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## The Copper Age

The beginning of the Early Metal Age in the USSR was, as mentioned above, associated with people from three main regions: the southern part of Soviet Central Asia; Transcaucasia; and the southwestern USSR – or, more accurately, the southern half of eastern Europe (fig. 7). Despite certain similarities in the general appearance of the cultural federations in these areas, they differed markedly in many important features, including their technological and metallurgical production. The development of each of the metalworking focuses was also different.

### **Southern Soviet Central Asia: the Namazga I–III culture**

The earliest farming culture in southern Soviet Central Asia was the Djeitun culture, named after the settlement site of Djeitun. It was distinguished by a purely Neolithic economy, without the slightest indication of metal use. The culture is now generally dated to the sixth millennium BC, although there is little to base this on. The Djeitun culture was replaced by one belonging to the Copper Age proper, previously known as the Anau type of culture, but now usually referred to as the Namazga I–III type. Metal artefacts occur sporadically for the first time in Soviet Central Asia, beginning in the earliest levels of this culture – Namazga I and Dashlydzhi-depe. The settlement sites of this culture usually form tells just north of the Koppeh Dagh. The Namazga-depe tell itself is the most striking of these artificial hills, with major constructions dating from the fifth through to the very end of the second millennium BC; at certain periods of its existence this settlement reached impressive dimensions (up to 100 hectares); because of this we consider it as one of the classic sites, both for the Koppeh Dagh and for regions further south.

It is very difficult to establish a strict chronology for the Namazga I–III culture. This is because of the very small and rather contradictory series of radiocarbon datings from it, as well as its peripheral position with regard to the related cultural community in Iran, and to Mesopotamian sites of the same period. Calibrated radiocarbon dates show that, as a whole, this culture can be dated to the period from the fifth to the middle of the second half of the fourth millennium BC. The latest levels (Namazga III) may be compared, in terms of their ceramic and terracotta assemblages, via Tepe Hissar IB and IC (in Iran), with Tepe Sialk III/5–7 (see, for example, Masson 1964: 123–70; 1982: 13–14; Dyson 1965: 225; Yule 1982: fig. 3), and via these, with Uruk XV–IV. The Sialk IV levels are probably contemporaneous with the Jemdet-Nasr period and with Namazga IV and date to the end of the fourth millennium BC, or closer to 3000 BC. The material from these sites provides evidence for the beginning of the EMA over a large

mentioned above, associated with the Neolithic Central Asia; Trans-Caspian in the southern half of eastern Europe. The appearance of the cultural features, including the development of each of the

as the Djeitun culture, which is now generally known as the Djeitun culture. The Djeitun culture is previously known as the Namazga I-III type. Metal in Central Asia, beginning in the late Neolithic, the settlement sites of the Namazga-depe tell us of constructions dating from certain periods of its history (up to 10 hectares); because of the presence of the Namazga-depe and for

I-III culture. This is supported by carbon datings from the Namazga-depe. Carbon dates show that the Namazga-depe belongs to the middle or late Neolithic (Namazga III) may be dated to the Hissar IB and Hissar III (123-70; 1982: 123-70; 1982: 123-70). The Sialk culture is dated to the period and with the Namazga-depe 3000 BC. The Namazga-depe is a Neolithic culture over a large

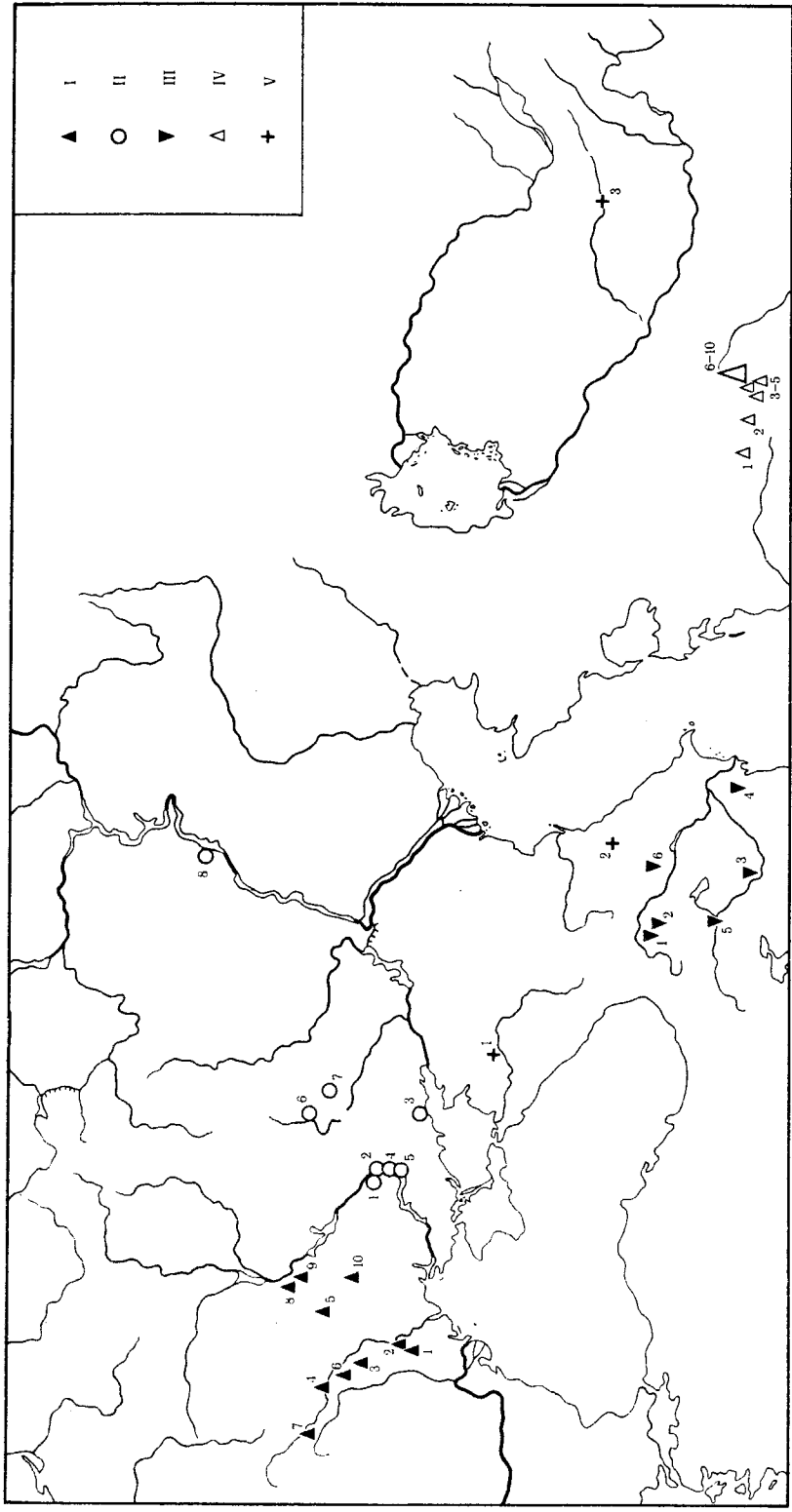


Figure 7 Copper Age sites in the USSR.  
 I Cucuteni-Tripolye A (nos. 1-5) and B (nos. 6-10) settlement sites; (1) Karbuna; (2) Novye Ruseshty; (3) Aleksandrovska I; (4) Luka-Vrublevetskaya; (5) Sabatinovka; (6) Bryzheny III and IX; (7) Gorodnitsa; (8) Tripolye; (9) Veremye; (10) Vladimirovka.  
 II Sites of Mariupol-Chapli-type steppe cultures (1-3) and the Khvalynsk-Sredny Stog community (4-7): (1) Nikolskoe cemetery; (2) Chapli cemetery; (3) Mariupol cemetery; (4) Sredny Stog II settlement; (5) Petrosvistunovo cemetery; (6) Dereivka settlement; (7) Aleksandrovska (Aleksandriya) cemetery; (8) Khvalynsk cemetery.  
 III Settlements of the Shulaveri-Shomutepe (1-4) and later cultures (5-6): (1) Shulaveris-gora; (2) Khramis Didigora; (3) Kül-tepe I near Nakhichevan; (4) Misharchai; (5) Tekhur; (6) Damtsvari-gora.  
 IV Settlements of the Namazga I-III culture: (1) Anau; (2) Kara-depe; (3) Altyn-depe; (4) Mondzhukly-depe; (5) Ilgynly-depe; (6-10) Geoksyur oasis (Geoksyur settlements 1 and 7, Yalangach-depe, and Mulalli-depe).  
 V Stray finds; (1) Ust-Labinskaya; (2) Rugudzha; (3) Sarazm (settlement).

region, extending through Iran, Mesopotamia and southern Soviet Central Asia. The use of calibrated radiocarbon dates may push back the start of the Early Bronze Age to the middle of the fourth millennium BC (Mellaart 1979: fig. 1).

The territory of the Copper Age Anau culture includes the foothills of the Koppeh Dagh, from the Caspian as far as the delta of the river Tedzhen, which disappears into the sands. The main sites can be divided into three geographical groups: western (Anau and other), central (Namazga-depe, Kara-depe, Yassy-depe and others), and the eastern or 'Geoksyur oasis' group in the Tedzhen delta (Geoksyur I, Yalangach-depe and others).

Decorated pottery is the feature that unites these sites into a single type of culture. Painting on vessels is either mono- or polychromatic. This painting changes over time, and from site to site. In the early stages, monochrome painting predominated, in a dark brown colour on a red or greenish-yellow background. In the Namazga I period geometric representations – triangles, rhombuses, chequered designs and so on – were drawn in this colour. In the Namazga II period, vessels with hatched bands of bi-coloured, geometric shapes occur, along with schematic representations of long-horned goats. As well as the dark brown coloured painting, a reddish-brown colour was used, observed in settlements of the central group. At this time pottery decoration in the Tedzhen delta was far more primitive (the Yalangach type of monochrome painting); however, in the next stage of development of this eastern type of decoration, the individual 'Geoksyur style' of vessels with elaborate and elegant ornamentation arose, with complex crosses and zigzags, rhombuses and triangles, graceful figures of goats and fantastic animals painted in black and red. In the west, bi-coloured painting was again replaced by monochrome.

This decorated pottery, so widely represented in layers of Namazga II and II sites was superseded by wheel-made pottery, although some decorated pottery still occurs in Namazga IV deposits. Generally speaking, archaeologists (Masson, Sarianidi and Khlopin) base their conceptions concerning the chronology of these sites, links between cultures, migrations of particular tribes, and so on, on the study of the style of pottery painting. However, painted pottery accounted for only a fifth of the total number of vessels on these tell sites. The vast majority of vessels were crude, comparatively badly worked kitchen pots.

The Anau culture is divided into two main chronological phases. This division is based on changes in the style of architecture (as well as on pottery). In the earlier phase, the rectangular one-room houses with annexes and small courtyards, already known to us from the Djeitun culture, predominate. Archaeologists generally take this as evidence that the Anau culture originated in the preceding Djeitun culture. It is true that, in the Copper Age, mud bricks, measuring roughly 45cm × 20cm × 11cm, began to be used for construction, replacing large clay blocks. These bricks were used to build not only house walls, but also, at several settlements, defensive walls around living complexes. The interiors of houses at this time (as later) were sometimes decorated with painted lines, triangles and rhombuses, and the remains of distinctive hearths or ovens are found in them.

In the later period houses had several rooms, separated from each other by narrow

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passages. Sometimes – as, for example, at Kara-depe – the centre of the settlement was not built over, and can be assumed to have been some kind of social area. Settlements differed greatly in size. One of the tiniest settlements of the Geoksyur oasis, Dashlydzhi-depe, occupied a total area of 1,600m<sup>2</sup> (Namazga I period). The Geoksyur I settlement covered 12 hectares, and Namazga-depe III is believed to have covered the vast area of 100 hectares. The Namazga III period was the climax of the development of the Copper Age cultures of Soviet Central Asia.

The economy of the inhabitants of this zone was based on irrigation agriculture. Although major channels have not been discovered, there must have been small drainage channels running off from the reservoir or stream. Barley and wheat were the principal cultigens, while stock-raising, mainly of cattle, finally took precedence over hunting for onager, small antelope and wild sheep. The predominance of cattle over sheep and goat is rather unusual for Soviet Central Asia, and can be explained by the presence of good pasture near the settlements and also by the better irrigation of the region as a whole.

Similarities between this culture and Iranian cultures such as Tepe Sialk II–III, Tepe Giyan and other more distant ones, in terms of the pottery vessel assemblage and the huge range of terracottas, were a function of the close links between them and the fact that they all had a farming economy. Among the terracottas, the wide range of carefully made female statuettes with (generally speaking) exaggerated sexual characteristics stand out as exceptional. They are usually in a sitting position and often decorated with representations of neck ornaments and coiffures. Male figurines, with attempts to depict an individual portrait likeness, are known from Kara-depe.

Scholars base their reconstructions of the complex ideology of these early agricultural and stock-breeding tribes (which were part of a broad zone of cultures, extending during the sixth to fourth millennium BC from the Balkans to southern Afghanistan) on the forms of plastic art and the decoration on prestige pottery. The Namazga I–III culture was on the extreme northeastern periphery of this zone of cultures, and had a basically similar economic system and world outlook.

The 'Near Eastern' tradition is also evident in the funeral rite. The majority of graves occur within settlements, but archaeologists have also found special 'tholos-type' funeral chambers. These are rectangular or oval in shape, sometimes distinguished by a corbelled vault, containing the remains of as many as eight people (Geoksyur I settlement) buried at different times.

The earliest metalwork in Soviet Central Asia appears in levels belonging to the Namazga I culture. The first metal tools are generally undiagnostic in type and occur as fragments. They increase in number in the Namazga II and III periods. It is then that a range of typologically distinctive artefacts appears. The awls and pins constitute the largest category (fig. 8.16–19). They are tetrahedral (square or rectangular) in section. Their average length is 5–10cm, although the vast majority occur as small fragments. Needles with eyes also belong to this category (fig. 8.17). The eye was formed by bending round one of the ends of a thin copper bar. Chisel-type tools are also sometimes found (fig. 8.15 and 19).

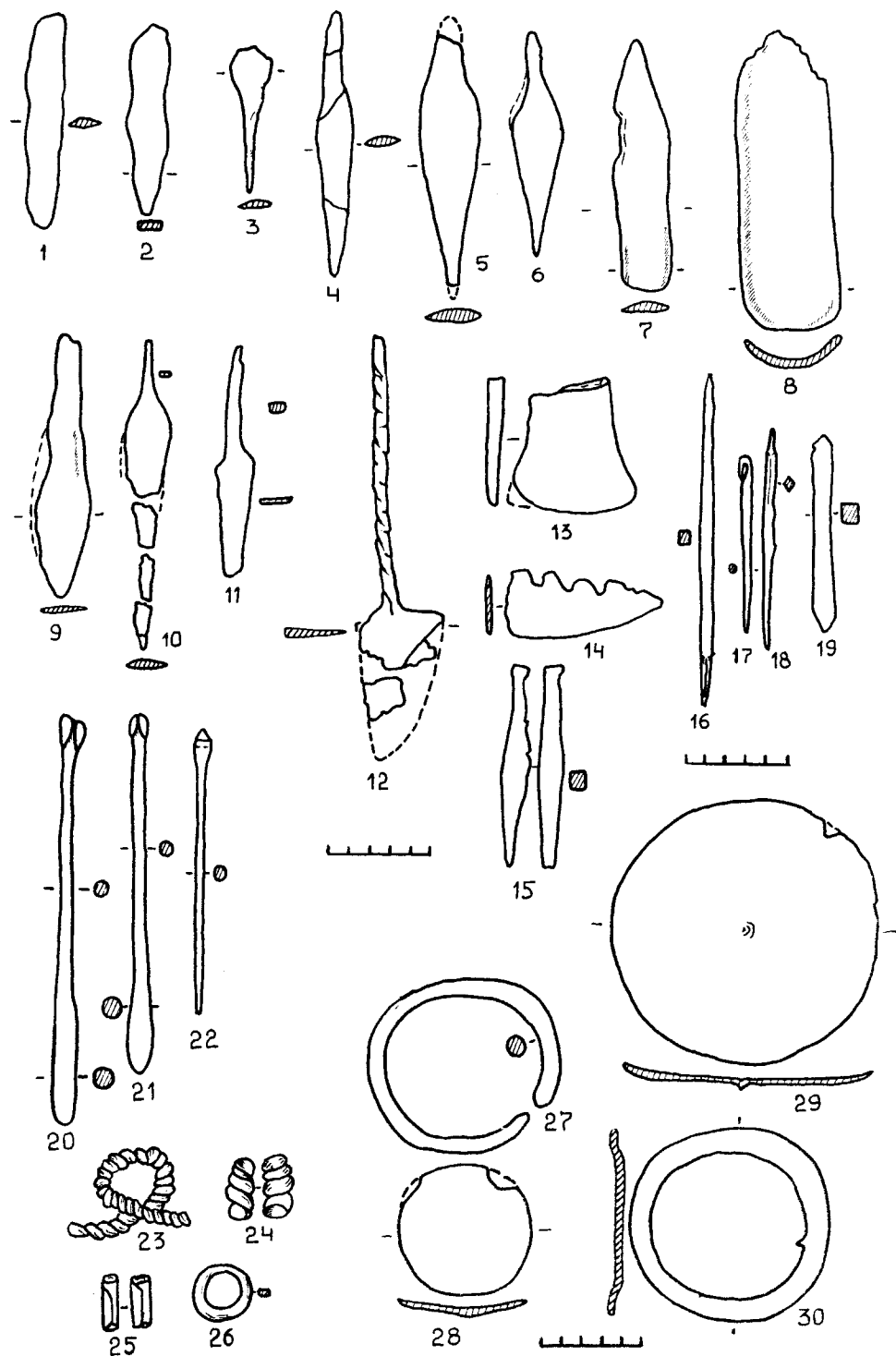


Figure 8 Copper artefacts from sites in southern Soviet Central Asia dating to the Namazga I-III period: (1) Geoksyur IV (settlement); (2) Aina-depe (settlement); (3) Geoksyur VII (settlement); (4, 11, 17, 20-22, 28, 29) Geoksyur I (settlement); (5, 13) Yalangach-depe (settlement); (6, 7) Ilgynly-depe (settlement); (8, 16, 18, 26, 27) Kara-depe (settlement); (9, 23-25) Anau (settlement); (10) Altyn-depe (settlement); (12) Mulalli-depe (settlement); (14) Tilkin-depe (settlement); (15, 30) Serakhscoe (settlement); (19) Mondzhukly-depe (Scales in cm).

Knives, of which there are a few dozen examples, are far more important. Their form is variable: simple flat knives with no tang (fig. 8.1, 2), knives with an indication of a tang (fig. 8.3-7), and knives with a clearly distinguished tang (fig. 8.9-12) all occur. On the whole, the length of the tools varies between 7cm and 15cm. Their morphological classification has not yet been worked out, since the number of tools is small, and the majority of them are broken. The chronological position of particular typological varieties of knife remains correspondingly unclear.

Large copper tools like the flat axe-adzes from Yalangach-depe (fig. 8.13) or tools like the gouge from Kara-depe (fig. 8.8) are very rare in sites of the Namazga I-III type. It seems evident that craftsmen in the early agricultural cultures of Soviet Central Asia did not usually produce large copper chopping tools.

Copper ornaments were a significant element in metalworking production (fig. 8.20-30): pins (up to 20cm long) with biconical heads and thickened ends were the most important of these (fig. 8.20-2). The earliest examples date to the Namazga I period. Their production then became traditional and continued for three to four millennia - up to the Namazga V-VI period.

In addition to pins, a certain number of rings and bracelets (fig. 8.26, 27, 30), flat disc-mirrors (fig. 8.28, 29), and small beads and pendants (fig. 8.23-5) were also manufactured. Their typological classification is also unclear: their forms are varied and the number representing each type is not great.

The technology of these copper artefacts has been studied in detail with the aid of microscopic methods of metallographic analysis (Chernykh 1962; Terekhova 1975). A large number of different categories of tools and ornaments has been studied and the chemical composition of the metal determined spectrographically.

The spectroanalytical work showed that these artefacts were made from copper that had not been deliberately alloyed, but was nevertheless contaminated with a large number of natural admixtures (lead, bismuth, arsenic, antimony, silver and so on) which had passed into the copper while it was being smelted from the original ore. It was also established that the high degree of impurity in many ways determined the methods of metalworking.

The basic methods of working metal were the smithing methods of casting, followed by hot forging. Cold forging was also used. Cast blanks were hammered into shape. Harmful admixtures of lead and bismuth, deposited in the form of massive inclusions along the boundaries of the copper crystals, prevented the craftsman from carrying out the complete hot-forging process. During heating, lead and bismuth, which have a low melting point, could fuse, which led to the hot-shortening of the object. The craftsman was therefore obliged to carry out the forging in a narrow temperature range - not above 200°C. During cold forging the smith annealed the metal to remove intercrystalline faulting, with the aim of restoring lost plasticity to the copper. During this process he could not exceed the melting point of pure lead and bismuth, which threatened to smelt and hot-shorten the artefact. Metallographic research has shown these methods to have been fundamental to the practice of coppersmithing in Namazga I-III type cultures.

The natural admixtures (those entering the copper from the ore) enumerated above provide clear evidence of the use of polymetallic deposits. The chemical composition of

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ores from such deposits was characterized by a sizeable set of admixtures occurring with the copper, of which the main ones were lead, zinc (which evaporated during smelting), bismuth, arsenic and antimony. All attempts to find a copper or polymetallic mineral source with a similar set of admixtures in neighbouring regions have failed. The Koppeh Dagh mountain system is generally very poor in copper deposits and ore outcrops. It is therefore assumed that the metal occurring in Namazga I–III contexts is imported, probably from the mining and metallurgical centres of Iran, where there is definite evidence of metallurgical activity for this period – Shahr-i-Sokhta, Tal-i-Iblis and others (Coldwell and Dougherty 1966; Hauptman 1980). We can thus conclude that the Namazga I–III cultures of the southern regions of Soviet Central Asia were connected with a metalworking, rather than a metallurgical focus. Its activities were quite closely linked with the more developed centres of the Iranian plateau, although the characteristics of these still remain in many respects ill-defined. Typologically similar ornaments are known from various Iranian sites, starting with the earliest, the Sialk I type (Pins with biconical heads: Ghirshman 1938: 16, table II, 49, 54–5), and later the Hissar I type (Schmidt 1933: table XC, A; Yule 1982: 18, fig. 10B).

#### **Transcaucasia: the Shulaveri–Shomutepe culture**

The second area where there were early agricultural cultures in what is now the USSR is Transcaucasia, represented by a striking and rather original culture, named the Shulaveri–Shomutepe culture (after the settlement sites Shulaveris-gora and Shomutepe) in the sixth to fifth millennia BC. Settlements occur in the southern (valley or steppe) regions of Transcaucasia. Sites of the northern variant of the culture, for example the settlements of Shulaveris-gora, Shomu-tepe, Khramis Didigora, are located in the basin of the middle reaches of the river Kura. Further to the southeast and south in the valley of the river Araks, sites of the southern version of the culture, such as the Kyul-tepe I settlement, occur.

The Shulaveri–Shomutepe settlements are the first of tell type to occur in Transcaucasia. The tells of the northern version of the culture are, generally speaking, quite small and do not exceed 7–8m in height. The southern tells, of the Kyul-tepe I type, are much larger, with up to 18m of stratification. The Shulaveri–Shomutepe culture was the first farming community in Transcaucasia, but it is hard to establish whether agriculture or animal-keeping was more important. The balance between these two elements of the economy has not yet been reconstructed. Domesticates included cattle, sheep and goat, and pigs.

In the Shulaveri–Shomutepe culture the buildings (conical, domed houses with annexes) were grouped tightly together. Each distinct complex of units was relatively surrounded by the low wall of a circular courtyard. Clay was the construction material; earlier buildings were made of wattle and daub whilst later construction mainly used mud bricks, with a slightly convex, ‘hunchbacked’ top, laid in single rows joined together with a clayey mortar.

Round dwellings predominated; rectangular constructions sometimes occurred, but these always had rounded corners. The diameter of a round dwelling varied from 2.5m to 5m, and the area from 10m<sup>2</sup> to 25m<sup>2</sup>. Those who have studied the culture believe that

such houses, as a rule, would have been roofed with a dome in which a single opening served as both flue and window (Kiguradze 1976; Dzhaparidze 1976). Traces of the original entrance are also often found in the walls. The dome was sometimes supported by a central wooden column. The remains of a sunken hearth are usually found in the dwelling. The interiors were not notable for luxuries such as painting or furniture.

In everyday life, for work, hunting and war, the population mainly used stone and bone tools. The widespread occurrence of bone tools in this culture has surprised scholars, as large assemblages of bone and horn tools are most often characteristic of northern rather than southern Neolithic cultures. A large number of needles, pins, burnishing tools, spoons and arrowheads were made of bone and horn. Red deer antlers were used for making hoes and hammers. All the bone and horn tools were finished to a high standard.

Even so, stone tools predominate. Large quantities of flat-bladed knives, cutters, scrapers and bushes for bone and wooden sickles were manufactured from flint and fine smoke-coloured obsidian (vulcanogenic deposits of which occur widely in Transcaucasia and Anatolia). There are many pencil-shaped and pyramidal flint cores. Although the technology of working stone and obsidian was of a high standard, polished stone tools – flat axes, hoes and so on – are comparatively rare.

The first pottery in Transcaucasia occurs in the Shulaveri–Shomutepe culture. The quality of the first vessels and the standard of workmanship was not particularly high, and pots had a rather simple shape: oval with large, very thick, flat base. Round-bottomed vessels are also found. The clay paste used for these vessels contained organic admixtures (straw?) and was badly fired. The decorative pattern was also very simple, consisting of rows of lumps beneath the rim. Over time, the quality of the pottery improved. This applies to the firing, the more stable form which the vessels acquired, and to the decorative designs, which became more complicated. The surface of some of the pots was burnished.

The Shulaveri–Shomutepe culture has been divided into five chronological phases (Kiguradze 1976: 151–67). The final phases (the fourth and fifth) are exceptionally important for us in that the materials contain specimens of the first copper artefacts in Transcaucasia (Khramis Didigora, Kyul-tepe I, Tekhut),<sup>1</sup> along with potsherds, painted with red, black and cherry-coloured stripes. It is difficult to overestimate the importance of this pottery, since it presents an opportunity to synchronize the Shulaveri–Shomutepe culture with northern Mesopotamian cultures like Tell Hassuna and Tell Halaf. Moreover, it seems that the final, fifth phase in the development of the Transcaucasian Neolithic – or the Eneolithic proper – can be correlated with the Halaf culture, and the preceding fourth phase can be correlated with the final stages of Hassuna. This is supported by the presence of anthropomorphic images and figurines of bulls. It is usually assumed that the painted pottery is imported, but the possibility of limited local production cannot be excluded.

In any event, the overall appearance of the Shulaveri–Shomutepe culture allows us to include Transcaucasia among the early agricultural communities in western Asia and Asia Minor where the people – for the first time among the cultures of the Old World – set out on the path of productive economy and continued through all the stages of the



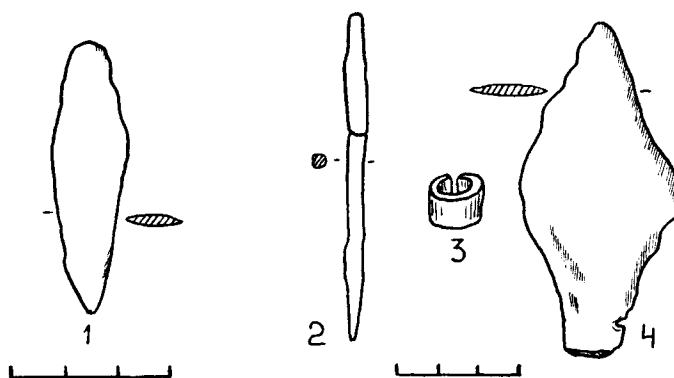


Figure 9 Copper and arsenical copper artefacts from Copper Age settlement sites in Transcaucasia: (1) Tekhut; (2-4) Kyul-tepe, I, near Nakhichevan. (Scales in cm)

'Neolithic revolution'. Admittedly, in more southerly regions (Iraq, Iran and Anatolia) this transition was completed much earlier with the rise of the outstanding cultures of the pre-pottery Neolithic, represented by sites like Jericho, Jarmo, Çayönü Tepesi, Catal Hüyük and others. Unless new discoveries are made in Transcaucasia, we should consider that this stage was completed here later, in the sixth millennium BC. In all probability, Transcaucasia was the northern and relatively backward periphery of the developed Neolithic communities of western Asia and Asia Minor.

The Shulaveri-Shomutepe culture is very important for us in another respect, as the first metal in Transcaucasia appears on its sites. The tools and ornaments are unusually modest, both in their undiagnostic form and in number. Metal is usually associated with the latest phases of the development of the culture (the fourth and fifth). Finds were mainly concentrated on two sites: the Shulaveri-Shomutepe layers of the Kyul-tepe I settlement, near Nakhichevan in the Araks valley, and in the upper levels of the settlement Khramis Didigora on the eastern edge of Georgia. In addition, a metal knife is known from the settlement of Tekhut in Armenia (fig. 9.1), although there is disagreement over whether this settlement belongs to the Shulaveri-Shomutepe culture: many date it to a later time. Nevertheless, it still pre-dates the appearance of the Kuro-Araks culture in Transcaucasia. It is possible that Tekhut should be linked with as yet culturally unattributed pre-Kuro-Araks sites, which archaeologists have recently started to discover in Kakhetia (e.g. the Damtsvari-gora settlement in eastern Georgia). It is possible that these were contemporaneous with 'Ubaid-type sites in northern Mesopotamia.

Metal artefacts from Shulaveri-Shomutepe sites occur in a very limited number of forms. Tools include various awls and fragments of awls (fig. 9.2), and two knives from Kyul-tepe I and Tekhuta (fig. 9.1, 4). Most of the objects are small, bead-like ornaments, rolled from thin copper leaf (fig. 9.3). The total number of metal finds in sites of this type, including the typologically least diagnostic, does not exceed twenty-five. It can hardly be expected that future excavations will increase this figure by very much.

The study of the typological parallels of this very limited assemblage is not fruitful. Only the knives from Kyul-tepe I and Tekhut provide an indication that these forms

were later (at the end of the fourth and during the third millennium BC, in the Early Bronze Age) to occupy one of the central places in the production of Transcaucasian metallurgical centres, already linked with the Kuro-Araks culture. Relatively similar forms of tanged knives occur at sites of the Sialk II-III (Ghirshman 1938: table LII.51; LXXXV. 127, 312, 1735) and Hissar I (Yule 1982: fig. 10b. 6, 7) types.

The vast majority of these artefacts are made of metallurgically 'pure' copper, in which only traces of smelting admixtures can be detected by spectroanalysis. However, some artefacts from Kyul-tepe I contain an admixture of arsenic exceeding 1 percent, which compels us to assume that it was introduced into the copper deliberately, although we cannot prove it. Evidence from the Tekhut knife is less ambiguous: it seems to be made from arsenical bronze with an arsenic content of 4.5-5.0 per cent (as determined by different laboratories). However, as we have already mentioned, Tekhut probably dates to a later period, for which the production of deliberately alloyed arsenical bronze can already be clearly proved on the basis of larger series of analyses.

However, copper artefacts which contain heightened concentrations of arsenic are found on contemporaneous sites in Asia Minor (belonging to the period preceding the Early Bronze Age): Mersin XII-XVI, Alişar, Pular, Beycesultan and others (Esin 1969, analyses nos. 17745, 17710, 17711, 17885, etc.).

The copper ore sources of the Shulaveri-Shomutepe-type sites remain uncertain. It is not impossible that this metal originates from Transcaucasian copper ores, but we are not yet able to prove this.

Nevertheless, metalwork of this type provides evidence of the first steps in Caucasian metallurgy, the main developmental sweep of which belongs to a later period.

#### The southwestern USSR: the Cucuteni-Tripolye culture

The Tripolye culture is one of the most famous archaeological communities in what is now the USSR, and has already been the subject of dozens of monographs. Tripolye-type settlements (many hundreds are now known) have attracted the attention of amateur archaeologists since the end of the last century. Interest in Tripolye-type antiquities was initially fuelled by the striking pottery, with its complex, original shapes and astonishing painting.

The pottery of the early (A) phase of the Tripolye culture was decorated with incised lines forming complex spirals, flowing, wave-like flourishes and various bands winding around the body of the vessel, as well as other designs. It was not just the vessels themselves which were decorated, but also their lids. The later Tripolye B (or developed) phase was characterized by multicoloured pot painting in the form of various red, black or white wavy bands, often on a bright yellow background. The same decorative motifs usually persisted - complex interlacing bands and an ordered alternation of geometric figures (oval, elliptical and circular). Birds, bulls, goats and clothed figures begin to be depicted. The painting is elegant, with a harmony of structure and colour that required the highest skills of decorative art, developed over centuries. This high level of artistic production is also indicated by the thousands of anthropomorphic clay statuettes of sitting, squatting and standing figures, the vast majority of which are female. The sexual characteristics are accentuated, especially on the female statuettes.

Depictions of men are also easily identifiable. Often the main facial features – nose, eyes and so on – are depicted. Painted statuettes are also found from time to time.

The Tripolye culture has been systematically studied and is usually divided into three consecutive chronological phases (Passek 1949; 1961). In the early (A) phase, sites are known from the Southern Bug in the Ukraine to Romanian Moldavia and the eastern Carpathians. In Romania, analogous settlements are termed Cucuteni type, and the whole culture is often called the Cucuteni–Tripolye culture. In the developed Tripolye B period the territory of the culture expanded eastward, as far as the middle reaches of the Dniester, and settlements are known as far west as eastern Transylvania. In the subsequent, third, stage (in fact corresponding with the CII or  $\gamma$ II phase in Passek's system) the Tripolye culture essentially broke up and can no longer be regarded as a single organism. A kind of chain of post-Tripolye cultures arose – the Usatovo, Gorodsk and Sofievka types, amongst others – which inherited only certain of the original features in terms of the production of pottery and clay plastic arts. These cultures are no longer Copper Age but have already entered the cultural system of the Early Bronze Age. For this reason, we will discuss only the Tripolye culture proper (phases A and B) in this section and exclude the latest C phase.

The Tripolye culture is known almost exclusively through its settlements. Only one large cemetery is known, dated to the very end of the Tripolye culture proper and located near the village of Vykhatintsi in Moldavia, where sixty-one burials were excavated (Markevich 1981: 50–3). The graves were usually marked out with stones, and the bodies were placed in a contracted position in a pit, with a rich assemblage of pottery, statuettes, flint tools and, very occasionally, copper artefacts. In early Tripolye settlements (Luka–Vrublevskaya, Soloncheny II), some burials in the classic mode of the early agricultural cultures of Eurasia (under the floor or in the foundations of buildings) are also known.

People of the Tripolye culture generally lived in rammed earth houses; sunken-floored or semi-subterranean structures also occur, but mainly in the earliest stage of the culture (phase AI). Later the one-, two- or three-roomed *pisé* house, rectangular in plan, became almost the only type of dwelling. The house was covered by a pitched roof, wooden rafters and straw or reed thatch. Inside, there were rectangular ovens, clay tables and sacrificial alters. The area of the dwelling varied considerably (between around 50m<sup>2</sup> and 160m<sup>2</sup>). It is now suggested that two-storey dwellings were constructed (Markevich 1981: 81–8).

Tripolye settlements varied considerably in size. The largest settlements occupied 50–70 hectares and consisted of around 200 houses (Vladimirovka, Varvarovka VIII, Starye Badrazhi, etc.). Settlements were situated on river banks, near ravines, and on high plateaus – mainly where there was fertile soil and good pasture.

The Tripolye culture had a mixed farming economy, although the hunting of meat animals also played a considerable rôle. The main crops were wheat of various types, barley and millet. Field crops included peas, vines, plums and apricots. The land was worked with hoes made of stone or bone, digging sticks and, possibly, primitive wooden ploughs pulled by oxen. The remains of this kind of plough have been found at the early Tripolye settlement of Novye Ruseshty, and at the Tripolye layers of the

settlement of Floreshty (Florești), clay figurines of two bulls in harness have been discovered.

Cattle predominated in the domestic herd; sheep, goat and pigs were less significant. A special, although not completely clear position was occupied by the horse. According to osteologists such as V. I. Tsalkin, the horse had already been domesticated and had been adopted by the Tripolye people from the neighbouring peoples of the east European steppe. Certain scholars (e.g. G. F. Korobkova) think that animal husbandry was of paramount importance in the Tripolye economy, although hunting still had a very important rôle in the early Tripolye phase. There were more wild animals than domestic animals in the settlements of Bernovo-Luka, Lenkovtsy and Luka-Vrublevetskaya. The animals hunted included deer, aurochs and wild boar.

The stone (flint) tool industry was also of a very high standard: long, bi-faced knives, scrapers and so on occur in very large numbers. This is surprising since copper artefacts occur far more often here than in Transcaucasia or even Turkmenia.

Over the past twenty-five years, research has shown copper artefacts to have been among the most characteristic and important elements of the Tripolye culture. This became particularly obvious after the discovery of the famous hoard at the village of Karbuna in Moldavia (Sergeev 1963) that consisted of hundreds of large copper beads, dozens of large, flat, anthropomorphic appliquéés, and two axes (fig. 10). The hoard in many ways upset previous conceptions about this culture. Subsequent excavations carried out in the 1960s by V. I. Markevich at the settlement of Novye Ruseshty, which belongs to early and the beginning of middle Tripolye (phases A and BI), recovered material confirming that the Karbuna hoard, with its rich assemblage of copper artefacts, was no aberration.

Among the metalwork currently known, dating to the initial phase of the culture, there is, generally speaking, a marked predominance of ornaments over other types of artefact: the beads (mentioned above); appliquéés (probably originally sewn onto clothing: figs. 10. 1-6, 8, 9, 11-31, 37-9; and 11.7); furred bands of sheet copper and bracelets including the particularly typical tightly wound spiral rings (fig. 10.6, 7, 35, 36). There are many tools. From a typological point of view, the most important are the shaft-hole axe-hammer (fig. 10.10) and adze-chisel (fig. 10.32) from Karbuna. Other, less important, tools from the initial phase of the Tripolye culture include awls (fig. 11.5), punches (fig. 11.1) and fish hooks (fig. 11.2-4), found mainly in settlement layers at Novye Ruseshty. The number of metal artefacts from Cucuteni-Tripolye A and B sites greatly exceeds that known from other ancient metal-using cultures in the USSR, such as settlements of Anau-Namazga I-III type in southern Soviet Central Asia or the Transcaucasian Shulaveri-Shomutepe-type cultures. Comşa rightly attributes many of the chance finds of axe-adzes, axe-hammers and adze-chisels from eastern Romania to Cucuteni A, A/B and B (Comşa 1980: 214-16 and figs. 7-9). More than 500 copper artefacts were known from the Cucuteni-Tripolye areas as a whole when they were catalogued by Greeves (Greeves 1975). The presence of such large amounts of copper provides clear evidence that the Tripolye metalworking centres were part of the larger system of the Carpatho-Balkan Eneolithic Metallurgical Province (see below).

The phenomenally high level of development in mining and metallurgical production

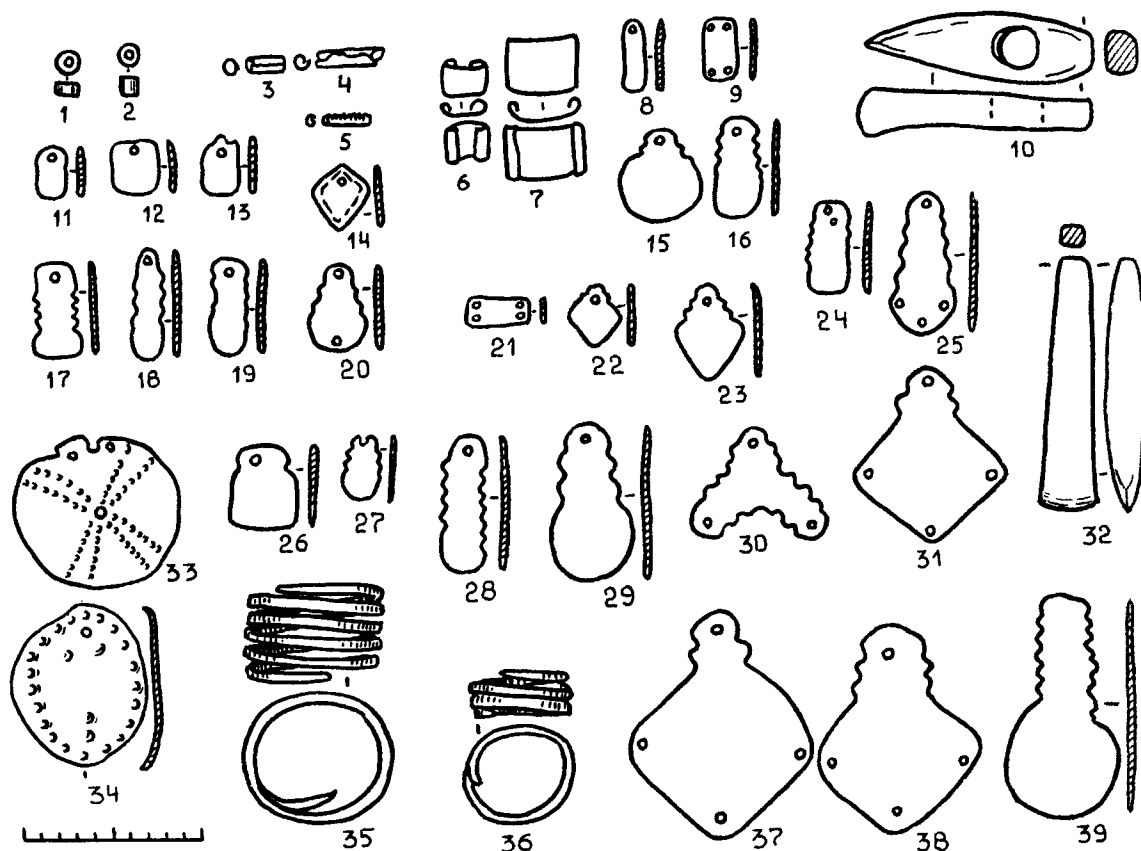


Figure 10 Copper tools and ornaments from the Karbuna hoard, Moldavia. (Scale in cm)

within this system has, in recent years, been the subject of great debate in the archaeological literature (Chernykh 1974 and 1978a: 263-5; Renfrew 1978; Todorova 1979: 41-9, 99 and map 8; Vulpe 1976; Kuna 1981: 44-52; Plesl and Pleslova-Stikova 1982; etc.). The discovery and investigation of ancient mines such as Ai Bunar and others in southern Bulgaria (Chernykh 1978b) and Rudna Glava in Serbia (Jovanović 1971; 1978; 1982) has completely overturned previous conceptions about the nature of ancient mining in southeast Europe.

Radiocarbon dating methods have significantly pushed back the dates of the earliest metal-production cultures in this region (Neustupný 1968), revealing the autonomous nature of the Copper Age in the Carpatho-Balkans (Renfrew 1970). Further, spectrographic analyses of Carpatho-Balkan Eneolithic metal artefacts have made it possible to associate particular groups with known mines (e.g. Ai Bunar) and to identify exchange networks extending over hundreds or even thousands of kilometres. Specialized metallographic investigation of large numbers of tools and ornaments from Bulgaria (Ryndina and Orlovskaya 1978; Todorova, Ryndina and Chernykh 1977) has clearly demonstrated the high level of metalworking technology in the province's major centres, with a wide variety of standardized tool types being cast in two-, three- and

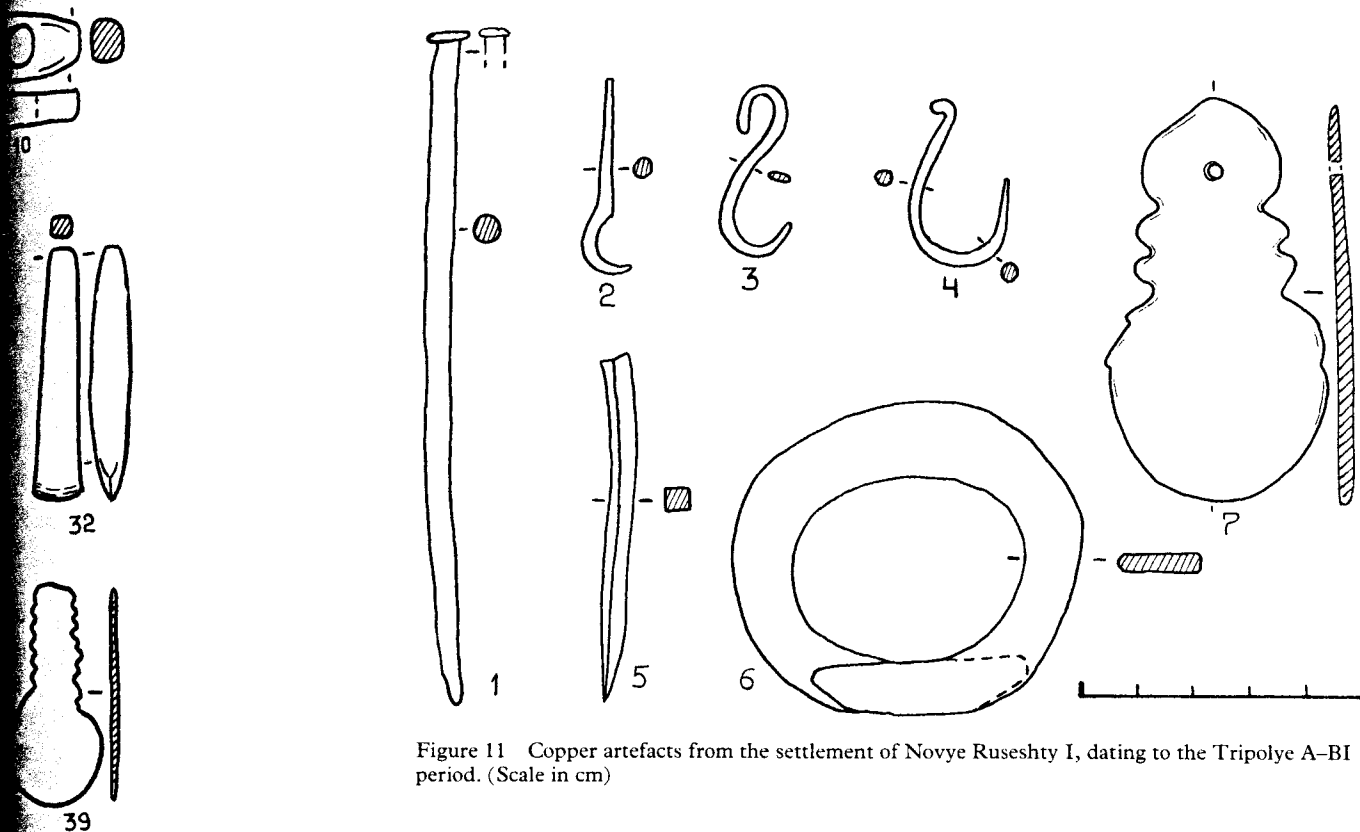


Figure 11 Copper artefacts from the settlement of Novye Ruseshty I, dating to the Tripolye A-BI period. (Scale in cm)

(probably) four-part moulds. Finally, the discovery of the Varna cemetery, with its inhumation and 'cenotaph' graves full of gold ornaments (Ivanov 1978), has revealed new and previously unsuspected aspects of gold exploitation in the Carpatho-Balkan province.

The typological, spectroanalytical and metallographic data lead us to conclude with some confidence that the Tripolye culture was itself a metalworking focus. At present there is no firm evidence that any of the scattered, minor, local ore sources of the Western Ukraine were exploited, although attempts have been made to demonstrate this. Rather, all the spectroanalytical data indicate that early Tripolye copper is chemically remarkably similar to or identical with copper from more westerly regions – Transylvania and, especially, the northern Balkans. All the analyses of tools and ornaments from the Tripolye metalworking focus show that the artefacts were made from a metallurgically 'pure' copper (i.e. without deliberate alloying and containing only those impurities already naturally present in the original ore: Chernykh 1966a: 53–8, pl. VI. vi). Quite a number of tools were hammered from copper in which significant levels of particular impurities – lead, bismuth, arsenic, etc. – can be identified. The majority of these objects are from the Karbuna hoard. On the basis of detailed investigation of early metal artefacts in Bulgaria and research into the chemical composition of copper ore sources exploited in the fifth and early fourth millennium BC, it has become clear that metalwork found in Tripolye contexts in Moldavia and the

