BLACKSMITHS, WARRIORS, AND TOURNAMENTS OF VALUE: DATING AND INTERPRETING EARLY MEDIEVAL HOARDS OF IRON IMPLEMENTS IN EASTERN EUROPE

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The idea of hoard is commonly associated with a large mass of gold or silver coins. Plotted on maps, hoards are used to trace movements of armies or peoples, as well as to identify areas of unrest and regions of wealth. This is particularly true for archaeological studies, in which the association of hoarding with impending disaster appears to be irresistible. A hoard is often viewed as a mute testimony of a misfortune, calamity or tragedy. A picture is likely to emerge of a terrified man who buries a pot or jug filled with his whole life's savings in cash next to a bloody battlefield.

It seems much more difficult to view a bundle of rusted tools and weapons as hoarded wealth. Agricultural implements found in such archaeological contexts illustrate textbooks on medieval technology[1], but little, if any, attention was paid to their hoarding and burial. Unlike late Bronze Age, Iron Age, or Roman hoards, in which large amounts of metalwork were buried and never recovered, early medieval ones still await their researcher. One possible reason for this neglect may be that archaeologists dealing with this kind of archaeological record were not too consistent in using the concept of "hoard". The current distinction is that between deposits of artifacts that *could* have been recovered and those which would have been difficult or impossible to retrieve, in other words between dry land and water finds[2]. The underlying assumption here is that "secular" deposits occur in locations from which they could be recovered, but votive finds would be impossible to retrieve from water[3]. Other authors, particularly in former Czechoslovakia and in Romania, argued that groups

[1] For the significance of hoards for the dating of early medieval agricultural implements, see Henning 1987: 42. See also Comșa 1980: 171 and Olteanu 1974: 45.

[2] Bradley 1990: 5–6 observes that the *Nibelungenlied* is a cautionary for tale this interpretation, for it is clear that Hagen sank the treasure in the Rhine with the express intention of recovering it later.

[3] For eighth- and ninth-century hoards of iron implements as votive deposits, see Beranová 1984: 16. See Bartošková 1986: 125, who believes agricultural implements to be an indication of votive deposition.

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of intact tools and weapons may be regarded as property of either extended families or village communities[4]. A variant of this interpretation is that identifying owners of hoards with craftsmen, especially where smith's tools are present[5].

The locations in which hoards of iron implements were found have rarely been recorded in much detail and all too often archaeologists have been concerned with hoards' content rather than with their context. It may be useful, therefore, to start with a definition[6]. Despite this variety of interpretations, a hoard is commonly viewed as a specific kind of archaeological record, consisting of a sufficiently large number of items (usually, more than two), for which it could safely be assumed that they have been deposited together at the same time, in an archaeologically well defined context, which is *neither house nor burial*. Unfortunately, very rarely is this context recorded or known, for many hoards of iron implements are in fact stray finds. A remarkable exception is the hoard found in the early medieval hillfort at Bitica (Ukraine). The hoard was deposited in a pit, close to a sunken-floored feature[7]. The pit was only 0.5 m deep and implements were found arranged in a specific order: to the east, eight sickles and two scythes; to the west, an axe and a plowshare, together with a millstone; between them, a group of tools including a scraping tool, a plane, and a knife. Thus, this carefully recorded context suggests a distinction between "hoard" as a valuable accumulation of goods and "deposition" as an act of deliberate abandonment in a place that would make the retrieval impossible. From the evidence that we have, there is, however, no indication of any kind of association between hoards of iron implements and water. No "wet" finds are known from the early Middle Ages, though some find spots were located close to a river or to a swampy area[8]. The deliberate character of the deposition, on the other hand, is shown by the intentional wrapping in a textile bag of all or only some of the constituent items. Sickles and other implements found in Bitica still had traces of textile on them, and a fragment of an unknown tool was stuck to a mattock found in the Curcani hoard[9].

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[4] For former Czechoslovakia, see Bartošková 1986: 125. For Romania, see Olteanu 1974: 53–54; Teodor 1981: 46; Teodor 1983: 123; Olteanu 1983: 64–65.

[5] Comșa and Constantinescu 1969: 434; Nania 1969: 127; Bartošková 1986: 125. *Contra*: Olteanu 1974: 52; Olteanu 1983: 62–63.

[6] Richard Bradley's recent essay on prehistoric hoards and votive deposits (Bradley 1990), though emphasizing the close interrelationship between the composition of hoards and their setting in the cultural landscape of the time, fails to give an operational definition of such basic terms as "hoard" and "deposit".

[7] Sukhobokov, Voznesenskaia, and Priimak 1989: 92–94 and fig. 1.

[8] For Curcani, see Comșa and Deculescu 1972. A large hoard of axe-shaped bars was found in 1979 in Cracow (Poland), close to the Vistula River's bank, far from the early medieval settlement on the Wawel hill (Zaitz 1988: 262).

[9] Sukhobokov, Voznesenskaia, and Priimak 1989: 96; Comșa and Deculescu 1972: 472. For Dragosloveni, see Comșa and Constantinescu 1969: 426. The iron bucket found in the Morávský Ján hoard was presumably used as a container for the other items; see Bartošková 1986: 33.

The traditional approach to hoards is to treat them as a series of closed associations, essential for the construction of artifact chronologies. When it comes to the interpretation of the deposition, archaeologists tend to follow one of three major directions of thought[10]. In Eastern and Central Europe, in particular, there has been a tendency to investigate the circumstances that led to the deposition of hoards, which necessarily involved writing political history. Needless to say, this interpretation has been influenced by the region's long history of invasions from the outside and by a much more recent history in which political authority and territorial boundaries could change from one generation to the other. Hoards were thus viewed as "savings" stored for reasons of precaution in case of wars or theft[11]. The current opinion about hoards of iron implements found in Moravia is that, since many of them could presumably date from the late ninth and early tenth centuries, they must be connected with the Magyars' raids that caused the collapse of the Moravian state. Many of these hoards were found hidden *under* the earthen ramparts of such hillforts as Stare Zámky, near Brno, or Petrova Louka, near Strachotín, which were destroyed by fire in early tenth century. Some other hillforts, such as Pohansko or Rajhrad, were however built precisely at this time and they also include hoards of iron implements[12].

A more pragmatic approach to the archaeological record tends to explain even deposits that might have appeared enigmatic in common-sense terms, as "utilitarian hoards", possibly related to metalworking[13]. The metal industry itself was at times interpreted as if it were directly comparable to an industry in the contemporary world, with its "merchants", "traders", and "middlemen". The presence of axe-shaped bars in certain Moravian hoards is thus viewed as indicative of merchant's or craftsman's hoards. Found either singly or in hoards, these bars are interpreted as currency bars, used in premonetary exchange networks[14]. But such tokens are unknown to other areas, such as Bulgaria, where

[10] Bradley 1990: 15.

[11] Beranová 1984: 16; cf. Henning 1989: 88. See Pleterski 1987: 290, who cites the Annals of Fulda narrating the expedition of Charles, Louis the German's son, to Moravia in 869, as the Franks found *abscondita quaeque in silvis vel defossa in agris*. See also Bartošková 1986: 125, who believes that the significant increase in number of mid-ninth-century hoards indicates the political and military confrontations that opposed Great Moravia to its neighbors.

[12] Nekuda 1991: 128–129 and 132 believes this to be an archaeological confirmation of Gardizi's reference to hillforts erected by Slavs against Magyars. The presence of hoards of iron implements in later hillforts, such as Rajhrad or Pohansko, is viewed, on the other hand, as an indication that these were centers of agricultural production, probably *Herrenhöfe* similar to Carolingian *curtes*, mentioned by contemporary Western sources (Stana 1985: 176). Hoards of iron implements found in Romania are believed to be an indication of Pecheneg raids; see Comșa and Constantinescu 1969: 434; Teodor 1985: 65.

[13] Bradley 1990: 16–17.

[14] Pleiner 1989; Tirpaková, Bialeková, and Vlkolinská 1989: 443. See also Zaki 1961. The notion of "currency bars" was first introduced by Reginald A. Smith in 1905, with reference to late Iron Age deposits of plowshares found in England (Novotný 1969: 200). Cf. Gaitzsch 1984:

hoards of iron implements have been found in significant numbers[15]. Metallographic analyses of various items found in Moravian hoards have shown that these were collections of implements of various origins. Three of the five axes found in the Žitavská Tôn hoard, for instance, were manufactured by using three different procedures, probably in three different places[16]. The distribution of hoards in relation to iron ores in Eastern Europe suggests, on the other hand, that there is no consistent connection between the hoarding phenomenon and the availability of local resources (Fig. 2)[17]. However, this does not mean that "utilitarian hoards" did not exist. A collection of iron implements, including such items as a bucket handle, a scraping tool, a billknife, and a sickle, was found in an eighth-century smithy uncovered not far from the early medieval hillfort at Kurortnoe (Kordon Oba), in Crimea[18]. Though the content of this deposit is quite similar to that of contemporary hoards, the difference here lies in the archaeological context. The smith's "hoard" from Kurortnoe was found *within* the habitation unit, whereas our definition requires a careful separation from any habitation structures or burial graves. Moreover, the association between agricultural implements, smith's tools, horse equipment, and weapons makes it hard to accept any purely utilitarian explanation of contemporary hoards[19].

Until recently, any interpretation that relied too heavily on ideas of "ritual" activity was regarded with great suspicion. Novotny's singular attempt to interpret the deposition of hoards in both Moravia and Scandinavia in connection with agrarian cults did not find any echo in more recent studies[20]. But Novotny was among the first to notice that, at least for some of the Moravian hoards, there is a clear indication of a votive deposition. Such is the case of the hoard found in 1961 under the apse of the church no. 8 of Mikulčice[21]. A similar interpretation may be applied to contemporary deposits of weapons and horse

384, who cites ethnographic evidence from twentieth-century Germany for hoarding of iron implements in Roman times.

[15] Cf. Nedelchev 1968: 141, who notices that the first currencies used in medieval Bulgaria were local imitations of emperor Michael III's golden issues.

[16] Pleiner 1967: 96–97 asserts that Moravian hoards of iron implements were "aller Wahrscheinlichkeit nicht unfertige Vorräte eines Schmiedes".

[17] Pleiner 1967: 103 argues that "kein Burgwall, keine Stadt und wahrscheinlich keine Schmiede war an ein bestimmtes Erzrevier gebunden".

[18] Baranov 1990: 80–83 and fig. 26 and 27.

[19] Cf. Henning 1989: 95, who believes the association of agricultural implements with weapons to be symbolical, just as the presence of sickles in contemporary burials.

[20] Novotný 1969: 205 correctly observes that deposits of axe-shaped bars were found in regions with intensive agriculture but no clear indications of industrial activity. For "ritual hoards", see also Beranová 1984: 16; Bartošková 1986: 125.

[21] Novotný 1969: 205. See, more recently, Kučerovská 1989: 23–24 and 28, who cites two other hoards of axe-shaped bars from Mikulčice, one found under the apse of church no. 2, the other close to the apse of church no. 5.

equipment in special ritual pits located close to cremation burials, a practice attested in a few cemeteries of the Saltovo-Mayaki culture in southern Ukraine[22].

What all current interpretations seem to overlook, in my opinion, is that we are dealing, in fact, with two independent though related problems. One is the deposition, an act that might have had a wide variety of meanings, from ritual to precaution in case of wars or theft. The other, less studied, aspect is the accumulation, the hoarding phenomenon, which antedates deposition and, therefore, cannot be explained in its terms. It has only recently been noted that, unlike Roman and early medieval hoards in Western Europe, those found in Eastern Europe include not only tools but also weapons and horse equipment[23]. How could this peculiar association of agricultural implements, weapons, and horse equipment be explained? Is there any pattern behind the mere accumulation of items that could shed some light on the hoarding behavior responsible for this phenomenon?

The catalogue attached to this paper includes 92 hoards satisfying the conditions set by our definition. They were found over a vast area, covering the present-day territories of 12 states, from Belarus to Bulgaria, from Bohemia to Macedonia, and from Romania to Croatia (Fig. 1). This distribution raises two important questions. Can we assume any degree of contemporaneity for all these hoards? And if so, what is the historical relevance of this contemporaneity?

This paper will attempt to answer these questions through an analysis of the archaeological evidence. I will first take into consideration the problem of chronology, and attempt, wherever possible, to date artifact types that could be further used for dating the entire assemblage of the hoard. In doing so, I will also emphasize the distribution and use of these artifacts in contexts similar to hoards, which could shed some light on the significance of the accumulation of iron implements. I will then focus on the meaning possibly attached to these collections. By means of various statistical analyses, I will bring into attention the symbolic value of various tools and weapons in relation to their occurrence in contemporary mortuary assemblages. My intention is to find the reason why iron was chosen as an important means for expressing social status and wealth. I will eventually attempt to explain the hoarding phenomenon in relation to conspicuous consumption (potlatch), as a form of competition for prestige between individuals possessing or claiming a status commonly associated with the traditions of the steppe. I will argue that hoards of iron implements may signalize not only simple political turmoil and constant warfare, such as those following the demise of the Avarian khaganate, but also drastic social and political changes often associated with the rise of royal centers in early medieval Bulgaria and Great Moravia.

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[22] Pletneva 1981: 71–72 provides examples from Novo Pokrovski and Sukhaia Gomol'sha.

[23] Henning 1985: 581; Henning 1989: 88.

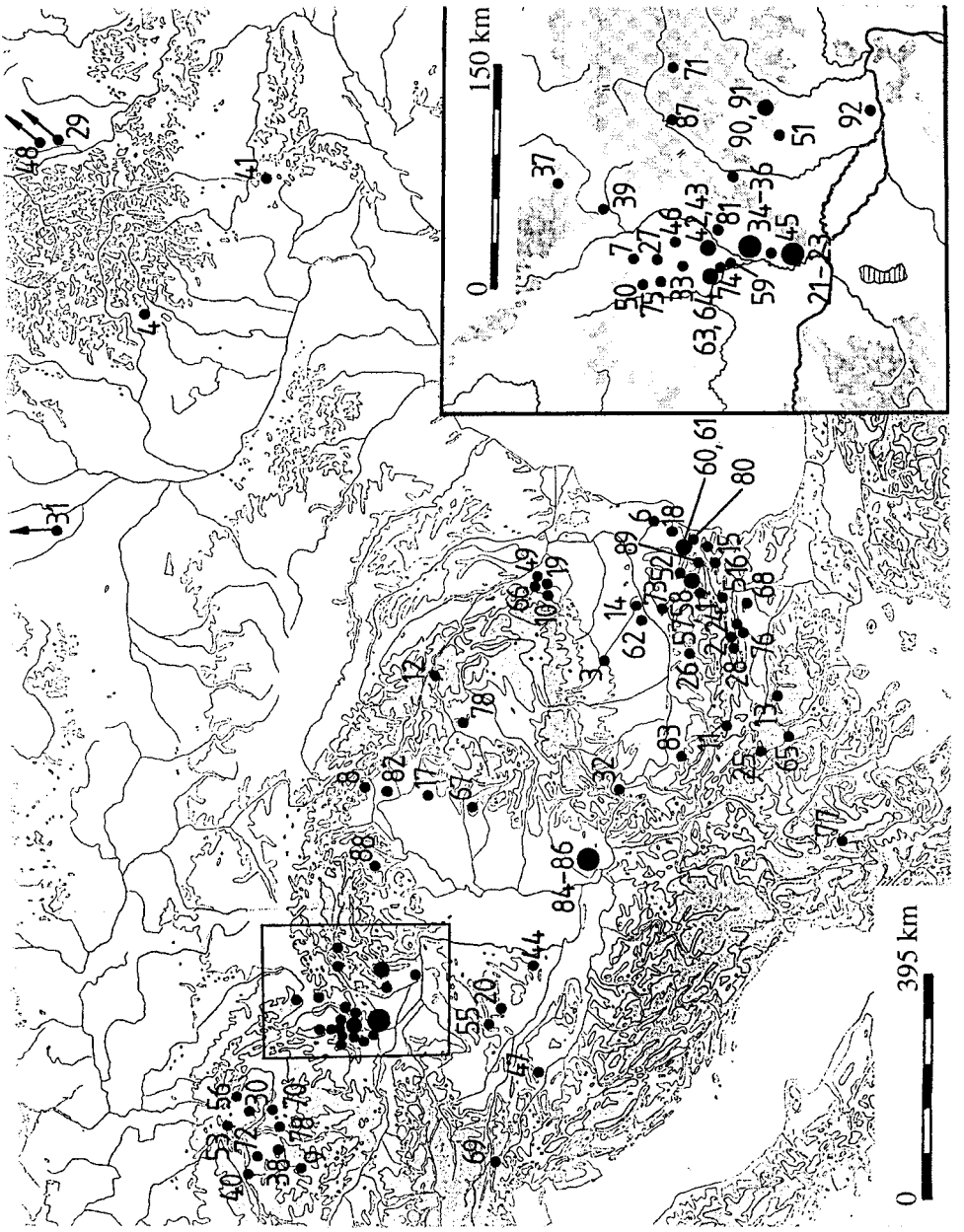

Fig. 1. Distribution of early medieval hoards of iron implements and weapons in Eastern Europe. Numbers refer to the catalogue.

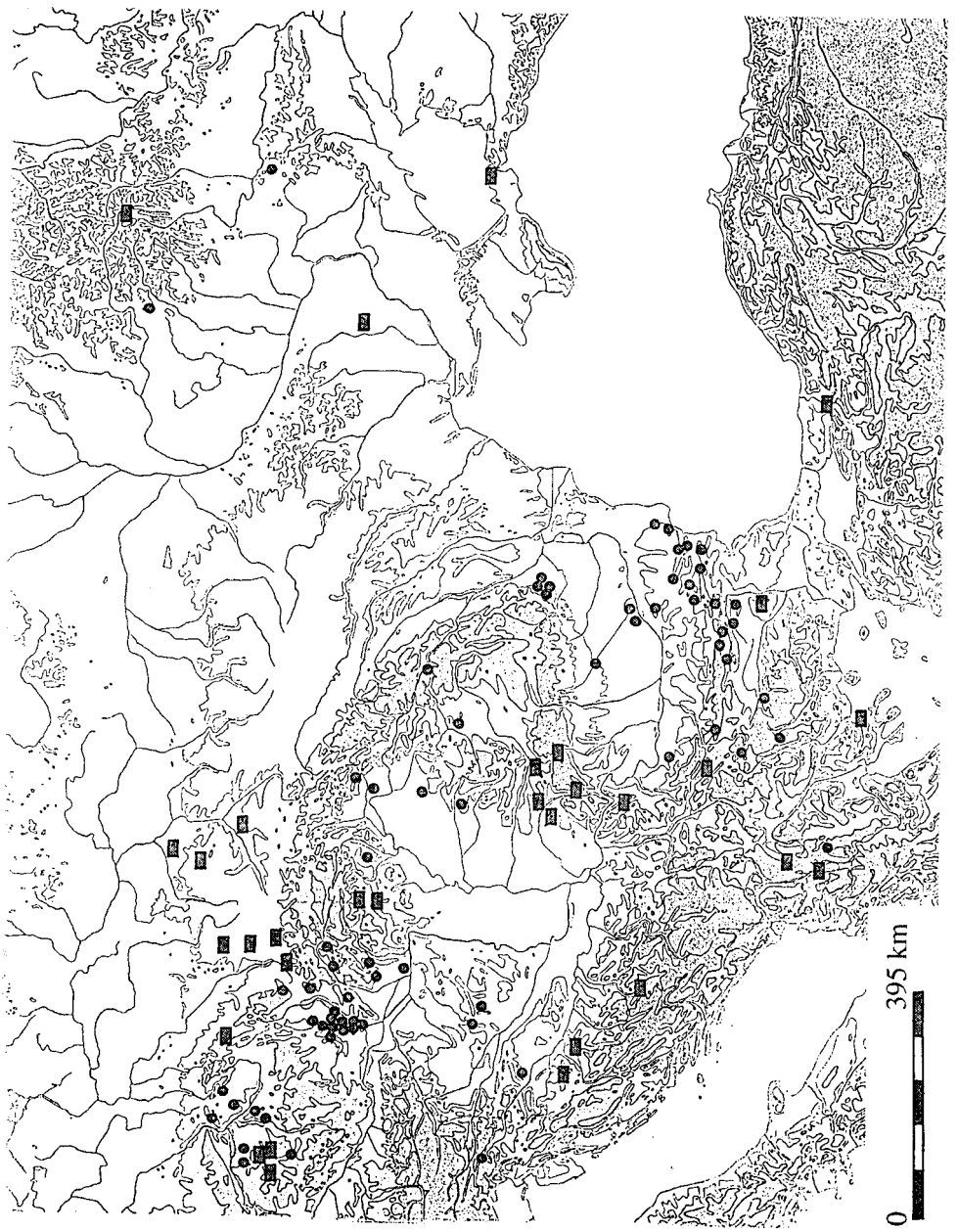

Fig. 2. Distribution of hoards of iron implements (circle) and major iron ore sources (rectangle).

