COPPER OBJECTS DISCOVERED IN THE *TELL* SETTLEMENT AT LUNCAVIȚA, CETĂȚUIA POINT

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In this article we will make some specifications concerning a group of copper pieces discovered in the last level (superior) from the *tell* settlement at Luncavița, *Cetățuia*[1] point, in the same context being remembered the similar discoveries from the contemporary settlements in the northern Dobruja.

For the beginning we underline the important number of pieces discovered in a neo-eneolithic settlement in the northern Dobruja[2], result of applying a new research method of the prehistoric sites in this region. The frequent sieving of the sampled sediment into spaces susceptible to give more information allowed the observation of copper pieces relatively small in dimensions.

We will continue with a short presentation of Luncavița lot, insisting in every case on the analyzed pieces' characteristics:

1. Awl, in advanced state of oxidation. Nevertheless we can observe the shape of the cross-section, circular in the distant part and rectangular in the closer one (Pl. I/1). The preserved length is 6,3 cm, maximum thickness is 0,3 cm, weight is 6,03 g. It was discovered near the L5 destruction;

2. Awl from the same category, severely bent on the closer half, completely preserved (Pl. I/2). Its length is 8 cm, maximum thickness is 0,3 cm and weight 5,24 g. It was discovered in the vegetal layer on the SI surface;

3. Piece slightly bent in its middle and more accentuated on one end (Pl. I/3). The cross-section is rectangular for the whole length of 5,3 cm. Maximum thickness is 0,2 cm, weight is 2,11 g.

It was discovered in the vicinity of L1. Being a fragment, it is more difficult

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[1] We intervened in several occasions on the cultural affiliation of this level (C. Micu, S. Micu 1996; C. Micu, M. Maille 2002a; iidem 2002b), the recorded archeological material belonging to the Gumelnița A2 phase.

[2] In the northern Dobruja were previously recorded a bone pendant with copper oxide (traces from a copper object), in the Ceamurlia de Jos settlement – a level attributed to the Hamangia III phase (D. Berciu 1954, p. 99) and three copper tools from the Ceamurlia settlement (El. Lăzurcă 1986, *passim*). For the transition period to the Bronze Age, one probable discovery was mentioned, a copper object (pearl-shaped) found in a tumular tomb from Baia (El. Lăzurcă 1980, p. 10).

to put it into a precise typological category;

4. Intensely oxidized fragment, with a flattened end (Pl. I/4). It is hard to tell what was the original tool or object. The preserved length is 1,2 cm, weight is 0,65 g.

It was discovered near L1;

5. Awl very well preserved, with a bent circular closer end. The thickness increases gradually towards the far end, which has a rectangular cross-section and a flattened tip (Pl. I/5).

It was discovered in the SI, in the vegetal layer. The actually length is 9,5 cm, thickness is 0,1- 0,5 cm (first figure applies to the far end), and weight is 6,96 g;

6. Circular bead, very well preserved. It was made from a thin rolled copper bar. Even now we can see the contact zone at its ends (Pl. I/6).

It was discovered in SI, in the exterior zone L1. Its diameter is 0,6 cm, maximum thickness is 0,2 cm and it weighs 0,27 g;

7. Convex disk-shaped piece, made from an extremely thin sheet of metal. It presents a hole in its superior part and two other smaller holes on one margin[3], all of them drilled from inside to outside. We can also specify that these perforations were made after the sheet of metal was crafted (Pl. I/7). It was discovered in the L1 destruction. Its diameter is 2,1 × 1,9 cm, maximum thickness is 1 mm and it weighs 0,902 g. the preservation status is mediocre.

The pieces 1, 2, 3, 4 and 5 were examined by spectral analysis at the Physics Faculty laboratory from „Ovidius" University in Constanța. We also integrated in this lot a bone handle discovered in L3 (Pl. II/1), for which it was determined the sediment composition deposited inside the longitudinal perforation. The analyzed pieces were consequently noted (in the respective order) Specimen 1 (piece no. 3), Specimen 2 (piece no. 1), Specimen 3 (piece no. 2), Specimen 4 (piece no. 4), Specimen 5 (piece no. 5), Specimen 6 (the sediment present in the handle recorded at L5). The analysis system used was calibrated for small and very small concentrations. The results indicate that all specimens, except for Specimen 6, are made mainly of copper with concentrations estimated to 97-98%. Lead is also present with concentrations between 0,01321 mg/l ± 0,0021 in Specimen 1, 0,01456 mg/l ± 0,0022 in Specimen 2, 0,01921 mg/l ± 0,0020 in Specimen 4 and 0,02101 mg/l ± 0,0019 in Specimen 5. The presence of this element in such minute quantities is considered „impurity", being excluded the possibility that this element was added in the raw material during fabrication.

Zinc is also present in all specimens, but the concentration is under the detection limit.

Iron is surprisingly dominant in Specimen 6 and has weak concentration – 0,0045 mg/l ± 0,0040 – in Specimen 3. Specimen 6 also revealed manganese – 0,00024 mg/l ± 0,0025.

In order to complete the inventory of the copper pieces discovered in Gumelnița culture settlements from northern Dobruja, we must also remind the three awls from the Carcaliu settlement. The context of their discovery remains unclear. It is known that two of them belong to the superior level, and the third belongs to the first level of this settlement (El. Lăzurcă 1986, *passim*).

[3] We cannot be sure that the other side has hole also, as the margin was partially damaged.

Unfortunately, their presentation was not accompanied by a detailed description.

The first piece (Pl. III/1), moderately bent in two points, has a rectangular cross-section at its far end and round cross-section in its active segment. The oxidation process is currently mild[4]. The initial thickness seem to have been 0,2 cm, the preserved length is 12,3 cm.

The next piece (Pl. III/2) is in advanced state of oxidation. The cross-section seems rectangular for the entire preserved segment. Its length is 7,8 cm, current thickness is 0,6 cm (this is certainly not the original value).

The last fragment (Pl. III/3), maybe the most interesting, keeps small fragments from its bone handle. The oxidation is rather advanced, so it is difficult to offer a description close to reality. The cross-section is rectangular for the most of the fragment, the piece being flattened in its active part. The total thickness of this piercing tool, including the bone handle, is 0,7 cm and the preserved length is 7,3 cm. The superior margin of the handle goes to approximately 2,8 cm from the piercing top.

One first discussion must take place concerning the awls discovered in the two settlements.

Typologically speaking, the first series are individualized by the pieces with rectangular cross-section at the far end and circular section at the piercing top. Here we can surely include pieces 1 and 2 from Luncavița and piece 1 from Carcaliu. Even though the context of their discovery is rather unclear, we can say that they belong to Gumelnița A2 phase. Pieces from the entire evolution of Gumelnița[5] culture, from phase A1 to B1, similar to those already presented, are also present in the northern Danube area. They are also present in the southern Danube area, the type being considered specific for the Eneolithic Age (E. N. Černych 1978, p.112-113, fig. 15/1-41; 16/1-16). Some working processes of the raw materials for the awls were specified: forging, copper strips, free forging, moulding then superficial treatment (E. N. Černych 1978, p.113).

It is very difficult to include pieces 2 and 3 from Carcaliu in one of the types defined by Gumelnița culture, because of their poor preservation. We must also observe that one piece only represents a fragment of a piercing tool.

Some reserves must also be kept concerning piece 3 from Luncavița, piece that may represent a bent-headed needle. As we do not have enough data to

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[4] All the three pieces from Carcaliu still wait to be restored in a laboratory. They will be submitted to spectral analysis in the near future. In this stage it is difficult to offer exact details on their shape.

[5] For A1 phase we know the pieces from Cernavodă (E. Comşa 1978, p. 114; idem 1990, p. 11; P. Haşotti 1989, p. 14 - *„posibil Gumelnița A1"*; eadem 1997 – *„faza Gumelnița A2"*; I. Mareş 2002, p. 211) and Hârşova (D. Galbenu 1962, p. 285, 292, 294-296; idem 1963, p. 501-509). C. Bem (2000, p 164, note 35) attributes to this phase other two pieces discovered in Lişcoteanca settlement, *„Movila Olarului"* point, in a level considered Gumelnița A2 (N. Harțuche 1987, p. 19, fig. 21/11). For the A2 phase, pieces of this type were discovered at Căscioarele (C. Bem 2000, p. 157-158, fig. 8/1-11), Gumelnița (E. Comşa, B. Ionescu 1979, p. 80-81), Sultana (C. Isăcescu 1984, p. 39) and Năvodari (S. Marinescu-Bîlcu *et alii* 2001, p. 126, pl. 8). Discoveries at Căscioarele (C. Bem 2000, p. 158, fig. 9/1-10; 10/1-6; 11/2), Gumelnița (E. Comşa, B. Ionescu 1979, p. 80-81), Drăgăneşti-Olt (M. Nica *et alii* 1995, p. 9, 17, fig. 15) and Sultana (C. Bem 2000, p. 164, note 35) belong to Gumelnița B1 phase.

support this assumption, we only say that this type of tool is common during the entire evolution of Gumelnița culture and on its entire area (C. Bem 2000, p.160).

Some specifications are also necessary concerning piece 5 from Luncavița. Variations of this type seem to be rare for the Gumelnița - Kodjadermen-Karanovo VI cultural complex. Such a specimen was recorded at Varna necropolis (I.S. Ivanov 1978a, fig. 33). In exchange, discoveries of this type seem to be numerous in levels from early Bonze Age in Bulgaria (E. N. Černych 1978, p. 156, fig. 1-5). The situation is complicated by the fact that we can not surely attribute this discovery to the eneolithic level from Luncavița, the piece being recorded in the vegetal layer. We also consider premature for the actual stage of the search to suggest a link with the discoveries related to the Bronze Age in the *tell* settlement. Anyway, the results from the spectral analysis indicate elements and concentrations largely similar to those of the other analyzed pieces (except for Specimen 6) considered certainly eneolithic.

The copper beads are distributed over a large geographical area in southern-east Europe. Many likely pieces were discovered at Varna necropolis (I. S. Ivanov 1978b, *passim*), at Cucuteni A phase Brad[6] deposit (V. Ursachi 1991, p. 339-340, Pl. IV/2, V/5; idem 1992, p. 55-56, Pl. IV/2, V/5) and Cărbuna (Republic of Moldova) (V. Dergačev 1998, p. 42-43, fig. 15-20, 21/411-444; idem 2002, tab. 3/68-166, 4, 5/391-440), belonging to the Cucuteni-Tripolje[7] cultural complex..

Convex disk-shaped objects, partly resembling to the one discovered in Luncavița, were discovered mainly in the area populated by communities from Cucuteni-Tripolie culture, at Târpeşti (S. Marinescu-Bîlcu 1981, fig. 199) and Brad (V. Ursachi 1991, p. 341-342, Pl. II-III, IV/1; idem 1992, p. 57-58, Pl. XIV/1, 3, XV/2, 3).

We should not forget, in this context, the numerous gold pieces discovered at Varna necropolis (I.S. Ivanov 1978b, *passim*) where a similar manufacturing technique was observed (C.Eluere 1989, p. 62-63).

Several hypotheses were emitted concerning the purpose of these objects. They are supposed to have been worn as pendants/amulets, hanged around the neck, sewed to the clothing (I. Mareş 2002, p. 131) or as components of necklaces. As we can observe, the object from Luncavița has the shape of a *Cardium* shell. There is the possibility, in this case, that the craftsman tried, with a different material, to create a jewel common to the neo-eneolithic civilizations.

It is undoubtedly interesting to compare the results of the spectral analysis of Luncavița objects with those of some objects from settlements more or less close in time and space. At the *tell* settlement in Hârşova, only results for four pieces discovered inside dwelling no. 5 are mentioned (P. Haşotti 1997, p.108)[8]. Apart from the copper, the respective objects contain: one chisel – traces of antimony, silver 0,07%, bismuth; first awl – traces of arsenic, antimony 0,03%, silver 0,11%;

[6] For the pieces in this deposit, a manufacturing technique resembling to the one indicated in the case of Luncavița bead was recorded (N. Ursachi 1991, p. 351). Similar observations can be made in relation to the gold beads from Varna necropolis (C. Eluere 1989, p. 62-63).

[7] We have a large biography dating the Cărbuna deposit: G.P. Sergeev 1963, p. 135; Al. Vulpe 1973, p. 219-220; idem 1976, p. 135; V. Sorokin 1994; V. Dergačev 1998; idem 2002; C.M. Mantu 1998, p. 67, 87.

[8] The mentioned author cites on his turn S. Junghauss *et alii* 1968, analysis 541-9283.

second awl – traces of nickel, bismuth and iron; last awl – traces of arsenic and iron, antimony 0,01%, silver 0,01%. We can easily see the high concentration of copper in the samples analyzed for the two settlements, along with the differences in secondary elements in their structure.

Partially similar observations can be made concerning the pieces discovered in south Muntenia plane. It has been specified (E. Comşa 1978, p. 118) that their majority is individualized by the presence of silver, from mere traces to concentrations up to 0,03% - 0,09%, in one case the registered value being 0,38%. Another present metal is nickel, averaging 0,01%, extremely rare 0,03%. Lead and gold are also very rare, iron is more present.

We believe that it is premature to make comparisons and detailed analysis between Gumelnița culture settlements in Muntenia and Dobruja, while we do not have enough data available.

One aspect truly important in the case of the *tell* settlement from Luncavița is the discovery of a clay mould (Pl. II/2), used to obtain copper pieces, registered in the domestic waste accumulation area. On the interior surface of this mould was preserved, in negative, the shape of a rather large tool (chisel or axe). The internal wall is uniformly covered by a fine layer of copper (1 mm). The maximum thickness of the fragment is 2,2 cm. We believe that in this case the manufacturing technique of the final product is based on the destruction of the mould, which is rare for the northern Danube Gumelnița culture settlements[9].

This discovery allows us to say that copper ore was processed at Luncavița. In the actual state of the search, we can not be precise about this practice's dimension in northern Dobruja.

In this context it is interesting to specify the possible raw material exploiting areas that supplied the *tell* settlement.

More than one time were remembered the ore deposits from Dobruja (R. Rîndina 1969, p. 31; E. Comşa 1978, p. 117; V. Bacalu 1978, p. 76-79; I. Mareş 2002, p. 355-336). The most important seems to be the one in Altîn-Tepe (Tulcea County). It is important to say, in this context, that the first modern mining operations in this area started at the end of the XIX century, when they also realized the first evaluation of the deposit structure (Gh. D. Cochino 1928, p. 387-388). In the oxidation layer, with a thickness of 50 m, iron ore was recorded (hematite, oligist and magnetite) along with copper ore (malachite, azurite, cuprite). The last ones come almost entirely from sulphides (N. Oncescu 1965, p. 117-118; V. Mutihac 1982, p. 53). In the cementation layer, which reaches 250 m in depth (almost the actual sea level) we can find pyrite, chalcopyrite, magnetite, and, as secondary products – native copper, cuprite, bornite and chalcosite. Tin, zinc and traces of gold and silver were identified. But because the dominant ore is copper pyrite, the Altân-Tepe mine was classified as Copper pyrite ore deposit

[9] A similar discovery seems to have been made at Gumelnița B1 level from Vidra (E. Comşa 1978, p. 119; idem 1987, p. 106). In the same phase were included the two moulds for axes from Căscioarele (Al. Vulpe 1973, p. 220; idem 1975, p. 57, table 33/259-260). In this last case, the manufacturing technique for the final product is different from the one signaled at Luncavița.

(N. Oncescu 1965, p. 118)[10].

In northern Dobruja, copper was also discovered near Somova and Câşla[11], on Culmea Pricopanului[12] Heights, near Turcoaia[13], Mircea Vodă[14], Cerna[15], Horia[16], Niculiţel[17], Ceamurlia de Sus[18], in the quartz porphyries from Movila Goală Hill, southeast from Camena[19] and on Saint George branch of Danube at the point called *Bogza*[20],

It is premature in our opinion to advance a hypothesis concerning the use of these deposits by the neo-eneolithic communities in Dobruja, because we lack direct evidences based on complete analysis. We do not exclude a possible link between the raw materials used at Luncaviţa and the Altîn-Tepe mines, considering the presence of the iron and zinc at this last point.

We must also remember the ore deposits from Bulgaria. Analysis results on samples from Ai-Bunar area (E. N. Černych 1975, p. 149; idem 1978, p. 72-75) showed the presence, next to the copper, of the zinc (percentage proportions), lead (tenths of percents), arsenic (hundreds of percents), stibium, silver and tin[21]. In the same area were also described mixes from the iron group: iron, manganese,

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[10] The minerals from Altân-Tepe were localized by the same author in the same layer of mezozonal crystalline schist developed between Fântâna Mare and Camena, in the green schist complex.

[11] Azurite and malachite on Cortelu, Bechir and Carierei hills, in quartz porphyries and Triassic limestone; tetrahedrite in the shape of sporadic grains in sulphides or barium limestone on Cortelu hill; chalcopyrite. The Somova ore is close to the surface and easy to exploit. It has the aspect of a compact ore band, with varable thickness, from several centimeters to 12 meters. The ore from Câşla, located in the gray Triassic limestone, is mineralized in the surface visible part under the shape of an oxidation area with high contents of Pb, Zn. and Cu (V. Ianovici *et alii* 1957; D. Rădulescu, R. Dimitrescu 1966, p. 53, 201, 290; D. Giuşcă *et alii* 1967; V. Bacalu 1978, p. 76-77; V. Bacalu, Gh. Martinof 1967, p. 275-276).

[12] Azurite, in clayed pegmatite and malachite (D. Rădulescu, R. Dimitrescu 1966, p. 53, 200).

[13] Malachite, in porphyry, phyllite and layers of carapellite (D. Rădulescu, R. Dimitrescu 1966, p. 200).

[14] Malachite, in quartz porphyry and phyllite on Carapelit, Amzelor, Maria and Chintuluc hills; azurite on Amzelor hill (D. Rădulescu, R. Dimitrescu 1966, p. 53, 201).

[15] Malachite, in layers of carapellite (D. Rădulescu, R. Dimitrescu 1966, p. 200).

[16] Malachite (D. Rădulescu, R. Dimitrescu 1966, p. 201).

[17] Malachite, in quartz and epidote seams from Triassic diabases (D. Rădulescu, R. Dimitrescu 1966, p. 221).

[18] The copper ore was identified in the green schists, 150-200 m in depth. The average copper concentration is estimated to 0,5%-1% (V. Bacalu 1978, p. 78; V. Bacalu, Gh. Martinof 1978, p. 276).

[19] It is estimated (V. Bacalu 1978, p. 79) that the copper ore – with a thickness between 0,5 to several meters – can be observed on hundreds of meters in length, with interruptions of meters or tens of meters. The deposit contains tens of thousands tons of copper ore.

[20] Apart from the barium mineralizations, we can also find copper mineralizations in inferior Triassic conglomerates.

[21] It is also specified that one remarkable aspect for Ai-Bunar is represented by important variations of the ore chemical composition from sector to sector of the ore deposit. The variations in the mineral structure would define mainly by secondary mixes, respectively stibium, bismuth, silver, arsenic, tin and sometimes zinc and lead (E. N. Cernych 1978, p. 72-75).

nickel and cobalt. The metal from Ai-Bunar seems to have circulated over a large territory, including the oriental Romania (R. Katinčarov 1989, p. 18).

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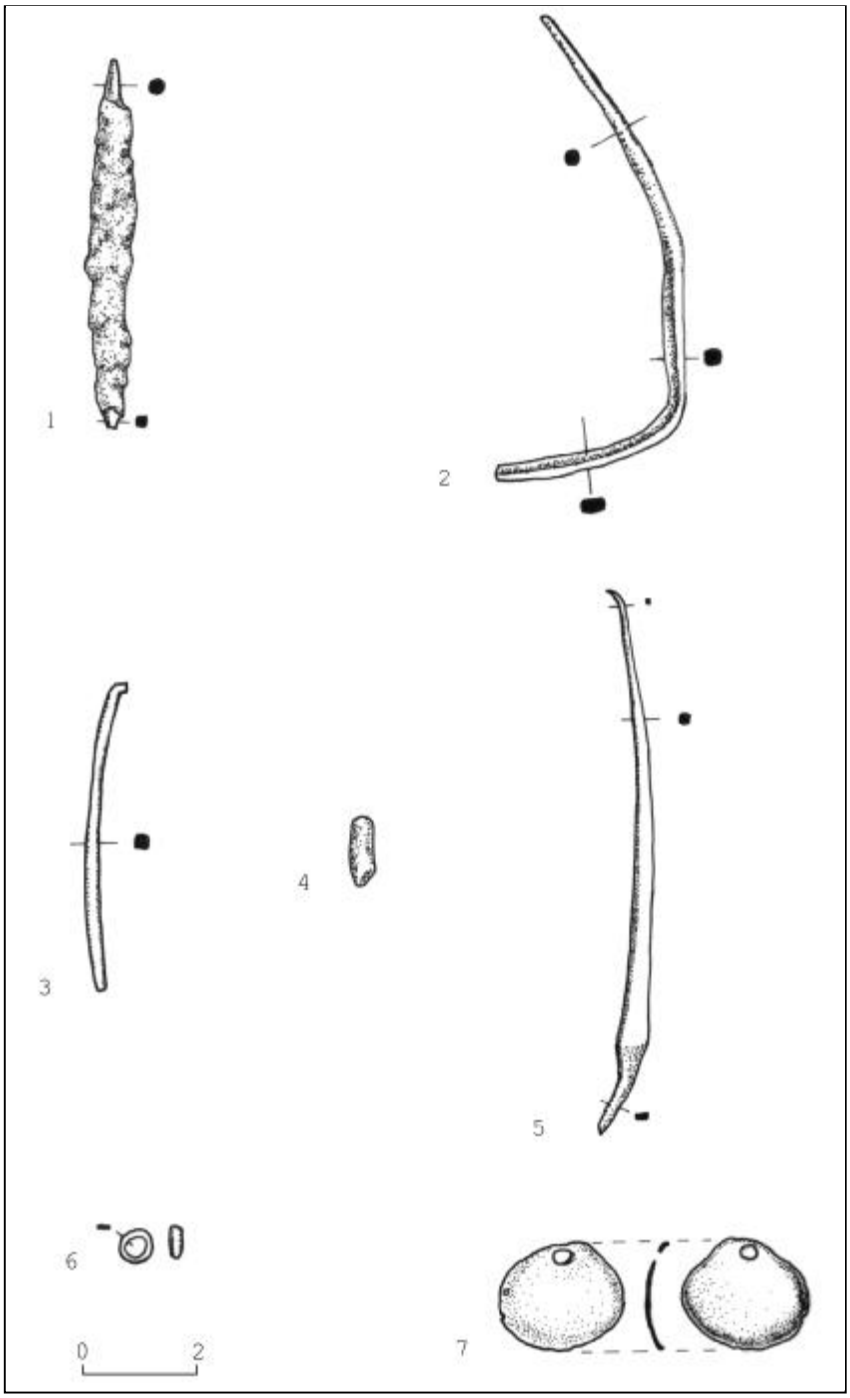
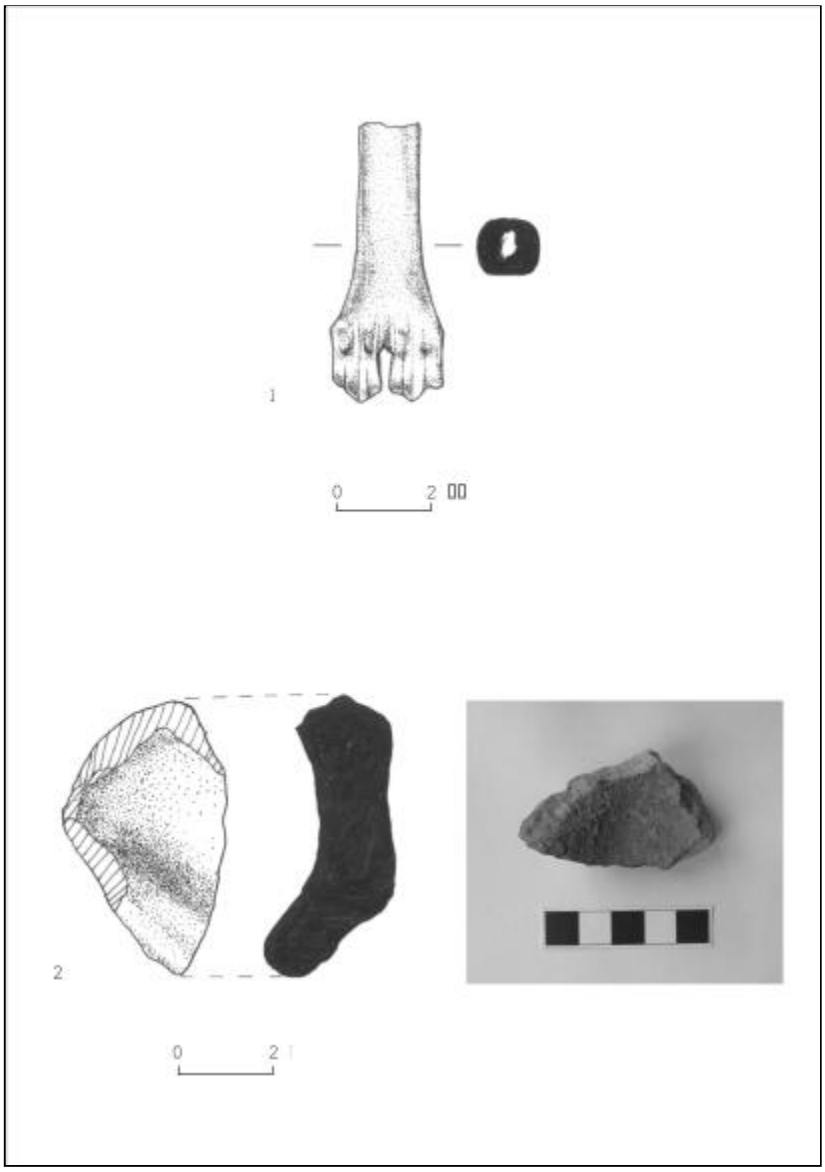
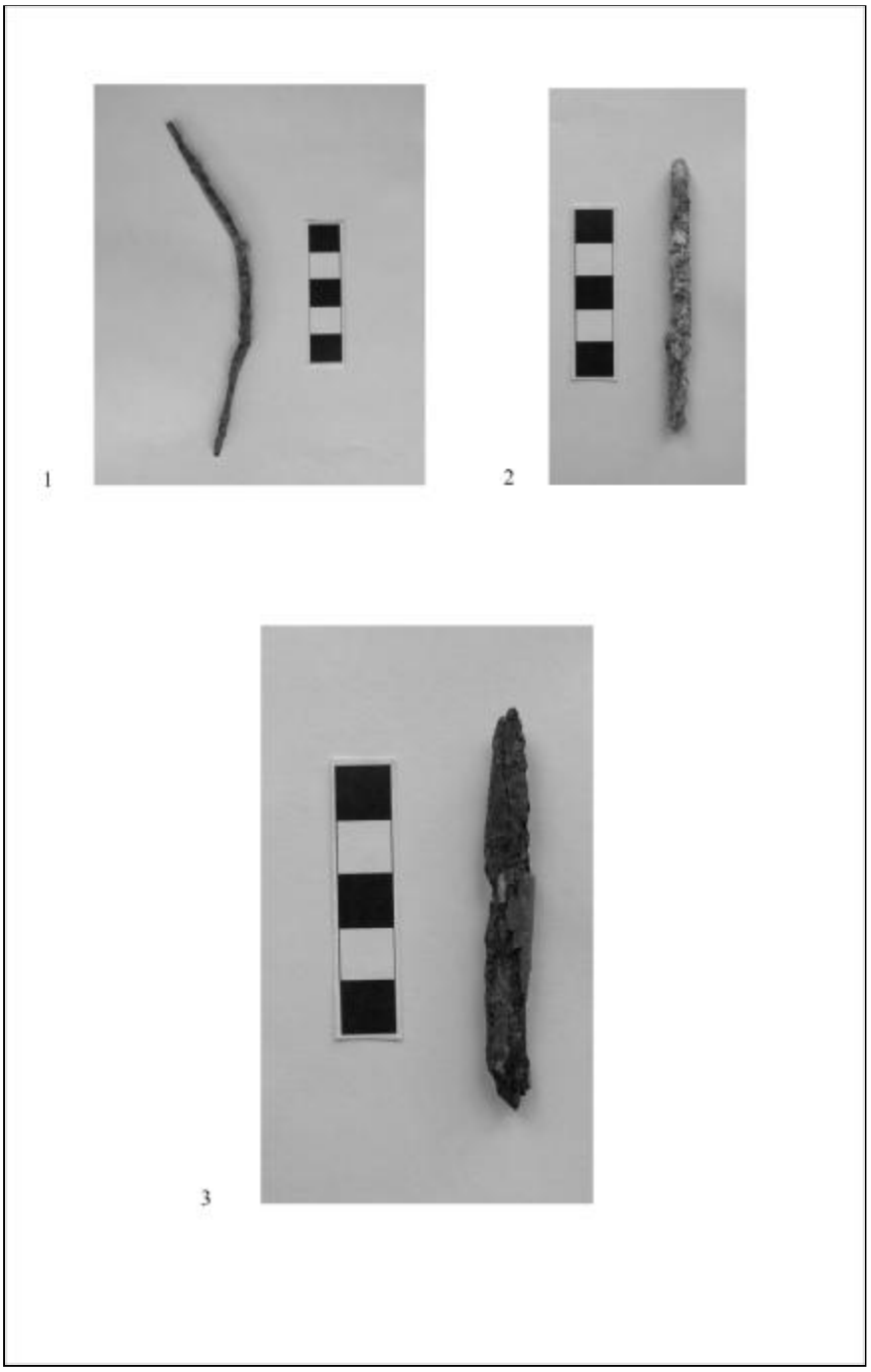


Pl. I - Luncavița, Cetățuia point. Copper pieces



Pl. II - Luncavița, Cetățuia point. 1. – bone handle; 2. – clay mould



Pl. III - Carcaliu, Vadu Mare point. Awls