

## **ECONOMICAL LIFE IN NOUA CULTURE IN THE TRANSYLVANIAN LATE BRONZE AGE**

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The Noua culture received its name from I. Nestor on the basis of the finds from Noua, nowadays a neighbourhood of Braşov city<sup>1</sup>. It is the last of the Transylvanian Bronze Age cultures, integrated into the Noua-Sabatinovka-Coslogeni cultural complex, defined as such by S. Morintz<sup>2</sup>. Its formation area is somewhere in the northern-Pontic steppes. What is specific of this culture is its extraordinary ability to adapt to the local conditions. I am referring to the rapid takeover of the indigenous way of life and a strong cultural and ethnic interference<sup>3</sup>, whose traces can be found in nearly all archaeological discoveries from Transylvania. Until recently, most investigations used to classify Noua populations as being nomads or semi-nomads. Basing myself on archaeological discoveries, I had a hard time agreeing with this idea, because this period was characterised by a real economic “boom” being the most prolific in the entire Bronze Age.

The present paper is an attempt, based on and limited by the amount of the available information, to shed light over the character of the economy existing within the Transylvanian Noua culture. Starting from the inventory of the settlements discovered, one can outline an image of the economic life in Noua communities: osteological remains testify about animal breeding; carbonized grains, as well as the tools discovered bring forward important data on crop cultivation, the diet and household economy at the time. The presence of bronze items and of moulds provides an image, although incomplete, of the metallurgy at the end of the Bronze Age.

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<sup>1</sup> Nestor 1932, 116–117.

<sup>2</sup> Morintz 1978, *passim*.

<sup>3</sup> Wittenberger 2006a, 146–155.

## Occupations

### 1. Animal breeding

I prefer using the term “animal breeding” instead of “herding”, because it avoids an inappropriate interpretation of an important economic activity. Contrary to some older theories, identifying the breeding of big-horned cattle as the main occupation<sup>4</sup>, I believe that Noua culture was characterised by a mixed economy, both agricultural and pastoral. Although statistically cattle bones are more numerous, osteological analyses have proven that there were plenty of other domesticated animals, as well: ovicaprids, pigs, horses, and activities connected to crop cultivation have also been archaeologically testified.

At the few Noua sites in Transylvania where statistical analyses have been carried out on osteological material, the results reveal a relatively even number of big-horned cattle and ovicaprid individuals. Of course, this bestows upon cattle a bigger quantitative weight, to the detriment of smaller animals. However, the following remark is called for: taking into account the existence of small communities and of relatively small agricultural areas, the presence of ovicaprids and big cattle on the same pastures is practically impossible! Under these circumstances, the system most likely to be used and still in use today is probably that of separate herds. Thus, ovicaprids were herded to other pastures than those visited by big cattle, or taken to fields big cattle had already been on. The presence of several species of domesticated animals in the settlements proves that Noua culture bearers were practicing animal breeding differently than nomadic populations; it is common knowledge that the latter were (and still are) specialized in the breeding of only one type of animal (either cattle or ovicaprids), to which can be added – maybe – horses and dogs<sup>5</sup>. N. I. Schishlina studied the pastoral system of populations in the Caspian steppes throughout the Bronze Age<sup>6</sup>. Three theories are hereby enumerated, theories that have obviously evolved, following the accumulation of information. Gryaznov’s theory, dating from 1955, reveals the shepherds’ uninterrupted daily movement; Schilov, in 1975, believed that small groups migrated on a seasonal basis; and Rassamakin, in 1994, considered that there used to be a mixed economy: both pastoral and agricultural. This third system seems to resemble the most the one in the Carpathian arch.

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<sup>4</sup> Florescu 1964, 162; Haimovici 1990, 127; Sava 2005, 143–159.

<sup>5</sup> Sherratt 1982, 92.

<sup>6</sup> Shishlina 2001, 347–349.

Referring to the bearers of the Noua culture, it must be emphasised that breeding activities played a very important role in their economy. That is what made some authors argue that Noua population would be semi-nomadic<sup>7</sup>. However, I believe that, should one analyze attentively the information on the fauna in Noua settlements, a more nuanced image could be outlined on their animal breeding activities.

### Comparative table of the fauna in Noua settlements, broken down to percentages per number of individuals

Moldavia, according to A. C. Florescu and S. Haimovici<sup>8</sup>

Settlement	<i>Bos taurus</i> %	<i>Ovis aries / capra hircus</i> %	<i>Sus scrofa domesticus</i> %	<i>Equus caballus</i> %	<i>Canis familiaris</i> %	Wild animals %
Valea Lupului-Iași	62.13	18.03	9.37	8.10	0.65	1.75
Piatra Neamț-Ciritei	65.08	7.77	9.84	6.39	1.65	9.18
Bîrlad	53.09	18.99	10.53	14.65	0.23	2.51
Gîrbovăț level 2	65.74	18.43	8.90	4.50	0.45	1.98
Gîrbovăț level 1	59.19	24.96	8.93	4.25	0.45	2.22

Bessarabia, according to O. Levițki and E. Sava<sup>9</sup>

Settlement	<i>Bos taurus</i> %	<i>Ovis aries / capra hircus</i> %	<i>Sus scrofa domesticus</i> %	<i>Equus caballus</i> %	<i>Canis familiaris</i> %	<i>Camelus bactrianus</i> %	Birds %	Wild animals %
Petrușeni	64.5	19.2	9.7	6	0.03	0.02	0.05	7.3

Transylvania, according to G. El Sussi<sup>10</sup> and D. Bindea<sup>11</sup>

Settlement	<i>Bos taurus</i> %	<i>Ovis aries / capra hircus</i> %	<i>Sus scrofa domesticus</i> %	<i>Equus caballus</i> %	<i>Canis familiaris</i> %	Birds and unidentified %	Wild animals
Deuș	29.5	32	14.5	5	1	5.5	12.5
Mera	35.2	33.4	15.6	7.3	0.8		7.7
Zoltan	28	32.6	19.2	8.2	0.8		11.2

<sup>7</sup> Florescu 1964, 142; Haimovici 1964, 182; Haimovici 1990, 62; Sava 2005, 143–159.

<sup>8</sup> Florescu 1964, 165.

<sup>9</sup> Levițki, Sava 1992, 130.

<sup>10</sup> El Sussi 2002, 153–174.

<sup>11</sup> Bindea, Ph.D. thesis, kind information.

The herein presented data reveal significant differences between Transylvania and Moldavia, related to the representativeness of certain animal species. A comparison with the Wietenberg culture can help understand the mutations occurring within the Noua culture.

Wietenberg culture, Derşida<sup>12</sup>

<i>Bos taurus</i> %	<i>Ovis aries/</i> <i>Capra hircus</i> %	<i>Sus scrofa</i> <i>domesticus</i> %	<i>Canis</i> <i>familiaris</i> %	<i>Equus</i> <i>caballus</i> %	<i>Wild</i> <i>animals</i> %
25.7%	28.3	25.1	5.6	3.7	11.3

It can be noted that there is a close connection between the Wietenberg and Noua cultures, related to the representativeness (in percentages) of big cattle and the ovicaprids. Furthermore, it seems that porcine have had a wider representativeness in the Wietenberg culture.

Skipping the strictly quantitative data related to the presence of the various species in Noua settlements, an interesting element, also revealed by statistics, is the animals’ sacrifice age. In the case of cattle and horses, most of the individuals are adult: 56.3% mature horses; 87% mature cattle; 97% adult and sub-adult porcine; 70% juvenile ovicaprids. As for ovicaprids, the juvenile sacrifice ratio is almost the same nowadays. The birth rate and family characteristics make possible the recovery of all the needed individuals in spring, the reproductive maturity period being of about 8 months. On the basis of data from the Zoltan settlement, G. El Sussi<sup>13</sup> argues that 34% of the cattle were exploited for productive purposes: traction, milk and meat (66%). Quite probably, big breeding cattle were only sacrificed when they reached full maturity or in special cases (accidents, illness, lack of fodder). The existence of a special interest in cattle has also been proven by the presence of castrated animals<sup>14</sup>, used exclusively for traction and meat.

2. Hunting and fishing

As proven by archaeological findings, other frequent occupations were hunting and fishing. The presence of wild boar, bear, rabbit, stag and bison bones are eloquent in this respect, even though they do not exceed 10% of the total

<sup>12</sup> Bindea, unpublished, kind information.  
<sup>13</sup> El Sussi 2002, 159.  
<sup>14</sup> El Sussi 2002, 166.

number of individuals. Most probably, in winter hunting was one of the most important occupations. The discovery of antler skates, both in Moldavia: Cavadinești, Bărboasa, Trușești and in Transylvania: Sebeș<sup>15</sup> and Mera, *pl. 1* could be an argument in favour of this idea. At Zoltan<sup>16</sup> and Mera have been discovered arrowheads, harpoons and fishing hooks *pl. 2, pl. 3, pl. 4*. The specialization of the arrowheads proves that hunting was a relatively important occupation, although seasonal. In the area dominated by the Noua culture, besides tubular arrows having an eastern origin, exceptionally well-crafted three-edged arrows have been found. They were meant for precision shooting appropriated for hunting big animals. In the case of the arrows from Mera, one can notice that the angle between the three sides is perfect: 120°. Moreover, the guiding edge perpendicular on the string is 2 mm taller than the other two, which gives the arrow an impressively precise rotation and ballistic trajectory<sup>17</sup>. Naturally, these arrows could also be used as weapons. A fishing pin made of bronze was discovered at Zoltan *pl. 3/2*, with analogies in eastern-European, Uralic areas<sup>18</sup>. The presence of his type of pin in Transylvania's eastern regions can be explained by the eastern tradition, which obviously the bearers of the Noua culture did no longer preserve. The impressive dimensions of the pin must also be noted, as it shows the rivers' abundance in fish, at that time.

I believe that the following conclusions can be outlined about animal breeding and hunting among Noua populations in Transylvania:

- There is a remarkable difference in what the representativeness of big-horned cattle is concerned between eastern-Carpathian areas and Transylvania: 61.62% of the total number of individuals, as compared to 30.9%. The difference is caused by the different specificity of the Transylvanian relief, on the one hand, and on the other, by the traditions of the indigenous populations.
- The representativeness of ovicaprids is significantly bigger in Transylvania, 32.66%, as compared to 17.89% in eastern regions.
- From a quantitative viewpoint, big cattle represented the main source of nourishment.
- The fact that about 87% of cattle were sacrificed when reaching maturity shows that they were also used for labour, which is also emphasised by the presence of castrated animals.

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<sup>15</sup> Florescu 1991, 321.

<sup>16</sup> Cavruc 1998, 226–228.

<sup>17</sup> Dobroiu 1982, 27.

<sup>18</sup> Cavruc 1990, 125–126; Grigoryev 1998, 114.

- The presence to a bigger percentage of game in settlements in Transylvania can indicate on the one hand a significant preoccupation for this activity, and on the other, the abundance of wild animals.

### 3. Agriculture

Next to animal breeding, crop cultivation was another very important occupation. The discovery of many hoes, “tupic” bone sickles or sickles made of bronze, with a hook or a tongue attached to the handle is conclusive evidence in this respect. Many grinding mill fragments were discovered at Buza, Mera, Deuș, Nicoleni and Zoltan. Moreover, in Deuș, Mera and Buza were discovered carbonized grains: wheat (*Triticum monococum* and *Triticum dicocum*), rye (*Saecale saecale*), chick peas (*Cicer arrietinum* sp) and buckwheat (*Fagyparum sagitatum*)<sup>19</sup>. The placement of cereals in graves as offerings (Cluj – Banatului St.) is yet another piece of evidence of the agricultural activities practiced – it is common knowledge that the placement of cereals as offerings is an exclusive attribute of agricultural, sedentary populations. E. Sava identified five kinds of wheat in the eastern-Carpathian area: *Triticum aestiva*, *Triticum compactum*, *Triticum Spelta*, *Triticum dicocum* and *Triticum monococum*, apart from leguminous plants such as millet, buckwheat and peas, and cereals like rye and barley<sup>20</sup>.

The discoveries made up to now do not allow for a clear identification of the way in which the land was worked; quite probably, a crop rotation system was used. The hoes, coulter and the various tools that could be used in agriculture indicate the presence of a subsistence agriculture, but allowing for a big enough diversity of cereals and vegetables to satisfy the needs of a small community. From the site at Buza were uncovered two items that could be hoes<sup>21</sup>, *pl. 5*. The two items made of young cervid antler must have been used as hoes or coulter. The third one, made of mature cervid antler has a slot for the fastening of a more solid piece, made of stone or bronze, *pl. 5/1*. The presence of flat stoves can indicate the way bread was made. It is no mystery that even nowadays, in Eastern Europe and in the Uralic areas, respectively in the Near East, unleavened bread is still used. Similar to the Spanish tortilla or to Greek bread, it could be baked on the stoves existing in dwellings, without requiring a strong fire or the existence of a bread oven.

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<sup>19</sup> Analyses carried out by N. Salontai Ph.D., University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca.

<sup>20</sup> Sava 2005, 159.

<sup>21</sup> Wittenberger 1994a, 152.

The data presented herein allow for the following conclusions:

- Next to animal breeding, agriculture was an important occupation and was based on a variety of cereal and vegetable cultures;
- The presence of specialized tools, corroborated with the existence of mixed cultures of cereals and vegetables indicate a stable and diversified agriculture, requiring an agricultural cycle of over a year.

#### 4. Stone processing

Directly related to agriculture, stone processing was a burning necessity. As we were arguing, there is a series of tools to indicate the fact that agriculture was practiced. If sickles made of a pig's jaw could indeed have been used<sup>22</sup>, the same thing cannot be said about sickles made of stone, known as *Krummesser*. Items belonging to this category were discovered in several Noua settlements<sup>23</sup>, the present paper exemplifying those from Ozd<sup>24</sup> no. 253, Mureş County, and Buza, Cluj County, *pl. 6*, where geological identifications have also been made. Other Noua sites attesting such tools are: Chintelnic and Tonciu<sup>25</sup>, Ocnîţa<sup>26</sup> and Sighişoara<sup>27</sup>.

Curved knives made of stone appear as early as the pre-Bronze Age<sup>28</sup> and continue to be used throughout the entire Bronze Age, up until the Hallstattian Age. Such items are present within the following cultures: Tei<sup>29</sup>, Otomani<sup>30</sup>, Füzesabony<sup>31</sup>, Wietenberg<sup>32</sup>, Monteoru and Sabatinovka<sup>33</sup>. Their function is not completely clear, but they most probably had a cult-related role, also connected to agricultural practices. An argument in this respect is the discovery made at the Sălacea sanctuary, in an Otomani environment, where several *Krummesser* were found, in groups of three<sup>34</sup>. In eastern-Carpathian areas, there are many such

<sup>22</sup> Florescu 1991, 288.

<sup>23</sup> Florescu 1991, 332–335.

<sup>24</sup> Marinescu 1993, 7.

<sup>25</sup> Marinescu 1995, 49–125.

<sup>26</sup> Marinescu 1993, 6–7.

<sup>27</sup> Baltag 1979, 90–91.

<sup>28</sup> Roman 1976, pl. 9/16–17.

<sup>29</sup> Leahu 1966, 5.

<sup>30</sup> Ordentlich 1972, pl. 15/8.

<sup>31</sup> Banner 1959, fig. 26/5.

<sup>32</sup> Boroffka 1994, 121; Rotea 2000, 41, pl. type 1/22.

<sup>33</sup> Florescu 1964, 157–159.

<sup>34</sup> Chidioşan, Ordentlich 1975, 15–26.

pieces, generally polished, made from Dniester flint<sup>35</sup>. Those from inside the Carpathian arch are convex, polished and have a triangular section.

Moreover, tools made of stone seem to have been very special items to be used for commercial exchanges. Thus, following analyses on several stone objects discovered in Noua settlements, their (approximate) origin can be specified. Microscopic analyses on thin sections have been carried out on a few items, in order to find out their area of origin. For the items from Ozd, Mureş County, the sources are different. Item no. 7143, is made of rhyolitic chlorite-sericite schist, a metamorphic rock from the epizone, with a massive structure, a greyish-greenish colour, originating from the southern-Apuseni Mountains, probably the Valley of the Mureş River, the Sebeş-Deva area. The *Krummesser* no. 7756 is made of pyroxene andesite, feldspat chlorite, with an extremely fine fundamental mass, originating from the Bîrgăului Mountains. The third item analyzed, the one from Buza, is made of a slightly metamorphosed detrital limestone, the source being the southern-Apuseni Mountains, probably the Valley of the Mureş river, *pl.* 7.

In almost all Noua settlements have been discovered fragments of grinding mills, items quite common in a settlement characterised by agricultural activities. They are present both in dwellings and outside them. Since we do not have at our disposal any un-broken piece *in situ*, it is hard to tell whether there was any rule related to their location.

Made of hard rocks, grinding mills have concave active parts, with highly visible traces of use. Several fragments of grinding mills have been discovered at Buza, made of different rocks<sup>36</sup>. Thin sections were carried out on six of the fragments, in order to identify their area of origin. Photographs taken under a microscope +N, enlarged 40, respectively 60 times, revealed the fact that the rocks are pyroxene andesite, and some items consist of feldspats and porphyritic hornblende. It is noteworthy that they originate from the Bîrgăului Mountains area. One of the pieces is part of a parallelepipedal, slightly concave grinding mill made of volcanic rock, originating from the Dej area. Several fragments of grinding mills were uncovered from Deuș, section S1. As the material was fragmentary, the initial shape of the grinding mills could not be identified, but it is noteworthy that some were made of red andesite, and others of dacite. The closest source of rhyolitic dacite is Poieni, on the Valley of the Criș river, outside the area taken by the Noua culture in Transylvania. Some small fragments of grinding mills made of rhyolitic dacite, also coming from the Poieni source, Cluj County, have been discovered at Mera, Cluj County, as well.

<sup>35</sup> Florescu 1991, 335–336.

<sup>36</sup> Săsăran, Wittenberger 2008.



In the Pălatca settlement, which we believe to be quite uncommon, several fragments of grinding mills made of different materials have been discovered. As they were probably coming from a bronze processing workshop, it is possible for them to have been used to crush the material to be melted. In the immediate vicinity, at Petea, near Pălatca, a fragment of a grinding mill made of grey granite was discovered, originating from the Oriental Carpathians.

## 5. Mining and metallurgy

This chapter in itself can be the object of an ample research thesis, as it has already been. However, I believe it necessary to make a few general precisions, given the economic context of the Noua culture, and to refer to concrete findings that can bring forward new data related to one of the most developed stage in bronze metallurgy. From a chronological viewpoint, the presence of the Noua culture overlaps almost perfectly the peak in the evolution of bronze metallurgy and mining.

*Mining.* There are no certain archaeological data related to the mining practiced by the Noua culture, but it was probably not different from any other moments in the Bronze Age. The menhir from Mihăiești, Bistrița-Năsăud County, representing a miner<sup>37</sup> or a mining deity, is one of the few pieces of evidence attesting the fact that in intra-Carpathian regions the extraction of useful ore was an important activity. The presence of bronze pickaxes in bronze deposits could be yet another element attesting this activity, as well as the legend of the “Golden Fleece”<sup>38</sup>; as it is common knowledge that until the discovery of mercury, gold dust decantation was carried out by the means of a sheep skin, technique still in use today in the Caucasian area, and in the Apuseni Mountains until the beginning of the XXth century.

The metals used in the age under discussion are copper, gold, tin, lead and silver. The constant presence of iron, about 3.5% in common bronze objects, can be explained by the “local mark” of Transylvanian ore. Nevertheless, the presence of obvious traces of rust on some of the items dated to the time-period in which the Noua culture was present makes me believe that sporadically iron pieces were used as well, possibly from imports. The main technique used in the mining of copper deposits was, quite probably, washing gold sand and copper-silver dust. Transylvanian deposits are to the greatest extent “complex deposits”, but the

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<sup>37</sup> Rotea 2002/2003, 11; Rotea 2004, 707.

<sup>38</sup> Rotea 2002/2003, 9.

mining of mineral outcrops using the fire-water technique cannot be excluded, either. Tin, which shall be discussed further on, was most probably brought in from the Woody Carpathians (Carpații Păduroși) through commercial exchanges, but it is also possible for it to have been obtained, just like lead, by washing sands containing heavy metals. Complex mineral ore containing lead and tin can be found in hydrothermal veins, also connected to neogene magmatism phenomena. The main utilised mineral is lead sulphide, which is mined nowadays as well, in Baia Borșa, Chirlibaba, Rodna, Bălan, Baia de Arieș, Roșia Montană etc.

Salt mining is also connected to mining and to bronze metallurgy. The relationship between the two activities has been argued by many specialists<sup>39</sup>. It is known that in the Neamț area, the Noua populations used to mine salt from salty springs, as proven by the findings from Oglinzi<sup>40</sup>. The massive presence of Noua findings along the Mureșului, Someșului and Tîrnavelor Valleys<sup>41</sup> in the proximity of salt sources cannot be accidental, and the rock salt outcrops from Cara, Cojocna, Pata, Ocna Dej, Valea Florilor, Cluj County; Uriu, Bistrița County or Uioara, Alba County have most definitely been mined. It is certain that salty fountains/springs have also represented a major salt source. Several sources of natural brine are still in use today: Vîlcele, Valea Florilor, Cojocna, Corpadea, Căian, Boju, Măriști, Iuriu de Cîmpie, Pata, Gheorgheni, Cluj County; Sărmășel, Mureș County, Ocna Sibiului, Sibiu County; Figa and Blăjenii de Jos—"Salt Fountain", Bistrița County. There probably are many more others, and I believe that a mapping of these sources related to the period under discussion would be worth the effort.

The discovery made at Valea Florilor, situated on the southern-western ridge of the salt massif from Turda, brings forward a very interesting dating element. The wood items discovered here, very well preserved because of the high concentration of sodium chloride, have been dated using the radiocarbon method and belong to the Noua culture. The calibration average indicates the year 1250 BC<sup>42</sup>, therefore the time in which the Noua culture was active in the Transylvanian Plain.

In the bronze deposits from Uioara, but not exclusively, many winged flat picks used in salt mining have been discovered. Among others, salt is used even nowadays for polishing bronze items. It was also indispensable for animal

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<sup>39</sup> Ackner 1856, 24; Alexianu, Dumitroaia, Monah 1992, 162–163; Harding 2000; Rotea 2002/2003, 7–17.

<sup>40</sup> Dumitroaia 1992, 36–42.

<sup>41</sup> Wollmann, Ciugudean 2005, 98.

<sup>42</sup> Wollmann, Ciugudean 2005, 100–101.

breeding, as all herbivores need this mineral. Most definitely, although we do not have any material evidence dating from the Bronze Age, salt was one of the items used in trading.

*Metal processing.* Unlike other materials, bronze items do not have an explicit cultural or ethnic connotation<sup>43</sup>, because bronze metallurgy is the most advanced technical element of an entire age, spreading over a large area, sometimes having an extended period of use. Precisely because of that, most bronze items cannot be regarded as elements with a precise cultural framing. An example is the *Rollenadel*-type pin, whose existence begins in the mid-Bronze Age and lasts till the Hallstattian Age, or the Transylvanian socketed axe, with all its variants, which has a wide utilisation area, respectively a long period of use.

The presence of types of objects originating from another area than the one into discussion cannot be denied, as they can represent objects traded, used and spread by a certain culture, in our case, the Noua-Sabatinovka-Coslogeni cultural complex. Among these, the most noteworthy are the knobbed pins, most probably used as fibulae and the oriental sceptre-axes from Drajna and Larga<sup>44</sup>, but also the daggers with median rib from Șercaia<sup>45</sup>, Sibiu County and Cașinul Nou, Harghita County<sup>46</sup>, having a three-stepped blade. Both pieces resemble Peschiera-type daggers, but have strong affinities with items from the Sabatinovka environment<sup>47</sup>. Knobbed pins, just like notched shoulder bones have been attested neither before, nor after the Noua culture. I therefore consider that the two objects are artefacts typical for this culture.

According to some of the specialists, the new models have been accompanied by a new technology<sup>48</sup> based on a Cu-Sn alloy. V. Cavruc considers the events in the western Siberia and eastern Urals to have caused the expansion of the Seima-Turbino phenomenon, having the Sintașta culture as link<sup>49</sup> and from here, through the Srubnaia culture, it would have reached the Eastern Carpathians, subsequently infiltrating into Transylvania throughout the Noua culture formation process. Although tempting, I do not believe that this hypothesis can be supported archaeologically, even though one cannot deny the fact that some bronze objects have eastern influences, indeed: knobbed pins imitating knobbed stone sceptres,

<sup>43</sup> Bruck 1999, 313–345.

<sup>44</sup> Petrescu-Dîmbovița 1989, 73–74.

<sup>45</sup> Mentioned in several articles, the item was not available to me.

<sup>46</sup> Crișan 1989/1993, 248.

<sup>47</sup> Kločko 1993, 43–45, pl. 1–2.

<sup>48</sup> Dergacev 1997, 135–205.

<sup>49</sup> Cavruc 1997, 72.

the Golourov-type two-handled socketed axes<sup>50</sup>, the sickles with hooks apparently imitating, “tupic” bone sickles widespread east of the Carpathians.

Based on the data available, we cannot refer to a discontinuity between Middle and Late Bronze Age metallurgy, when the Noua culture was present in Transylvania, quite probably because of the influences of the Wietenberg-tradition indigenous element, which undoubtedly held the secret of processing tin bronze. An argument in this respect is bronze processing technology, which has not changed essentially, but suffered improvements. Thus, from the beginning of the Middle Bronze Age up to the Hallstattian Age, the percentages of tin in the alloy only suffered small modifications, in order to have a better alloy equilibration. The increase, broken down into stages, ranges between 0.04–9%, 1.9–7.1%, and 4.1–8.4%<sup>51</sup>. What is important is the increase of the average and the emergence of a Transylvanian “local mark”, with about 3% Fe. Corroborating data from Transylvania with the information provided by Chernikh related to the chronology of copper and bronze artefacts, one can notice that artefacts made of a Cu-Sn alloy emerged in about the same historical moment in: Syria, Altai, Central Asia and, last but not least, the Carpathian area, all around 2000–1800 BC<sup>52</sup>. Under these circumstances, I believe that the above-mentioned idea, according to which the Cu-Sn alloy would have an eastern origin lacks archaeological support. It is much more natural to consider that the same technological phenomenon was taking place in about the same historic moment, in different places.

I believe that the quantitative and qualitative leap is the result of the local Wietenberg tradition interferences with a great cultural area: the eastern-European one, represented by the Noua and the entire series of deposits Uriu-Domănești. An argument in this respect is the socketed axe group from Oinac in the southern Carpathians, which imitates the Transylvanian-type socketed axe<sup>53</sup>, *pl. 16*. There is a deposit type to attest Transylvania in the “Noua period”, characterised by a relatively reduced number of items and by the uniformity of the inventory. These items are small, mostly unbroken, usually sickles, socketed axes, and spearheads: Mociu<sup>54</sup>, *pl. 9*, Cîmpenești, Cluj County. This is the fundamental difference between the “Noua Age” and the early Hallstattian age, in which almost all the pieces discovered had been intentionally broken, like in Vîlcele II<sup>55</sup> or Uioara<sup>56</sup>.

<sup>50</sup> Dergacev 1997, 138.

<sup>51</sup> Petrescu-Dîmbovița 1977, 18.

<sup>52</sup> Chernikh 1992, 67–71.

<sup>53</sup> Petrescu-Dîmbovița 1977, 78–79.

<sup>54</sup> Petrescu-Dîmbovița 1977, 64, *pl. 56*, with older bibliography.

<sup>55</sup> Soroceanu 1988, 249–261.

<sup>56</sup> Soroceanu, Istrate 1975, 32; Petrescu-Dîmbovița 1977, 23–24, *pl. 114–117*.

West of the intra-Carpathian area have been discovered a few Arpășel-type deposits, as defined by K. Kacsó<sup>57</sup>. This type of deposit is very frequent in northern-western Romania, in the Cehăluț area, where they probably got to the Noua environment from. It is highly probable for some Otomani pottery models to have also reached Transylvania through the Cehăluț group, which had a strong Otomani component.

Bronze findings are classified in three groups: those from settlements, necropoleis and deposits.

The predominant findings in settlements are pins, with or without buttons, piercers and a few spearheads. Comparing spearheads from Transylvania to those from the eastern-Carpathian area, one can note that, while the weapons used inside the Carpathian arch were very similar, if not identical to those in the Suciul-Lăpuș, Otomani or Cehăluț area; east of the Carpathians, the weaponry is Sabatinovka-type<sup>58</sup>, like in: Țigănești, Rogojeni, Stuhuleț<sup>59</sup>.

Necropoleis have a different inventory. Weapons, sickles and socketed axes are not to be found, necropoleis revealing only jewellery items: knobbed pins, buttons, lockerings or bracelets.

The deposits from the “Noua Age”, belonging to the Uriu-Domănești series<sup>60</sup> are different than contemporary ones belonging to the Suciul-Lăpuș area, both by composition and by quantity. Those in the Noua area are small deposits, made of a few unbroken items, usually sickles with hooks and socketed axes: Suatu, Cara, Cătina, Corund, Cluj I, Cluj II, Cluj IV, Mociu, Zimbor, Valea Largă, Toplița<sup>61</sup> etc. A few deposits: Uriu, Iara, Aiud etc. also contain knobbed pins, saws and fragments of weaponry. One can see that, unlike in Arpășel-type deposits, deposits in the Noua areas have not revealed pendants or other jewelry. It must also be noted that deposits in this horizon do not contain intentionally broken pieces, like those from Uioara or Vîlcele II. Most sharp items (sickles, swords, daggers) had been broken or bent before being placed there. Without going into further details, I believe that these are offerings made to honour a Chthonian divinity, maybe “mother earth” – the one who offered the metal and who was not to be hurt?

Among the numerous deposits and isolated items discovered, a significant one is the settlement at Pălatca, which is not only a settlement proper, but also a

<sup>57</sup> Kacsó 1995, 81–131.

<sup>58</sup> Klochko 1993, 43–55.

<sup>59</sup> Florescu 1991, 282–283.

<sup>60</sup> Petrescu-Dîmbovița 1977, 51–80.

<sup>61</sup> Petrescu-Dîmbovița 1977.

bronze processing workshop<sup>62</sup>. The presence of bronze moulds, slag, burnt stones and of two bronze anvils of different types are arguments in this respect. One of the items is a replica of an “oxhide”-type Cypriot ingot *pl. 10/a*.

It is not known for sure whether the blacksmiths settled down in the proximity of one or several Noua settlements, but it is certain that pottery elements, pins with four protuberances, notched shoulder bones and *kantharos*-type vessels are pieces of evidence placing the settlement from Pălatca in the Noua environment. There is a Noua settlement nearby (Petca) and a Noua grave as well, at Arburaș. Metallographic analyses indicate a local replica of an oxhide Cypriot ingot, due to the high percentage of iron – 3.07%<sup>63</sup>, as compared to the percentage usually encountered in such items, which does not exceed 0.1%. Technical data related to the findings from Pălatca have been kindly provided by M. Rotea, the author of the discovery. The only item having a different composition is an anvil *pl. 10/b*. Besides the peculiar shape<sup>64</sup>, this anvil has a concentration of 18.5% lead, 80.94% copper and only 0.91% iron, tin being completely absent. The massive presence of lead, obviously not accidental, is probably due to the need for an elastic resistance in the anvil. Without the lead, due to its rigidity, the anvil could break. Not all anvils had the same role. Their functions were probably different, according to the products that had to be made.

There is an item discovered near Dej at the beginning of the XXth century, which is a mixture between the socketed axe with a concave mouth model, typical for the Late Bronze Age and Early Hallstatt, and a hammer. Although the item was inventoried by the National History Museum of Transylvania in 1918, it was considered to be a forgery because of its unusual shape. The centre of mass, quite unbalanced as compared to other socketed axes, makes it impossible for the item to have been used as a socketed axe. A macro-photograph of the item *pl. 11/2* clearly indicates that the flat end was used as a hitting surface. The “mushroom” created is typical of the tools in any mechanical workshop. Most probably, the item was used as an anvil for the processing of fine bronze pieces using the cold hammering technique.

Moreover, a meteorite, *pl. 10/c*, was discovered in the Pălatca settlement. The interesting part, besides the rarity of such an item, is that one of the ends had been carved in prehistoric times. Chemical analyses indicate a percentage of over

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<sup>62</sup> Rotea, Rotea 1997, 13–19.

<sup>63</sup> Rotea, Mair 2009 (under press).

<sup>64</sup> Rotea 1997.

80% manganese and 10% iron. It is possible for blacksmiths from the Late Bronze Age to have used such an ore source, the metals being in an almost pure state.

I believe it is important to highlight the fact that the presence of a replica of an “oxhide” ingot displaying local characteristics, as well as the percentage of iron, in the time of the existence of the original items, proves that cultural, commercial and technical connections were fast, solid and stretching over extended areas.

In the perimeter of several Noua settlements have been discovered moulds, either unbroken or fragmentary. A few moulds and fragments of moulds have been discovered at Pălatca, all bearing traces of use. Both the moulds from Pălatca and those from Nicoleni, Lacu and Dobric are made of volcanic tufa from Dej. A fragment of a mould identical to those in the Cehăluț environment was discovered at Cluj-Mănăstur. This is the same discovery as the one in which I. Kovács's dragon and “reels” were found in 1911, *pl. 12*. The “reels” are in fact a representation of oxhide ingots. Very probably these small artefacts are offerings for a god of fire. The “dragon” is similar with the dragon from Lichitișeti, from Moldavia<sup>65</sup>.

As previously mentioned, the items discovered in deposits differ from those from necropoleis and from settlements. The most frequent bronze items discovered in other contexts than in deposits are: knobbed pins (Cluj, Buza, Pălatca, Mera, Deuș, Zoltan, Dumbrăvița etc.); sickles (Zoltan, Rotbav, Apahida, Mociu); socketed axes (Bistrița, Dumitrița); spearheads (Deuș, Mociu, Rotbav) and bronze moulds (Pălatca).

Even though they did not have control over the ore, the bearers of the Noua culture were undoubtedly ore users, and even imposed several distinct types and models. The items belonging to the bearers of the Noua culture are bone sickles with hooks, (probably) tunic, and knobbed pins, widespread over the entire Noua culture area, including east of the Carpathians. Major deposits in Transylvania have been dated to the Br.D-HaA<sub>1</sub> chronological bracket, concomitantly with the presence of the Noua culture in this area. The presence in deposits of items originating from areas far away, like the Caucasian-type socketed axe from the Uioara deposit cannot be accidental, even though it is immediately subsequent to the Noua culture, or the sceptre decorated with a bird's beak discovered at Uriu, the sceptre axe from Drajna – Moldova – also of eastern provenience or the sceptre axes discovered at Larga, belonging to the Suciua area<sup>66</sup>.

Related to bronze items dated to the Transylvanian Noua Age, I have to mention the fact that the bronze items deposit from Vilcele II, Feleacu village, Cluj

<sup>65</sup> Florescu 1991, 97, fig. 95/1.

<sup>66</sup> Petrescu-Dîmbovița 1977, 16, pl. 49.

County was dated by T. Soroceanu to the Br. D-Ha A, but the vessel in which the items were deposited was dated to the Noua Age<sup>67</sup>. The *Passamanterie*-type fibula fragment places the discovery into the Cincu-Suseni series, therefore Ha A1! Should this chronological attribution be correct, the question which arises is: to which culture belongs the deposit I from Cluj<sup>68</sup>, made of 10 items, 7 socketed axes and three sickle fragments, which most certainly belong to a previous period, but certainly a post-Wietenberg one? Transylvanian socketed axes are part of the same typological series as the “Oinac”-type ones, which can be attributed to the Noua culture. The presence of fragmentary items makes me believe that the Cluj I deposit must be attributed to Ha A1, probably being contemporary to the Vilcele II one, attributable to the period immediately following the Noua Age. These latter also have a Transylvanian origin, as proven by the findings from the northern-western part of the intra-Carpathian area. Such items have also been discovered in the Someșului Valley, at Cernic, Sălaj County<sup>69</sup>. Most probably, these artefacts were “exported” south of the Carpathians, either directly or through itinerant craftsmen.

Besides bronze ones, gold items have also been attributed to the Noua culture. However, they are rare and have been generally discovered in graves, like the lockering discovered in the necropolis from Cluj-Banatului Str., the lockering from Morești, the string of beads with four protuberances from Boarta, which have not been 100% proven to belong to the Noua culture, *pl.* 13. It is possible for some of the bracelets discovered in small treasuries to belong to the period under discussion as well, but due to the absence of precise information, I prefer not to discuss them here.

## 6. Exchanges

Although difficult to attest archaeologically, trade was most definitely an important component of economic life. The presence of bronze items of eastern provenience in Transylvanian deposits, the presence of beads made of Mycenaean glass discovered in Cluj<sup>70</sup>, of the Baltic amber discovered at Cioclovina<sup>71</sup>, and also that of the Transylvanian type socketed axes in the extra-Carpathian area are

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<sup>67</sup> Soroceanu 1988, 249–261.

<sup>68</sup> Petrescu-Dîmbovița 1977, 122.

<sup>69</sup> Bejenariu 2005, 134, fig. IV/3.

<sup>70</sup> Wittenberger 2006b, 107.

<sup>71</sup> Rotea 1995, 88.



pieces of evidence attesting a stable and long-lasting commercial exchange. The discovery of the “oxhide” bronze ingot at Pălatca suggests a more wide-spread trade, as indicated by the Cypriot origin of this type of item. The presence of the biggest deposits of bronze items in the immediate vicinity of salt sources cannot be accidental, although they only partially belong to the period under discussion. Since in Hungary commercial routes have been established ever since the Bronze Age<sup>72</sup>, trading bronze, tin, etc., it is unconceivable for such routes not to have existed inside the Carpathian arch. Moreover, Transylvania’s biggest rivers were natural communication ways and the fact that they were used in other periods, as well (Roman and medieval) is, in my opinion, yet another argument to support this idea.

The existence of major commercial routes is more than certain. The fact that major communities (cultures) settled in some often unfavourable areas can be explained either by the fact that they probably controlled some commercial routes or vital natural resources, or both. We must visualize Europe being criss-crossed by major commercial routes connecting the more developed South to the other regions. These regions, although not equally highly developed economically and culturally, were producers of goods that were necessary in any society of the time. Thus, tin was mined in today’s Slovak and Czech Republics, gold and probably copper were mined in the Apuseni Mountains and salt in the Transylvanian Plain and Plateau. Amber was imported from the Baltic Sea and glass was produced in Mycenaean workshops. Moreover, archaeological findings represent important evidence attesting the existence of commercial routes. The skeleton of a Bachtrian camel from Asia was discovered in an ash hill in Moldova (Petrușeni) belonging to the Noua culture. Steppe cultures, Andronovo for instance, used this animal intensively<sup>73</sup>. Referring to the classical cultures of the Bronze Age in this area, it is important to remember that each of the major cultures had control over specific natural resources. Thus, in Transylvania, the Wietenberg culture had control over salt, a vital element both for men and for animals. Thanks to the geographical location and as a consequence of the relief configuration, the Wietenberg culture played a key role both for extra-Carpathian products and for those having a western origin.

The discovery, in Transylvania alone, of over 5000 kg bronze items<sup>74</sup> cannot be accidental. Should one analyze the geographical spread of bronze deposits, it would be noted that most of them are in the vicinity of major salt

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<sup>72</sup> Kovács 1966, 22–47; Kovács 1977, 152.

<sup>73</sup> Bulliet 1975; Kuzmina 1994, 66.

<sup>74</sup> Rusu 1972, 29; Petrescu-Dîmbovița 1977, 23.

deposits. Moreover, gold deposits are also to be found in the same area; 30 deposits, with a total number of 3100 items, most of them made from Transylvanian gold<sup>75</sup>. Quite probably, all the bearers of the Wietenberg culture also held the secret of the making bronze artefacts; the presence in the areas dominated by these cultures of the most numerous and the biggest deposits being an argument in this respect.

The Otomani culture controlled metalliferous resources in the Woody Carpathians and the Bükk Mountains, as well as the commercial routes coming from Transylvania and along the Tisza/Tisa river. The Suciul de Sus culture held all the resources from the Maramureşului Mountains area: salt, gold, silver and controlled the access in the Valleys of the Someş and upper Tisza/Tisa rivers<sup>76</sup>. The bearers of the Monteoru culture held the passes in the Curved Carpathians and probably the enormous salt resources in the area.

As Prof. Christian Christiansen once said in a private conversation, there must be three accumulation levels related to the ore, the raw product. First, there are the miners, those who hold the secrets of the ore deposits and lodes and knew which rock is active and which is not. Unfortunately, they are the hardest to attest archaeologically, due to the absence of financing projects focused on archaeo-mining (a most honourable exception is represented by the studies of V. Wollmann and H. Ciugudean). The second important segment is that of the people controlling the production, bringing an added value to the raw material (generally moulds) through their work, turning them into usable artefacts. Then, there is a third level, also very important, made of the traders and of the people controlling commercial routes. It is quite natural for the people producing the raw material not to need fortified settlements...everybody needed them.

It is common knowledge that from a cultural viewpoint, the bearers of the Noua culture had an eastern origin, being part of the Noua-Sabatinovka-Coslogeni greater cultural area. It is not impossible for this particular culture to have been the link between eastern Andronovo-type cultures. The discovery of a Bachtrian camel in a Noua ash hill in the Republic of Moldova<sup>77</sup> seems to confirm this idea. The active role played by the Noua culture in the commercial exchanges of the time cannot be denied.

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<sup>75</sup> Rusu 1964, 29–64.

<sup>76</sup> Bader 1978, 63–66.

<sup>77</sup> Sava, Leviţki 1995, 31–32.

## 7. Household crafts

*Spinning, weaving and sewing.* Vegetal fibres, like flax and hemp and animal fibres, like wool were quite necessary for making clothes. These fibres were probably used by the Noua environment, as well. Even though no discovery of grains from technical plants has been documented yet, it can be assumed that the bearers of the Noua culture, like others in prehistoric times, knew how to harvest them from a natural environment. Animal fibres, like wool, were undoubtedly widely used. Evidence to support this idea is provided by the numerous spindle whorls, post-ends and hand loom weights discovered. On the basis of the data available, it can be noted that they were all made of fired clay. Hand loom weights were tronconical, which enables us to believe that the vertical hand loom was widely used. It is possible that the pig jaws discovered in dwellings were used as hand loom combs. Such objects are still in use today. Bone needles were used for sewing.

*Skin processing.* As previously indicated, animal breeding was one of the basic occupations of the bearers of the Noua culture and skin processing is directly connected to it. Information related to the techniques used in skin processing is unavailable, but they were undoubtedly used, especially in cold seasons. A. C. Florescu launched the hypothesis according to which notched bones, like shoulder bones, ribs or hooves may have been used for skin degreasing<sup>78</sup>, but salt was surely used besides these, as well.

*Bone processing.* Bone artefacts are omnipresent among Noua findings, being “truly commonplace”, as A. C. Florescu used to say<sup>79</sup>. I do not wish to insist upon the typology of bone artefacts; briefly, they can be categorized as: notched bones (shoulder bones, ribs, hooves), generally made of mature cattle bones; knives, made of long cattle or horse bones; pins, piercers, spatulas, made of horse or ovicaprid bones; spikes and piercers made of stag and bison bones, *pl. 2, 14, 15*.

*Clay processing.* I will not approach the pottery of the Noua culture in this subchapter, I will only deal with clay processing. It is common knowledge that not every type of clay is good for making pottery, just as the clay layers for the walls of the dwellings, incorrectly called adobe, could not have been processed without prior knowledge of the characteristics of clay. This clay must be plastic and non-contractile. Otherwise when dry, it would simply crack.

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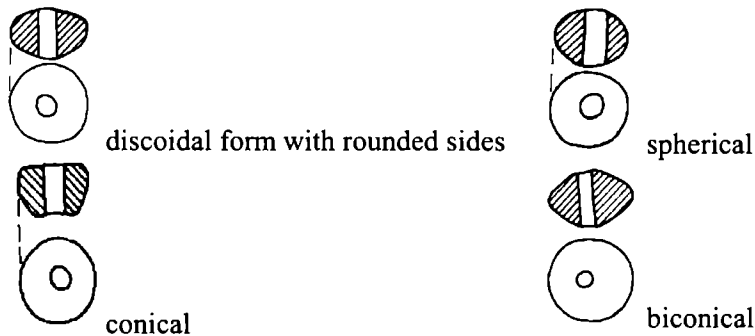
<sup>78</sup> Florescu 1964.

<sup>79</sup> Florescu 1964, 19.

Many clay objects have been discovered in settlements, coming from spinning and weaving tools, but also rush lights and toys. Some cult objects were also made of clay, like votive statues and chariots.

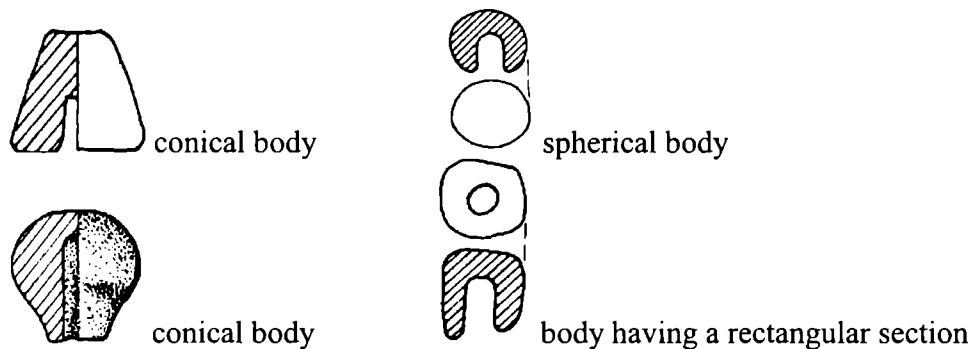
### *Spindle whorls.*

Based on the information available, the Noua culture is much poorer regarding this type of findings than other cultures of the Bronze Age. However, several types of spindle whorls have been discovered:



### *Post-ends*

Very few such objects have been discovered, and they can be attributed to the following types:

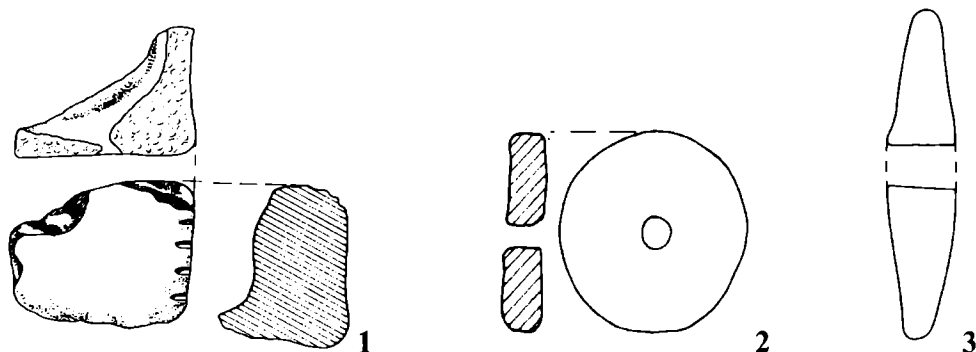


### *Weights*

The items discovered so far can be attributed to one category, but this does not exclude the existence of other models. Having different dimensions and weights, they had a pyramidal shape, a rectangular section, one or two perforations in the upper part. Such items have been discovered at Deuș-Lunga, Deuș-Apreșul de Jos, Buza, Mera etc.

### *Chariots and small wheels*

Although frequent in mid-Bronze Age cultures, these items are rare finds within the Noua culture. Several discoveries were attested to previous or partially contemporary cultures – both in a Wietenberg, Otomani or Suci environment<sup>80</sup>, and in a Monteoru<sup>81</sup> or Tei<sup>82</sup> environment. For western cultures and cultural groups, these items were not rare<sup>83</sup>, but they have been rarely encountered within the Noua culture. A few pieces were discovered in Moldova<sup>84</sup>. A fragment of a chariot was found inside the Carpathian arch, at Buza<sup>85</sup>. For this piece from Buza, I suggested the classification as an A2-type, according to the shape, and according to the decoration, the classification as a C type, according to C. Schuster<sup>86</sup>. According to the material in pit no.1, the item can be attributed to the final stage of the Transylvanian Noua culture. The objects from Iclod also belong to the same period. I also know that two chariot wheels have been discovered in Noua settlements, at Dumitrița – 2 and Deuș-Apreșul de Jos – 3.



### *Toys?*

Based on my knowledge, the object discovered in the necropolis from Band is the only item belonging to the Noua culture that can be attributed to this category. Similar items existed in the Neolithic Age, the Iclod group<sup>87</sup>.

<sup>80</sup> Bader, Dumitrașcu 1970, pl. 4–6; Ordentlich, Chidioșan 1975, 27–44; Bader 1978; Boroffka 1994, 167–168; Rotea 1999, 102–103.

<sup>81</sup> Căpitanu, Florescu 1969, pl. 7; Oancea 1976, 199, pl. 4/5.

<sup>82</sup> Leahu 1963, 15–47; 1963, 179–270; 339–372; pl. 36/7; Ulanici 1979, pl. 9/6; Schuster 1995, 148; Schuster, Popa 1996, 117–137.

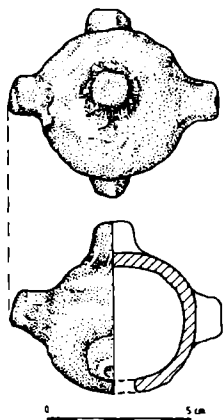
<sup>83</sup> Petrovsky, Gumă 1979, 127; Rogozea 1995, 83.

<sup>84</sup> Florescu, Florescu 1990, pl. 31/3, 7–9, 97/2.

<sup>85</sup> Wittenberger 1997, 703–715.

<sup>86</sup> Schuster 1996, 118.

<sup>87</sup> Maxim kind information.



I have tried in the present paper to re-create a fragment of the organisation and economic dynamics existing in Noua settlements in Transylvania, as indicated by the discoveries up to the present moment and based on my way of understanding them. It is regrettable that some of the specialists keep clinging to clichés originating from a political ideology and having no archaeological support. There is no doubt that the information related to this subject will be enriched further on, as more and more Noua objectives will be investigated.

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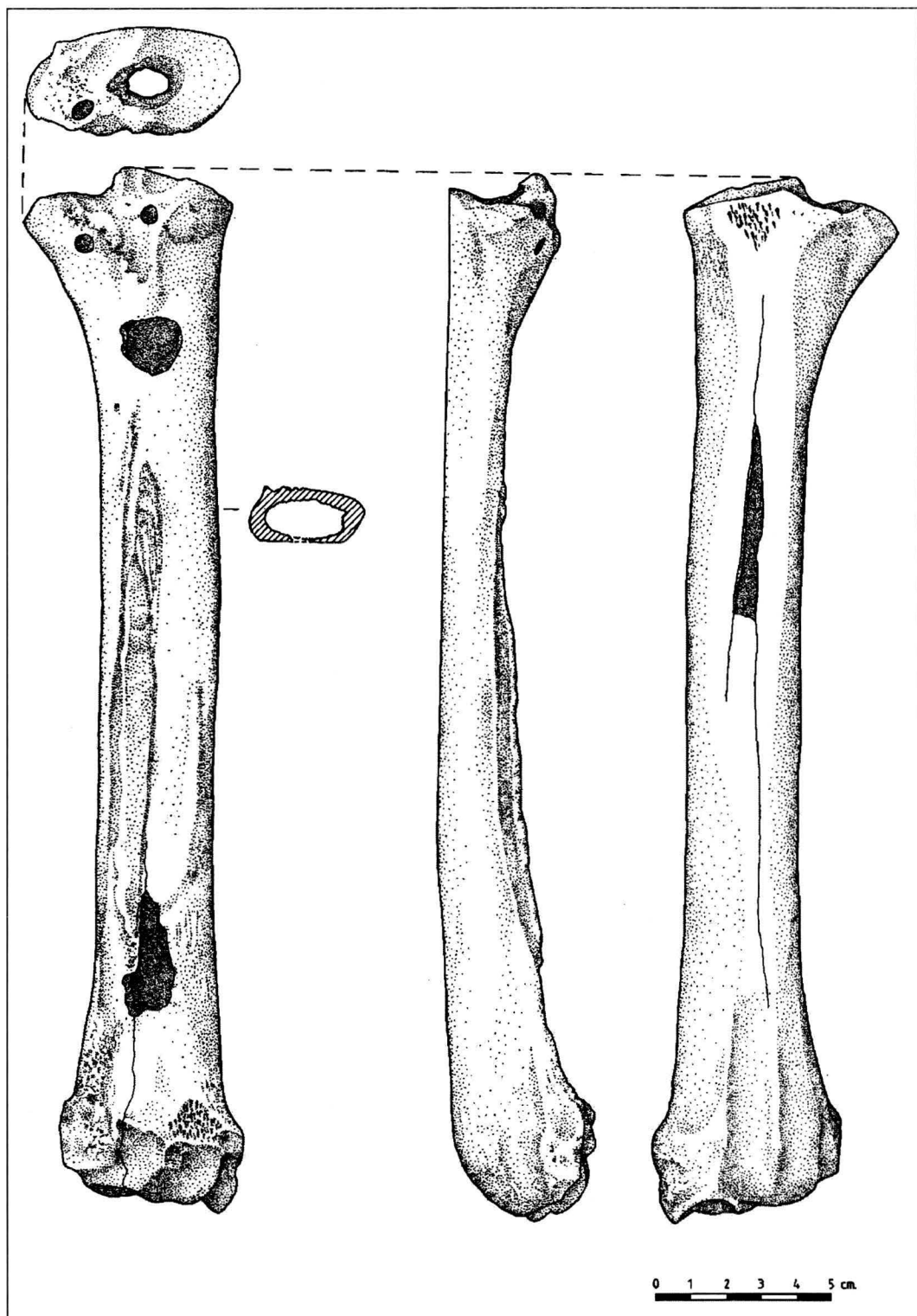
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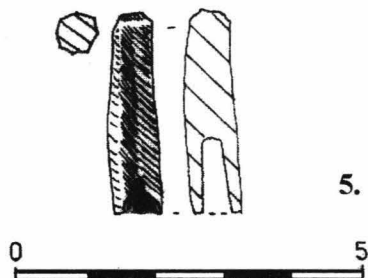
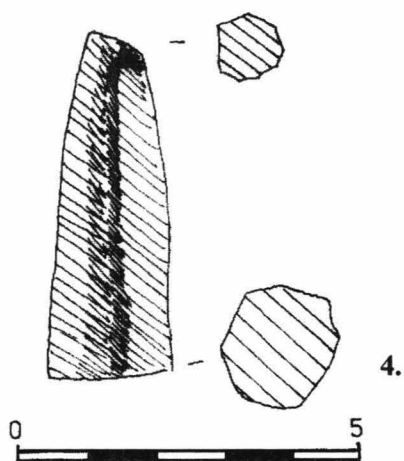
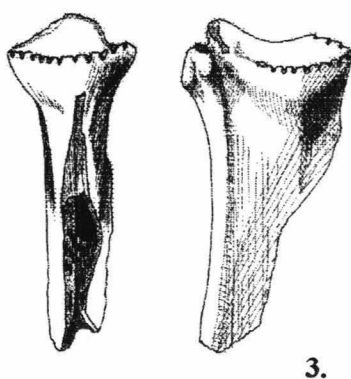
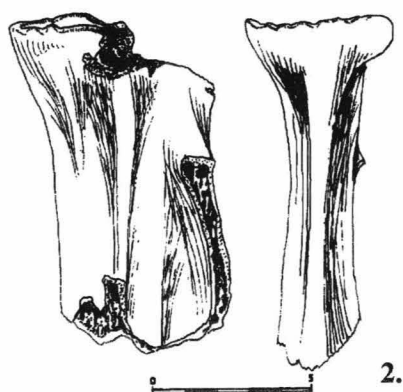
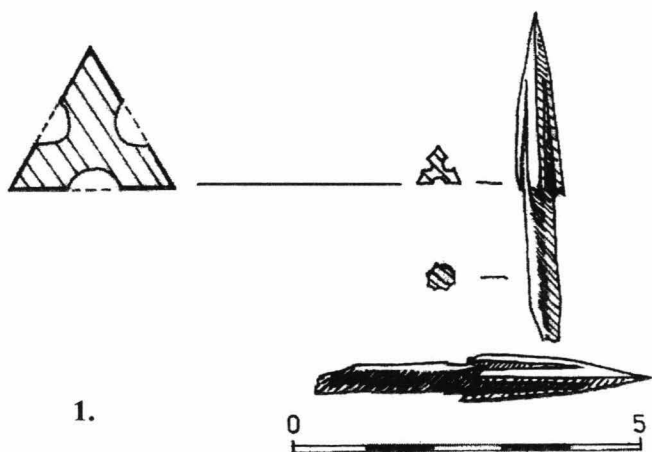


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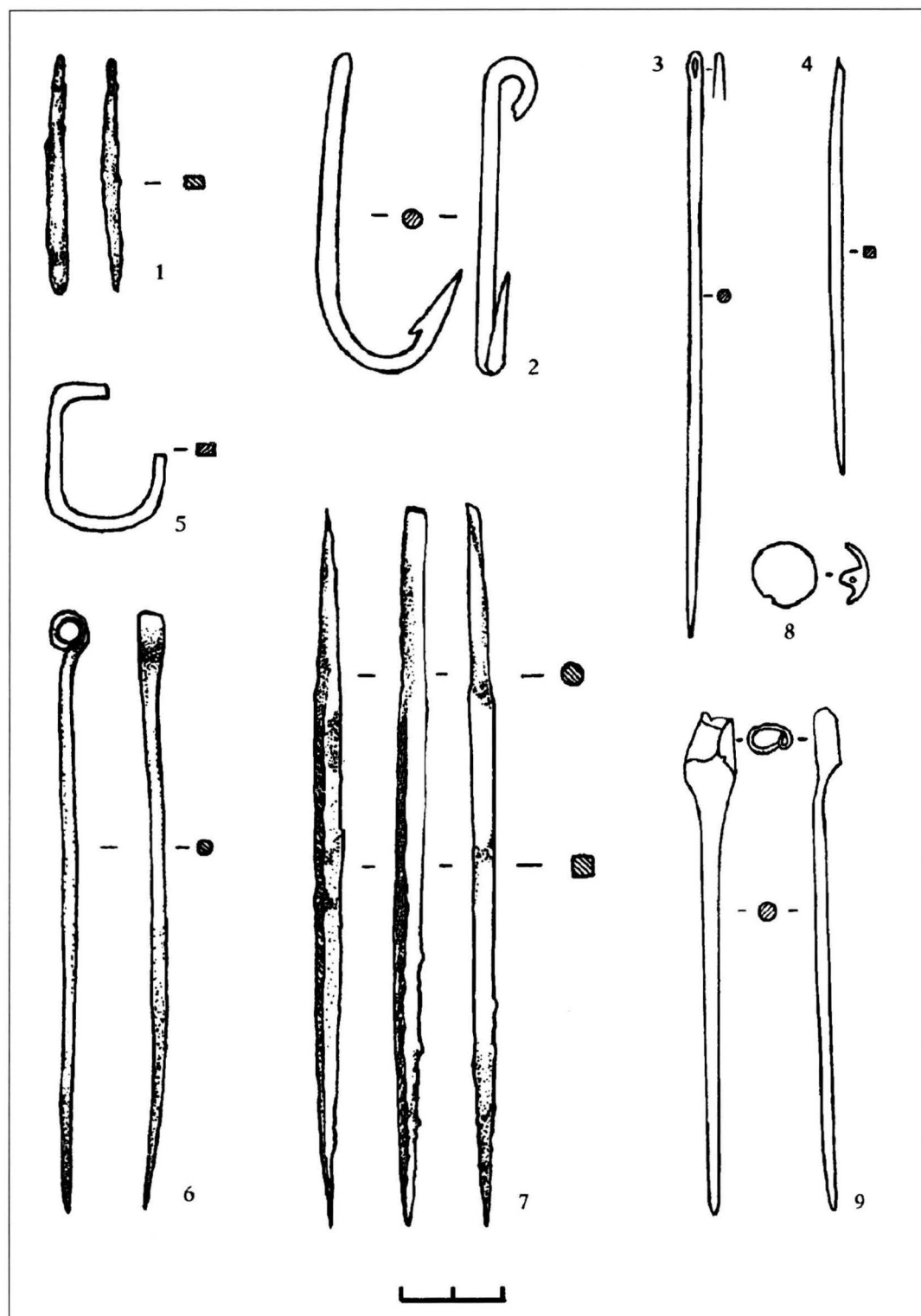
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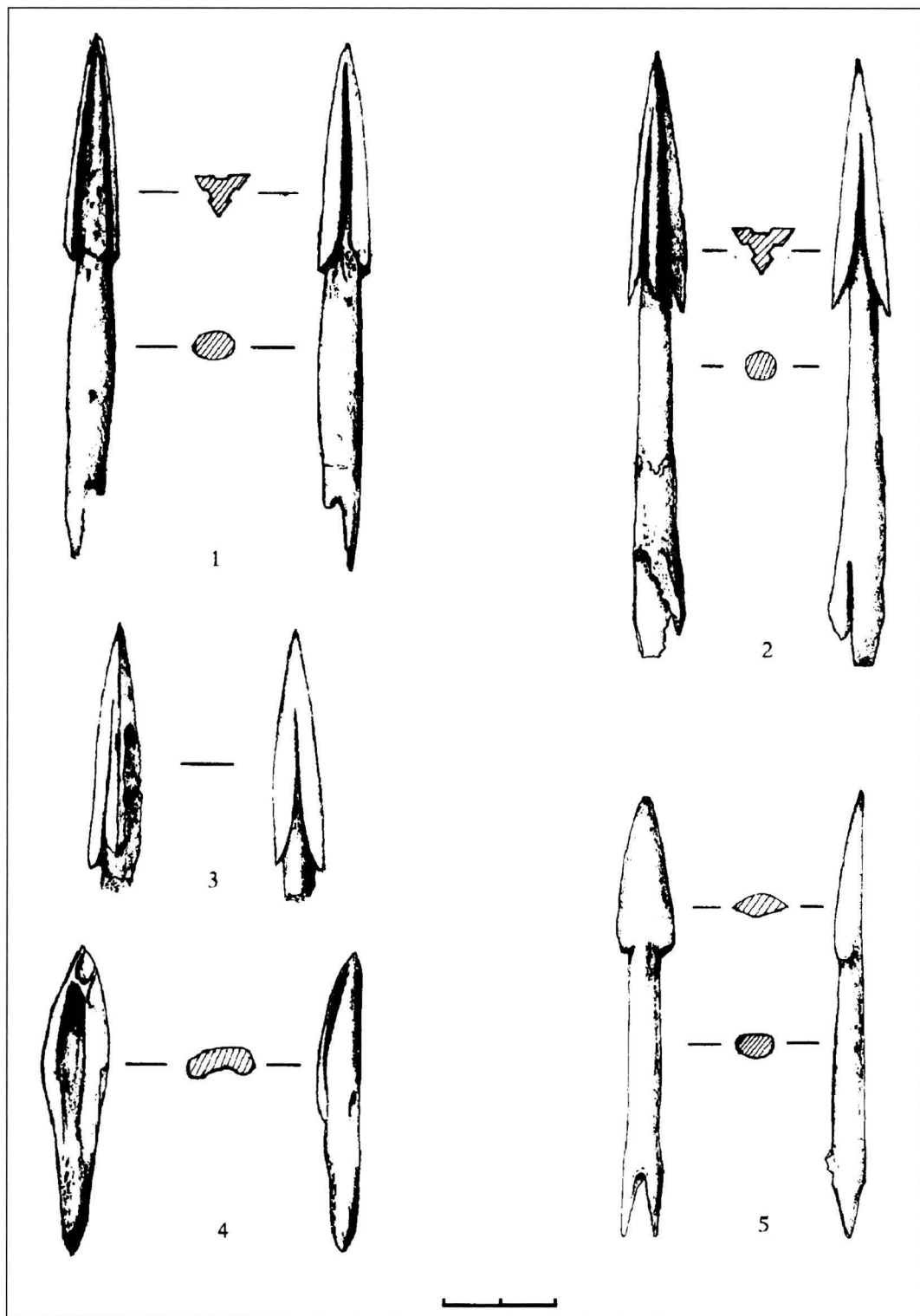
Pl. 1. Mera L1. Skate from deer bone.



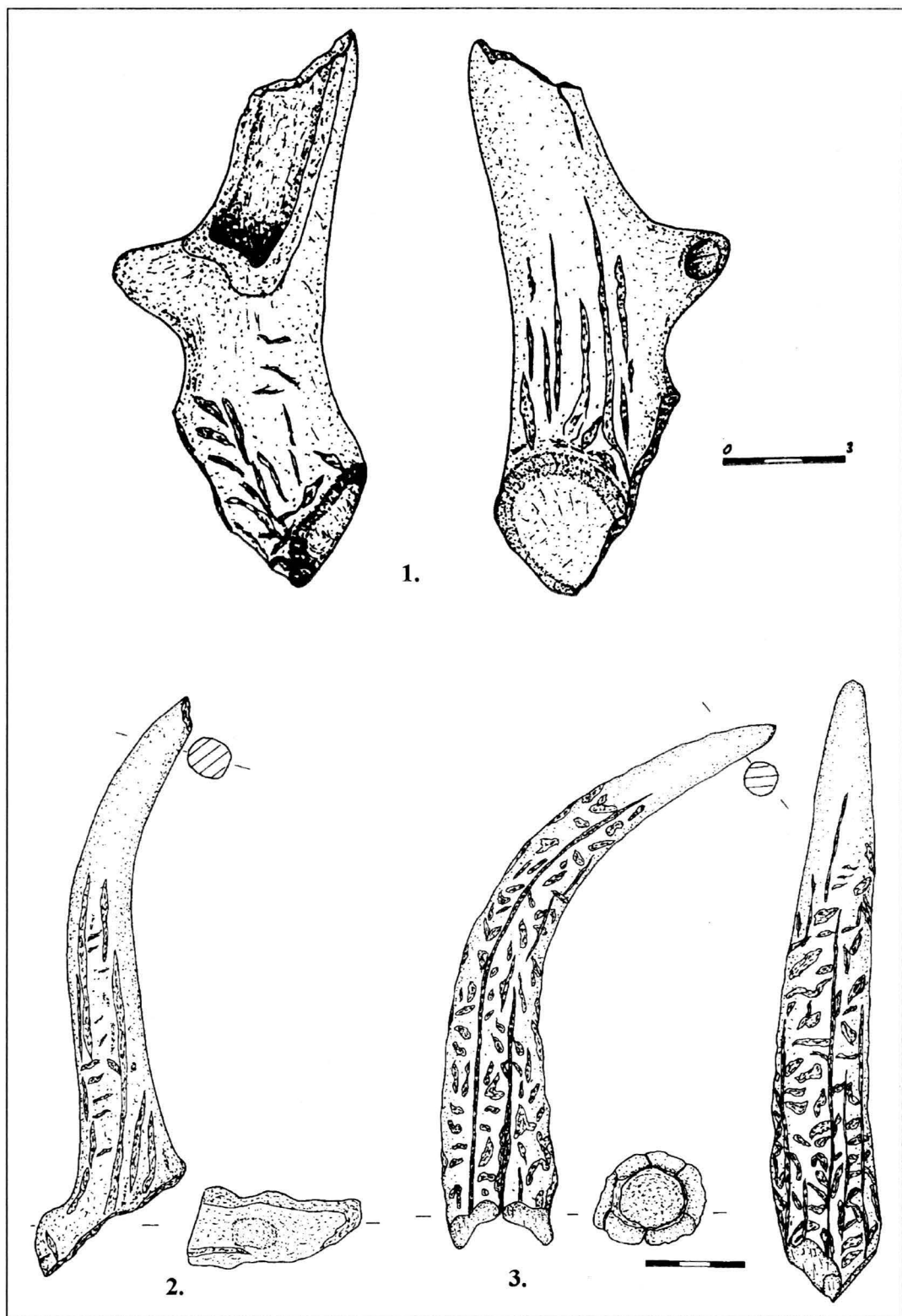
Pl. 2. Mera-“Cuimel”, 1 – arrow head; 2, 3 – shoulder bones; 4 – buffalo bone tool; 5 – small bone tool.



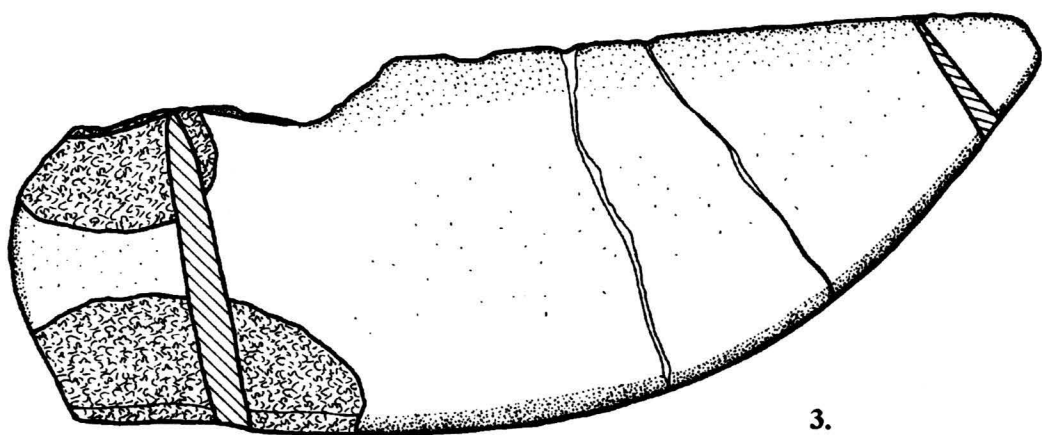
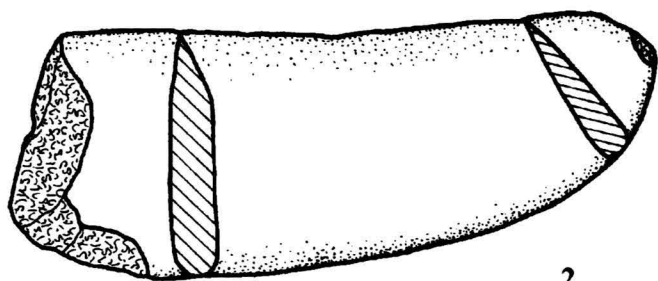
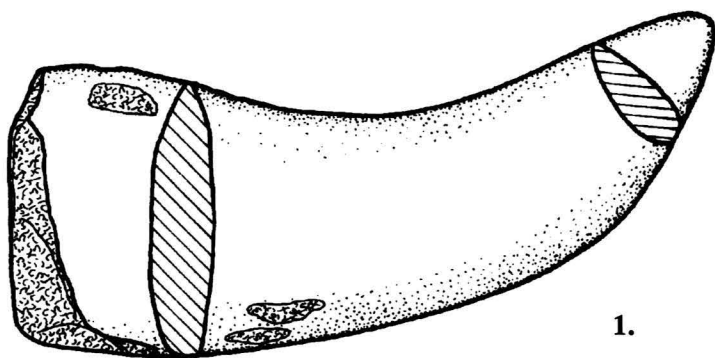
Pl. 3. Zoltan-“Cariera de Piatră”, bronze tools (after V. Căvruc).



Pl. 4. Zoltan-“Cariera de Piatră”, arrow heads (after V. Cavruc).



Pl. 5. Buza-“După Lab”, hoes.



Pl. 5. Buza-“După Lab”, Krummesser.





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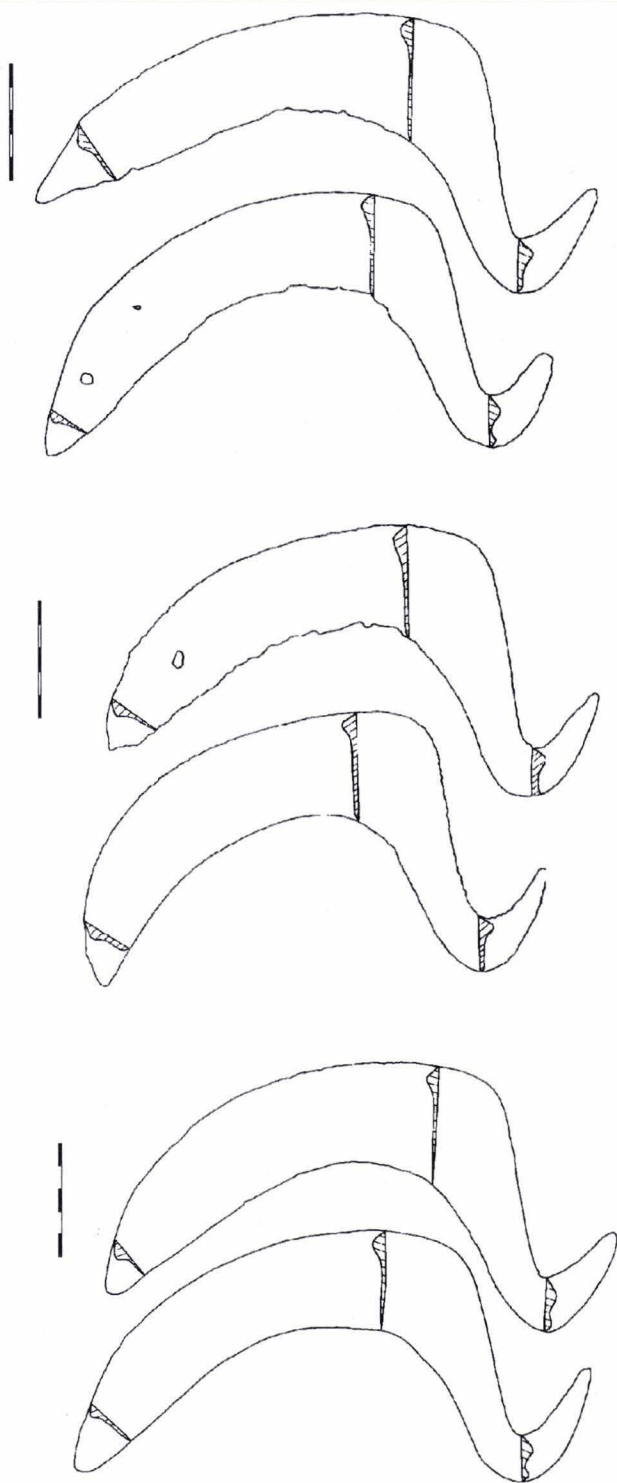


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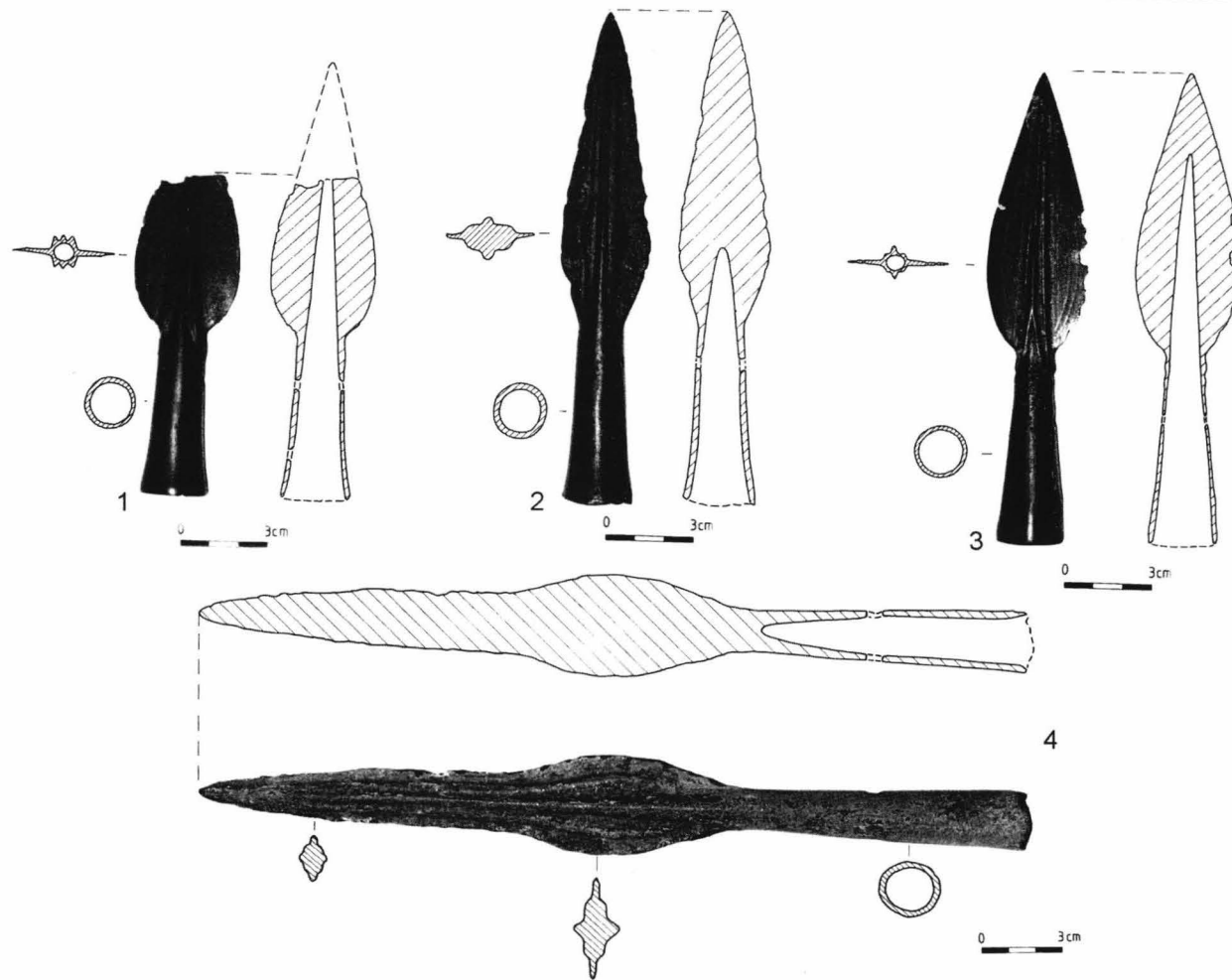


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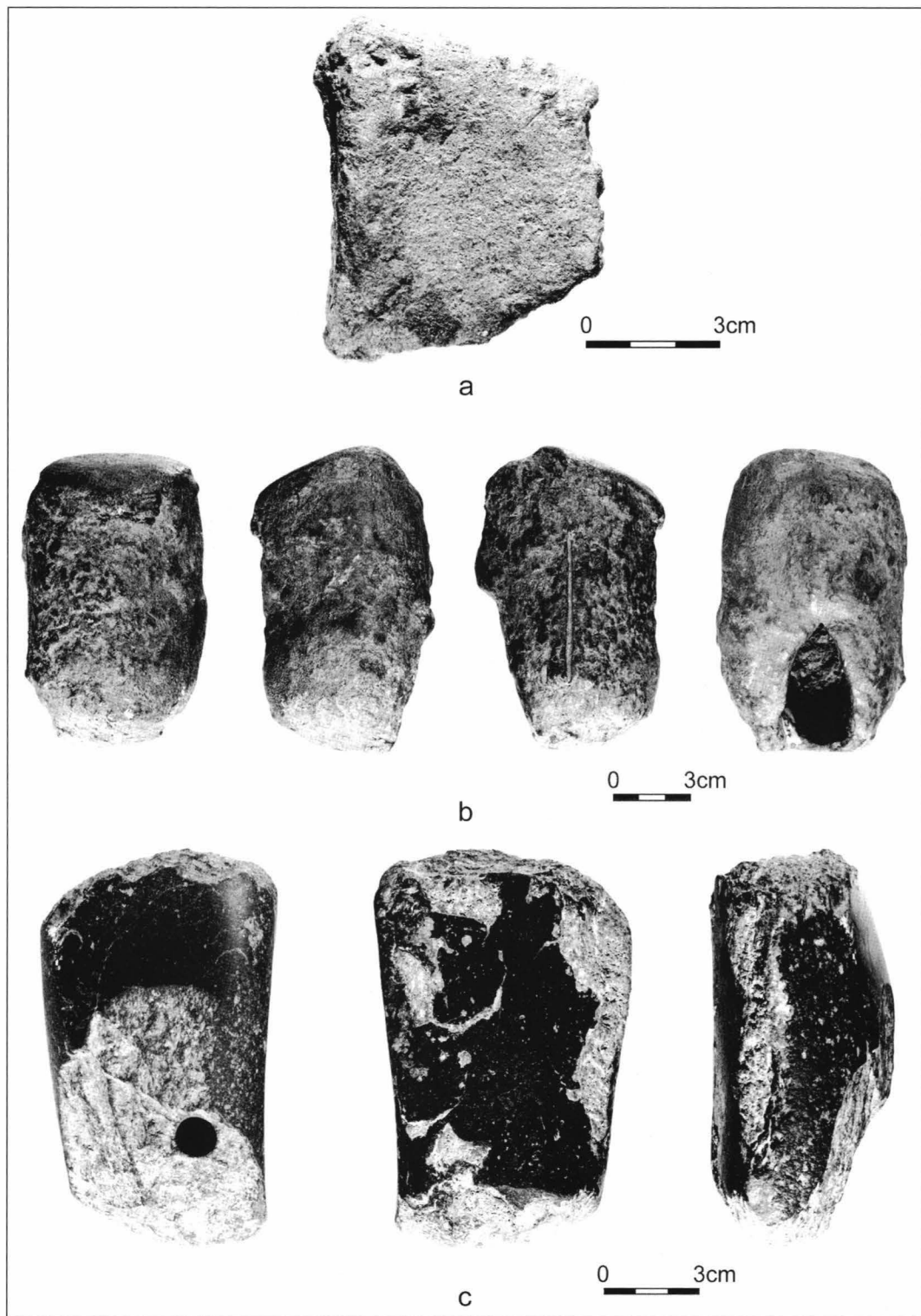
Pl. 7 Buza, Cluj County fine sections on grindining mills – andezit with piroxen,  
sours: Munții Bărgăului, Valea Someșului Mare.



Pl. 8. Bronze sickles deposit from Moeciu, Cluj County.



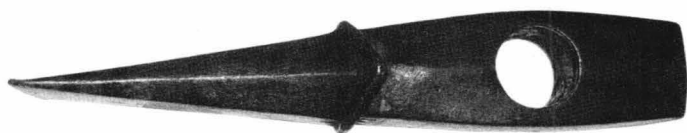
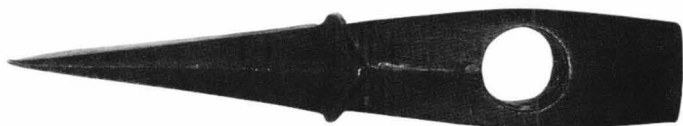
Pl. 9. Spearheads. Cluj. 1 – Vâlcele; 2 – Moldovenești; 3 – Mociu; 4 – Cheile Turzii.



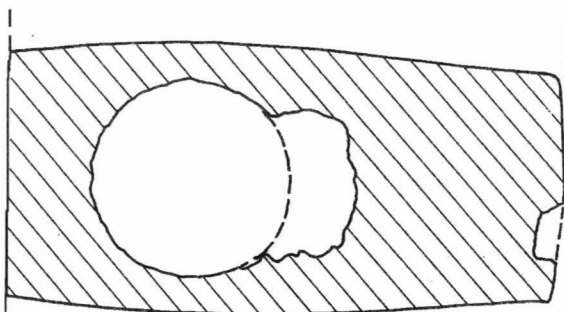
Pl 10. Pălatca 1 oxhide ingot 2 anvil 3 meteorit.



1

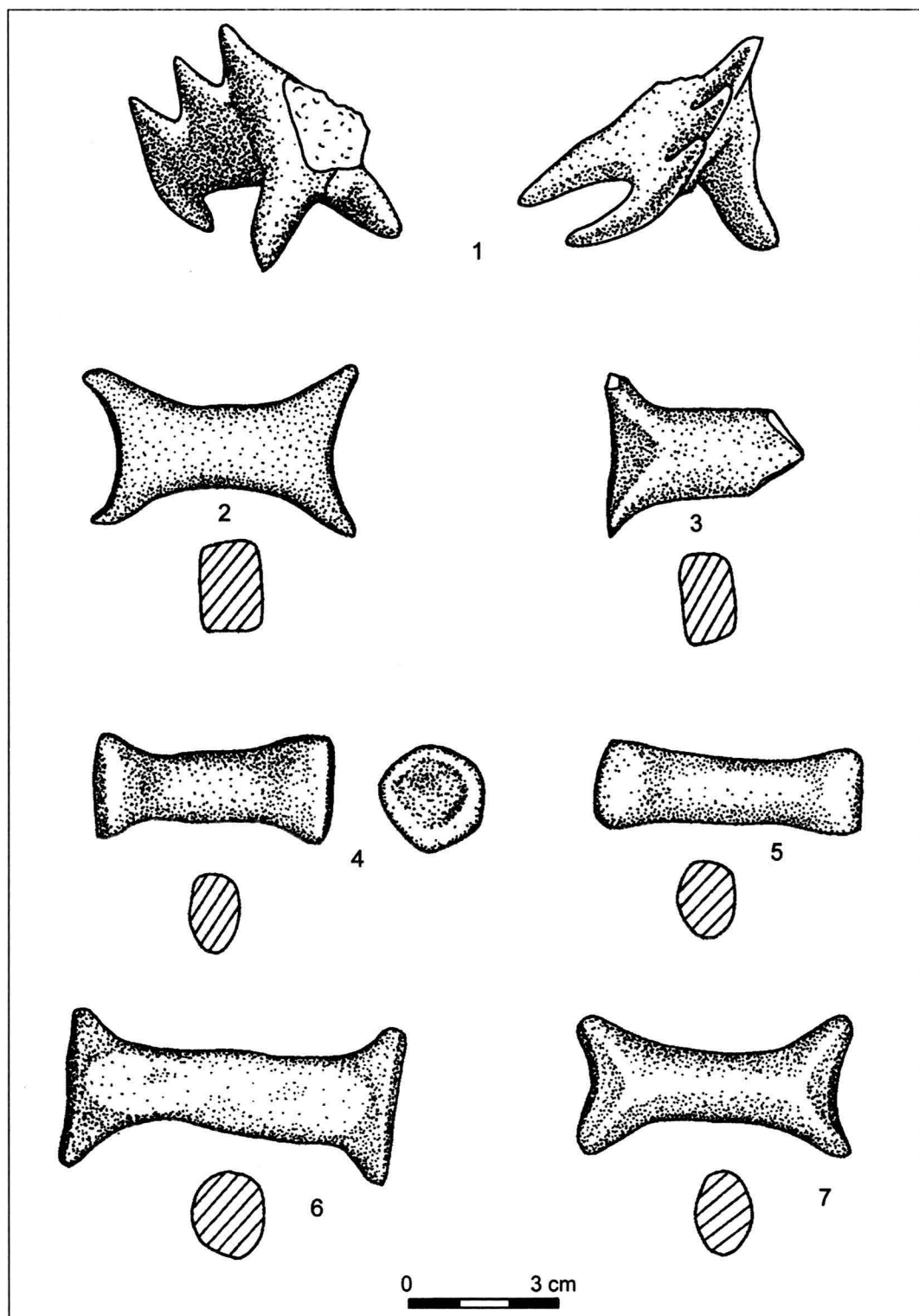


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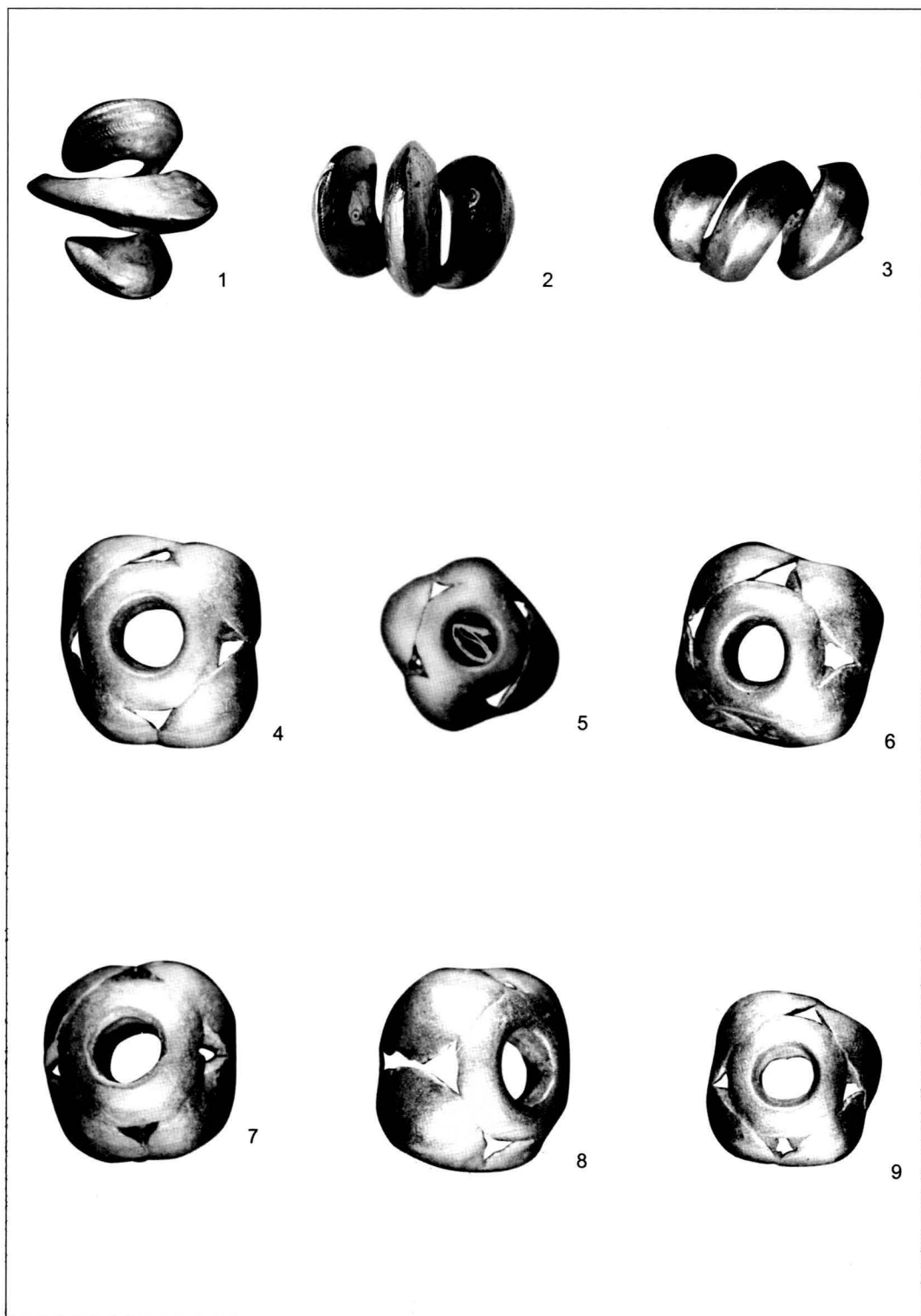


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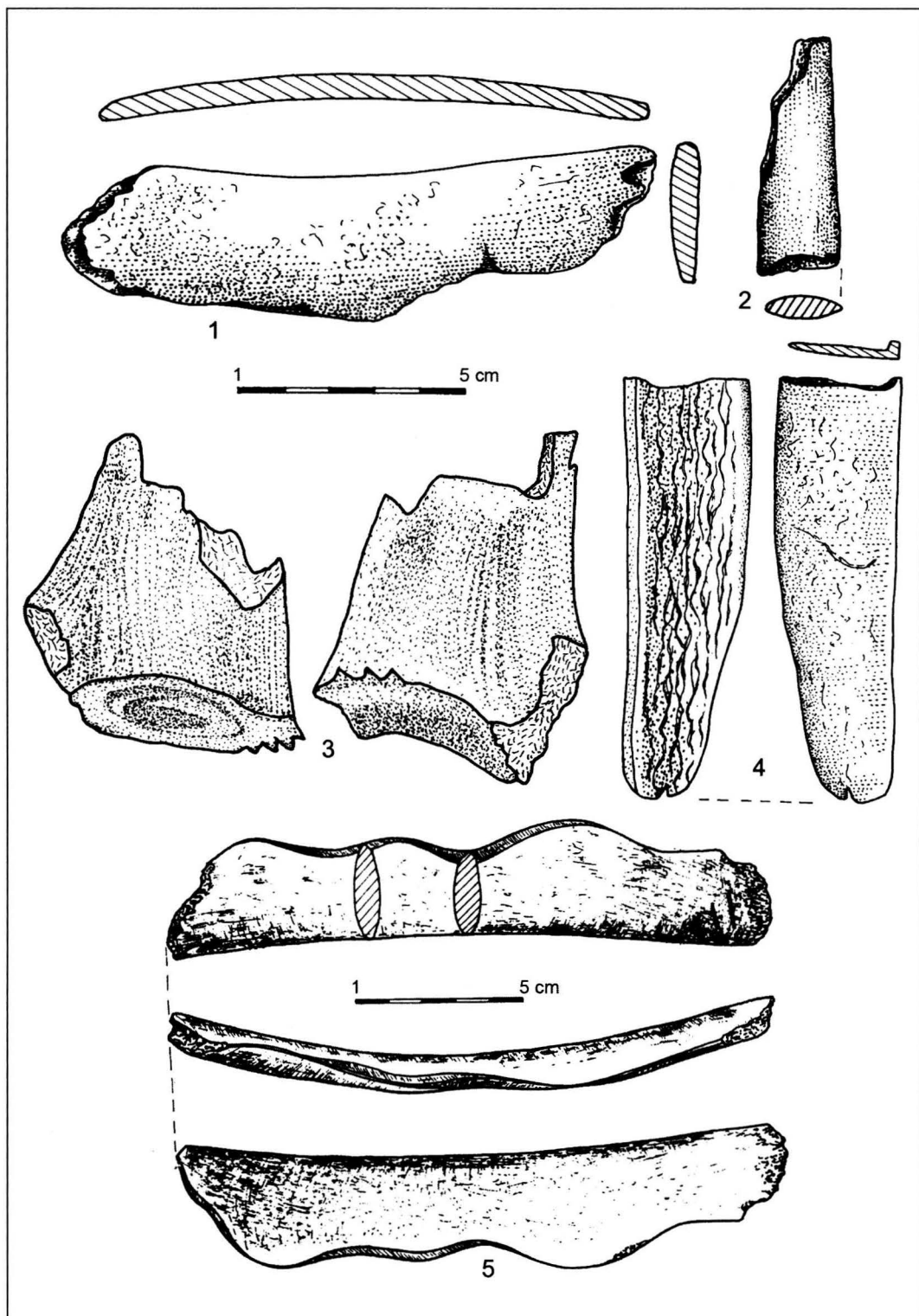
Pl. 11. Small bronze anvil.



Pl. 12. Cluj-Mănăstur, 1 – dragon 2–7 – oxhide representations.

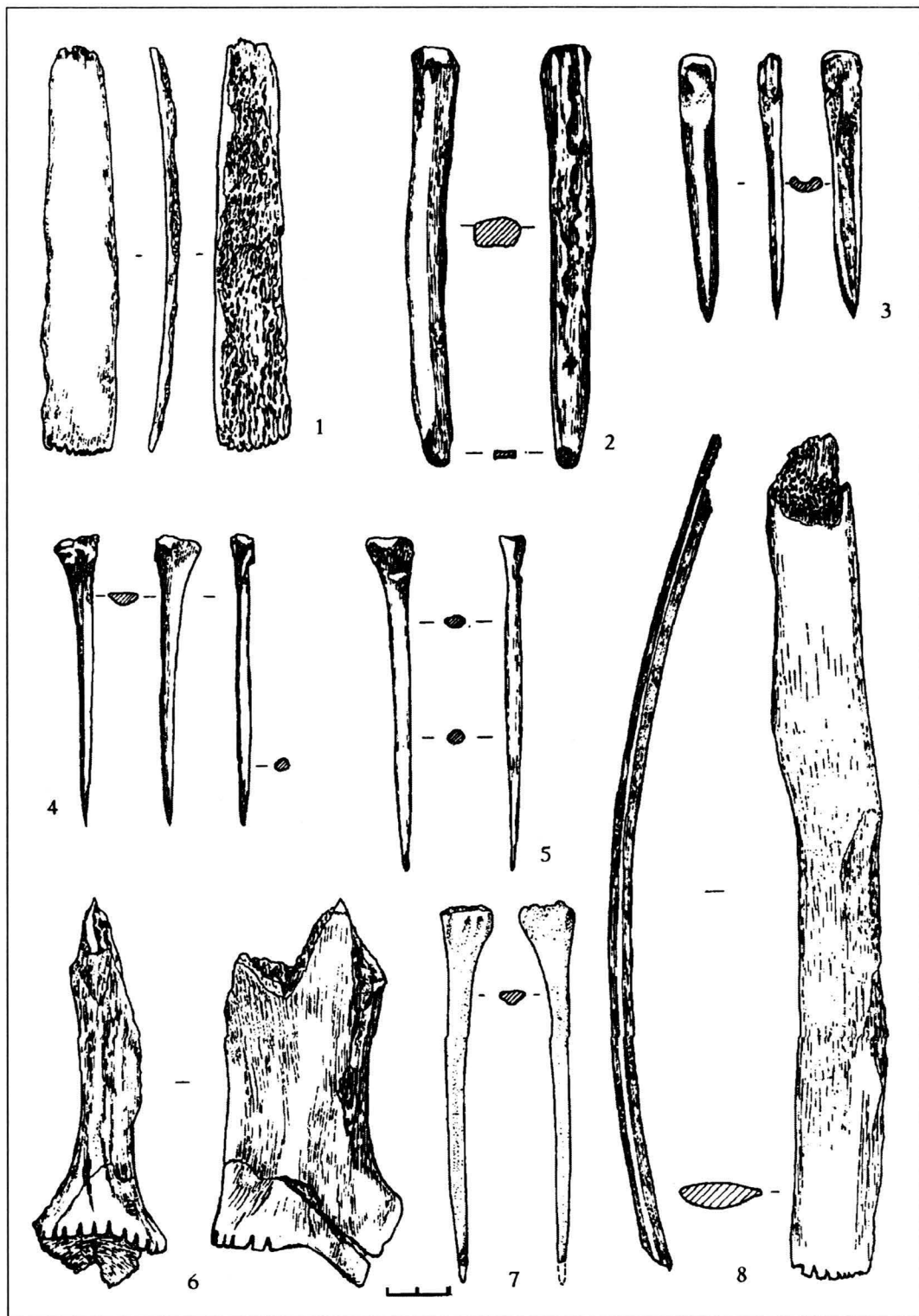


Pl. 13. Gold hair rings, 1 – Morești; 2 – Băgău; 3 – Cluj-Banatului st.; 4-9 – Gold bent from Boarta, Sibiu county.



Pl. 14. Buza-“După Lab”; 1-5 – Bone tools from Gr. Nr. 1. Cluj County.





Pl. 15. Bones tools from Zoltan (after V. Cavruc).



1



2



3



4



5



6

Pl. 16. Socketed axes (Transilvanyan Axes) from Noua founds.