TYPOLOGY AND DATING

Implements included in early medieval hoards could be easily divided into seven major groups: agricultural implements, smith's tools, wood-carving tools, weapons, horse equipment, dress accessories, and miscellaneous artifacts. The largest group is by far that of agricultural implements, dominated by plowshares and sickles. Taking into account the overall area of the former Czechoslovakia, finds of early medieval agricultural implements are the most numerous of all contemporary Europe[24]. The ratio between iron plowshares and coulters found in former Czechoslovakia is about one to four, most finds coming from Moravia and southwestern Slovakia. Most of them were found in hoards; only a few came from settlement or hillfort finds[25]. But plowshares and coulters, together with sickles and scythes, were a tool-kit typically associated with the steppe and forest-steppe belts of Eastern Europe. They are usually interpreted as indications of the mixed economy of semi-nomadic or even settled communities, expanding into fertile regions of loess soils[26]. Because of their special role in this expansion in previously less inhabited areas, plowshares have been intensively studied in recent decades. While Joachim Henning preferred a crude classification into two basic types with corresponding sub-groups, Iurii Krasnov, the author of a sophisticated study based on both archaeological and ethnographic evidence, paid more attention to the size and proportions of each individual specimen[27]. It is very difficult to accurately date various types and there seems to be no progression from "primitive" ard to the more "advanced", heavy wheeled plow. Occasionally, plowshares of Henning's type A1 (Krasnov's types IB2, IB3, IB4, IVB1, IVB3, and IVB4) occur singly in settlement contexts, which could fortunately be well dated. Such is the case of a plowshare found in a sunken-floored house in the settlement at Lazuri (Romania), together with a later variant of earring with a star-shaped pendant, dating from the eighth century[28]. Henning's class A1, the commonest of all, sometimes occurs in large numbers, such as in Dălgopol, Dragosloveni, or Kirzheman. In contrast, other radically different types, such as Henning's classes A5, B1, and B4, may be considered exceptions, whose presence could be explained in terms of either chronological variation, as in the case of the Glufishevo and Gorna Vrabcha hoards, for which a later dating

[24] Beranová 1984: 9.

[25] Beranová 1984: 16; cf. Canache and Curta 1994: 194.

[26] Henning 1989: 95; cf. Pletneva 1981: 74 and fig. 51/50–53, 55, and 57.

[27] Henning 1987: 42–44; Krasnov 1987: 72–123.

[28] Lazin 1981–1982: 137–142 and fig. 1; for the dating of this earring, see Comșa 1971: 383 (class II) and Čilinska 1975: 71 (class IIC). A similar plowshare was found in a sunken-floored house in the eighth-century settlement at Șimonești (Romania); see Székely 1988: 174 and fig. 16/7; cf. Székely 1973: 221. The specimen from Pobedim (Slovakia) was dated to the first third of the ninth century (Bialeková 1981: 42 fig. 30).

(probably the tenth or even eleventh century) may be assumed, or regional isolation, as in the case of the Nizhne Borki hoard.

Plowshares were components of ards with soles, but asymmetrical specimens may indicate swing plows with fixed mould-boards turning the soil to one side. They often occur in hoards together with relatively short, slightly curved coulters (Henning's class E1)[29]. They were set at right angles to the coulter, could cut the earth horizontally at the grass roots, and also turned the slice of turf either to the right or to the left. It has been argued, therefore, that asymmetrical plowshares indicate significant changes in plowing techniques. This is further substantiated by the association of plowshare and coulter with chain loops and iron rings, which were components of the plow beam chain, a device clearly indicating a wheeled plow[30]. Images of such plows equipped with plowshares and coulters were found in the royal palace at Pliska, dated to the eighth and ninth centuries, at least one hundred years earlier than the earliest evidence for the heavy wheeled plow in Western Europe[31].

Plowshares, especially where there are a great number of specimens, often appear together with ard-shares, either socketed or tanged. Both types, though rarely found together, have a common, Central Asian origin. The earliest evidence of ards equipped with socketed or tanged shares comes from China under the Han dynasty[32]. Tanged shares in the form of a spade iron were frequently used during the first millennium A.D. by nomads, as it is clearly indicated by both Chinese and Uygur sources[33]. Their presence in Eastern Europe is usually attributed to the migration of Avars and Bulgarians in the sixth and seventh centuries[34]. Indeed, none of the tanged shares found in settlements in the Lower Danube region (Razgrad, Preslav, Pliska, Shumen, Silistra, Bucov, Capidava, Garvăn) could be dated earlier than the sixth century[35]. Except for the specimen from Morávský Ján, all the other tanged shares found in hoards come from the same region (Obrejița, Dragosloveni, Dălgopol, Pliska, Vršac III), just as single specimens of socketed shares (Chelopech, Zlatar, Curcani, Bârlogu). The asso-

[29] Henning 1987: 63 – the average length is 38 centimeters.

[30] Henning 1987: 64 notices that none of the plow beam chains found in southeastern Europe could be dated earlier than about 400.

[31] Henning 1987: 67.

[32] Pleterski 1987: 275. For a detailed description of the "butting plow" (*sokha*), see Krasnov 1987: 163–196.

[33] Henning 1987: 73 carefully separates spade irons, such as that found in the Morávský Ján hoard, from tanged shares. Tanged shares are still used in certain areas of Afghanistan and Caucasus. The first to claim a Central Asian origin for this type of shares was the Bulgarian ethnographer Hristo Vakarelski (Vakarelski 1929).

[34] Pleterski 1987: 275; Henning 1987: 74.

[35] Henning 1987: 74. A dating determining the ninth century is suggested by the specimen found in the house no. 6 from the settlement at Bucov-Tioca (Romania) together with wheeled pottery with lustered decoration (Comșa 1978: 45 and 48, fig. 30/9; Comșa 1980: 177, fig. 9/6).

ciation between plowshare and ard-share may thus be viewed as a characteristic of Bulgarian and Romanian hoards.

Both plowshares and ard-shares often occur with various hoe types, usually with small ones (Henning's classes K9–11), which were occasionally deposited in contemporary burials[36]. The Macedonian hoard of Strezhevo even includes a drag-hoe with five tines, which may suggest that hoes were sometimes used as an alternative to plow or ard. It is interesting to note, on the other hand, that in hoards of the Lower Danube region, such as Dălgopol, Dragosloveni, or Zlatar, the customary assemblage consists of hoe, plow or ard-share, and billknife, which may be interpreted as evidence for the use of small mattocks in horticulture or in vineyards[37]. In contrast, mattocks found in Moravian or Slovakian hoards were more often associated with sickles and scythes. Indeed, it has been noted that during the eighth and ninth centuries, the mode of harvesting underwent deep changes, small and flat sickles being replaced by well-balanced ones, with handles set apart (Henning's class H2)[38]. Unlike plow or ard components, evidence for sickles also comes from burials, particularly from late Avarian and post-Avarian ones[39]. In the Lower Danube area, sickles occur in both cremation and inhumation burials, more often with male skeletons[40]. But the practice was not restricted to the region of the Danube valley, for it is also attested by eighth- and ninth-century long-barrow burials of the Upper Dnepr area[41].

Short scythes with shortened "half handles" (Henning's class I5) were not used for corn harvesting. Since they were activated by oblique slashes to left and right, a part of the grass above the earth might have remained uncut. Therefore, they must have been better suited for wood clearings, stony soils, and for

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[36] A mattock of Henning's class K10 was found in burial no. 79 from Devínská Nova Ves (Bialeková 1981: 43, fig. 33), another one of class K23 in the ninth-century cemetery of Keszthely, Hungary (Henning 1987: pl. 51/29). For specimens found in Bulgarian settlements (Pliska, Preslav, Odărci, Krivina, Stărmen, Vălchedrăm), see Henning 1987: 83.

[37] Henning 1987: 83 – "...ließen sich die mit der Hacke auszuführenden Tätigkeiten auf solche des leichten Unkrautjätens auf Feld-und Gartenflächen und des Bodenauflockens auf kleinen Flächen beschränken". The evidence of eighth- to ninth-century billknives comes from settlements, but there are also cases of burials marked with billknives (Obrochishte, Bulgaria); see Henning 1987: 96.

[38] Beranová 1984: 15; cf. Henning 1988: 223. New sickles allowed the cutting of larger sheaves just above the earth. See also Henning 1987: 90, who observes that the evidence for his class H4 suggests a later dating, namely, the tenth century at the earliest.

[39] Cf. Henning 1987: 90. No trace of hardening was found on sickles from eighth- and ninth-century burials in Moravia and Slovakia (Pleiner 1967: 87). *Contra*: Longauerová and Kocich 1993: 257, who argue that deliberate heat treatment in order to increase the strength and hardness of the tool working part is evidenced by the presence of tempered mertensite and of other non-equilibrium structures on the edge tip. For sickles in late Avarian burials from Transylvania, see Horedt 1958: 98 and 77, fig. 14/16; Erdelyi 1975: 162, fig. 7.

[40] Fiedler 1992: 215.

[41] Shmidt 1989: 73 (the cemeteries at Zaozer'e and Shugailov, in the Smolensk region).

all spots where grass grew in abundance and had a sufficient height[42]. Scythes only occur in settlements (Krivina, Preslav, Karanovo, Pernik, Bucov), in contexts which may date from the ninth century[43].

Unlike agricultural implements, the evidence for smith's tools is scantier. The most common item is the hammer, only occasionally accompanied by tongs (Vršac, Vršatecké Podhradie). The only hoards including a complete set of smith's tools (hammer, anvil, and tongs) are Bârlogu and Dragosloveni, both found in Romania. The most intriguing features of this distribution are the complete absence of smith's tools in Bulgarian hoards, and the scarce evidence for anvils and tongs from Moravia, though blacksmithing is well attested in both areas[44]. It is difficult to take this evidence further, but it is clear that a greater caution is required when interpreting all early medieval hoards as "utilitarian hoards". Moreover, some hoards with no smith's tools contain iron ingots (Budești, Vršac III). In this case, iron ingots may have not been mere raw material for a smith, but had a different meaning.

In contrast with smith's tools, wood-carving ones are more evenly distributed. The most common implement is the scraping tool (Henning's class P2), sometimes interpreted as a hoe[45]. Ethnographic evidence from Mongolia suggests, however, that this tool was rather used for carving. The earliest specimens, dating from the fourth and fifth centuries, come from southern Siberia, but similar implements frequently occur in sixth- and seventh-century warrior burials from present-day Tuva Autonomous Region[46]. Scraping tools also occur in eighth- and ninth-century burials in the area of the Saltovo-Mayaki culture. Along with certain axe types, they have been recently interpreted as social-status markers for Alanic secondary-rank warriors (*afsad*)[47]. In the Middle Danube region, such tools were also found within warrior graves from the Avarian

[42] Beranová 1984: 25; cf. Henning 1988: 224–225.

[43] Henning 1987: 121–137. For the scythe found in Bucov-Tioca, see Comșa 1978: 18–19, 28 and 48, fig. 30/5. For a later dating of the associated pottery, see Doncheva-Petkova 1990: 79.

[44] For Bulgaria, see Vitlianov 1989–1990. For early medieval tongs in Bulgaria, see Changova 1962: 20 and pl. II/1. For Moravia, see Bialeková 1981. For tongs, anvils, and hammers found in Khazar settlements, see Pletneva 1981: 149, fig. 36/43–44, 59, and 62; Bálint 1989: 50 and 51, fig. 22/4.

[45] Pletneva 1981: 72; cf. Henning 1981: 69.

[46] Kovács 1981: 92 (specimens from the museum in Minusinsk); Mogil'nikov 1981: 26 (sixth- and seventh-century cemetery from Kokel'). More to the west, similar implements come from warrior graves in the Upper Ob' valley, around Tomsk (Kovács 1981: 93), Upper Irtysh valley, at Bobrovsk (Mogil'nikov 1981: 124, fig. 20/39), and southern Ural region, at Briskom (Makhitov 1981: 25 and 116, fig. 13/58). Cf. Henning 1989: 91. The early tenth-century burial from Hajdúböszörmeny (Hungary), in which a similar tool was found together with a "nomadic" sword, contained golden plates, presumably sewn to the shroud, a practice frequently attested in contemporary Ugrian cemeteries from the southern Ural region (Kovács 1981: 101).

[47] Afanas'ev 1993: 141–142. Cf. Kovács 1981: 94.

period[48]. This is further substantiated by the evidence of hoards. Scraping tools occur together with battle-axes (Lety u Dobrichovic, Mikulčice I, Zabokreky II, Vršac II, Mohács, Strezhevo, Chelopech, Curcani), but also with spearheads (Semice, Nartski Novaki, Bitica). They usually accompany other tools, such as chisels, planes or wimbles, which are more difficult to date[49]. Scissors occur only in Moravian hoards (Gajary II and III, Kuty III, Lipník), typically associated with the so-called "Silesian" iron dishes. In contrast, hook-shaped keys occur in both Moravia (Staré Zámky, Rajhrad I, Mikulčice I, Zabokreky II, Kuty II, Morávský Ján) and Bulgaria (Chelopech, Dălgopol, Preslav I), usually accompanied by belt fittings, bucket handles or hoops, axes, and spearheads. An yet sharper contrast is shown by the distribution of millstones and tools for scraping the kneading trough. The former are only known from Moravian hoards (Staré Zámky, Staré Mesto, Mikulčice I), the latter only from Bulgarian ones (Glufishevo, Preslav II). Moravian hoards are also characterized by wooden buckets with iron handles and hoops (Brankovice, Oslavany, Staré Mesto, Staré Zámky, Zabokreky I and II, Gajary II and III), items commonly found in late Avarian or post-Avarian burials[50]. Incidentally, the Morávský Ján and Zabokreky I hoards contain iron buckets, while the hoards from Gorna Vrabcha, Lety u Dobrichovic, and Kostol include bronze vessels. The bronze jug found in Kostol bears an engraved inscription in Greek (*Psalms of David* 3, 29) and is believed to date from the late tenth century[51].

One of the best datable categories of artifacts in hoards is that of belt fittings. Moravian hoards, such as Morávský Ján and Gajary I, include belt straps and plates, which are typically found in burial contexts of the late Avarian period, *ca.* 750–780[52]. The fact that belt fittings entered hoards suggests that their contents were in some way related to social status, for belts were extensively used to mark status in late Avarian burials. In contrast, the lyre-shaped belt buckle from Chelopech points to a later dating. As recently demonstrated,

[48] Kovács 1981: 100.

[49] Similar wimbles were found in the settlements at Bucov-Rotari (Comșa 1978: 61 and 53, fig. 35/1, dated the tenth century), Dridu (Zaharia 1967: 94–95; 127, fig. 53/6, stray find), and Svetinja (Popović and Ivanišević 1988: 160 and 161, fig. 31/4, dated the twelfth century). Almost identical specimens were still used in late nineteenth-century Bulgaria (Ostuni 1986: 149; cf. Changova 1962: 37, fig. 18/5). For the reconstruction of their use, see Pleiner 1967: 88 and 94, fig. 11. For ethnographic parallels to planes, see Ostuni 1986: 136–137.

[50] Horedt 1958: 70. For buckets found in early ninth-century barrows in north-western Transylvania, see Comșa 1959: 71; Horedt 1986: 72. Wooden buckets were also found in some cemeteries of the Lower Danube area, such as Obârșia Nouă (Toropu and Stoica 1972: 171). Cf. Canache and Curta 1994: 188.

[51] Marjanović-Vujović 1988: 157.

[52] Zábojník 1991: 241. The Morávský Ján hoard contains Zábojník's classes 90, 113, 229, and 251, dating from the third phase of the late Avarian period (750–780). Zábojník's class 251 is also represented in the Gajary I hoard, along with three bronze plates of his class 172, dating from the fourth phase of the late Avarian period (780–825).

lyre-shaped belt buckles occur in the Middle Danube area only in connection with the Magyars' migration[53]. The earliest specimens of this belt-buckle type could date from the ninth century, while later variants were still in use as late as the eleventh century[54]. Other less easily datable types, such as D-shaped iron belt buckles found in the Kirzheman, Obrejița, and Pobedim hoards, may have been components of the harness. The Bitica hoard also includes a jingling bell, an artifact commonly associated with late Avarian, post-Avarian and Khazar burials with horse skeletons[55]. The hoard also contains a large number of segmented beads, which became fashionable in Eastern Europe only during the ninth century, but remained popular in both Moravia and Scandinavia until the late tenth century[56]. An yet later dating may be ascribed to two Bulgarian hoards, Chelopech and Glufishevo. Both contain coins issued by emperors John Tzimiskes (969–976) and Alexius III Comnenus (1195–1203), respectively. Even if the presence of late twelfth-century coins raises suspicions as to the accuracy of hoards' recording and publishing, there are still clear indications of a later dating to the tenth century, such as the lyre-shaped belt buckle from the Chelopech hoard.

Certain Moravian hoards (Kuty I, Krumvír, Ivanovice, Gajary II and III) contain slightly concave, so-called "Silesian", iron dishes. Similar artifacts were found in late Roman and early medieval hoards from Western Europe, such as Osterburken or Kornwestheim[57]. They are generally believed to be a sort of standardized token, which might have represented the intermediary stage between iron blooms and final products[58]. Their dating to the late eighth and early ninth centuries is suggested by the late Avarian belt plate found together with a "Silesian" dish in the Krumvír hoard. Though no hoard contains both "Silesian" dishes and axe-shaped bars, they must have belonged to the same chronological phase. There is no indication of a different dating and, moreover, three "Silesian" dishes appear to have been associated with six axe-shaped bars in a habitation structure of the Pohansko hillfort[59]. It seems likely, then, that some of these axe-shaped bars entered hoards at about the same time as the rest of the collection. In any case, the major deposits of axe-shaped bars have a very peculiar distribution. They are concentrated in central Moravia, but also in a limited area in the Upper Vistula basin, within which no indications of metalworking have

[53] Révesz 1987: 268–269.

[54] Harhoiu 1972: 418–420. Cf. Fiedler 1992: 198–199.

[55] Fiedler 1992: 194–195.

[56] Fiedler 1992: 190. Cf. Andrae 1973: 129.

[57] Henning 1985: 589 – "eiserne Tellerplatte eines Backgerätes".

[58] Kolchin 1953: 45, with further examples from the medieval settlement at Vasil'kovsko, near Kiev.

[59] Bartošková 1986: 41; 42, fig. 14 A. Similarly, radiocarbon dating of the wooden structure in which the 4212 specimens of the Cracow hoard were deposited indicates a date between 800 and 880 (Zaitz 1988: 264).

been found[60]. If some of these finds are to be regarded as parts of the goods left behind in destroyed hillforts, large hoards including only axe-shaped bars, usually in bundles, and the deposition of such an artifact in a ninth-century burial of the Devínská Nova Ves cemetery[61] may have a different explanation. A recent study based on factorial analysis of the main attributes of 270 bars has suggested that there was a strong correlation between length and weight, which may further indicate that bars were manufactured as standard units of raw material. They were made in a restricted range of weights, usually equivalent to divisions of the Roman pound, and have therefore been claimed as a type of primitive currency – *Gerätgeld*[62]. The fact that at least two hoards including such axe-shaped bars were found hidden under the floor of two churches of the royal center at Mikulčice might explain why so many specimens were found in hoards without any other kind of artifact.

In some respects, horse equipment and weapons stand apart from the rest of the artifacts. Almost all stirrups found in hoards belong to the so-called "Avarian" type, which was popular in Europe until the tenth century[63]. Such stirrups occur frequently in an area extending from the Middle Danube River, to the west, to southern Ukraine, particularly the Lower Don River area, to northern Caucasus and the middle course of the Volga River, to the east. A more exact dating is possible only for one of the stirrups found in the Sebenje hoard. Its incised decoration points to the so-called Blatnica-Mikulčice archaeological phase (late eighth century to *ca.* 810)[64]. A later dating, presumably to the twelfth or thirteenth century, could be ascribed to the stirrup found in the Vršac II hoard, which belongs to Kirpichnikov's class IX[65]. As Lynn White has observed, stirrups are a clear indication that the dominant warfare mode is mounted shock combat, for they allow both lancer and swordsman to stand and wield their weapons while still controlling the horse[66]. This is further confirmed by the association of stirrups with various types of battle-axe and spearheads. At another level, it is interesting to note that when stirrups occur together with horse-bits (Dragosloveni, Brankovice, Morávský Ján, Sebenje, Gajary II, Mikulčice I,

[60] Zaitz 1988: 275; see also Zaki 1961; Pleiner 1989; Tirpaková, Bialeková and Vlkolinská 1989: 427.

[61] Zaitz 1988: 274.

[62] Bialeková and Tirpaková 1989: 94; the phrase was first used by Pleiner 1989.

[63] Henning 1989: 90; Iotov 1987: 94. Cf. Horedt 1958: 94–95 and 73, fig. 11/2–3; 100–101 and 84, fig. 18/6–7; Winkler, Tákács, and Păiuș 1977: 270–271 and 280, fig. 4/4–5; Ciugudean 1974: 457 and fig. 1/2; Zaharia 1977: 62, 88–89 and 81, fig. 29/10 a–b; Rusu and Dörner 1962: 274 and 277; 276, fig. 4/9; see also Diaconu and Diaconu 1962: 165–166 and fig. 3/1a. For parallels in the area of the Saltovo-Mayaki culture, see Pletneva 1981: 149, fig. 36/17; see also Viznatiova 1981: 85.

[64] Pleterski 1987: 253.

[65] Kirpichnikov 1973: 53.

[66] White 1962: 18. Cf. Henning 1989: 93, who argues that the combination stirrup/horse-bit/battle-axe emerged in the steppe milieu, whereas spurs represent a local, European tradition.

Strezhevo), there were never found more than four specimens of the latter. This corresponds to the equipment of either one or two horses, which may suggest that in such cases hoards were equivalent to burials with horse skeletons. It would be tempting to associate this to the social meaning attached to burials with horses, and thus interpret hoards in the light of the funerary practice[67].

To some extent, this is also confirmed by the deposition of weaponry in hoards. In the late Avarian period, particularly in the second half of the eighth century, there is a substantial increase in the number of warrior burials marked with axes, rather than with any other weapons[68]. For the following period, axes were found in Bohemia primarily with ninth- and tenth-century rich burials, presumably belonging to members of the military retinue[69]. Axes of Bartošková's class II were also restricted to warrior burials in early medieval Croatia[70]. It is important to note that many, if not all, axes found in hoards were typical horsemen weapons. This is true, at least, for the spear-shaped axe for which the only parallels known come from burials in north-western Caucasus, in present-day Karachevo-Cherekskaia autonomous region, where they were found together with artifacts characteristic for Saltovo-Mayaki assemblages[71]. Fan-shaped axes, such as those found in Curcani and Dragosloveni, have parallels in the Ugrian cemetery from Panovo[72]. All these weapons were meant to pierce coats of mail or to smash helmets and could therefore be seen as indicating mounted shock combat, a type of warfare closely associated with steppe traditions[73]. The same is true for spearheads, usually found together with various types of axes, more often with Bartošková's classes II and III. The Nartski Novaki and the Sklabina hoards contain two specimens of long lance, a weapon typically found with late Avarian warrior burials. Even the *Flügellanze* from Sebenje might be easily viewed as a horseman's weapon, just like many other specimens found in ninth-century Pannonia, which are believed to be of a Frankish origin[74].

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[67] In any case, most of the analogies for horse-bits with straight or S-shaped ends found in hoards come from late Avarian and post-Avarian burials (Kirpichnikov 1973: 14; Henning 1989: 90; Pleterski 1987: 251 and 256).

[68] Szentpéteri 1993a: 173 and 194.

[69] Sasse 1982: 310 and 317–318.

[70] Simoni 1982: 257; Milošević 1987: 114 – seventh- to eighth-century graves from Bijelo Brdo, Zagreb-Kruge, Velika Gorica, Nove Ciče, and Medvedička.

[71] Henning 1989: 91. See Canache and Curta 1994: 191. This might be the weapon to which emperor Leo the Wise's *Tactica* (6.25) refers as τζικούρια (Kolias 1988: 169).

[72] Cf. Canache and Curta 1994: 191, who cite another stray find from Romania (Tăvădăreşti). For East-European analogies, see Fodor 1981: 156 and fig. 3/3, 4. Similar axes come from burials of the so-called Koman culture in Albania, such as those found in Kruje and Kalaja Dalmacës. See Milošević 1987: 116–117, who ignores any eastern analogies and believes this type of axe to be of a Byzantine origin.

[73] Fodor 1981: 156; Henning 1989: 91. For the techniques employed in the manufacturing of axes of Bartošková's class IV, see Pleiner 1967: 81.

[74] Pleterski 1987: 248.

The fact that this is no accident is also suggested by the absence of Carolingian swords in hoards, though at that time they were known to high-status burials in both Moravia and Dalmatia[75]. Moreover, where simple swords occur, they are never accompanied by horse equipment (Lipník, Verkhniia Viznica, Glufishevo).

DISTRIBUTION AND SOCIAL MEANING: WHY IRON?

We have traced the origin of certain types of implements or weapons, many of which point to the East. Our brief look at their typology and dating emphasizes their contemporaneity. A seriation of 66 hoards for which there is a detailed description shows, in fact, no clear-cut chronological phasing (Fig. 3). Hoards containing late Avarian belt straps (Gajary I, Krumvír, Morávský Ján) must obviously be dated earlier than those including tenth- or twelfth-century coins. There is not too much compactness on the diagonal, though the output correlation index is relatively close to one (0.825). This may further suggest that either our raw data are too "fuzzy" or both earliest and latest types do not have any effect upon the rest of the collection. Indeed, the Chelopech hoard, which could safely be dated later, probably to the tenth century, contains a bucket handle, two scraping tools (Henning's class P2), a hook-shaped key, and a sickle (Henning's class H2) for which an earlier dating could also be assumed. It seems that, in this case, the often stated "rule" that an ensemble is dated by its "latest" type may be inapplicable. We may presume that the hoarding of collections including "later" types, such as Chelopech or Glufishevo, started much earlier. Implements that are extremely common in excavated ensembles (such as sickles, for instance) may have been produced over a long period of time, in more or less modest quantities, and are, therefore, poor indicators of chronology. This possibility may be easy to distinguish in the archaeological record by the difference in variety of possible associations. But the cluster analysis of the same set of hoards by means of chi-square distance, which accounts for differences in total quantity of types in assemblage, yields no positive result (Fig. 4). There is no significant clustering and hoards separated by means of seriation now appear as close to each other (as, for instance, Morávský Ján and Glufishevo). These conclusions are further strengthened by a correspondence analysis of the same set of data (Fig. 5–10). With this technique, which has only recently been introduced to archaeology[76], the relationships between hoards, those between types and those between types and hoards, all may be analyzed together and represented in the same scattergram or series of scatter-

[75] Vinski 1983: 468 and 495.

[76] For a brief discussion of its principles, see Shennan 1988: 283–286; Madsen 1989. For an application to hoards, see Nielsen 1988.

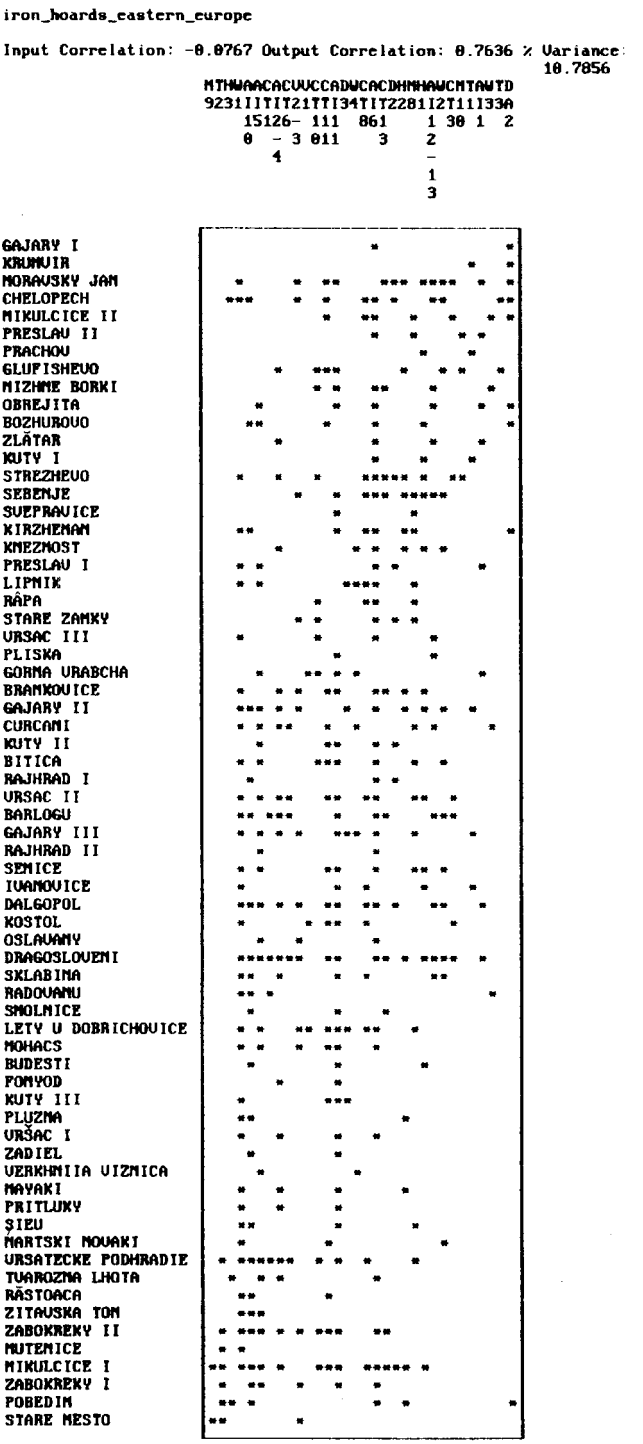

Fig. 3. Seriation of 66 early medieval hoards of iron implements and weapons. Codified types: DA2b – belt strap; V2 – iron bucket; AI1 – billknife; T1 – "Silesian" dish; H2a – horse-bit with straight ends; CT3 – hammer; H1a – stirrup of Bartošková's class I; AI13 – tanged share; CT13 – wimble; H1c–d – stirrup of Kirpichnikov's classes I and IX; AI6 – sickle; D2 – key; W2 – spearhead; CT11a – scraping tool of Henning's class P2; W1d – axe of Bartošková's class III; M10 – tool for scraping the kneading trough (*ogribka*); W1c – axe of Bartošková's class IV; M8 – knife; AI11a–c – plowshare of Henning's classes A1, A2, and A3; D3 – scissors; H2b – horse-bit with S-shaped ends; W1b – axe of Bartošková's class II; H1b – stirrup of Bartošková's class II; W4 – sword; AI5 – scythe; AI2–3 – hoe; V1 – bronze vessel; V3 – wooden bucket with iron handle and hoops; AI12 – socketed share; W1h – spear-shaped axe; CT6 – tongs; CT8 – chisel; W1g – fan-shaped axe; AI10 – coulter; AI11d – plowshare of Henning's class A4; CT1 – anvil; W1a – axe of Bartošková's class I; CT10 – plane; W1f – axe with asymmetrical blade; DA2a – belt buckle; W3 – arrow head; CT11b – scraping tool of Henning's classes P1 and P3; T2 – axe-shaped bar; AI11f–g – plowshare of Henning's classes B1 and B4; M9 – millstone; H3 – spur; T3 – coin.

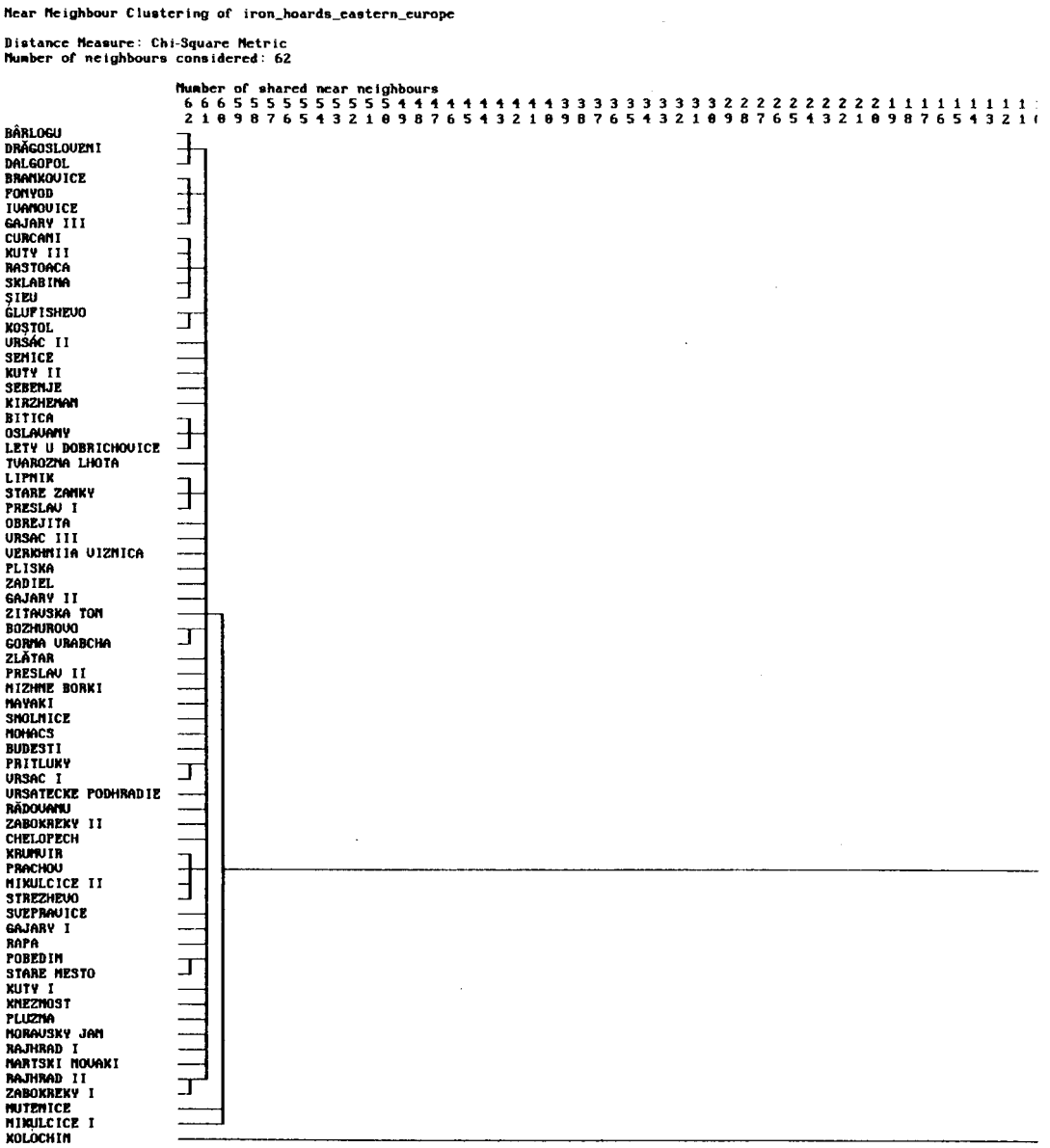

Fig. 4. Dendrogram resulting from the single-link cluster analysis by chi-square metric method of 67 early medieval hoards of iron implements and weapons.

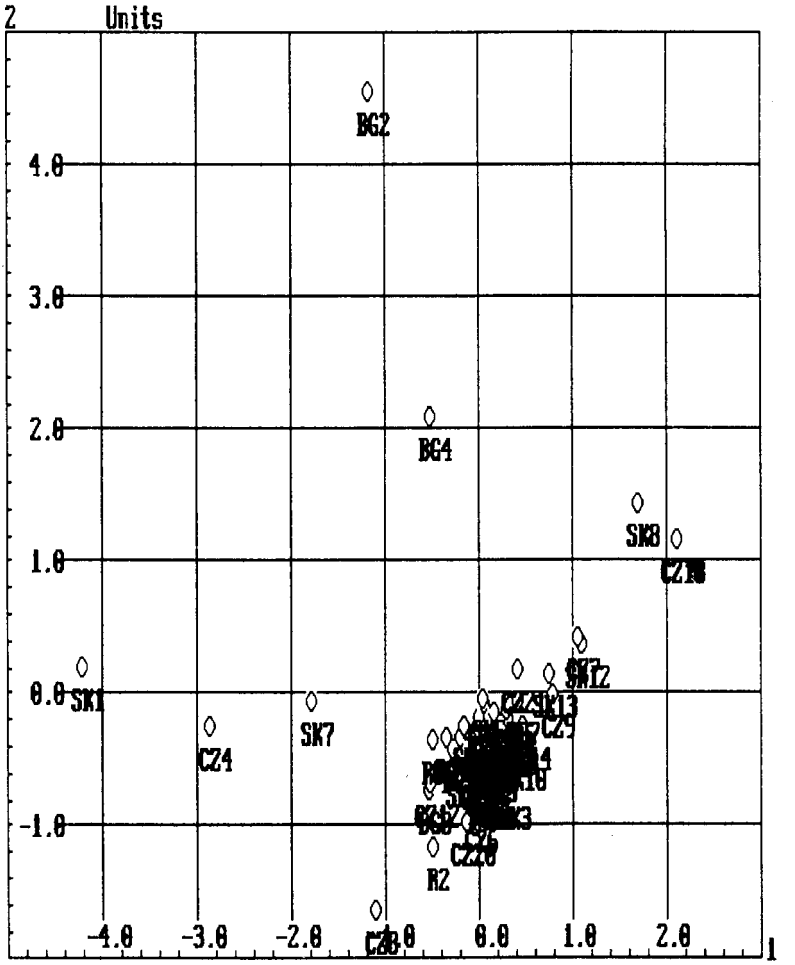

Fig. 5. Correspondence analysis plot of 66 early medieval hoards of iron implements and weapons. Codified names: BE1 – Kolochin; BG1 – Bozhurovo; BG2 – Chelopech; BG3 – Dălgopol; BG4 – Glufishevo; BG5 – Gorna Vrabcha; BG6 – Pliska; BG7 – Preslav I; BG8 – Preslav II; BG9 – Zlatar; C1 – Nartski Novaki; CZ1 – Brankovice; CZ2 – Ivanovice; CZ3 – Knežmost; CZ4 – Krumvír; CZ5 – Lety u Dobrichovic; CZ6 – Lipník; CZ7 – Mikulčice I; CZ8 – Mikulčice II; CZ9 – Mutenice; CZ10 – Oslavany; CZ11 – Plužná; CZ12 – Prachov; CZ13 – Pritluky; CZ14 – Rajhrad I; CZ15 – Rajhrad II; CZ16 – Semice; CZ17 – Smolnice; CZ18 – Staré Mesto; CZ19 – Staré Zámky; CZ20 – Svépravice; CZ21 – Tvarožna Lhota; H1 – Fonyód; H2 – Mohács; M1 – Strezhevo; R1 – Kirzheman; R2 – Nizhne Borki; RO1 – Bârlogu; RO2 – Budești; RO3 – Curcani; RO4 – Dragosloveni; RO5 – Obrejița; RO6 – Radovanu; RO7 – Răstoaca; RO8 – Râpa; RO9 – Șieu; SK1 – Gajary I; SK2 – Gajary II; SK3 – Gajary III; SK4 – Kúty I; SK5 – Kúty II; SK6 – Kúty III; SK7 – Morávský Ján; SK8 – Pobedim; SK9 – Sklabina; SK10 – Vršatecké Podhradie; SK11 – Zadiel; SK12 – Žabokreky I; SK13 – Žabokreky II; SK14 – Žitavská Tôn; SR1 – Kostol; SR2 – Vršac I; SR2 – Vršac II; SR3 – Vršac III; SV1 – Sebenje; UK1 – Bitica; UK2 – Mayaki; UK3 – Verkhniia Viznica.

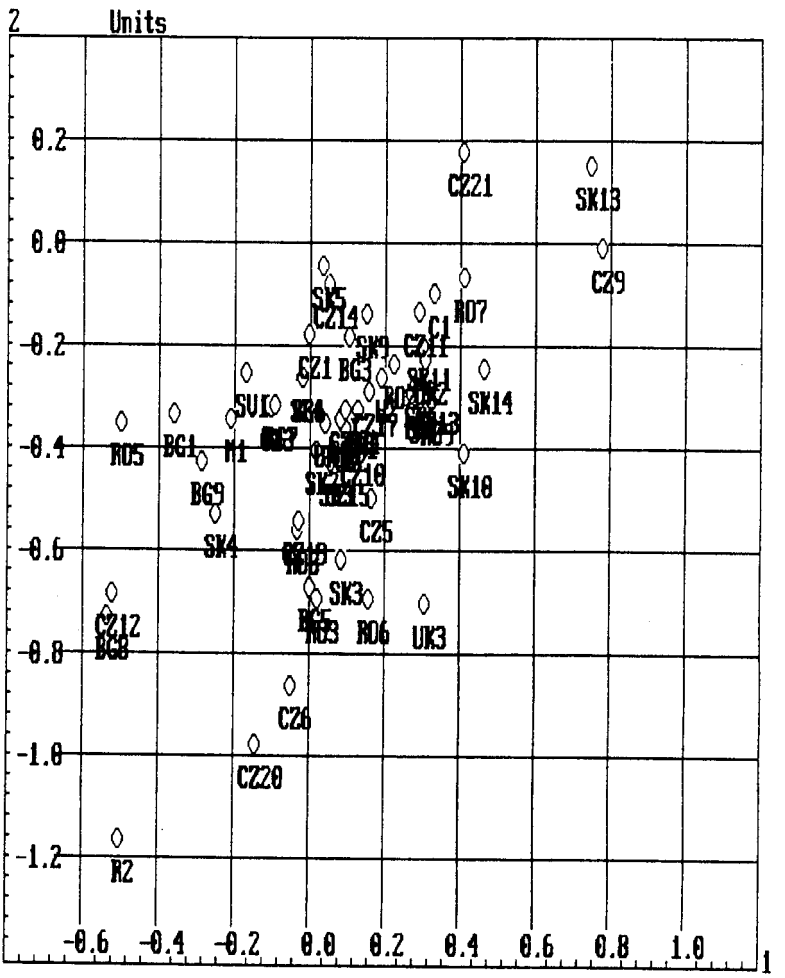

Fig. 6. Zoomed detail of the correspondence analysis plot of 66 early medieval hoards of iron implements and weapons. For codified names, see Fig. 5.

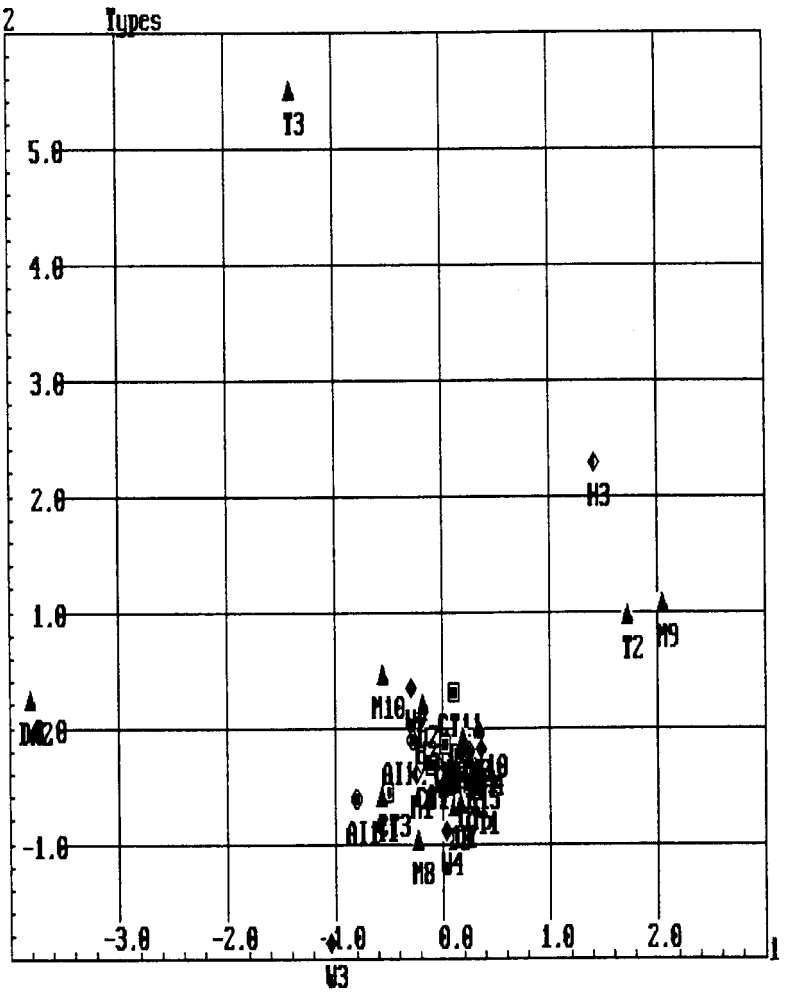

Fig. 7. Correspondence analysis plot of the types found in 66 early medieval hoards of iron implements and weapons. For codified types, see Fig. 3.

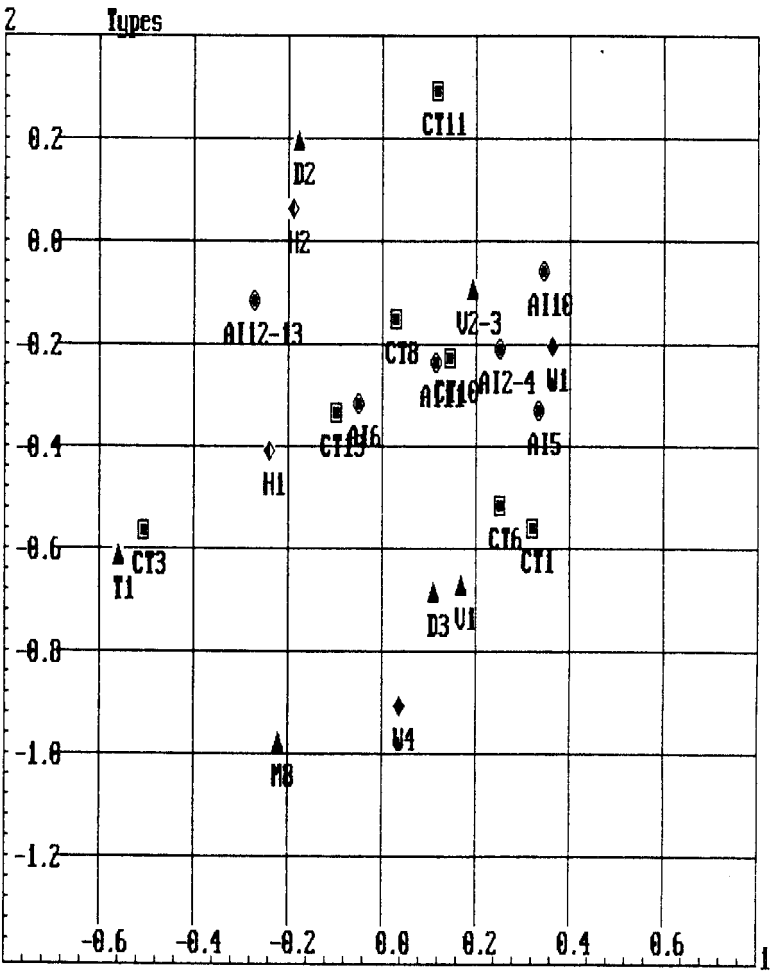

Fig. 8. Zoomed detail of correspondence analysis plot of the types found in 66 early medieval hoards of iron implements and weapons. For codified types, see Fig. 3.

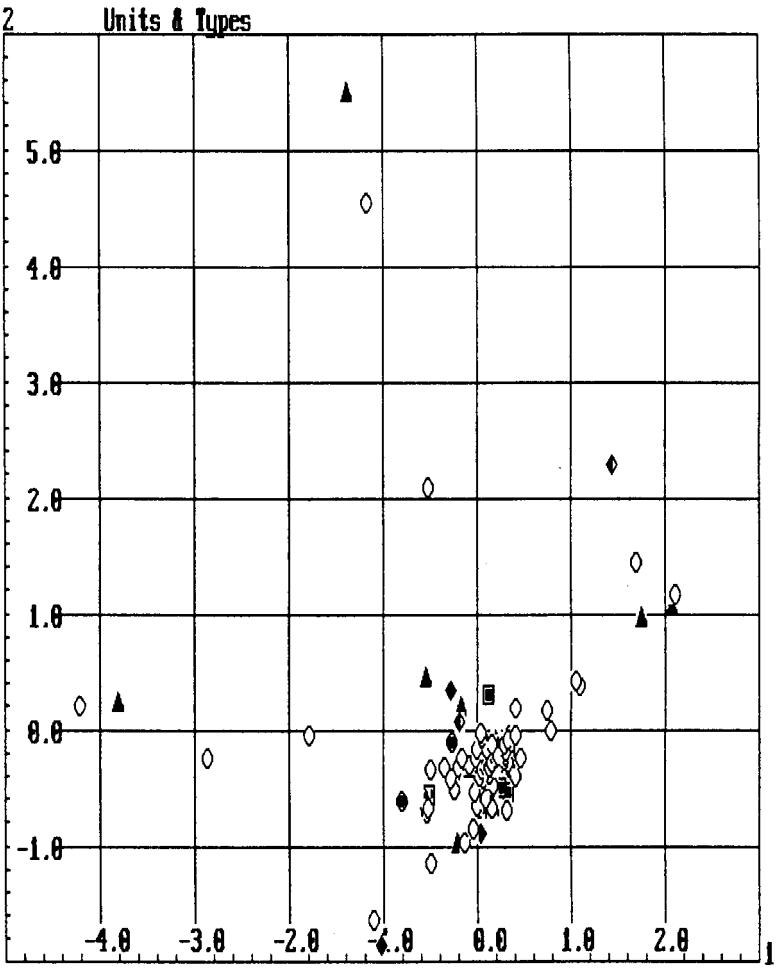

Fig. 9. Correspondence analysis plot of 66 early medieval hoards of iron implements and weapons and the types found in them. For codified types, see Fig. 3, and for codified names, see Fig. 5.

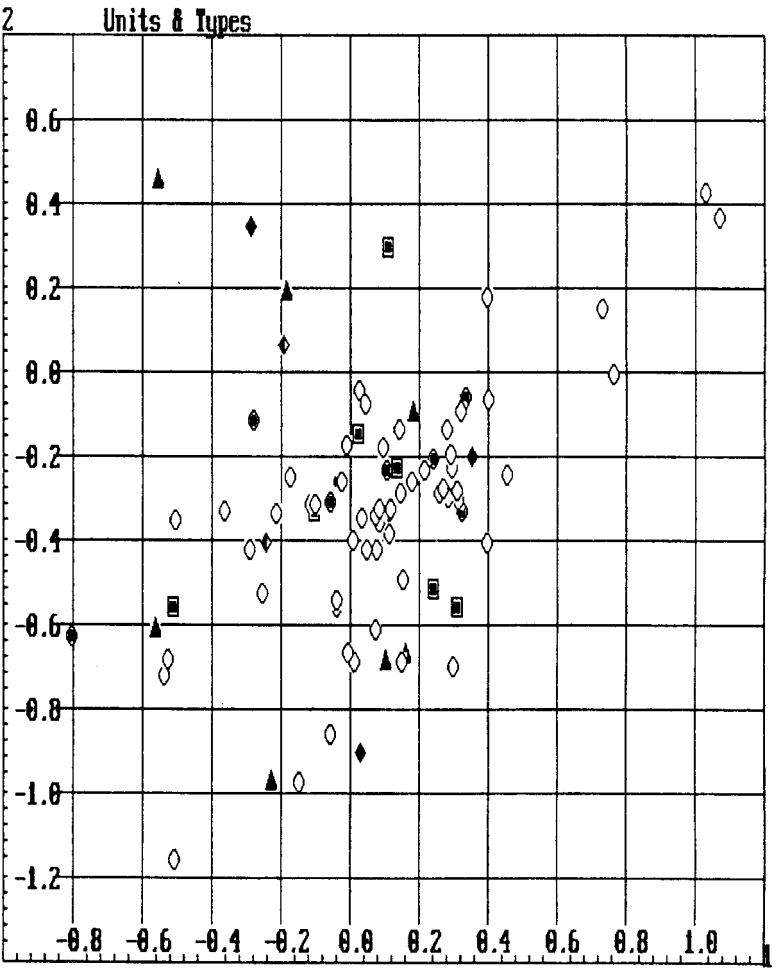

Fig. 10. Zoomed detail of the correspondence analysis plot of 66 early medieval hoards of iron implements and weapons and the types found in them. For codified types, see Fig. 3, and for codified names, see Fig. 5.

grams produced by the plotting of pairs of orthogonal axes. What catches the eye at first on the scattergram showing the relationships between hoards (Fig. 5) is a large cloud around the intersection of the two axes with only a few scattered assemblages. The first axis opposes this large group to three isolated hoards – Gajary I, Krumvír, and Morávský Ján –, which, as already shown, contain the earliest datable artifacts, namely late Avarian belt straps. The second axis opposes two Bulgarian hoards – Chelopech and Glufishevo –, which include coins, to two Moravian ones – Staré Mesto and Pobedim –, which are characterized by the presence of axe-shaped bars. A zoomed detail of the main cloud at the intersection of the axes shows that there is no regional clustering, hoards from Moravia, Serbia, Romania, and Ukraine being located close to each other (Fig. 6). This suggests, in my opinion, the existence of a pattern, a fact that is further substantiated by the examination of the second scattergram, that of the relationships between types (Fig. 7). Zoomed details of the area at the intersection of the axes show what types are at the heart of the central cloud (Fig. 8–10). A brief enumeration may be illustrative. Among agricultural implements, we have only coulter, hoe, plowshare (Henning's class A1), and sickle, followed at a distance by another type of plowshare (Henning's class A4), scythe, and tanged share. The craftsman's tools closely associated with these implements are chisel, anvil, tongs, scraping tool (Henning's class P2), and wimble, followed at a distance by hammer and plane. The associated weapons are various types of axe (Bartošková's classes I, II, III, and IV, axes with fan- and spear-shaped blades) and the sword. Stirrups and horse-bits are at a certain distance from this central group. But such artifacts as wooden buckets with iron handles and hoops, bronze bowls, knives and scissors seem to be also closely related to the main concentration of types. If we take into consideration only the three major groups of types listed here, we may "read" this concentration as a combination of three basic activities: warfare, plowing (and harvesting), and blacksmithing. It may be therefore relevant that, according to our scattergram, tongs are located at an equal distance from both axes of Bartošková's class II and plowshares of Henning's class A1.

Correspondence analysis, though making explicit the relationship among hoards and types, and between these two, does not allow us, however, to perceive the relative significance of associations between items. A cross-type seriation reveals interesting details (Fig. 11). The output correlation is significantly low and the largest figures concentrate not along the diagonal, but along the incidences of axes. A summary of this seriation, showing only the first four major correlations for each type, indicates that the dominant item is the axe (Annex I). Moreover, the most frequent correlations are axe with plowshare, hoe, sickle, and scraping tool, which confirms our interpretation of the second correspondence analysis scattergram (Fig. 7 and 8). The patterns of association for agricultural implements and weapons seem to be quite similar, but different

IRON4

Input Correlation: 0.0310 Output Correlation: 0.2123 % Variance: 20.5120

	M9	T3	T2	H3	M10	D2	H2	H1	CT10	CT13	AI10	U3	AI2-4	W2	AI1	AI11	AI16	CT11	CT8	DA2	AI12-13	W1	U1-2	AI5	T1	CT3	CT1	CT6	D3	M8	W4	W3
MILLSTONE	3		2			2	2	1	2	1	1	2	2		1	1	2	1	1			2		1						1		
COIN		1		1	1	1	1		1		1	1	1	2		2	1	2	1	1	1	1										
AXE-SHAPED TOKEN	2		5	1		2	3	1	3	2	6	2	4			5	4	2	3	1		8	1	4			1	1		1		
SPUR		1	1			1	1				2	1	1	1			4	1	1	2	1	1		1								
OGRIBKA		1				1	2	1	2	2			3	1	1	2	2	1	1			1				1				1		
KEY	2	1	2	1	1	3	4	3	4	4	5	4	8	3	3	6	9	6	5	2	3	9	1	5		2				1		
HORSE-BIT	2	1	3	1	2	4	8	14	4	8	7	5	15	7	3	14	13	8	5	3	3	22	1	5	1	3	1	1	1	3	1	
FLAME	2	1	3		2	4	4	2	1	4	5	2	7	3	1	10	8	4	5		2	10	1	6		1	1	1		4	1	1
STIRRUP	1		1		1	3	14	15	2	7	7	6	14	6	2	10	12	7	6	3	3	20	1	6	5	4	1	2	2	2	1	
WIMBLE	1		2		2	4	8	7	4	1	6	4	9	4	2	11	8	6	4	1	5	14	1	3		4	2	3		1		1
COULTER	1	1	6	2		5	7	7	5	6	12	5	10	7	2	17	16	8	7	4	8	26	1	9	1	3	1	3	1	3		1
WOODEN BUCKET (HANDLES AND HOOPS)	2	1	2	1		4	5	6	2	4	5	4	8	4	2	9	12	7	5	1	4	15	1	8	2	1	1	1	3	4	1	
HOE	2	1	4	1	3	8	15	14	7	9	10	8	18	8	4	20	20	12	11		7	36		12	2	7	3	5	2	5	3	1
SPEAR		2		1	1	3	7	6	3	4	7	4	8	1	3	10	9	8	4	2	7	22	1	5	1	3	1	2	1	3	1	
PLOWSHARE	1	2	5		2	6	14	10	10	11	17	9	20	10	5	30	21	17	14	3	10	44	5	16	3	5	4	4	3	10	2	1
SICKLE	2	1	4	4	2	9	13	12	8	8	16	12	20	9	6	21	32	14	13	8	9	34	2	21	3	5	2	3	4	13	3	3
SCRAPING TOOL	1	2	2	1	1	6	8	7	4	6	8	7	12	8	3	17	14	7	8	4	5	32	3	12		5	2	3	2	6	1	2
BILLKNIFE					1	3	3	2	1	2	2	2	4	3	2	5	6	3	1	2	8	8	2	5		2	1	1		1	1	
CHISEL	1	1	3	1	1	5	5	6	5	4	7	5	11	4	1	14	13	8	6	3	4	19	2	7	1	4	1	2	2	8	1	2
BELT FITTINGS		1	1	2		2	3	3		1	4	1		2	2	3	8	4	3	2	3	4	1	2	1	2				2		2
ARD-SHARE		1		1		3	3	3	2	5	8	4	7	7	6	10	9	5	4	3	8	13	1	4		3	2	3		2	1	2
AXE	2	1	8	1	1	9	22	20	10	14	26	15	36	22	8	44	34	32	19	4	13	96	4	28	6	14	5	13	6	15	4	6
BRONZE/IRON VESSEL			1			1	1	1	1	1	1	1		1	2	5	2	3	2	1	1	4	1	3		2			1	1	1	
SCYTHE	1		4	1		5	5	6	6	3	9	8	12	5	5	16	21	12	7	2	4	28	3	12	2	2	6	4	4	8	5	1
SILESIAN DISH							1	5			1	2	2	1	1	3	3		1	1		6		2	1				2	1	1	
HAMMER					1	2	3	4	1	4	3	1	7	3	2	5	5	5	4	2	3	14	2	2		4	2	3		3		2
ANVIL			1				1	1	1	2	1	1	3	2	1	4	2	2	1		2	5		6		2	1	2		1		1
TONGS			1				1	2	1	3	3	1	5	2	1	4	3	3	2		3	13		4		3	2	2		4	1	1
SCISSORS							1	2			1	3	2	1		3	4	2	2			6	1	4	2				1	3	2	
KNIFE	1		1		1		3	2	4	1	3	4	5	3	1	10	13	6	8	2	2	15	1	8	1	3	1	4	3	6	3	4
SWORD							1	1	1			1	3	1	1	2	3	1	1		1	4	1	5	1			1	2	3	1	1
ARROW									1	1	1		1			1	3	2	2	2	2	6		1		2	1	1		4	1	5

[0,0]

Fig. 11. Cross-seriation of types found in 66 early medieval hoards of iron implements and weapons. For codified types, see Fig. 3.

from both horse equipment and smith's or wood-carving tools. The encoded grammar of the hoards seems to be based on the opposition between warfare and agriculture, on the one hand, and crafts, particularly blacksmithing, on the other hand.

The fact that agriculture and warfare might have been the main activities represented in hoards is also confirmed by indirect evidence. The distribution of hoards in Eastern Europe strikingly coincides with that of burials marked with sickles (Fig. 12). From the evidence we have, it seems that the practice of depositing sickles in male burials began sometime in the late Avarian period, but continued well into the ninth and tenth centuries. The distribution of late Avarian burials marked with axes overlaps to some extent that of hoards, though the two phenomena were certainly not contemporary (Fig. 13). The same is true for the distribution of burials marked with scraping tools (Henning's class P2), which either antedate or postdate hoards (Fig. 14). It is important to note that only one group of burials shares material with hoard deposits, while a large number of contemporary burials maintained a rigid separation. In Moravia, 83 percent of all weapons found in contexts other than hoards come from warrior burials[77]. In contrast, in contemporary cemeteries in the Lower Danube area, no burial contains weapons such as those found in Bulgarian or Romanian hoards[78]. Though the lance has become the predominant weapon of late Avarian warriors, as evidenced by both the rich horseman burial from Kaposvár-Toponár and the warrior depicted on one of the golden jugs of the Sânnicolaul Mare/Nagyszentmiklos hoard[79], neither spears nor lances are among the most common weapons represented in hoards. The evidence from post-Avarian cemeteries suggests, on the other hand, that the period that followed the collapse of the Avarian khaganate witnessed a "democratization" of weaponry as a status marker. At Devínská Nova Ves, for instance, every third male burial contains either weapons or horse equipment[80]. However, it is important not to press this evidence too hard. At present, it is clear that the distribution of hoards extends over a wide area with two major clusters, one in Moravia, the other in north-eastern Bulgaria. Twenty-two out of 92 hoards were found in early medieval hillforts, either around or in the royal centers at Mikulčice, in Moravia, Pliska and Preslav, in Bulgaria[81]. In contrast, the distribution of hoards of iron implements and weapons and that of seventh- to ninth-century nonfortified settlements in the Carpathian basin are mutually exclusive (Fig. 15). Hoards were *not* the property of

[77] Ruttkay 1982: 188.

[78] Fiedler 1992: 215–218.

[79] Szentpéteri 1993b: 267. Cf. Szentpéteri 1993a: 175.

[80] Szentpéteri 1993b: 267.

[81] Cf. Giuzelev 1991: 86, who cites three inscriptions (Bešhevliev nos. 51–53) from Preslav, attesting that during the ninth century the hillfort had a permanent garrison of heavy-equipped horsemen.

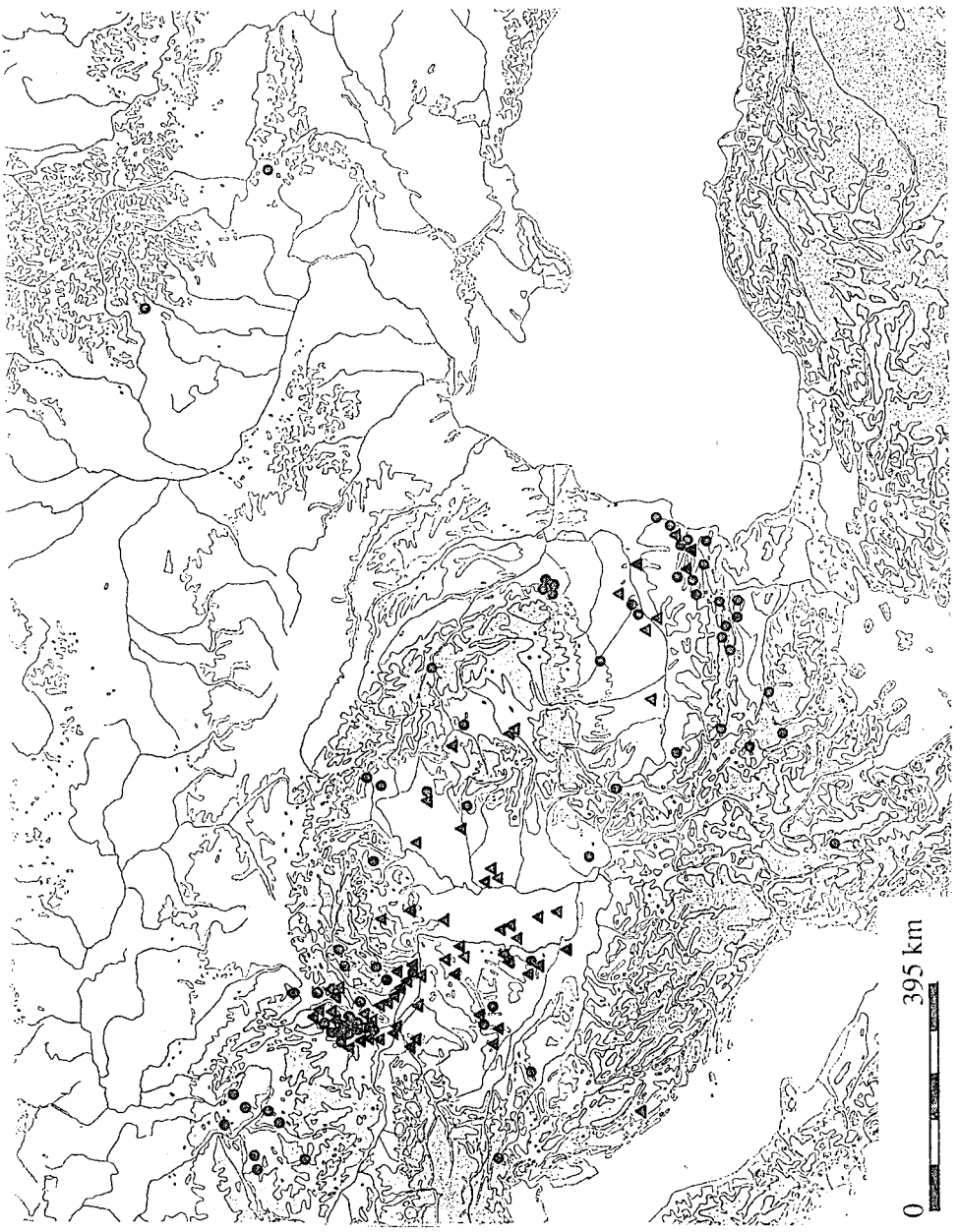

Fig. 12. Distribution of hoards of iron implements and weapons (circle) and deposits of sickles in eighth- to tenth-century burials (triangle). Data after Henning 1987 and Fiedler 1992.

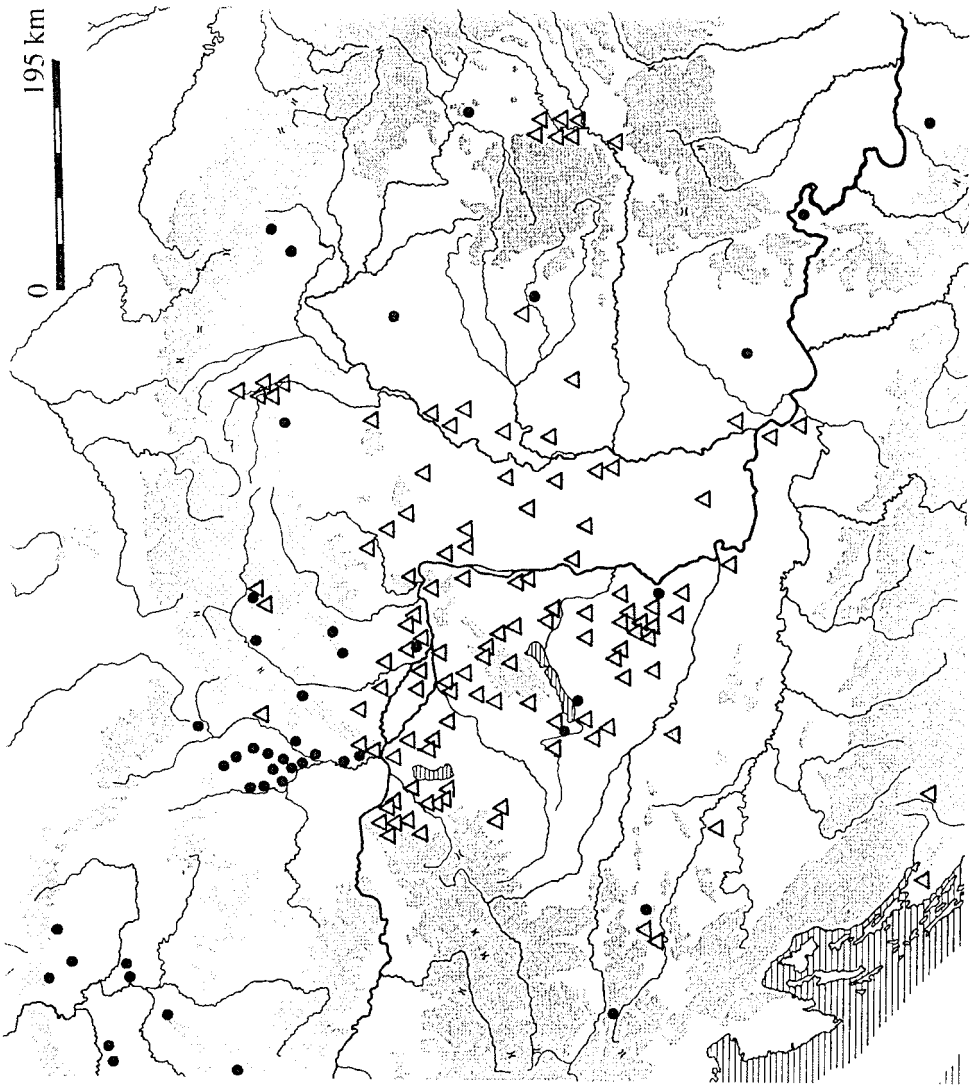

Fig. 13. Distribution of hoards of iron implements and weapons (circle) and late Avarian warrior burials with axes (blank triangle). Data after Szentpéteri 1993a.

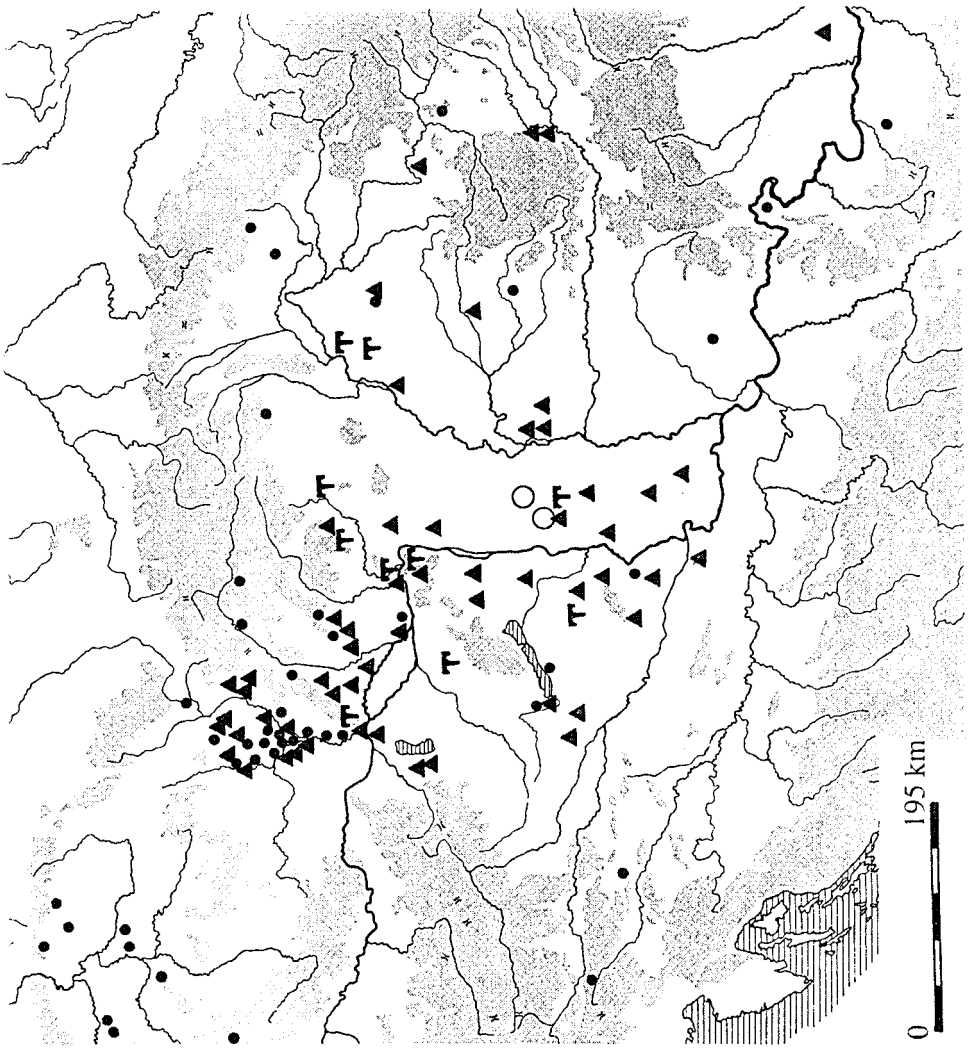

Fig. 14. Distribution in the Carpathian Basin of hoards of iron implements and weapons (circle) and deposits of sickles (triangle), tanged shares (blank circle), and scraping tools (T) in eighth- to tenth-century burials. Data after Henning 1987 and Kovács 1981.

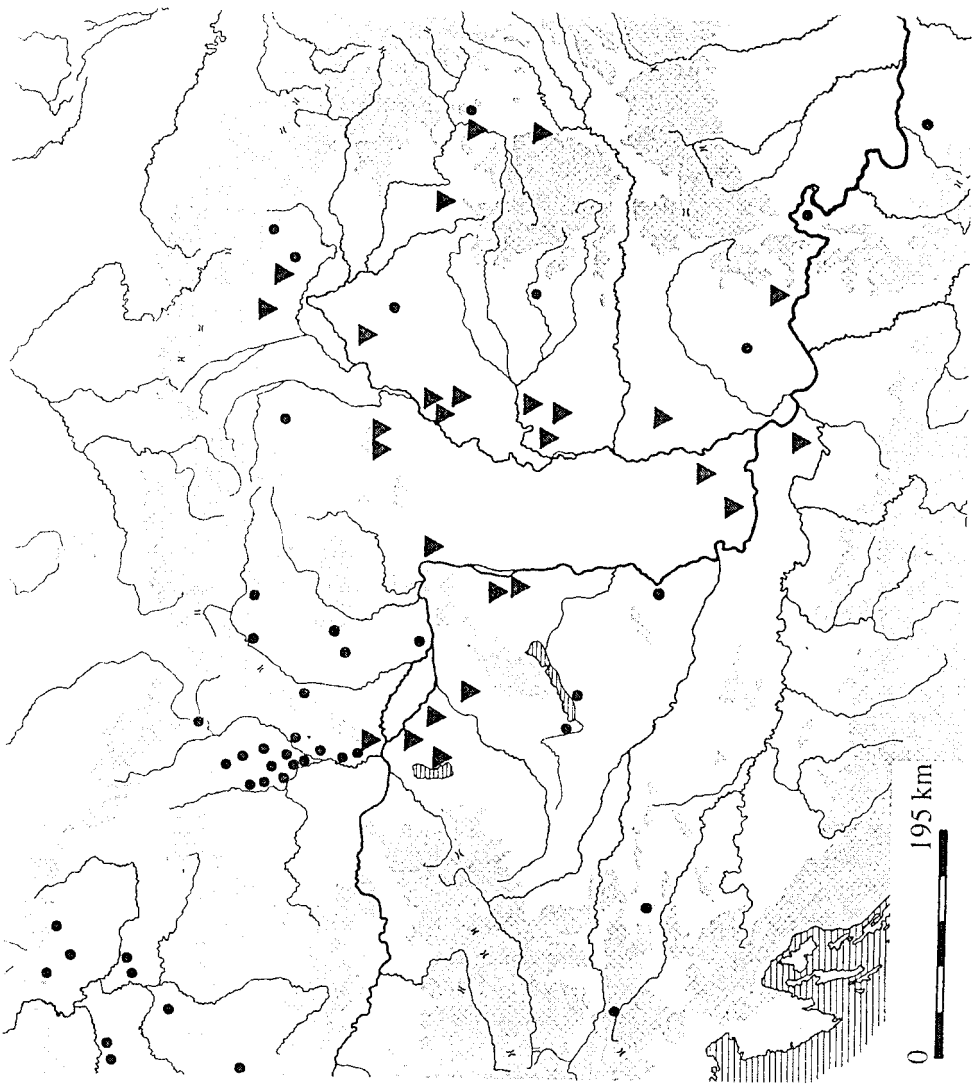

Fig. 15. Distribution in the Carpathian Basin of hoards of iron implements and weapons (circle) and seventh- to ninth-century nonfortified settlements (triangle). Data after Stanojević 1987, with additions.

extended families or village communities. It has been noted, on the other hand, that the concentration of agricultural implements in early medieval hillforts is a clear indication that elites residing there may have controlled the access to means of production[82]. The relative scarcity of weapons in contemporary burials and their concentration in cemeteries associated with hillforts, as in Moravia and Bohemia, may point to the same phenomenon. It is therefore possible to associate hoards with these newly emerging elites.

If this is true, however, we are left with a more puzzling question: Why iron? The current opinion is that hoards of iron implements did not have any intrinsic economic value[83]. Others pointed to the contrast of value between the hoards of iron and hoards of silver[84]. It is important to note that no hoard of iron implements contains silver items and, though eighth-century dirhams do occasionally occur in the Carpathian Basin[85], the evidence for hoards of iron falls off rapidly as we approach those areas with a significant number of hoards of eighth- and ninth-century dirhams (Fig. 16). This distinction between the two distribution areas may indicate that hoards of iron were not a phenomenon caused by the intrusion of trade networks from the East[86]. The fact that, however, an indirect connection may have existed between trade and the hoarding phenomenon has been already suggested[87]. But in this case, metal may have been more important because of nonutilitarian considerations. Since its most important use was in the production of weapons, iron was a strategic metal that could not be exported from the Byzantine Empire. A fifth-century constitution of the *Codex Justinianus* states that: "nobody [shall] dare to sell cuirasses and shields and bows and arrows, sabres or swords or weapons of any kind to the foreign barbarians of whatever tribe coming under the appearance of an embassy (sub legationis specie) or under whatever other likeness to this most sacred city [Constantinople] or to other various towns or places. Likewise, let absolutely no woven stuff *nor objects of iron either already manufactured or still nonmanufactured* [nihil penitus ferri vel facti iam vel adhuc infecti ab aliquo distrahatur] be sold in lots by anybody... Moreover, should anyone sell something of the kind of weapons to the foreign barbarians of whatever nation

[82] Henning 1987: 40–41 cites as examples the hillforts from Mikulčice, Staré Mesto, Zalavár, Pernik, Silistra, Shumen, Car Krum, and Dăbâca. Cf. Comşa 1982–1984: 40 and 42.

[83] Olteanu 1974: 53. *Contra*: Pleterski 1987: 327, who cites *Lex Salica* penalizing the theft of an iron plowshare with a fine of 15 solidi, and concludes: "Mithin war der Sebenjer Hortfund ein hübsches Häuflein Goldmünzen wert".

[84] Teodor 1973: 228, with conclusions drawn from Kazhdan, Litavrin, and Udalcova 1961: 187.

[85] See, for instance, the three eighth-century dirhams found in Vojvodina (Stanojević 1987: 130–131).

[86] Cf. Bálint 1981: 105–131. For a more detailed analysis of 77 ninth-century hoards from European Russia, see Noonan 1981.

[87] Teodor 1981: 82; Canache and Curta 1994: 195–198.

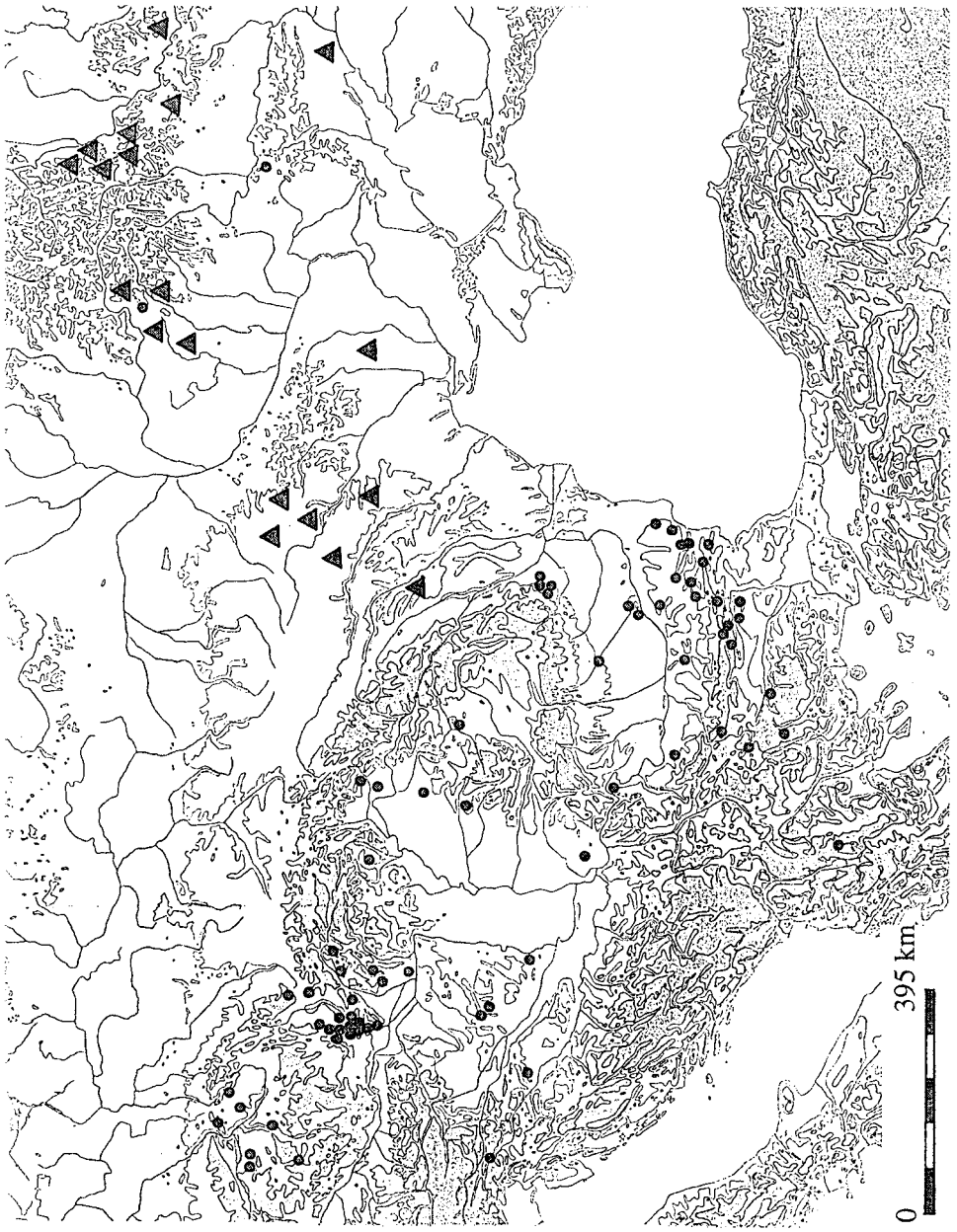

Fig. 16. Distribution of hoards of iron implements and weapons (circle) and hoards of eighth- and ninth-century dirhams (triangle). Data after Pletneva 1981.

against the injunctions of our kindness, we decide that his whole property be confiscated by the State Treasury and he himself be submitted to the capital punishment (emphasis added)"[88].

This prohibition is taken almost verbatim by the late ninth-century law code of emperor Leo the Wise, with the same emphasis on iron implements[89]. Both constitutions index iron among articles of the prohibition list (κεκωλυμένα), along with objects made of gold and silver, pearls, precious stones, silk, olive oil, wine, or salt fish[90]. The fact that this prohibition was taken very seriously is best illustrated by an episode narrated by Menander the Guardsman. An Avarian embassy came in 563 to Constantinople to request permission to settle on imperial soil. But "since the envoys of the Avars could obtain none of their demands from the emperor, they received their accustomed gifts from him and were allowed to depart, having purchased whatever they required, *both clothing and weaponry* [τοῦτο μὲν ἐσθῆτος, τοῦτο δὲ καὶ ὅπλων]. However the emperor secretly ordered Justin to deprive them of the arms by whatever means and when the general received the envoys on their return, he acted accordingly"[91].

We know, on the other hand, that, according to the treaty of 716 between the Bulgarian khan and emperor Theodosius III, the tribute paid to the Bulgarians consisted of woven stuff and red skins (κόκκινα δέρματα), both items of the prohibition list[92]. Iron, however, is not mentioned. After the area around Bostra, Damascus, and Tyre, one of the major centers of iron working, was lost to the Arabs, Byzantium constantly needed to import iron. According to John Kameniates, iron was one of the most important trade items on the market at Thessaloniki in the late ninth and early tenth centuries[93]. The Arab chronicler Ibn Khurdadhbah, who wrote sometime between 847 and 885, claimed that merchants from Rus', "who are a sort of Slavs", exported to Byzantium beaver skins, fox furs, and swords from the areas inhabited by Slavs[94]. But iron may have played a strategic role in "barbarian" societies as well. According to the

[88] *Codex Justinianus* 4.41.2, ed. by P. Krueger (Berlin, 1954), pp. 178–179 (dated to 455–457); author's translation.

[89] *Basilicorum libri* 19.1.86 (87), ed. by H.J. Scheltema and N. van der Wal (Groningen, 1960), p. 923. Cf. Canache and Curta 1994: 195–196.

[90] *Codex Justinianus* 4.41.1, p. 178. *Basilicorum libri* 19.1.82, p. 923. See also *The Book of the Eparch* 2, 4, and 17, ed. by E.H. Freshfeld (Cambridge, 1938), pp. 23, 27, and 53.

[91] *The History of Menander the Guardsman* 5.4, ed. by R.C. Blockley (Liverpool, 1985), p. 53. For more details on this embassy, see Pohl 1988: 40–41.

[92] Theophanes Confessor, *Chronographia*, ed. by C. de Boor (Leipzig, 1883), p. 497. See Beševliev 1981: 198–199; Ferluga 1987: 620.

[93] John Kameniates, *De expugnatione Thessalonicae*, ed. by G. Böhlig (Berlin–New York, 1973), pp. 26–26; Ferluga 1987: 624. Cf. Nasledova 1956: 69, who however believes that iron artifacts sold on the market at Thessaloniki may have been locally produced.

[94] Vasiliev 1932: 319–320; Ferluga 1987: 631.

Russian Primary Chronicle, the Polynians paid as a tribute to the Khazars one sword per hearth[95].

If hoards of iron implements had been in any way associated with the trade with Byzantium, we might have expected them to be found in areas of scarce ore sources, namely, within the Empire. We have already observed that no necessary association exists between iron ore sources in Eastern Europe and clusters of hoards. Moreover, no hoards of iron implements have been found so far in the territories held by the Byzantines then, though precious objects and iron ingots may occur in lists of monastic properties or in wills. In contrast, regions that were less rich in iron, such as north-eastern Bulgaria, yielded a considerable number of hoards and stray finds of individual implements[96].

Access to the ore sources may have indeed influenced the history of early medieval metallurgy. Axe-shaped bars and "Silesian" dishes tend to be found in areas close to metal sources in Moravia, and in an obvious sense they shed light on the scale and organization of metal production during the early Middle Ages. By contrast, there is little evidence for such items in areas more distant from ore sources. It is possible, therefore, that in the early Middle Ages Bulgaria became dependent on a supply of imported iron, in the very same way the Byzantine Empire was depending upon supplies of "barbarian" iron. The reopening in the middle of the ninth century of the trade route across the Balkans, from Thessaloniki to Belgrade, may have offered Bulgaria an unexpected opportunity to control the trade between Moravia and Byzantium[97]. But if this were the case, the evidence of iron hoards would be very difficult to explain, for their accumulation would represent a *loss* to the trade system as a whole, but particularly to its Bulgarian connection.

In fact, the pressures on the metal supply by means of trade may be a mere exaggeration. Adoption of iron as a material support for the wealth accumula-

[95] *The Russian Primary Chronicle. Laurentian text*, ed. by S.H. Cross and O.P. Sherbowitz-Wetzor (Cambridge, 1953), p. 58. See Bartha 1975: 12. A similar account provides William of Rubruck, who claims that in 1253, Mongols levied taxes in iron from Bulgaria (Vitlianov 1989–1990: 146). Cf. *The Mission of Friar William of Rubruck* ch. 1, ed. and transl. by Peter Jackson (London, 1990), p. 66: "...in recent years they have further levied on each household one axe and all the unwrought iron that has been found". According to Jadran Ferluga (Ferluga 1987: 633), among goods brought for sale at Chersonesus by Pechenegs there were also iron implements. This is however based on a misinterpretation of Constantine Porphyrogenitus, *De administrando imperio* 6.1–12, ed. by Gy. Moravcsik (Washington, 1967), pp. 52–53: "they [the Pechenegs] *receive* from the Chersonites a prearranged remuneration... in the form of pieces of purple cloth, ribbons, loosely woven cloths, gold brocade, pepper, scarlet or 'Parthian' leather, and other commodities which they require (emphasis added)". There is, moreover, no mention of iron products. Cf. Ferluga 1993: 450–454.

[96] Cf. Vitlianov 1989–1990: 154, who suggests that ore sources in the Rhodope Mountains or in Macedonia might have been exploited at that time. There is, however, no evidence for that.

[97] Ferluga 1987: 627 notices that it is precisely at this time that we know of the first treaties between Bulgaria and Byzantium involving economic stipulations.

tion provided a potential solution to the uneven distribution problems regarding ore sources. Metallographic analyses of iron implements from hoards or stray finds suggest that iron was extracted from ores with a substantial phosphoric composition[98]. Such ores were readily accessible in swampy areas or lakes and may have represented an alternative in areas without major resources of underground ores. A relatively high percentage of phosphorus posed, however, an important technological problem. Iron was extracted by the blooming method, a direct chemical reduction of iron from the iron ore. In the blooming process, the burning charcoal created a high temperature and a strongly reducing atmosphere in the furnace. Under these conditions, the iron ore consisting of iron oxides, silica, and other oxides underwent a chemical change, as a result of which one part of the iron oxides was reduced to metallic iron. This iron was formed in separate grains which fused into a friable iron sponge (the bloom) that contained a certain quantity of slag in its interstices[99]. The smaller the percentage of phosphorus in the ore is, the larger the carburized core of the bloom becomes. Pure steel could be therefore obtained by blooming metal from ores with a slight concentration of phosphorus (less than 0.6 percent P_2O_5)[100]. All these suggest that, in the case of iron ores with significant amounts of phosphorus, the key condition of the blooming process is the ability to maintain a temperature exceeding 1000 centigrades throughout the entire working space of the furnace. This was often accomplished by building blooming hearths of a relatively modest height or even by digging the lower part of the furnace into the soil[101]. Such bloomery furnaces, all dated to the eighth and ninth centuries, have been found in Moravia, at Želechovice and Žerotin[102], in north-western Hungary, at Tarjánpuszta and Nemeskér[103], and in southern Ukraine, at Yutanovka[104]. All come from areas with iron hoards. No such furnace is known to have been found in Bulgaria, a fact which may suggest that iron was probably

[98] Kolchin 1953: 36; Piaskowski 1974: 78; Olteanu, Neagu, and Secleman 1981; Baranov 1990: 81. Axe-shaped bars found in Poland were also made of iron with significant quantities of phosphorus (Zaitz 1988, 274). By contrast, local ores in the Malé Karpaty and the Slovakian Erzgebirge have a comparatively lower concentration of phosphorus (Bialeková 1981: 11–12).

[99] Ziniakov 1988: 86 and 89. On the basis of archaeological and ethnohistorical evidence, B.A. Kolchin has described the procedure by which, in order to obtain highly carburized iron, the bloom was introduced in cold water (quenching) (Kolchin 1953: 43–45).

[100] Piaskowski 1974: 80.

[101] Ziniakov 1988: 89 notices that when the height of the working chamber is raised, other conditions being equal, the high temperature needed for smelting can be attained only in the lower part of the chamber where air is forced in. The presence of high-carbon steels in both Moravia and Khazaria testifies to the use of various preparatory treatments of iron billets, such as soaking in a carboniferous medium at temperatures not lower than 900 centigrades.

[102] Pleiner 1955; Ludikovský 1961: 52–54.

[103] Gömöri 1980: 332 and 335.

[104] Afanas'ev and Nikolaenko 1982: 172–173.

imported there in the form of blooms. Whatever their origin, these blooms must have had relatively small carburized cores, for all early medieval iron artifacts analyzed proved to have been tempered[105]. The fact that in Bulgaria artifacts were produced locally is confirmed by the ninth-century anonymous Byzantine chronicler known as *Scriptor incertus*, who claims that, before his expedition against Constantinople, Krum ordered the manufacturing of a large quantity of iron implements and weapons[106]. Smithies have been found in Pliska and Preslav[107].

In order to manufacture tools or weapons, early medieval smiths had the choice between three different basic methods: multi-layered welding of the edge; welding of the steel edge of high-carbon steel into a soft core of low-carbon steel; whole edge made of high-carbon steel. The most common technique was multi-layered welding, in which one of the layers, usually the edge, had always a ferritic structure, while one or two others had a harder ferritic-pearlitic character[108]. The smiths usually welded two or more semi-products by forging. Sickles found in ninth-century Moravian settlements, such as Pobedim and Šebastovce, were manufactured in this way. The same is true for swords found in burials of the contemporary cemetery at Želovce, which were also constructed by welding iron plates by the layering method[109]. Almost 50 percent of the artifacts analyzed by Radomír Pleiner by means of a metallographic analysis had steel edges welded to iron bases[110]. This is also true for more than 60 percent of the iron artifacts found in the eighth- and ninth-century hillfort at Mayaki, in southern Ukraine[111]. On the other hand, the distribution of iron objects with whole edge of high-carbon steel is not restricted to hillforts or high-status burials. Rich burials in Moravia, for instance, often contain artifacts produced with less sophisticated techniques[112].

We have seen that hoards of iron implements include types of evidence for blacksmithing, although more for manufacturing than for blooming. There is no indication of bellows jets, slag, or plate scrap. Broken objects are rare, but there is evidence of repaired ones, particularly plowshares, such as those from Ivanovice and Bârlogu. The fact that anvil, tongs, and hammer are closely associated with the main types of tools and weapons further suggests that implements

[105] Vitlianov 1989–1990: 165. By contrast, in Moravia, only two thirds of the iron artifacts dated to the seventh and eighth centuries were hardened or tempered (Bialeková 1981: 108). Cf. Sukhobokov, Voznesenskaia, and Priimak 1989: 100 and Tolmacheva 1990: 212.

[106] Scriptor incertus, ed. by Im. Bekker (Bonn, 1842), p. 346; Vitlianov 1989–1990: 145.

[107] Vitlianov 1989–1990: 149–150.

[108] Piaskowski 1974: 83; Mihok, Holý, and Čilinská 1993: 233.

[109] Longauerová and Kocich 1993: 257; Mihok, Holý, and Čilinská 1993: 233. Cf. Ziniakov 1988: 91, who observes that, in order to weld iron to steel, which requires different temperatures, one needed a flux to remove scale (usually common river sand).

[110] Pleiner 1967: 93–94.

[111] Tolmacheva 1990: 212.

[112] Pleiner 1967: 95.

production may have been viewed as more important than blooming. What is stressed here is not the iron *per se*, but the technology and skills associated with it. The meaning behind this hoarding phenomenon has much more to do with activities in which iron is involved than with its intrinsic value. Similarly to warfare and agriculture, blacksmithing participates in defining the social status or aspirations of the hoards' owners. An important factor that defined the attitude toward blacksmiths in early medieval steppe societies was their comparison with shamans, as controllers of magic and wizardry[113]. Many steppe nomads claimed to be descendants of legendary smiths, a genealogical and political tradition still appealing to Genghis Khan in the thirteenth century[114]. The respect for blacksmiths has old Turkic roots, a reflection of which is found in a sixth-century Chinese source narrating an old Turkic legend, "On rulers of the Turki Khaganate, who usually were blacksmiths..."[115]. The fact that iron may have played a symbolic role in early Turkic society is suggested by Menander the Guardsman's account of a Byzantine embassy to Sizabul, the Khagan of the Western Turks in 569–571: "When Zemarchus [the Byzantine envoy] and his companions completed a journey of many days, they entered the land of the Sogdians. At this point, they dismounted from their horses, and certain Turks, who had apparently been ordered to do this, offered them iron for sale (ὤνιον σφίσι προίσχοντο σίδηρον), the purpose of which, I think, was to demonstrate that they had iron mines. For it is said that amongst them iron is not easily obtained (οὐκ εὐποριστόν τι χρῆμα ὁ σίδηρος). Thus one can assume that they made this demonstration to imply that they possessed land that contained iron"[116].

Menander's account suggests, moreover, that iron might have played an important role in representation of political power. It may not be an accident the fact that, immediately after this symbolic offering of iron, Zemarchus and his companions witnessed a strange display of shamanic rituals, which were meant, if we are to believe Menander, to purify the envoys entering the territory of the polity ruled by Sizabul[117]. The association between iron and political power emerges again in Menander's account, as he refers to the envoys sent by Sizabul

[113] Pohl 1988: 194; Ziniakov 1988: 97.

[114] Pohl 1988: 194 – "Diese Wertschätzung stammt wohl daher, daß die Entwicklung der Metallurgie die militärische Überlegenheit und wirtschaftliche Eigenständigkeit der Nomaden mitbegründet hatte".

[115] Mao-Tsai 1958: 5 and 7; Ziniakov 1988: 97; Pohl 1988: 194.

[116] *The History of Menander the Guardsman* 10.3, pp. 118–119. The fact that iron had a symbolic meaning seems to be confirmed archaeologically by iron hoards. It is true that the agricultural implements found in hoards are, without exception, *used* tools, but at least one example, that of the plowshare from Bârlogu, points to a special treatment of the tool before entering the collection. This plowshare was not only repaired but also decorated, and its upper part now served as support for what are believed to be Turkic runes (Nania 1969: 128).

[117] Ibidem, p. 119.

to Constantinople: "With them [Zemarchus and his companions] he [Sizabul] sent another envoy, since the former one, Maniakh, had died. His successor's name was Tagma, *and his title was Tarkhan* [ἄξίωμα δὲ Ταρχάν] (emphasis added)"[118]. What Menander had in mind when referring to Tarkhan was more than a title attached to an individual. Tarkhan, as the Greek word ἄξίωμα allows us to presume, is an office. A late eighth-century Western source, *De Pippini regis victoria Avarica*, confirms this interpretation: as the Frankish armies under Pippin and Eric, the duke of Frioul, reached the Danube in 796, the Avarian khagan came in person, *cum Tarcan primatibus*, to negotiate the peace[119]. The title is also mentioned by early medieval Bulgarian inscriptions. Here tarkhans seem to have belonged to an aristocratic group of a higher rank, but they were specifically linked to the exercise of important state offices: Theodoros *oglu tarqan* mentioned by an inscription of the reign of Symeon (904) was count of Dristros, while *bori tarqan* seems to have been the military governor of Belgrade, an equivalent of the Byzantine title ὑποστράτεγος[120]. The title, however, derives from the name of a legendary blacksmith[121].

If this is true, then we might interpret hoards as associated with that aristocratic group known to early medieval sources as tarkhans. We know that in the late Avarian period, shortly before Charlemagne's expeditions, power shifted from the central government – the Khagan – to local rulers – iugurrus, tuduns, or tarkhans[122]. Their political orientation might have been completely different from that of the central ruler. In 795, the tudun accepted Frankish domination and remained until 803 the most influential political figure in Avaria[123]. The archaeological evidence seems to confirm this process of fragmentation that most probably antedates the collapse of the Avarian khaganate in the hands of Charlemagne's armies. The distribution of male burials marked with weapons reveals the existence of several clusters around Vienna, in the Danubian region of Komárno, and in some other places[124]. Many of these regions are those in which power was already exerted by local factors rather than by the central ruler. If we take into consideration the relationship between the distribution of

[118] Ibidem, p. 123.

[119] MGH Poet. Lat. 1: 117: "*Audiens Cacanus rex, undique peterritus,/protinus ascendens mulam cum Tarcan primatibus,/regem venit adorare et plagare munere*".

[120] Beševliev 1981: 331 and 352 – *Tarqan* is a title attested by the Orkhon inscriptions, as well as by Uygur sources. Cf. Pohl 1988: 302, who observes that this title was still used by Bashkirian princes of the seventeenth century.

[121] Alföldi 1932: 212 and 214 – To Mongols, *darchan* is both the word for blacksmith and the name of the blacksmith's patron; Tarchan is also the name of the blacksmith-god in the Transbaikal region. András Alföldi cautiously noted, however, that in many, if not all, Turkic languages, *tarqan* is a title, not the name of the blacksmith.

[122] Széntpeteri 1993b: 267.

[123] Pohl 1988: 301.

[124] Széntpeteri 1993a: 175.

burials marked with weapons (especially axes), on the one hand, and that of iron hoards, on the other hand, we might infer from it that there is a great degree of continuity of the social mechanisms responsible for power representation. Bulgarian inscriptions suggest that the office of tarkhan was in some way related to hillforts or centers of power, and we have seen that hoards often occur within or near major fortified sites in both Moravia and Bulgaria. The early ninth century was a period of changes in the Bulgarian state, and one of the most important transformations was that of the then tribal-military institutions into more or less formalized administrative state offices[125]. It has been argued, on the other hand, that production of iron artifacts and expansion of new technologies involved in blacksmithing may have been associated with state formation[126]. There are other reasons for suggesting that iron hoards were more than a simple accumulation of wealth. The distribution of eighth- and ninth-century hoards in Romania strikingly coincides with the region commonly identified with "Bulgaria beyond the Danube", mentioned by early medieval sources, where Bulgarians deported the prisoners taken after having conquered Adrianople in 813[127]. The role of this territory in covering the northern border of Bulgaria against Khazaria has not received sufficient attention[128]. Nevertheless, it is a striking coincidence that the last datable artifacts in Romanian hoards may not be later than about 900, that is, contemporary with the disappearance of this march-like border region of Bulgaria in the circumstances of the Bulgarian-Byzantine war and the raids of the Magyars to the Lower Danube[129]. We know that "Bulgaria beyond the Danube" had its own local ruler, who enjoyed a certain degree of autonomy[130], and it is tempting to associate this local power with hoards of iron implements found in the area. The presence of certain types, such as spear-shaped axes, with no parallels in Bulgaria, may substantiate this hypothesis.

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[125] Giuzelev 1978: 77.

[126] Gopak 1976: 56.

[127] Leo Grammaticus, *Chronographia*, ed. by Im. Bekker (Bonn, 1842), pp. 345–346; Symeon Magister, *Annales*, ed. by Im. Bekker (Bonn, 1838), pp. 615–616. For more details on Βουλγαρία ἐκεῖθεν τοῦ Ἴστρου ποταμοῦ, see Tăpkova-Zaimova 1970: 64–65; Brezeanu 1984; Spinei 1985: 49; Spinei 1990: 109–110.

[128] A ninth-century Bulgarian inscription refers to *kopanes* Okorses, who led an expedition to the Dniester, presumably against Khazars. See Beševliev 1963: 281–285 (inscription no. 58, dated to about 823). Cf. Spinei 1985: 49; Spinei 1990: 109; Canache and Curta 1994: 197–198 (who believe that the expedition was organized against Magyars). For more details on Bulgarian-Khazar relations, see Dimitrov 1989. For the attack of the Magyars as allies of the Byzantines, see Dimitrov 1986: 67–68. See also Varady 1989.

[129] For the Bulgarian-Byzantine strife and the subsequent military conflict, see Brătianu 1940: 30–36; Siuziumov 1959: 39–40; Cankova-Petkova 1968: 80–81. For the involvement of the Magyars, see Spinei 1985: 51–52 and Spinei 1990: 117–118.

[130] Tăpkova-Zaimova 1970: 63–65; Brezeanu 1984: 128–129.

CONCLUSIONS

Hoards of iron implements were more than simple collections of iron tools and weapons with an intrinsic value. The deliberate choice of items and the value attached to iron and blacksmithing seem to indicate the conspicuous consumption of a type known to anthropologists as "potlatch"[131]. In the absence of warfare, it may have served a number of functions, such as celebrating rites of passage or succession to office. It was certainly the privilege of an aristocratic group and probably involved the provision of food and of certain other valuables that did not survive in the archaeological record. The potlatch could be used for building alliances with other groups, who were obliged to respond in kind if they were to keep the alliances in being. Under certain conditions, the potlatch could become a form of surrogate warfare, entailing a greater number of participants and involving lavish consumption or even destruction of property. A ceremony which had originally been concerned with the formation and nurturing of alliances became a form of aggressive competition for prestige. Lavish offerings such as hoards of iron, involving either destruction or deposition in locations from which the items could not be recovered, might thus have provided a way of fixing status and of claiming the prestige associated with it. There are at least three reasons for favoring this approach. We have already mentioned the importance of weapons during this period, particularly of those associated with mounted shock combat, and the increasing role of hillforts in contemporary society. It is revealing that in some areas we find a direct relationship between the use of fortified sites and the accumulation of hoards. If this pattern is more than a coincidence, then it would suggest that the deposition of weapons in hoards played a role equivalent to the military posturing associated with fortified sites and, at least in the case of Bulgaria, to a high social rank associated with certain administrative offices. Thus depositions of hoards with axes may have served as "tournaments of value"[132]. Political turmoil and constant warfare, such as those characterizing the history of Great Moravia or the eighth- and ninth-century history of Bulgaria, may have resulted in competitive accumulation and deposition of items in hoards, in order to reinforce prestige. The fact that the same hoarding pattern could be found on a large area across many cultural or political boundaries may also indicate that the social meaning attached to hoards was the lavish provision of offerings[133].

To sum up, it seems possible that in early medieval Eastern Europe a specific system of metal deposits, entirely different from that found in earlier periods in Western Europe or in the Roman Empire, may have become estab-

[131] Rosman and Rubel 1971; for the relationship between potlatch and political organization, see Tollefson 1995.

[132] For potlatch as the hallmark of Tlingit aristocracy, see Tollefson 1995: 68–69.

[133] Bradley 1990: 139 employs A. Appadurai's phrase.

lished. Its adoption may have involved competition for goods with a special, symbolic value, such as iron implements or weapons, and the provision of generous offerings. To some extent, funerary ritual provided the starting point for this development, but this was not the only occasion for acts of conspicuous consumption. In Eastern Europe, it is sometimes possible to relate the development of these transactions to the evidence for the mobilization of productive resources and the creation of royal centers.

ANNEX I

Cross-type correlations

	First	*Second*	*Third*	*Fourth*
A. Agricultural implements				
billknife	axe	sickle ard-share	scythe plowshare	hoe
hoe	axe	plowshare sickle	hoe	horse-bit
scythe	axe	sickle	plowshare	hoe scraping tool
sickle	axe	sickle	plowshare scythe	hoe
coulter	axe	plowshare	sickle	coulter
plowshare	axe	plowshare	sickle	hoe
ard-share	axe	plowshare	sickle	coulter
B. Smith's tools				
anvil	scythe	axe	plowshare	hoe
hammer	axe	hoe	plowshare	sickle
tongs	axe	hoe	plowshare scythe	wimble sickle
C. Wood-carving tools				
chisel	axe	plowshare	sickle	hoe
plane	axe plowshare	sickle	hoe	scythe
scraping tool	axe	plowshare	sickle	hoe scythe
wimble	axe	plowshare	hoe	horse-bit sickle
D. Horse equipment				
stirrup	axe	stirrup	hoe horse-bit	sickle
horse-bit	axe	hoe	plowshare stirrup	sickle
spur	axe	coulter belt	–	–

	First	*Second*	*Third*	*Fourth*
E. Weapons				
axe	axe	plowshare	hoe	sickle
spear	axe	plowshare	sickle	scraping tool
arrow	axe	arrow	knife	sickle
sword	scythe	axe	sickle	scissors
F. Miscellaneous				
"Silesian"				
dish	axe	stirrup	plowshare	bucket
			sickle	hoe
axe-shaped bar	axe	coulter	plowshare	sickle
belt fittings	sickle	axe	horse-bit	spur
		coulter	stirrup	key
key	sickle	hoe	plowshare	coulter
	axe		scraping tool	chisel
scissors	axe	sickle	plowshare	stirrup
bronze				
iron vessel	plowshare	axe	scythe	billknife
wooden bucket	axe	sickle	plowshare	hoe
knife	axe	sickle	plowshare	scythe
ogribka	hoe	horse-bit	–	–

CATALOGUE

1. *Alexandrovo, Liliak county, Tărgovishte district (Bulgaria).* Stray find; contains: 2 tanged shares; Local Museum, Tărgovishte.
   Henning 1987: 114.
2. *Asenovec, Korten county, Sliven district (Bulgaria).* Stray find; contains: 1 plowshare A1 Henning, 1 plowshare A3 Henning, 1 billknife G5 Henning, 1 mattock K11 Henning; Local Museum, Nova Zagora.
   Henning 1987: 114.
3. *Bârlogu, Negrași county, Argeș district (Romania).* Stray find (1964), 3–6 feet far from a habitation structure; contains 19 items (only 9 preserved): 1 anvil, 2 axes IIAa Bartošková (one lost), 1 axe with asymmetrical blade, 2 coulters E1 Henning (one lost), 2 hammers (one lost), 1 mattock K10 Henning, 2 plowshares (1 IVB4 Krasnov, asymmetrical, repaired), 1 socketed share, 2 sickles H2 Henning (one lost), 1 spearhead, 1 pair of tongs, 1 wimble.
   Nania 1969.
4. *Bitica, Sumy district (Ukraine).* Found in a pit (0.50 m deep) on the territory of the early medieval hillfort, not far from a habitation structure; traces of textiles on several items indicate that the hoard was deposed in a bag; contains 141 items: 1 axe IIB Bartošková, 96 glass beads, 3 jingling bells, 1 knife, 26 spiral-shaped bronze ornaments, 1 plane, 1 plowshare A1 Henning (IVB1 Krasnov, asymmetrical), 1 scraping tool P2 Henning, 8 sickles H2 Henning, 2 scythes I5 Henning, 1 spearhead, 1 whetstone.
   Sukhobokov, Voznesenskaia, and Priimak 1989.

5. *Boiadzhik, Jambol district (Bulgaria).* Stray find; contains: 1 coulter E2 Henning, 2 plowshares A3 Henning, 1 sickle H4 Henning.
Henning 1987: 116.
6. *Bozhurovo, Paskalevo county, Tolbukhin district (Bulgaria).* Stray find on the territory of the medieval settlement; contains: 2 cattle bells Q4 Henning, 1 belt buckle, 1 coulter E1 Henning, 1 spade iron F2 Henning, 1 scraping tool P2 Henning, 1 scythe I5 Henning, 8 sickles H2 Henning, 4 stirrups IAb Bartošková; Local Museum, Tolbukhin.
Bobcheva 1972.
7. *Brankovice, Vyškov district (Czech Republic).* Stray find on the territory of the early medieval hillfort; weight: 4 kg; contains: 1 axe IVAa Bartošková, 1 horse-bit with S-shaped ends, 2 horse-bits with straight ends, 3 bucket fittings, 1 mattock K10 Henning; 1 mattock K23 Henning, 4 chain loops, 2 plowshares A1 Henning (1 IB2 Krasnov, asymmetrical, 1 IB3 Krasnov), 2 scraping tools P2 Henning, 1 sickle H2 Henning, 1 stirrup IB Bartošková, 1 stirrup IAa Bartošková, 1 stirrup IIA Bartošková, 1 wimble, 1 unidentified object.
Skutil 1946: 47; Bartošková 1986: 10–11.
8. *Brestiv, Svaliavo county, Zakarpatska region (Ukraine).* Stray find (1935) in a ditch, under a large stone; contains 12 items: 2 sickles H2 Henning, 10 scythes I5 Henning.
Peniak 1980: 121.
9. *Breznice, Příbram district (Czech Republic).* Stray find on the territory of the early medieval hillfort; contains 4 scythes.
Bartošková 1986: 11.
10. *Budești, Cotești county, Vrancea district (Romania).* Stray find (1964), during deep plowing; contains 8 items: 3 coulters E1 Henning, 1 hook, 2 plowshares A1 Henning (IVB4 Krasnov, 1 asymmetrical), 1 stirrup IAa Bartošková, 1 unidentified object.
Paragină and Constantinescu 1980.
11. *Chelopech, Zlatica county, Sofia district (Bulgaria).* Stray find; contains 16 items: 1 axe, 1 lyre-shaped belt buckle, 1 bucket handle, 1 chisel, 1 coulter E1 Henning, 1 key, 1 iron ring, 2 multiple chain loops, 2 scraping tools P2 Henning, 1 sickle H2 Henning, 1 socketed share, 1 spearhead, 1 spike, 1 spur, 18 coins issued by John Tzimiskes.
Mutafchev 1914.
12. *Coșna, Dorna Cândrenilor county, Suceava district (Romania).* Stray find (1960); contains tools and harness items, but only 3 were preserved: 1 billknife, 1 censer, 1 sickle, 1 stirrup.
Mitrea 1972: 121; Teodor 1980: 95–96.
13. *Crăncha, Pazardzhik district (Bulgaria).* Stray find; contains: 1 coulter E2 Henning, 1 plowshare A1 Henning; Local Museum, Pazardzhik.
Henning 1987: 120.
14. *Curcani, Călărași district (Romania).* Stray find (1960), during deep plowing; contains 11 items: 1 arrow head I Ruttkay, 1 fan-shaped axe, 1 hilt guard, 1 iron ring, 1 mattock K23 Henning, 1 knife, 1 scraping tool P2 Henning, 2 scythes I5 Henning, 1 socketed share, 1 pair of tongs.
Comșa and Deculescu 1972.
15. *Dăbraveno, Dălgopol county, Varna district (Bulgaria).* Stray find; contains: 1 coulter E1 Henning, 4 plowshares A1 Henning (2 asymmetrical); Local Museum, Dălgopol.
Henning 1987: 121.
16. *Dălgopol, Varna district (Bulgaria).* Stray find (1958), during deep plowing 2 miles north of the village; all items were found in a large ceramic pot; contains 54 items: 1 axe IIIB Bartošková, 1 billknife G4a Henning, 2 bucket handles with 6 hoops, 4 chisels, 7 coulters E1 Henning, 2 tanged shares, 2 mattocks K10 Henning, 2 mattocks K15 Henning, 1 hook,

4 hook-shaped keys, 2 scraping tools, 9 plowshares A1 Henning (IVB4 Krasnov, 2 asymmetrical), 4 scythes (2 I4 Henning), 6 sickles H2 Henning, 1 spearhead.
Zlatarski 1960.

17. *Debrecen, Hajdú-Bihar district (Hungary).* Stray find; contains 7 items: 3 coulters E1 Henning, 3 plowshares A1 Henning, 1 scythe I5 Henning.
Ecsedi 1931.

18. *Donchevo, Opanec county, Tolbukhin district (Bulgaria).* Stray find; contains 3 items: 1 bronze hammer, 1 plowshare A1 Henning, 1 sickle H1 Henning; Local Museum, Tolbukhin.
Bobcheva 1972.

19. *Dragosloveni, Vrancea district (Romania).* Stray find (1963), in an orchard, in a ditch two feet deep; contains 60 items: 2 anvils, 2 axes IIAb Bartošková, 1 axe with asymmetrical blade, 1 billknife G5 Henning, 1 fan-shaped axe, 2 spear-shaped axes, 1 horse-bit with straight ends, 1 coulter E1 Henning, 1 coulter E3 Henning, 2 hammers, 9 bucket handles, 3 mattocks K10 Henning, 1 mattock K11 Henning, 1 iron ring, 7 plowshares A1 Henning (IVB1 Krasnov, all asymmetrical), 2 scraping tools, 1 scythe I5 Henning, 5 sickles H2 Henning, 3 tanged shares, 1 spearhead, 2 stirrups IAb Bartošková, 7 pairs of tongs, 1 whetstone, 1 wimble.
Comșa and Constantinescu 1969.

20. *Fonyód, Somogyi district (Hungary).* Stray find; contains 3 items: 1 plowshare A1 Henning, 2 mattocks K10 Henning, 1 harpoon; Local Museum, Kaposvár.
Müller 1978.

21. *Gajary, Bratislava district (Slovakia).* Stray find on the territory of the early medieval hillfort; contains 26 items: 21 bronze belt fittings, 1 bronze brooch, 2 sickles H2 Henning, 2 sickles H1 Henning; National Museum, Bratislava.
Bartošková 1986: 11 and 13.

22. *Gajary, Bratislava district (Slovakia).* Stray find on the territory of the early medieval hillfort, not far from the previous hoard; contains 36 items: 1 axe IIAb Bartošková, 1 horse-bit with S-shaped ends, 3 bucket handles with 20 hoops, 2 coulters E1 Henning, 3 flint steels, 1 mattock K10 Henning, 1 hook-shaped key, 3 concave dishes, 2 pairs of scissors, 5 scythes I5 Henning, 10 sickles H2 Henning, 1 spearhead, 1 stirrup IAa Bartošková, 1 stirrup IIA Bartošková, 1 stirrup IIB Bartošková; National Museum, Bratislava.
Bartošková 1986: 14–16.

23. *Gajary, Bratislava district (Slovakia).* Stray find on the territory of the early medieval hillfort; contains 13 items: 1 axe IIICa Bartošková, 1 axe IVAa Bartošková, 1 bucket handle, 1 concave dish, 1 mattock K10 Henning, 2 knives, 2 plowshares A1 Henning (IVB1 Krasnov, 1 asymmetrical), 1 pair of scissors, 1 scythe I5 Henning, 1 sickle H6 Henning, 1 sword.
Bartošková 1986: 17–18.

24. *Glufishevo, Samuilovo county, Sliven district (Bulgaria).* Stray find; contains 15 items: 1 horse-bit V Kirpichnikov, 1 wool comb Q3 Henning, 1 pick mattock, 1 iron ring, 1 plane, 1 plowshare A3 Henning (IБ2 Krasnov), 3 plowshares B1 Henning, 1 spearhead, 1 tool for scraping the kneading trough (*ogribka*), 1 scraping tool P3 Henning, 1 unidentified object, 4 coins issued by Alexius III Comnenus.
Gerasimov 1955.

25. *Gorna Vrabcha, Elov dol county, Pernik district (Bulgaria).* Stray find in a medieval hillfort; contains 6 items: 1 billknife G1b Henning, 1 plowshare B4 Henning, 1 plane, 1 scythe I6 Henning, 1 sword, 1 bronze bowl.
Gerasimov 1955.

26. *Iantra, Polikraishte county, Tărnovo district (Bulgaria).* Stray find; contains 9 items: 1 billknife G1a Henning, 1 mattock K4 Henning, 1 mattock K9 Henning, 4 scraping tools P1 Henning, 1 sickle H1 Henning, 1 sickle H6 Henning; Local Museum, Tărnovo.
Henning 1987: 128.
27. *Ivanovice, Vyškov district (Czech Republic).* Stray find (1885); contains 14 items: 1 axe IIAa Bartošková, 1 axe IIIAa Bartošková, 1 axe IVAa Bartošková, 1 axe IVAb Bartošková, 2 chisels, 1 iron ring, 1 concave dish, 2 plowshares A1 Henning (IB3 Krasnov, 1 asymmetrical), 2 plowshares A4 Henning (1 IA2 Krasnov, 1 IA3 Krasnov), 2 stirrups IIA Bartošková; Local Museum, Olomouc.
Bartošková 1986: 20.
28. *Karanovo, Sliven district (Bulgaria).* Stray find; contains 4 items: 1 plowshare A4 Henning, 1 mattock K11 Henning, 1 mattock L1 Henning, 1 scythe I5 Henning; Local Museum, Nova Zagora.
Henning 1987: 129.
29. *Kirzheman, Atyashevo district, Mordvin Autonomous Republic (Russia).* Stray find; contains 32 items: 1 adze, 3 axes IIAd Bartošková, 1 belt buckle, 1 horse-bit with straight ends, 3 chisels, 3 coulters E1 Henning, 4 iron rings, 3 plowshares A1 Henning (IVB4 Krasnov, 2 asymmetrical), 3 sickles H6 Henning, 9 sickles H2 Henning, 1 knife.
Cirkin 1969.
30. *Knežmost, Mladá Boleslav district (Czech Republic).* Stray find; contains 9 items: 1 jingling bell, 1 horse-bit, 1 mattock K23 Henning, 1 hook, 1 single-edged sword, 1 spearhead, 1 sickle, 1 stirrup; National Museum, Prague.
Bartošková 1986: 20.
31. *Kolochin, Rechica county, Gomel' district (Belarus).* Found in a ditch on the territory of the early medieval hillfort; contains 4 sickles H1 Henning.
Symonovich 1963: 133.
32. *Kostol, Negotin district (Serbia).* Found in a pit in the ninth- to tenth-century settlement; contains 7 items: 1 axe IIIAb Bartošková, 1 axe IIIAc Bartošková, 1 chisel, 1 hammer, 1 plowshare A1 Henning (IБ1 Krasnov), 1 scraping tool P2 Henning, 1 bronze jug with an engraved inscription in Greek (*Psalms of David* 3, 29).
Marjanović-Vujović 1985; Marjanović-Vujović 1988: 157.
33. *Krumvír, Breclav district (Czech Republic).* Stray find (1882); contains 2 items: 1 concave dish, 1 bronze belt strap; Moravian Museum, Brno, and National Museum, Prague.
Bartošková 1986: 20 and 22.
34. *Kúty, Senica district (Slovakia).* Stray find (1944) on the territory of an early medieval settlement; contains 5 items: 1 concave dish, 3 sickles H2 Henning, 1 stirrup IB Bartošková; National Museum, Bratislava.
Bartošková 1986: 22.
35. *Kúty, Senica district (Slovakia).* Stray find on the territory of an early medieval settlement; contains 6 items: 2 hook-shaped keys, 1 scraping tool P2 Henning, 1 plowshare A1 Henning (IB4 Krasnov), 1 scythe I5 Henning, 1 sickle H2 Henning; National Museum, Bratislava.
Bartošková 1986: 22.
36. *Kúty, Senica district (Slovakia).* Stray find (1944) on the territory of an early medieval settlement; contains 5 items: 2 axes IA Bartošková, 1 scraping tool, 1 plowshare A1 Henning (IVB4 Krasnov, asymmetrical), 1 pair of scissors; National Museum, Bratislava.
Bartošková 1986: 22–23.
37. *Kylešovice, Opava district (Czech Republic).* Stray find (1931), from which only 1 asymmetrical plowshare A1 Henning was preserved.
Bartošková 1986: 23.

38. *Lety u Dobrichovic, Prague district (Czech Republic).* Stray find (1936); contains 25 items: 1 axe IIICb Bartošková, 1 axe IIIAc Bartošková, 2 bucket handles with 2 fittings, 1 chisel, 1 cramp, 1 hook, 1 knife, 2 iron rings, 1 scraping tool P2 Henning, 1 plowshare A1 Henning (IVB3 Krasnov, asymmetrical), 1 pair of scissors, 1 scythe I5 Henning, 3 sickles H2 Henning, 2 bronze dishes, 2 bronze buckets; National Museum, Prague.
Bartošková 1986: 23–24.
39. *Lipník, Prerov district (Czech Republic).* Stray find; contains 19 items: 1 axe IIIAa Bartošková, 1 chisel, 6 knives, 1 pair of scissors, 4 sickles H2 Henning, 1 scythe I5 Henning, 2 swords, 2 unidentified objects; Local Museum, Prerov.
Bartošková 1986: 24–25.
40. *Líštany, Louny district (Czech Republic).* Stray find (1936) on the territory of the early medieval hillfort, together with 2 ceramic pots; contains 7 items: 1 axe, 1 key, 3 knives, 1 pair of scissors, 1 bone skate.
Bartošková 1986: 25.
41. *Mayaki, Slaviansk county, Doneck district (Ukraine).* Stray find in a ditch four feet deep, not far from the early medieval hillfort; contains 7 items: 1 axe IIAa Bartošková, 2 axes IIAb Bartošková, 1 axe IIIAc Bartošková, 1 horse-bit, 1 asymmetrical plowshare A1 Henning, 1 mattock K11 Henning.
Mikheev 1968.
42. *Mikulčice, Hodonín district (Czech Republic).* Found inside the church no. 8 of the early medieval hillfort; contains 87 items: 3 axes IIAb Bartošková, 3 axes IVAa Bartošková, 2 axes IVAb Bartošková, 1 axe IVAc Bartošková, 1 axe IVB Bartošková, 1 axe IVCa Bartošková, 1 axe IVCb Bartošková, 2 horse-bits with straight ends, 1 horse-bit with S-shaped ends, 2 chisels, 5 chain loops, 2 coulters E1 Henning, 1 mattock K10 Henning, 1 hook-shaped key, 2 iron rings, 2 pick mattocks, 1 plane, 7 scraping tools, 2 plowshares A1 Henning (IB4 Krasnov), 8 sickles H2 Henning, 4 scythes I5 Henning, 1 stirrup IIB Bartošková, 2 millstones, 1 wimble, 30 axe-shaped bars; Archaeological Institute, Brno.
Bartošková 1986: 26–28.
43. *Mikulčice, Hodonín district (Czech Republic).* Found on the territory of the early medieval hillfort; contains 24 items: 1 adze, 10 arrow heads (2 I Ruttkay), 1 belt buckle, 1 chisel, 1 hammer, 3 knives, 1 scraping tool P2 Henning, 1 sickle H2 Henning, 11 fragments of iron plate, 2 bone plates; Archaeological Institute, Brno.
Bartošková 1986: 26–28.
44. *Mohács, Baranya district (Hungary).* Stray find; contains 6 items: 2 axes (1 IIAb Bartošková), 1 bucket handle, 1 harpoon, 2 plowshares A1 Henning (1 IB4 Krasnov, asymmetrical; 1 IVB4 Krasnov), 1 scraping tool P2 Henning, 3 sickles H2 Henning, 1 scythe I5 Henning, 1 spike, 1 spit.
Kiss 1963.
45. *Morávský Ján, Senica district (Slovakia).* Stray find (1933), on the Morava River's bank, in a ditch two feet deep; contains 39 items: 1 axe IIAd Bartošková, 1 axe IIIAa Bartošková, 1 jingling bell, 11 bronze belt straps, 3 billknives G2b Henning, 4 horse-bits with straight ends, 1 iron bucket, 2 hammers, 1 hook, 1 hook-shaped key, 3 iron rings, 2 scraping tools P2 Henning, 1 plowshare A1 Henning (IB4 Krasnov, asymmetrical), 1 tanged share, 1 spade iron F2 Henning, 1 spearhead, 1 stirrup IA Bartošková, 1 stirrup IB Bartošková, 1 wimble, 1 unidentified object; National Museum, Bratislava.
Bartošková 1986: 33–36.
46. *Mutenice, Hodonín district (Czech Republic).* Stray find; contains 6 items: 3 axes IIA Bartošková, 1 axe IIIAb Bartošková, 1 axe IVAc Bartošková, 1 axe-shaped bar; Moravian Museum, Brno, and National Museum, Prague.
Bartošková 1986: 36.

47. *Nartski Novaki, Dugoselo district (Croatia).* Found in a ditch, about 330 feet away from the Sava River; contains 12 items: 1 Frankish axe (*francisca*), 2 axes IA Bartošková, 2 axes IIAb Bartošková, 1 fan-shaped axe, 1 knife with bronze handle, 1 scraping tool P2 Henning, 1 spearhead, 2 spikes, 1 unidentified object.
Simoni 1982.
48. *Nizhne Borki, Temnikovski district, Mordvin Autonomous Republic (Russia).* Stray find (1968), during deep plowing; contains 17 items: 5 arrow heads, 1 adze, 1 socketed share, 3 chain loops, 1 plane, 4 plowshares A5 Henning (2 IA4 Krasnov, 2 IIIБ2 Krasnov), 1 sickle H2 Henning, 1 wimble.
Cirkin 1971.
49. *Obrejița, Tâmboiești county, Vrancea district (Romania).* Stray find; contains 12 items: 2 plowshares A1 Henning (1 asymmetrical), 3 sickles H2 Henning, 1 sickle H1 Henning, 1 billknife G4b Henning, 2 scythes I5 Henning, 1 tanged share, 1 belt buckle, 1 unidentified object; Local Museum, Râmnicu-Sărat.
Florentin-Liviu Cristea (Râmnicu-Sărat), unpublished, personal communication.
50. *Oslavany, Brno-venkov district (Czech Republic).* Stray find, together with 4 sherds of wheeled pottery; contains 8 items: 1 bucket handle, 2 scythes I5 Henning, 1 file, 4 sickles H2 Henning; Moravian Museum, Brno, and National Museum, Prague.
Bartošková 1986: 36–37.
51. *Palanka, Nitra district (Slovakia).* Stray find; contains 11 items: 2 mattocks K10 Henning, 2 plowshares A1 Henning, 7 sickles H2 Henning; Naturhistorisches Museum, Vienna.
Henning 1987: 139.
52. *Pliska, Shumen district (Bulgaria).* Found near the palace of the "interior city"; contains 3 items: 1 plowshare A2 Henning (IIБ1 Krasnov), 1 plowshare A3 Henning (IB2 Krasnov), 1 tanged share.
Antonova and Damianov 1969.
53. *Plužná, Mladá Boleslav district (Czech Republic).* Stray find; contains 4 items: 1 axe IIAc Bartošková, 1 axe IIC Bartošková, 1 horse-bit, 1 coulter E1 Henning; Local Museum, Belé.
Bartošková 1986: 37.
54. *Pobedim, Trenčín district (Slovakia).* Found in a ditch in the southern rampart of the early medieval hillfort (1960); contains 27 items: 1 horse-bit with straight ends, 1 coulter E1 Henning, 1 belt buckle, 1 sickle H2 Henning, 5 spurs, 18 axe-shaped bars.
Bartošková 1986: 38–40.
55. *Pölöske, Zalaegerszegi county, Zala district (Hungary).* Stray find; contains 3 items: 1 coulter E1 Henning, 1 mattock K11 Henning, 1 plowshare A4 Henning.
Müller 1971: 250.
56. *Prachov, Jičín district (Czech Republic).* Found in the rampart of the early medieval hillfort; contains 4 items: 1 concave dish, 3 stirrups IAb Bartošková; National Museum, Prague.
Bartošková 1986: 49.
57. *Preslav, Shumen district (Bulgaria).* Stray find; contains 10 items: 1 axe with asymmetrical blade, 1 billknife G5 Henning, 2 hook-shaped keys, 1 scythe I5 Henning, 5 sickles H2 Henning.
Dzhingov 1966: 52–53.
58. *Preslav, Shumen district (Bulgaria).* Stray find near the northern gate of the medieval fortress; contains 20 items: 7 billknives G5 Henning, 4 knives, 2 fishing lines, 6 sickles H4 Henning, 1 tool for scraping the kneading trough (*ogribka*).
Vitlianov 1978.
59. *Prítluky, Breclav district (Czech Republic).* Stray find (1952); contains 4 items: 1 axe IIIAa Bartošková, 1 mattock K10 Henning, 1 mattock K11 Henning, 1 plowshare A3 Henning (IБ2 Krasnov).
Bartošková 1986: 49–50.

60. *Provadiia, Varna district (Bulgaria).* Stray find; contains 2 items: 1 coulter E1 Henning, 1 plowshare A1 Henning; Local Museum, Provadiia.
Henning 1987: 143.
61. *Provadiia, Varna district (Bulgaria).* Stray find; contains 5 items: 1 mattock K11 Henning, 1 pick mattock, 1 scraping tool, 1 plowshare A3 Henning, 1 tanged share; Local Museum, Provadiia.
Henning 1987: 143.
62. *Radovanu, Călărași district (Romania).* Stray find (1964), during deep plowing; contains 6 items: 1 anvil, 1 arrow head I Ruttkay, 1 axe IIAb Bartošková, 1 axe with asymmetrical blade, 1 spear-shaped axe, 1 coulter E3 Henning.
Comșa and Gheannopoulos 1969.
63. *Rajhrad, Brno district (Czech Republic).* Found in 1960, on the territory of the early medieval hillfort; contains 3 items: 1 coulter E1 Henning, 1 hook-shaped key, 1 sickle H2 Henning; Archaeological Institute, Brno.
Bartošková 1986: 50.
64. *Rajhrad, Brno district (Czech Republic).* Found in 1960, on the territory of the early medieval hillfort; contains 10 items: 3 scythes I5 Henning, [illegible] sickles H2 Henning; Archaeological Institute, Brno.
Bartošková 1986: 50.
65. *Razlog, Blagoevgrad district (Bulgaria).* Stray find; contains 5 items: 1 plowshare A1 Henning, 4 sickles H4 Henning.
Karkelev 1971.
66. *Răstoaca, Milcovul county, Vrancea district (Romania).* Stray find (1968); contains 6 items: 1 axe IIAb Bartošková, 1 axe IIB Bartošková, 1 scraping tool P1 Henning, 2 coulters E1 Henning, 1 coulter E2 Henning.
Paragină 1979.
67. *Râpa, Tinca county, Bihor district (Romania).* Stray find; contains 5 items: 1 chisel, 1 knife, 1 ladle, 1 plane, 1 sickle.
Dumitrașcu 1978: 69.
68. *Rumaniia, Dălboki county, Stara Zagora district (Bulgaria).* Stray find; contains 5 items: 1 billknife G3a Henning, 1 pick mattock, 1 plowshare A4 Henning, 1 scythe I4 Henning, 1 tanged share; Local Museum, Nova Zagora.
Henning 1987: 145.
69. *Sebenje, