées pour constructions ou pour la fabrication des lits des artères hydrographiques qui arrosaient la zone cucuténienne ou des affleurements. Dans le cas d'exploitation de ces ressources de matières premières, l'impact anthropique sur le milieu naturel était cependant peu significatif.

Considérations finales

En conclusion, il est à constater dans la zone cucuténienne des Sous-Carpates de la Moldavie une grande variété géographique structurée suivant des limites bien définies, de manière à engendrer une série de particularités d'ordre culturel et économique par rapport au reste du territoire habité par ses communautés humaines, sans pour autant que celle-ci affectent l'unité d'ensemble de la civilisation concernée.

Dans cet espace, les membres des communautés humaines ont trouvé des conditions favorables à l'habitation et aux différentes activités de nature économique et leur adaptation optimale à l'environnement ainsi que la valorification judicieuse des ressources naturelles ont influencé tant la longue durée d'évolution que leur degré élevé de développement, traits caractéristiques de la culture Cucuteni.

Traduit par Grația-Elena Preoteasa

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Improving research results through analytical power

Geangoeşti-Hulă, Romania: A Gumelniţa settlement on the banks of the Dâmboviţa River. Non-invasive research results

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Abstract: *Geangoeşti-Hulă, Romania: A Gumelniţa settlement on the banks of the Dâmboviţa River. Non-invasive research results***.** The Geangoeşti-Hulă neo-eneolithic tell, Romania, is one of the numerous settlements belonging to the Gumelniţa culture: it is located at the northern extremity of the culture area, which involves, from the point of view of the habitation landscape, certain features. This study presents results of non-invasive research, archaeological survey and geo-physical prospection as a component part of a new project of systematic archaeological research of the place. The issues related to the position and micro-relief of the area were analyzed based mainly on the detailed digital terrain model (DEM) of the site allowing hypsometric, slope declivity, morphological profile tracing or visibility analyses. The magnetometric prospection completes the whole image of the site pointing out part of the structures underground, which is an important starting point in future invasive research.

Keywords: Geangoeşti-Hulă, Gumelniţa settlement, topographical and geophysical survey, non-invasive research

Introduction

The study of settlements from the perspective of the environment and landscape where they started and evolved asks for the discussion of some elements belonging to at least two different fields – archaeology and geography – that combine harmoniously producing what we call nowadays *landscape archaeology*. The importance of geography in understanding history, and particularly the importance of understanding the factors that determined the choice of certain places to settle are basic elements in the study of both current and past civilizations. The need to integrate geography in the study of history was illustrated in a very suggestive manner by the reputed Romanian geographer Ion Conea (I. Conea, 1934, p. 60) who claimed that „Without a presentation and an understanding of the geographical frame where a village was born and has lived we cannot present or understand anything that makes it up [...]. We cannot understand its location, shape, orientation, or structure – nor can we understand the material or spiritual life of its inhabitants."

This paper presents the Gumelniţa settlement at Geangoeşti-Hulă, Romania, starting from the non-invasive research of the site by the team of the West University from Timişoara, Romania, and the team of the „Curtea Domnească" National Museum Complex from Târgovişte, Romania. The research started from at least four premises that cover both old and current research topics:

- Identifying the trajectory of the defence system made up of earth walls and ditches;
- Identifying older digging made by G. Mihăiescu in the 1960s;
- Identifying the distribution of dwelling complexes within the settlement and its extension within the territory;
- Determining with accuracy the metric features of the tell;

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- Determining the features that favored the settlement within this landscape.

We believe that both archaeological survey and geo-physical research have allowed us to reach these desiderata and developed the premises for a new stage in the research of the Geangoeşti-Hulă site.

Historiographical and geographical background

The archaeological site at Geangoeşti-Hulă, Romania, is a neo-eneolithic tell that belongs to the Gumelniţa culture. It was first researched in the 1960s by Romanian archaeologists R. Gioglovan and G. Mihăiescu who traced a 64 m main section. From a stratigraphic point of view, they identified five dwelling levels; the last of which being also the best documented – the remains of a burned down dwelling (G. Mihăescu, A. Ilie, 2003-2004, p. 72). According to monographic and repertoire works, the stratigraphic succession of the tell covers six dwelling levels (A. Păun, 2003-2004, p. 86; C.E. Ştefan, 2011, p. 91). As for the chronological stages specific to the culture, most researchers agree that the settlement was functional during the stages A_2 and B_1 (A. Ilie, I. Neaga, 2010, p. 80; A. Păun, 2003-2004, p. 86; A. Frânculeasa, 2008, p. 15), the latter being superimposed by a inconsistent dwelling level of the Brăteşti type (A. Frânculeasa, 2008, p. 17; A. Frânculeasa, 2011, p. 17).

Bibliographical references to the site at Geangoeşti also concern the fortification system; however, in this case also there are inconsistencies regarding the depth of the defence ditch, i.e. 1.1-1.2 m (G. Mihăescu, A. Ilie, 2003-2004, p. 73) or 1.2-1.3 m (A. Ilie, 2006-2007, p. 245).

Archaeological materials consisting in ceramic vases, metal items or stone items, found during the invasive researches in the 1960s or recuperated from the hands of “treasure seekers”, were valorized in several synthesis articles and studies whose extensive mention would burden this paper.

The habitat and landscape at Geangoeşti was the core of analyses and succinct mentions in papers on landscape archaeology or on the analysis of habitat types in the Gumelniţa culture area (S. Morintz, 1962, p. 274; A. Morintz, 2007, p. 50; C. E. Ştefan, 2011, p. 62, 91;C. Bem *et al.*, 2012, p. 21).

The archaeological site is circumscribed geographically to the Romanian Plain: it is located at the limit between several relief sub-units such as the Piedmont Plain of Târgovişte, the Ciuta Plain, the major riverbed of Dâmboviţa and the Piedmont of Cândeşti (Fig.1). From the perspective of major milestones in the area, it is located 1.7 km NE from the School of Geangoeşti, 2.1 km N from the church in Mogoşeşti and 2 km south-south-west from the church in Priseaca; the geographical centre of the site has the coordinates 531521.796; 377926.662 (Stereo 70). The macro-geography of the area is made up of three major units easily discernible upon analysis of the Digital Elevation Model (DEM) in the Dragomireşti downstream area – Văcăreşti upstream area, as follows: the Târgovişte Plain, the major riverbed of Dâmboviţa and the Piedmont of Cândeşti. The Plain of Târgovişte has a fluviatile origin and is the result of the juxtaposition of discharge cones of the rivers Dâmboviţa and Ialomiţa (P. Coteţ, 1976, pp. 183-184). Its altitude is 282-298 m, which defines, morphologically, a terrace bridge between the two watercourses.

The passage to the major riverbed of Dâmboviţa has a level difference of about 15 m, with abrupt slopes and important relief energies. The micro-relief of the major riverbed is characterized by flatness, which has caused in time strong divagations of the main flow of Dâmboviţa, thus developing a rich network of meanders that are now fossil. Though nowadays the pre-historic settlement is at about 2 km from the River Dâmboviţa, satellite images point to the presence, at only 70 m far from the tell, of a fossil meander (probably a paleo-riverbed). The ex watercourse is well profiled in the field as shown by the satellite image print (it is about 12 m wide on the average). In addition, in the southern part of the site, agricultural works bring to the surface materials once deposited made up of rolled gravel: the soil here has a loamy-sandy texture (Fig.2). The NW area between the archaeological site and the Geangoeşti village is an ex-marching area that spread to the contact area with the slope of the high terrace.

To the west, the riverbed of Dâmboviţa is bordered by the Piedmont of Cândeşti characterized by altitudes higher than those of the other geographical sub-units ranging between 295 and 356 m. In this case, the relief is strongly

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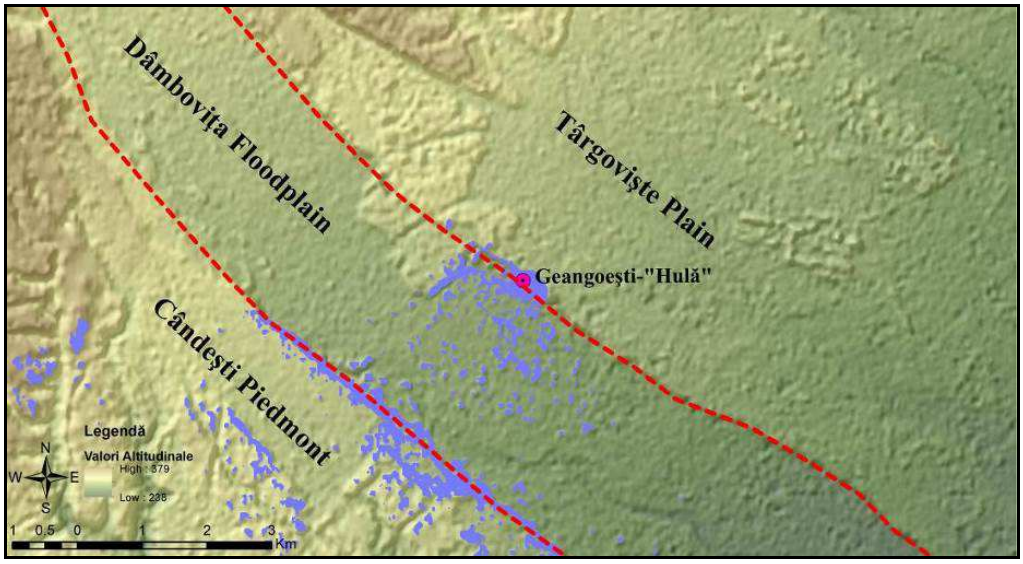

Fig. 1 Geographical framework and visibility factor analysis of Geangoeşti-"Hulă" archaeological site

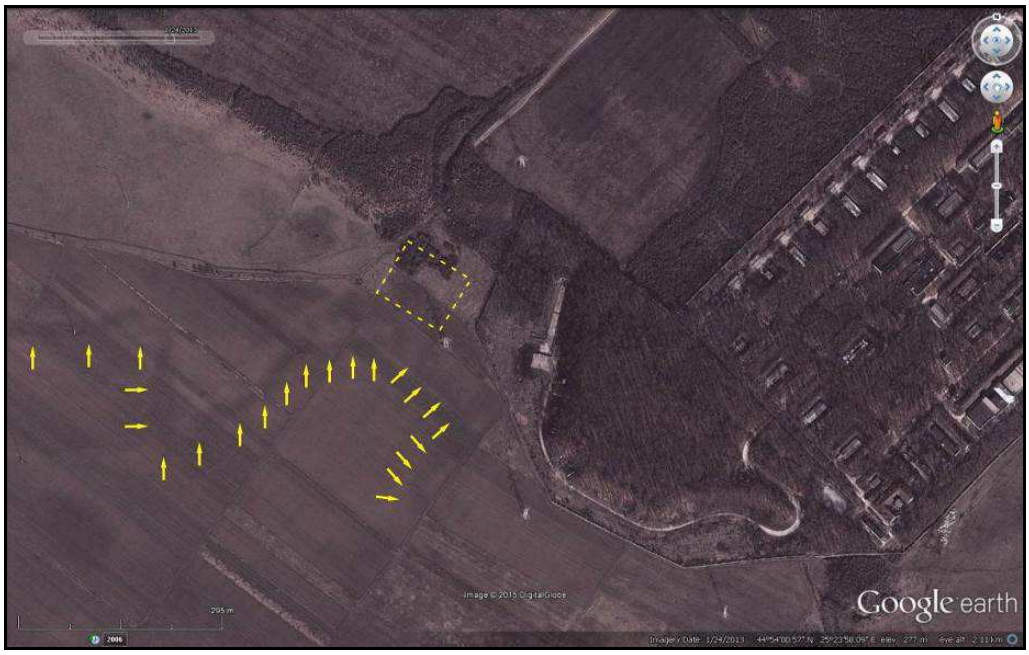

Fig. 2 Satellite image with the indication of fossil meander

fragmented into numerous valleys and small valleys; the transition to the lower area is done, as in the previous case, through a slope fall of 15 m.

Data acquisition and processing

Serious archaeological research nowadays should use a more consistent range of research techniques and methodologies that allow finally more complete and complex correlation and interpretation of the data.

The non-invasive research of the settlement at Geangoeşti-Hulă involved the use of two research methodologies belonging to different fields – geodesy and geophysics. To point out the micro-relief forms in the area and the outer look of the tell, we surveyed the site archaeologically: this allows a 2D and 3D reconstruction of the site as well as a set of analyses relevant in the pointing out of its morphological and morphometric features. The geophysical research

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aimed at detecting the structures underground as well as their space distribution; geophysical prospection allowed us to reach all these desiderata. To complete the data, we also consulted and analyzed historical map and satellite images of the area.

The archaeological survey was analyzed with a Leica TCR1201 Total Station: we thus collected from the field a set of data under the form of a cloud of 206 points based on which we later generated the DEM of the studied area. The goal of the archaeological survey was to reconstitute the 2D and 3D configuration of the terrain while removing as much as possible elements of modernity upon reading field data (D. Micle *et al.*, 2010, pp. 86-87; D. Micle *et al.*, 2010a, pp. 140-141). The morphology of the terrain allowed the use of a single base station with random orientation of the horizontal angle of 0º towards a fixed point. Both the working procedure and the lack of points with known coordinates in the field made us use a local reference system (M-M. Ştefan *et al.*, 2012, pp. 58-59). Turning the data in the local reference system into the national one (Stereo 70) was done according to the methodology described by A. Cîntar (Cîntar, 2013), which supposes to rotate the points by applying a trigonometry formula specific to Euclidian transformations.

Magnetometry, a component of geophysical prospection, was used to measure the vertical gradient of the land magnetic field; this was done with a Bartington Grad 601-2 unit. This equipment has two sensors capable of recording data with high accuracy (D. Ştefan, 2012, p. 46). The conditions *in situ* allowed the magnetometric research of the entire site; its area was covered with 9 grids (Fig.3) measuring 30 × 30 m (900 m^2/grid). The ninth grid could not be prospected entirely because of the vegetation that prevented us from seeing about ⅓ of its area. Under these conditions, we prospected an area of 7,860 m^2, recording 31,200 individual values of the vertical gradient.

The values read in the field were processed to produce a magnetogramme that reflects as accurately as possible the structures and their space distribution underground. To remove the errors inherent to such an approach, we applied a set of filters of geometrical correction of incorrect data caused by a lack of synchronization of the pace during the crossing of the traverses (*DeStagger*) or by the removal of linear anomalies (*DeStripe*). To point out the details, the value variation of the data was limited within the interval ±44 nT by removing extreme values (*Clip*).

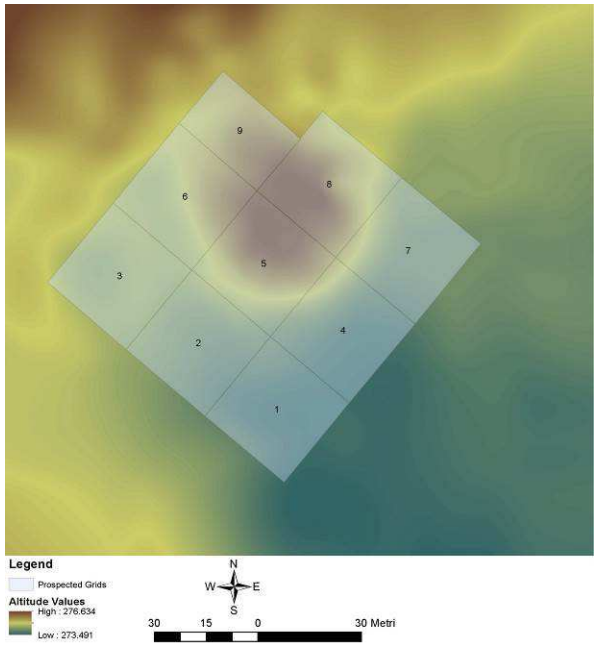

Fig. 3 - Spatial distribution of prospected grids

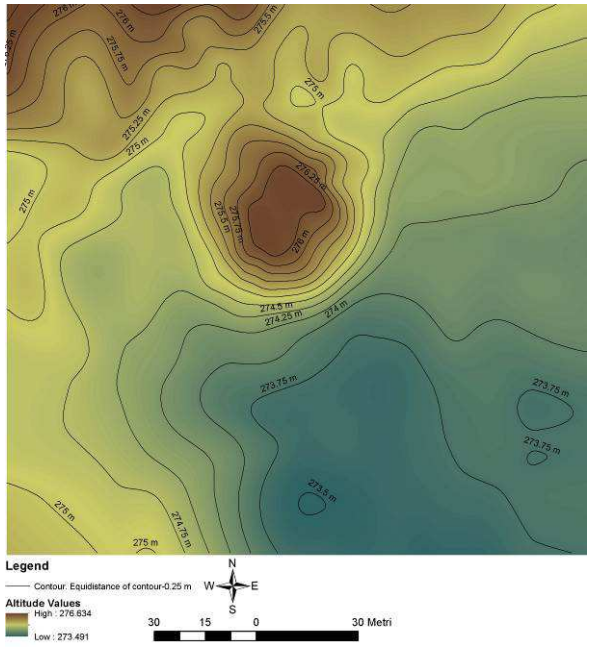

Fig. 4 - The hypsometric analysis (Equidistance of contour – 0,25 m)

Analysis of survey and geophysical data

As stated previously, the role of non-invasive research of the site at Geangoeşti-Hulă

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was to clarify some older issues related to both the site morphology and its inner structure; we also aimed at developing a starting point for the new research project of the site.

The survey research aimed at developing a working tool meant for a landscape archaeology study for the most exact capture of geomorphological elements that favored the settlement in this specific point.

The location of the site on the northern branch of the culture also involves morphological and morphometrical features. In general, as far as the northern area of the Gumelniţa culture is concerned, they identified four general types of landscape (A. Frânculeasa, 2011, pp. 9-10). The tell at Geangoeşti, according to this classification, belongs to the third category (the Prahova-Olt interfluve) characterized, in general, by a relief dominated by high areas of piedmont with altitudes ranging between 150 and 325 m; the settlements speculated, in general, the base of the terraces, the river banks or the aits (A. Frânculeasa, 2011, p. 10).

The Gumelniţa settlement at Geangoeşti-Hulă individualises clearly through a set of natural features. The micro-relief speculated by the tell is a transition one from the High Plain of Târgovişte to the major riverbed of Dâmboviţa, with the site covering the last terrace of the higher relief unit. Though in the field the transition from a high relief form to a flooding meadow seems to be abrupt, the detailed analysis of the land survey allows some detail observations. Thus, we can see that the people of those times settled on the last terrace of the high plain, a well-defined altitudinal step within the interval 274.5-275.5 m (Fig.4). Higher forms belonging to the Plain of Târgovişte were in the northern-western area of the site; the transition to these forms was done slightly by progressively increasing the altitude along the direction SE-NW. The differences in altitude between the two areas are minor (between 0.5 and 0.7 m).

The eastern side of the settlement is also an area higher than the flooding meadow, with a difference of level between the two units of 1.5 m.

The flooding meadow was perceived exclusively in the south-east area of the tell: it is characterized by absolute altitudes between 273.5 and 274.5 m. Most probably, this area represented the permanent water source of the settlement, an area crossed by a divagation meander of the River Dâmboviţa, currently a fossil. Though it is difficult to see the morphology of the meander nowadays, the traces of its activity in the area are still visible on the soil (there are deposits of alluvial materials). The soil in the southern area of the site has a loamy-sandy structure intertwined with well-rolled river gravel of different size (Fig.2).

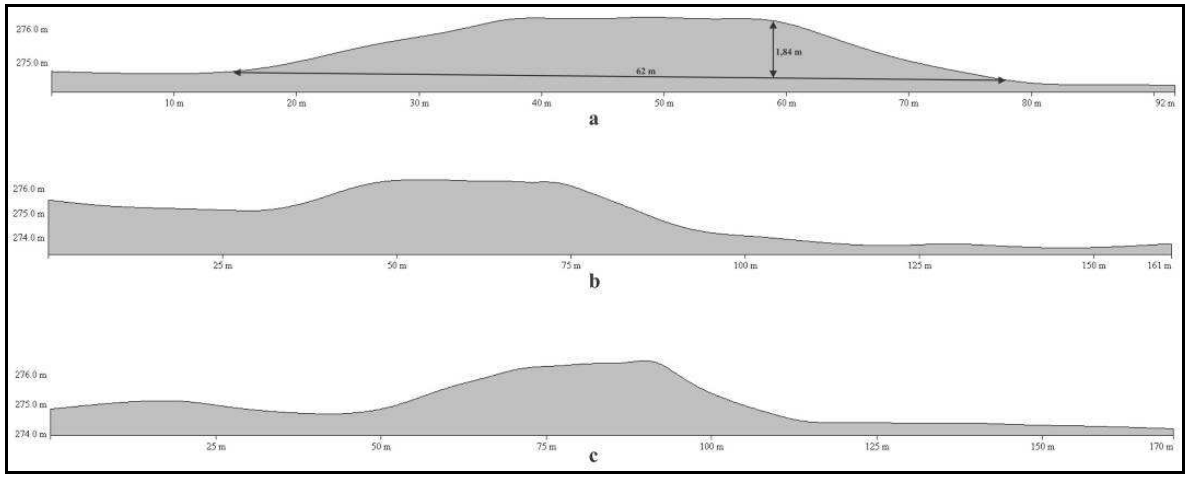

Fig. 5 - Longitudinal profiles: a – profile of the tell; b– N-S profile of the site; E-W profile of the site

As for the strict morphology of the tell, it is characterized by a circular mound 276.4 m high and 1.84 m higher than the surrounding ground. The diameter of the mound is also important from the perspective of classification: 62 m. In general, the figures supplied by the land survey contradict the information supplied by the bibliography regarding the morphometry of the site (G. Mihăiescu, A. Ilie, 2003-2004, p. 72; A. Ilie, I. Neaga, 2010, p. 80; C. Bem *et al.*, 2012, p.

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21), which reflects only a stage of natural changes of the landscape and, implicitly, of the tell (Fig. 5).

The individualisation of the Plain of Târgovişte and of the Piedmont of Cândeşti through the deepening of the major riverbed of Dâmboviţa in the studied sector determined specific slope declivity. The area is characterized mainly by slopes with low declivity (ranging between 0 and 4.3 degrees) specific to the interfluve Dâmboviţa-Ialomiţa, to the major riverbed of Dâmboviţa and to certain well-defined areas of the Piedmont of Cândeşti. Medium and high slopes (10.8-30.6 degrees) are more frequent in the Cândeşti Plateau and in the contact areas of the three relief subunits, which once more emphasises the landscape diversity in the area.

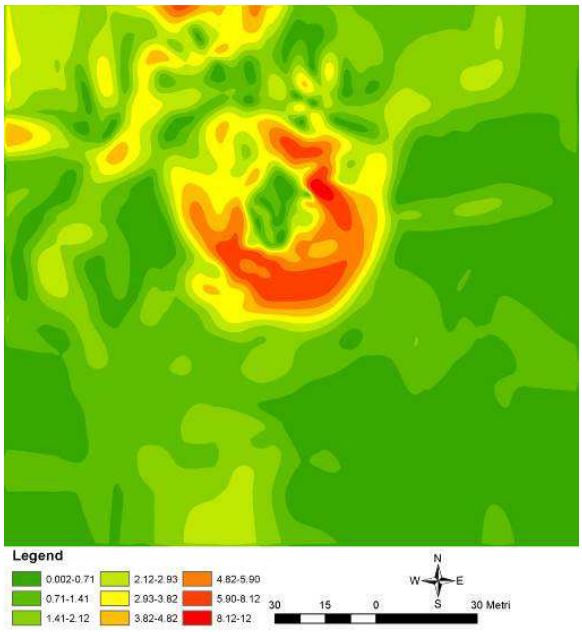

Fig. 6 - Thematic map of slope gradient (degrees)

Speculating, in general, a landscape with altitudes whose variations are not spectacular over small distances, the environment characteristic to the tell has small and medium slopes (0.02-3.3 degrees) representing 90.2% of the total slopes. Medium and high slopes individualize the mound, in general: thus, declivities ranging between 3.3 and 5.7 degrees are distributed at its base, while slopes with considerable values (ranging between 5.1 and 12 degrees) are met on the northern and north-eastern side of the tell. The slope classes with considerable vales are also in the north-eastern areas of the site along the linking segment between the low terrace and the high plateau of the interfluve Dâmboviţa-Ialomiţa (Fig.6).

The relationship between the geography of the place and the location of the settlement is also obvious in the analysis of the exposition of the slopes whose relevance is concrete exclusively when applying it at a general level. According to land survey and historical maps, the entire left slope of the major riverbed of Dâmboviţa has a southern and south-western exposition, which, corroborated with the flatness of the low terrace of the settlement, ensure a good exposition to sunlight during the entire day.

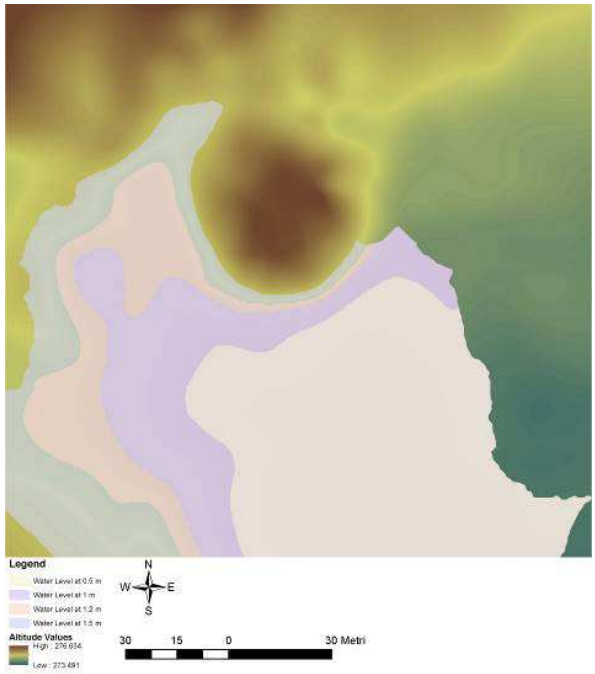

Fig. 7 - Water levels according to minimum elevation read on DEM
(levels between 0.5 and 1.5 m)

The capture of the relief detail features was done by tracing longitudinal profiles in the relevant points of the DEM. In general, they pointed out level differences, the general features of the mound and the ratios between the morphological units identified within the landscape (Fig.5). In most cases, through such analyses, it is possible to point out the defensive structures of a settlement; but most probably, the features of the ditch surrounding the settlement at Geangoeşti – 4.2 m opening and 1.1-1.3 m depth (A. Ilie, 2006-2007, p. 245; C.E. Ştefan, 2010, p. 62) – corroborated with the effects of modern

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agriculture, have removed from the landscape the land survey anomalies characteristic to such a structure.

Based on the detailed DEM of the terrain, we could simulate the possible flooding levels of the area (Fig.7) and their effects on the tell. Starting from the minimum altitude recorded (273.5 m), we simulated four levels of water level increase within the range 0.5-1.5 m. The increase of the water level with 0.5 m would have flooded the flooding meadow area close to the tell, and the minimum distance between it and the marsh area would have been 8 m. compared to the results described previously, when water level increased 1 m, the western areas of the settlement would have also been flooded and the distance to the water bank would have been only 2.5 m. The last two simulation levels (1.2 and 1.5 m) would have affected the tell directly, with the entire southern and even the eastern-northern areas being flooded. Obviously, our model is a fictitious one, but we believe that it clarifies once more the configuration of the relief, the intuitive intelligence and the „professionalism" of the people of the Gumelniţa culture in choosing dwelling areas.

The results of magnetometric researches are presented as magnetic maps or magnetogrammes superimposed over the terrain digital model in an attempt to corroborate the two types of data – geophysical and land survey (Fig.8-10).

As expected, most magnetic anomalies focus on the mound surface allowing distinguishing two concentration areas separated by a relatively linear anomaly. *Extra situ* we could identify mainly linear anomalies and point anomalies with variable contrasts depending on the nature of the objectives detected. An important observation refers to the fact that the data collected were relatively "clean" magnetically, while anomalies generated by modern pollution were localised punctually, with an increased share within the grids 8 and 9 of an earth road (Fig.8).

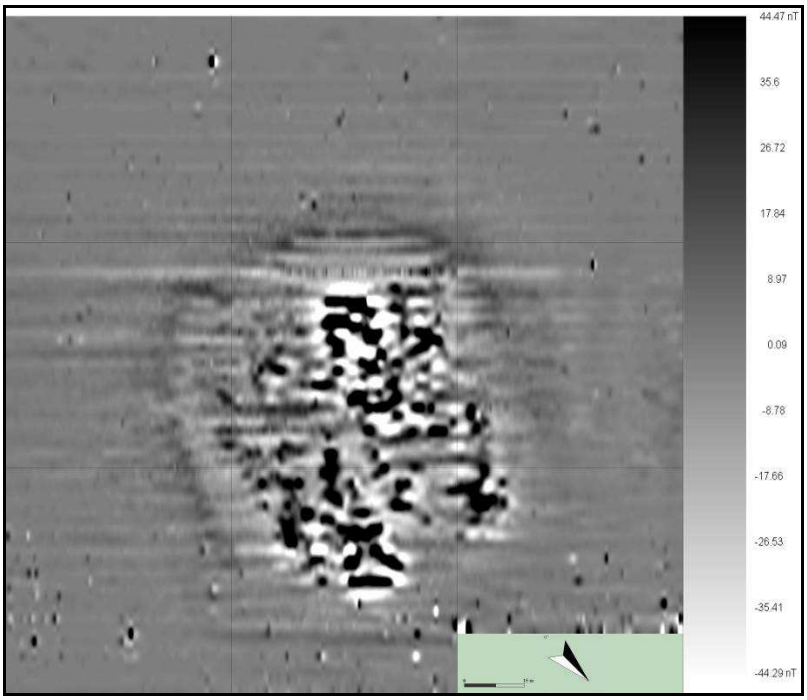

Fig. 8 The magnetogramme of Geangoeşti – "Hulă" tell settlement

To interpret the magnetic map, we identified a set of areas for practical reasons, which we designated from A to D (Fig.9).

The structures delimitated by a red contour (A) represent rectangular positive magnetic anomalies with rounded corners whose medium size is, in general, 6 m x 2.5 m. The anomalies show increased values of the magnetic gradient ranging between 50 nT and 100 nT; the representation of each of them is done by a abrupt passage from dark grey or black shades to white shades. The structural and value features of the anomalies point to a remnant magnetisation caused by temperatures that, during a fire, were above Curie point, i.e. 585ºC (D. Ştefan, 2012, pp.38-39). The anomalies discussed describe

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archaeologically dwelling structures identified due to their strongly burnt adobe platforms belonging to the fifth dwelling level of the tell. The relatively small depth of these structures (0.5-0.6 m) as well as the thickness of the layer made up of massive pieces of adobe (0.6-1.0 m) (G. Mihăiescu, A. Ilie, 2003-2004, p. 74) are the main factors having generated the strong signal and the bipolar aspect of the anomaly.

We could also mark some well-delimitated anomalies (yellow contour/B) of black colour whose structure differ from those previously described due to the lack of bipolar aspect. From an archaeological point of view, they describe the same type of construction as discussed above, only most probably their make-up is less compact or not as thick.

Both types of anomaly also have circular structures whose diameter is up to 1 m and whose gradient values range between 10 nT and 40 nT. This type of anomaly can be interpreted as pits whose function can be established exclusively through invasive research.

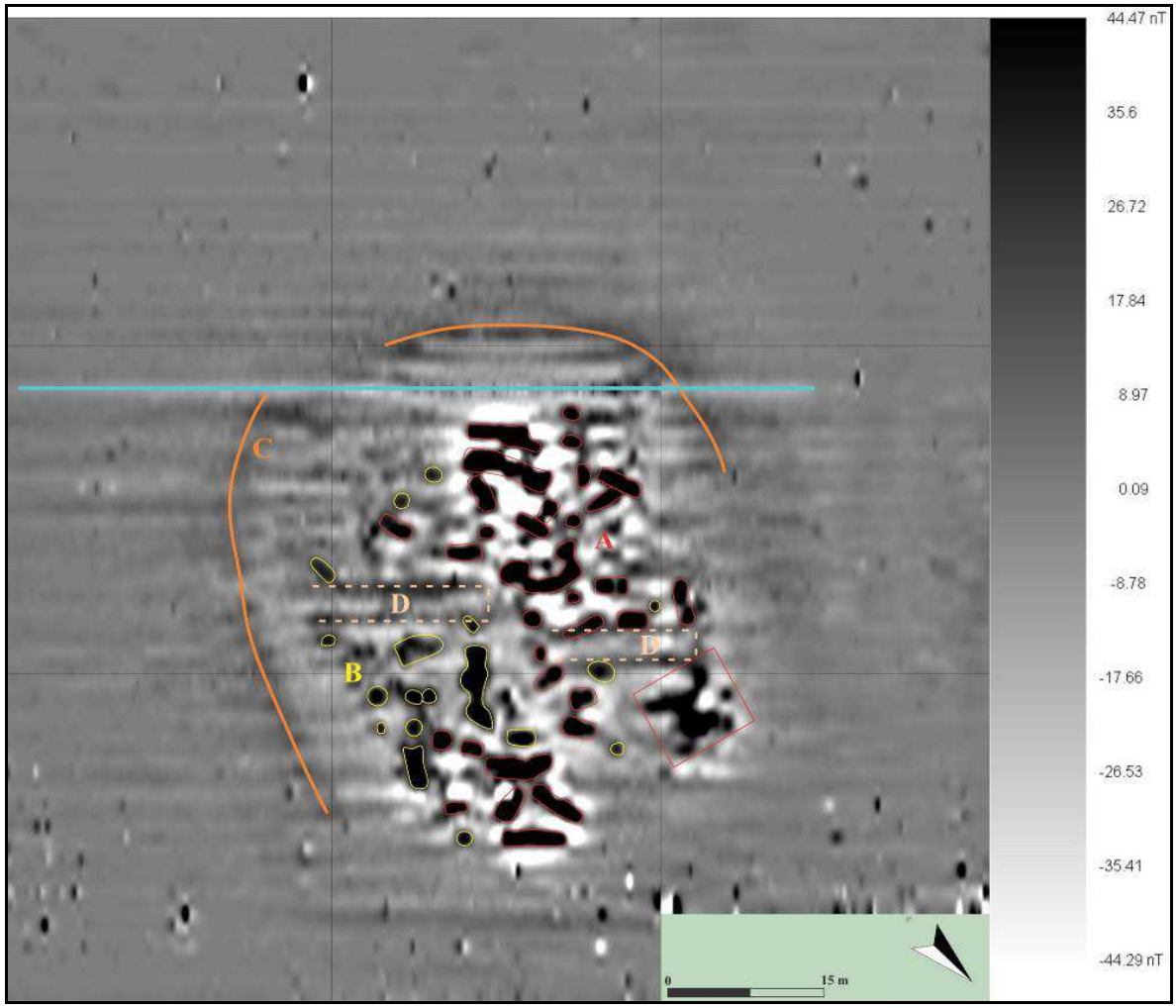

Fig. 9 - The interpretation of the magnetometrical prospection of the Geangoeşti – „Hulă" site

Two of the layers belonging to the type A anomalies have irregular shapes (a and 2) and can be interpreted as two or more archaeological complexes overlapping partially.

In the eastern and south-western areas there is a linear anomaly (C) that follows the shape of the tell, with an interruption of 9 m in the southern point of the mound the rest of which totals 80 m in length. The contrast of this anomaly is a weak one (its values range between 5 and 10 nT) and it is represented in the magnetogramme by inconspicuous shades of grey. By corroborating our results with the data from the findings, we can assume that this

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anomaly represents the defence ditch of the settlement. The weak contrast of the complex on the magnetic map was most probably determined by the physical features of the ditch: an opening of 2.4 m and a depth of only 1.1-1.2 m (G. Mihăiescu, A. Ilie, 2003-2004, p. 73; A. Ilie, 2006-2007, p. 245 and Fig. 1). The prospection did not capture the ditch o the northern and north-western sides: their absence is confirmed by the archaeological research that found here, below a superficial layer of soil, natural deposits of gravel. Likewise, the possible defence wall that doubled the ditch was not identified by magnetic research: its situation is not clear archaeologically either. Stratigraphically, the defensive structure is linked to the second dwelling level (G. Mihăiescu, A. Ilie, 2003-2004, p. 73).

A negative linear anomaly 60 m long represented by shades of white can be noticed on the southern side of the tell (marked in blue). The mean values of the magnetic gradient in the area can be ranged between 6 and 12 nT. Terrain observations in this case were important because this anomaly is rooted in our modern times: they represent a delimitation of agricultural plots by a furrow that created a level difference of about 0.3-0.4 m between the mound and the area south from the mound.

Back to the central area of the tell, there are two areas represented by rectangular anomalies (D) 2 m wide and a gradient whose value ranges between 10 nT and -20 nT. The position of the anomaly corroborated with available data make us believe that the two sectors are parts of the main line section practiced by G. Mihăescu back in 1960.

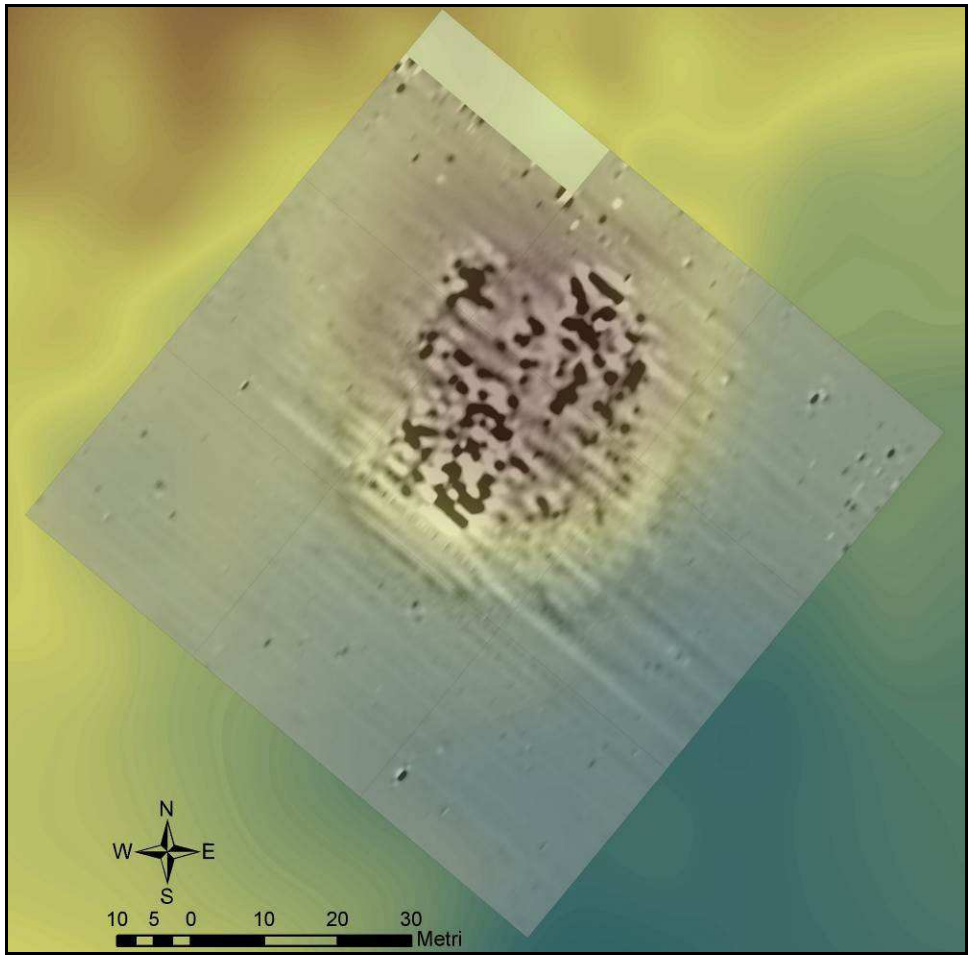

Fig. 10 The magnetogramme overlaied on the topographical survey

Other objectives of archaeological interest can also be identified outside the perimeter of the earth mound, mainly in grid 8, but with a lower intensity.

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Conclusions

Non-invasive research carried out at Geangoeşti-Hulă represents the debut of a new stage in the systematic research of the Gumelniţa tell. The land survey of the entire area pointed out certain morphological features of the landscape occupied by the mound that are difficult to notice in the field. We could determine the exact size of the mound: the height of 1.84 m and the diameter of 62 m place the settlement in the range of medium settlements from the point of view of its size (see the classifications in C. Bem *et al.*, 2012, pp. 23-25). We could also determine the absolute altitude of the site – 276.4 m – that differs from known altitudes in historiography (48.6 m more).

A first classification of the types of landscapes speculated by the Gumelniţa communities based on thorough field observations from geographically different micro-areas was advanced by S. Morintz (1962) who distinguished three main types of settlements: settlements located on hill ends or on terrace head lands (a), settlements located on heights and bordered by difficult slopes (b) and settlements located in flooding meadows (c) (S. Morintz, 1962, p. 274). Though the number of Gumelniţa settlements increased due to the researches carried out in the last 50 years, the classification advanced by S. Morintz is still valid and is embraced by most researchers.

Judging the settlement at Geangoești after the morphological and morphometric features presented above, we see they range from the perspective of landscape in the third category because it speculated the terrace between the flooding meadow of the River Dâmboviţa and the terrace of the Piedmont of Târgoviște. Altimetric classes are clearly delimited: the three areas pointed out (the link area with the upper terrace, the median terrace and the flooding meadow) are organically linked topographically. To classify it in the third category of the classification advanced by S. Morintz we can also rely on slope declivities in the DEM: they range between small and medium (0.02-3.3 degrees), which points once more to a landscape that does not supply direct natural defensive opportunities specific to the categories „a" and „b".

Based on the general DEM of the area, we also analysed the visibility of the site centre (Fig.1): the visual field is limited toward the north because of the terrace, its extension being exclusively in the south-east areas. The community had good visibility in the area close to the settlement over 0.5-1.0 km and over the area on the slope on the right bank of Dâmboviţa, at the contact point with the Piedmont of Cândeşti. Over the area of major riverbed, visibility is distributed exclusively over certain areas, similar to the heights characteristic to the plateau area. It is possible that, by eliminating certain factors in the flooding meadow area (the vegetation within the DEM), visibility increase along it. The control of the high terrace and its use in case of danger is just a supposition (A. Morintz, 2007, p. 50): future systematic field research could clarify these aspects.

Magnetometric research of the site supplied a first image of the structural elements underground. We could point out clearly within the magnetogramme, the burnt dwellings of the fifth level of dwelling: the limits of the method did not allow the detection of other possible dwelling structures beneath it. Another desideratum of the geophysical investigation was the identification of the trajectory of the defence ditch surrounding the settlement dating from the second dwelling level period. The trajectory of the ditch was identified strictly along the southern half of the tell: the linear anomaly is missing for the northern area. The space distribution of the archaeological objectives of points to the fact that the settlement concentrated strictly on the tell protected by a ditch dug on the southern side. Archaeological digging will clarify if it closed the tell completely or if the communities purely and simply speculated the higher area in the north as a direct form of protection.

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An uncommon archaeological discovery: an incised blueprint of a church on a brick from Prince Brâncoveanu's architectural complex of Potlogi

Florin Gabriel Petrică, Mihai Claudiu Năstase**

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Abstract. *An uncommon archaeological discovery: an incised blueprint of a church on a brick from Prince Brâncoveanu's architectural complex of Potlogi*. The archaeological discovery that makes the subject of our paper regards the identification of an incised rectangular blueprint of a church on a brick found in the courtyard of Potlogi Palace. Churches such as this, dating from the times of Prince Constantin Brancoveanu, all similar in plan can be found in Potlogi, Mogoşoaia and Doicești. It is a distinct possibility that even one of those mentioned above could be represented on the brick in question. We consider, however, based on a short historical context described in this material, that could be the case of St. Nicholas church from Făgăraş, a corollary of Prince Constantin Brâncoveanu's political ideology, which core was the figure of Prince Mihai Viteazul.

Key-words: church, incised blueprint, medieval age, Potlogi Palace, Romania

Our short paper mainly aims to provide a general presentation and description of an exceptional medieval age artefact discovered during the archaeological research carried out within the premises of Potlogi Palace, Dâmboviţa County, Romania. These archaeological investigations were a step in the process of obtaining the rightful approvals from Ministry of Culture and National Cultural Heritage for the development and completion the project of restoration and reconstruction Potlogi Palace architectural complex („Restaurarea şi valorificarea durabilă a patrimoniului cultural precum şi crearea /modernizarea infrastructurii şi utilităţilor conexe, în zona ansamblului brâncovenesc Potlogi comuna Potlogi, judeţul Dâmboviţa" – "Restoration and sustainable upgrade of cultural heritage and setting up / modernization of infrastructure and related utilities, in the area of Potlogi Palace architectural complex, Potlogi commune, Potlogi, Dâmboviţa County").

Under these circumstances, the Archaeological Service from the Ministry of Culture and National Cultural Heritage was requested for preventive archaeological research permits (no. 198/2010 and no. 55/2012). The research team was lead by Ph.D. Gheorghe Olteanu and the members of the research team were: Ph.D. Ovidiu Cîrstina, Ph.D. Diaconescu Petru Virgil, Mihai Claudiu Năstase, Cheosea Felician and Ph.D. candidate Florin Gabriel Petrică (G. Olteanu et al., unpublished report).

The artefact that makes the subject of our presentation is a building brick on which was traced a plan of a church (fig. 1, 2). Its discovery was done during a surface survey in the court yard of the palace, it was recovered fragmentary, broken into two halves. Despite that it kept most of the incised elements which allowed a rather easy restoration. This does not undermine the effort and the skills of our colleagues from the Restoration Laboratory of National Museums Complex "Princely Court" Târgovişte, Daniela Iamandi and Andrei Scărlătescu, whom we thank once again*. The size of the object studied is part of the typological format bricks used in the construction of buildings in the whole

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architectural complex built here by Prince Brâncoveanu and its dimensions are 29x15x4 cm. The church, incised in raw slurry is 24x7 cm and space components of this construction are: porch 7x3,5 cm .; narthex 5x5 cm; nave 4x5 cm. The altar is represented as a triangle, 4 cm and 5.5 cm at the base. isosceles sides. Measurements were made on the inside wall of the church having a thickness of 1.5 cm, the hatched with oblique lines.

Fig. 1 - Photography of the artifact – brick with a church incised sketch

As the plan suggests, it is an elongated rectangular church without side aisles so, and plotted almost like a ship. The first question, otherwise normal, is related to the identification of this church.

Typological the object that makes the subject of our study, with its dimension: 29x15x4 cm, is the same as the bricks used in the construction of buildings of the whole architectural complex Prince Constantin Brâncoveanu (1688 – 1714) raised in Potlogi. The church, incised in raw slurry is 24x7 cm and its represented space components of the construction are: porch 7x3,5 cm; narthex 5x5 cm; nave 4x5 cm. The altar is represented as a triangle, with a 4 cm base and 5.5 cm for the isosceles sides. All measurements represent inner dimensions of the spaces, the walls of the drawn church have a thickness of 1.5 cm and they are hatched with oblique lines.

As the blueprint suggests, it is an elongated, rectangular church therefore without asides, resembling on its graphical representation more with a ship. The first question, otherwise normal, is related to the identification of this blueprint with an existing or perished church and it can not be, in our opinion, sought than between the churches with rectangular planning raised by the great prince (fig. 3-5) (for the typology and the chronology of this type of churches see N. Ghika-Budesti, 1936). Since Potlogi Palace was built between 1697-1698, and certainly the brick in question comes from one of the buildings of this architectural complex, it comes somehow natural to think of a church that was already in a constructional process at that date or was to be built somewhere around the year 1698.

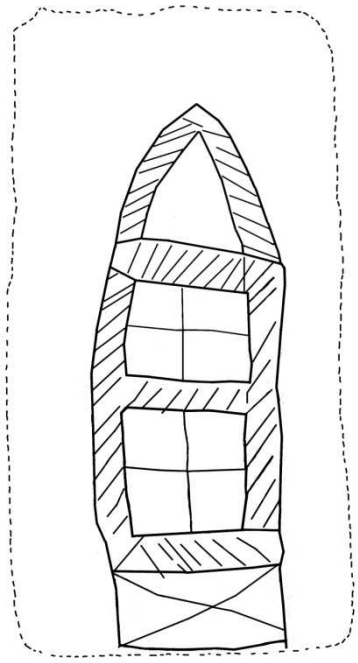

Fig. 2 - Drawing of church's incised blueprint (by restorer Andrei Scarlatescu)

The year 1698 was rich in constructions for Prince Brâncoveanu, it was the tenth year of his reign, as well. The new princely courts were meant to represent the peak his constructive efforts and this year Potlogi Palace was completed as well as a new painting for the Grand Princely Church of his summer residence Târgovişte.

Beyond the mountains, in Transylvania, Prince Constantin Brâncoveanu initiates another constructional process, starting in the years 1697-1698, from Sâmbata de Sus, his grandfather's

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estate, Preda Brancoveanu to Făgăraş, where previously there had been a church founded by Prince Mihai Viteazul (1593 - 1601). About last prince's chronicle states: "in this year His Highness sent Neagoe pitariul Măjăscu in Transylvania, in Fagaraş, to finish the church, which foundations were started since last year, all on His expense. For Christians there did not had a church of their own and many prayers had they sent for it before and His Highness did not shirk from this divine task, more than that He happily answered their prayers and sent His envoys to build a large and beautiful church, in remembrance and honour of the great miracle worker, St. Nicholas Mirlicheischii " (R. Greceanu, p. 498).

By this constructional effort across the mountains, Prince Constantin Brâncoveanu placed himself in the lineage of his illustrious predecessors on Wallachia's throne, protecting materially and spiritually the Orthodox Church in Transylvania (M. G. Abrudan, 2014).

Moreover, as we shall see, the prince wanted saw himself as a follower, at least ideologically, of the earlier Prince Mihai Viteazul's politics. Moreover, in addition to his family estate from Sâmbăta de Sus, whose architectural components will undergo substantial transformation in the years 1698 - 1701, the prince will rebuild in the same period, another two churches, whose first founder was Prince Mihai Viteazul (R. Greceanu, p. 46).

These churches are those from Ocna Sibiu and Făgăraş, first built in 1701, the latter being built, after long delays, in two stages in the years 1697 and 1698.

The church from Făgăraş was built on the west of Făgăraş Fortress, by Prince Mihai Viteazul, at a date that can not be determined exactly, probably soon after the year 1595. Its existence must have been quite short, since in 1617 Gabriel Bethlen, Prince of Transylvania, mentioned it at past tense. Prince Constantin Brâncoveanu's intentions to restore the church, started since 1694 but they have not been achievable earlier than 1697, when the foundations stone was put first (R. Greceanu, p. 43).

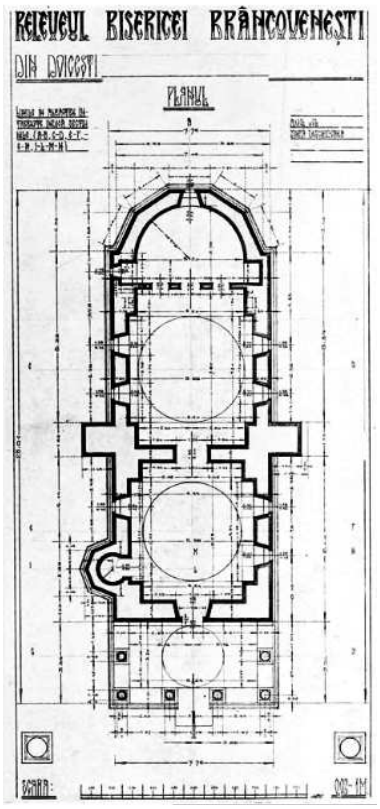

Fig. 3 - Blueprint of Doiceşti Church (after N. Ghika-Budesti, 1936 – sketch CI).

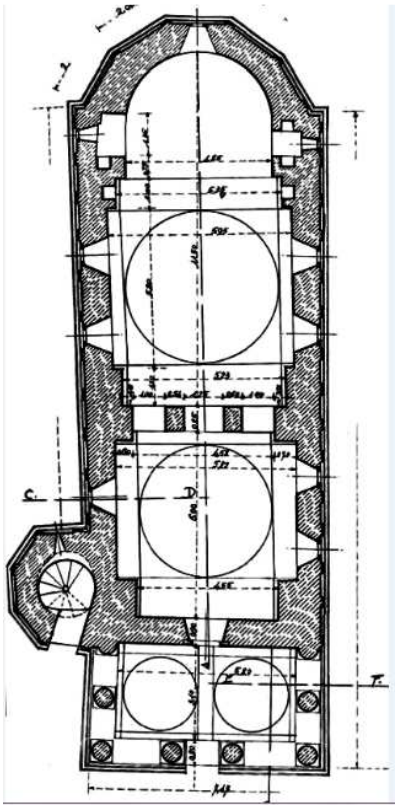

Fig. 4 - Blueprint of Mogoşoaia Church (after N. Ghika-Budesti, 1936 – sketch CIX).

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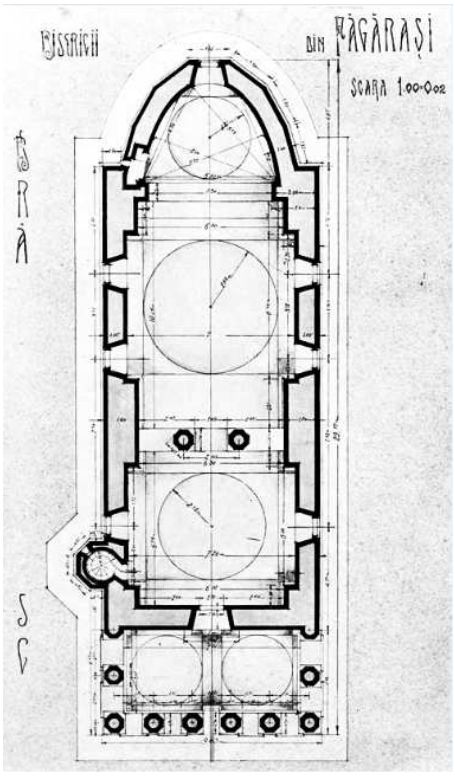

Fig. 5 - Blueprint of Făgăraş Church (after N. Ghika-Budesti, 1936 – sketch CVII).

The church's inscription is eloquent in attesting these two constructional stages: "This holy and divine church of the Orient, I, Costandin B. Băsărabu Waywode, Lord and Protector of all the land of Wallchia / For glory and praise of the blessed and contained in three ipostasis and one being Trinity and for St. Nicholas Mirelechii's Bishop wonder-worker whose patron is, from keystone and with all the expense, he founded and built in year 1698 of the world's absolution, in the tenth year of his reign. And it begun in the month of June, the 17th day and was finished in the month of September, the 30th day in the year - and in there times was steward Neagoe Pitar Răţescu – the year 7206 from the creation of the world, year 1697" (N. Iorga, 1906)

By its planning, the Făgăraş church attracted our attention by default (fig. 5), considering, as a working hypothesis, for the moment, that, perhaps, it is the church represented on brick found in the court yard of Potlogi Palace since is the only building corresponding to this blueprint built by the prince in those years. Another key element that also drew our attention is the close connexion, like true arch over time, that Prince Brâncoveanu achieved, in this way, with Prince Mihai Viteazul, ideological connexion suggested by the political message contented in the votive portraits gallery located in the narthex above mentioned Grand Church from Târgovişte. In this respect, I presented the paper with the title *"Once more on the votive painting from the Grand Church of the princely residence in Târgovişte"* during the debates of the scientific session "*Brâncoveanu 300. Old capital cities of Wallachia between East and West*, Târgovişte, May 23rd 2014. I tried, on this occasion, dedicated to the memorial of martyr waywode, to demonstrate the political message the prince encrypted in the votive painting containing this portraits gallery located in the nartex of the Grand Princely Church of Târgovişte. He refers, on the one hand, to the anti-Ottoman and unifying political legacy of Prince Mihai Viteazul, ideologically continued by princes of ruling families Craioveşti and Cantacuzino and, on the other hand, he expressed the idea of Byzantine imperial heritage, traceable even earlier since the times of Prince Neagoe Basarab (1511 - 1521) and to whom Prince Constantin Brancoveanu was not a stranger.

St. Nicholas church of Făgăraş was built by Constantin Brâncoveanu, on the site of the elder church of Mihai Viteazul, with rather large dimensions of 30x10 m. It has a massive octagonal bell tower on the narthex (N. Ghika-Budesti, 1936). The church has rectangular

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shape, with an elliptical apse covered by a spherical dome and on the northern facade the staircase of the bell tower. Ten octagonal pillars bear up an open porch. The windows and doors frames have Gothic profiles and the roof, redone, gives the church a characteristic note in the region's landscape. The church is subdivided into porch, narthex, nave and altar. The shrine's apse is semicircular on the interior and polygonal on the exterior (G. Ionescu, 1937, p. 186).

Returning to Făgăraş church's inscription, we see that it contains, a rather common feature of the inscriptions for the constructional works of Prince Ştefan cel mare (1457 - 1504), mentioning both the beginning and end of the construction works. The second phase, that of 1698, because that is referred to in the text, certainly includes the start date as June 17th.

The date June 17th is present in the painters 'inscription of the Great Princely Church of Târgovişte, painted for the first time, as Tereza Sinigalia underlines, during the reign of Prince Mihai Viteazul (T. Sinigalia, 2001). The coincidence of these data, we believe, is not really random, for it is precisely a binder to the illustrious figure of Prince Mihai Viteazul, the above mentioned church of Făgăraş being nothing else but a sequel in the constructional of Târgovişte, the main residence of Prince Mihai Viteazul since the autumn of 1596.

*The artefact numbers among those c. 700 selected by their exceptional value to be part of the exhibition "Treasures of Romania in China"

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-Primul subtitlu de paragraf - literă mare, bolduit şi aliniat la stânga paginii).

-Al doilea subtitlu de paragraf - litera mare numai la începutul cuvântului, aliniat la stânga paginii).

-Al treilea subtitlu de paragraf - caracter italic, litera mare numai la inceputul cuvantului, aliniat la stânga paginii).

2. Caracterul "italic" va fi folosit pentru termeni sau abreviaţii de genul "et al.", et collab. "etc".

3. Unităţile de masură trebuie sa fie reprezentate prin simboluri apartinind Sistemul International de Măsură.

4. Autorii citati:

a - Sistemul de trimiteri bibliografice este unic, şi anume cel britanic, adica note în text, iniţiala prenumelui va precede numele autorului, după care se va menţiona anul apariţiei lucrării respective, exemplu – (M. Otte, 1995), iar când în text se utilizează un citat, care se va pune între ghilimele, citarea va cuprinde pagina (M. Otte, 1995, p. 56-57).

b - Dacă numele autorului face parte dintr-o propoziţie, numai anul se pune in paranteza, de exemplu "….M. Otte (1995) a demonstrat.....".

c - Pentru cazul a doi autori care trebuie citati, se va pune numele celor doi si anul, (M. Otte, P. Noiret, 2004), iar pentru cazul mai multor autori (mai mulţi de trei) se va cita primul autor urmat de "et al", (M. Otte et al., 2006).

d - Autorii trebuie asezati în ordine alfabetică şi se va folosi a, b pentru cazul in care un autor trebuie citat şi are mai multe lucrări în acelaşi an. Se pune virgulă

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între același autor și punct și virgulă când apare un alt autor citat (M. Cârciumaru, 2002; M. Carciumaru, 2002b; M. Anghelinu, 2005).

Bibliografía

1 - Titlul **BIBLIOGRAFIE** se va redacta în TNR, 12 bold, centrat, cu majuscule;
2 - Se vor include autorii citați în text, precum și autorii figurilor, tabelelor, planșe etc. citate in text;
3 - Se vor aranja autorii în ordine alfabetică după numele primului autor și apoi după numele celui de-al doilea autor. Daca unul dintre autori este citat cu mai multe lucrări, se aranjează în ordine cronologică;
4 - Pentru lucrările cu mai mult de doi autori se aranjează după numele primului autor și apoi în ordine alfabetică;
5 - Nu se vor prescurta numele revistelor şi ale editurilor citate;
6 - Pentru cele mai multe dintre situații urmează exemplele de mai jos:

a - Lucrări în reviste:

Numele autorului/autorilor, Inițiala prenumelui autorului/autorilor, Anul, Titlul articolului (italic), Numele revistei, Tome/Volum, Număr, Paginile.

Demars P.-Y., 2008, *Paleogeographie de l'Europe dans la premere partie du Paleolithique superieur – Premiers travaux*, Annales d'Universite « Valahia » Targoviste, Section d'Archeologie et d'Histoire, Tome X, Nombre 1, p. 29-45.

b - Cărti:

Numele autorului/autorilor, Initiala prenumelui autorului/autorilor, Anul, Numele cartii (italic, bold), Editura, Orasul in care a fost publicata, Numarul de pagini, figuri, tabele şi planse, ISBN;

Carciumaru M., Anghelinu M., Nitu E.-C., Cosac M., Muratoreanu G., 2007, ***Geo-Archeologie du Paleolithique moyen, Paleolithique superieur, Epipaleolithique et Mesolithique en Roumanie,*** Editura Cetatea de Scaun, Targoviste, 187 p., 48 fig., ISBN 978-973-8966-38-3.

c - Capitole în cărti:

Numele autorului/autorilor, Initiala prenumelui autorului/autorilor, Anul, Titlul capitolului (italic), in Numele autorului/autorilor, Initiala autorului/autorilor [ed(s)], Numele cartii (italic, bold), Editura, Orasul unde a fost publicata, Numarul de pagini, figuri, tabele si planse, ISBN, paginile capitolului.

Carciumaru Marin, 1978, *Studiul paleoclimatic şi geocronologic asupra unor statiuni paleolitice din Banat*, in Florea Mogosanu, ***Paleoliticul din Banat***, Editura Academiei Romane, Bucuresti, 152 p., 53 fig., p. 83-101.

d - Lucrări prezentate la congrese

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Carciumaru Marin, 1994, *Paleoenvironnement et chronostratigraphie du Paeéolithique moyen et superieur en Roumanie, Paleoecologie et geochronologie des industries du Paleolithique superieur ancien de la Roumanie,* in ***"El Cuadro geochronologico del Paleolitico superior inicial",*** *Museo y Centro de Investigacion de Altamira. Monografias*, No. 13, ISBN 84-8181-024-X, p. 15-23.

e - Teze (doctorat, master, licențe) și rapoarte nepublicate:

Numele autorului/autorilor, Initiala prenumelui autorului/autorilor, Anul, Titlul lucrarii (raportului), Universitatea, Institutul sau Compania, Orasul, Tipul lucrarii, Pagini:

Geneste J.-M., 1985, Analyse lithique d'industries mousteriennes du Perigord: une approche technologiques du comportament des groupes humains au Paleolithique Moyen, These presentee a L'Universte de Bordeaux I pour l'obtention du titre de Docteur, Universtite de Bordeaux I, 572 p.

f – Harţi:

Numele autorului/autorilor, Initiala prenumelui, Anul, Tipul, Titlul si numarul hartii, Scara, Editura, Orasul publicarii, Seria hartii, Numarul foii:

Patrulius D., Dimitrescu R., Dessila-Codarcea M., Gherasi N., Popescu I., Popa E., Bandrabur T. (redactori coordonatori si redactori), 1968, Harta geologica, Scara 1:200.000, Braşov, Comitetul de Stat al Geologiei, Institutul Geologic, Bucuresti, 68 p.

Titlurile figurilor

Titlurile figurilor se vor pune pe o pagină (pagini) separate, paginate consecutiv și vor fi incluse dupa bibliografie.

Titlurile figurilor trebuie să fie însoțite de numărul figurii și descrierea acesteia. Descrierea trebuie să fie clară și să conțină explicația tuturor simbolurilor folosite.

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1. Fiecare figură (hartă, grafic, fotografie) trebuie incluse pe pagini separate, fiecare figură fiind însoțită de numarul corespunzator din text și numele primului autor al articolului.
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6. Citarea figurilor în text trebuie să fie facută ca Fig. 1 - de exemplu.

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Trebuie sa fie incluse pe pagini separate, pagini consecutiv paginate.
Marimea tabelelor trebuie sa fie aproximativ de 21 X 29 cm.
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Manuscrisul trebuie trimis spre publicare în forma completă, respectând normele revistei. Editorii își rezervă dreptul de a returna autorilor materiale necorespunzatoare, pentru corectarea greșelilor. Dacă articolul va fi returnat de două ori, va fi publicat eventual într-un număr viitor. A treia respingere face imposibilă publicarea articolului în revistă.

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2. In a cover letter, the corresponding author must clearly state that the submitted manuscript has not been published submitted or accepted elsewhere, and that all authors agree with the content and the submission of the manuscript.
All manuscripts should be submitted electronically to the Chief Editor (mcarciumaru@yahoo.com) in one single attachment in a PDF file, containing the text, the figures and tables and they must fulfill the requirements of the journal. The text and the tables must be submitted in a MS Word format and the figures in a separate JPG or TIFF file.
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The manuscript should be accompanied by: (1) cover letter, (2) manuscript, (3) figure captions, (4) figures, (5) tables.
The manuscript should not exceed 25 pages, including bibliography, written in Time New Romans (TNR), and font size 11, justify. The pages dimension is A4 (21 x 29.7 cm) with a 2.5 wide margin. The manuscript must contain an abstract in English and preferably a second abstract in a foreign language different from that of the manuscript. The abstract in other languages should include the title too.

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The submitted manuscript should be arranged as follow: (1) title, (2) author's names, (3) author's affiliations, (4) abstract, (5) keywords, (6) manuscript, (7) references, (8) figure captions, (9) figures, (10) tables.
Title: This should be short, specific and informative and be written in Time New Roman, size 13, in bold and centered.
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Abstract: It contains between 300 – 500 words and should not contain abbreviations or reference citations. The abstract should be brief and objective, and represent a summary of the paper that includes the methods used, the main results and conclusions. It should be written in TNR size 10 and the word "abstract" has to be in bold, as well as the translation of the title.
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Main text:
1. Follow the structure shown below for the headings:
-First level (Bold capital and lower case, left)
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2. Italics should be used for terms or abbreviations in other languages "et al.", et collab, "etc".
3. Measure units must be represented by their symbol in the International System of Units.
4. Chemical and isotopic analyses as well as radiometric and paleontological dating must be referred to sampling locality and include coordinates.
5. References cited:
a) References are cited in the text by the initial of the author, last name of the author and the year (M. Otte, 1995). In the case of a citation of a paragraph, this will be put in quotation and the page will be cited (M. Otte, 1995, p.56-57)
b) If the authors´ name is part of the sentence, only the year is bracketed: "M. Otte (1995) determined…."
c) For references with two authors use the initial followed by their names and the year, (M. Otte, P. Noiret, 2004) and for those with three or more authors, use the last name of first author followed by "et al" (M. Otte et al., 2006).
d) References cited should be arranged chronologically; use a, b, c, etc. for references to one author in the same year. Separate with coma the references to same author and with semicolon the references to different authors: (M. Carciumaru, 2002 a; M. Carciumaru, 2002 b; M. Anghelinu, 2005).

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a) Papers in periodical journals

Last name(s), Initial(s), Year, Article title (italic font), Journal title, volume, pages.

Demars P.-Y., 2008, *Paleogeographie de l´Europe dans la premiere partie du Paleolithique superieur – Premiers travaux*, Annales d'Úniversité Valahia, Targoviste, Section d´Archeologie et d´Histoire, Tome X, Numero 1, p. 29-45.

b) Books

Last name(s), Initial(s), year, Book title (Italic, bold), Publisher, City of publication, no. of pages, no of figures, tables, ISBN

Carciumaru M., Anghelinu M., Nitu E-C., Cosac M., Muratoreanu G., 2007, ***Geo-Archeologie du Paleolithique moyen, Paleolithique superior, Epipaleolitique et Mesolithique en Roumanie,*** Editura Cetatea de Scaun, Targoviste, 187 p., 48 fig., ISBN 978-973-8966-38-3

c) Chapters in books

Last name(s), Initial(s), year, Chapter title (in Italic), in Last names(s), Initial(s) (ed(s).), Book title(Italic, bold), Publisher, City of publication, No. pages and figure, ISBN, chapter pages. 1. Carciumaru M., 1978, *Studiul paleoclimatic si geocronologic asupra unor statiuni paleolitice din Banat,* in Florea Mogosanu, ***Paleoliticul din Banat,*** Editura Academiei Romane, Bucuresti, 152 p., 53 fig., p. 83-101.

d) Proceedings from symposia and conferences

Last name(s), Initial(s), Year, Title (Italic), in Symposia/conference name (Italic, bold), Publisher (Italic), City of publication, ISBN, pages.

Carciumaru M., 1994, *Paleoenvironnement et chronostratigraphie du Paleolithique moyen et superior en Roumanie, Paleoecologie et geochronologie des industries du Paleolithique superieur ancien de la Roumanie,* in ***El Cuadro geochonologico del Paleolítico superior inicial***, *Museo y Centro de Investigacion Altamira. Monografías*, No.13, ISBN 84-8181-024-X, p. 15-23.

e) Unpublished thesis or reports

Last name(s), Initial(s), Year, Title, University, company, etc, City, Type of work, pages.

Geneste J-M., 1985, Analyse lithique d´industrie mousteriennes du Perigord: une approche technologiques du comportament des groupes humains au Paleolithque Moyen, These presentee a L´Universite de Bordeaux I pour lobtention du titre de Docteur, Universite de Bordeaux I, 577 p.

f) Maps

Author(s), Initial(s), Year, Type, Title and map number, scale, Publisher, City of publication, Map series, number of sheets.

Patrulius D., Dimitrescu R., Dessila-Codarcea M., Gherasi N., Popescu I., Popa E., Bandrabur T., 1968, Harta geologica, Scara1:200.000, Brasov, Comitetul de Stat al Geologiei, Institutul Geologic, Bucuresti, 68p

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A list of figure captions should be supplied on a separate sheet(s), numbered consecutively and included after the list of references.

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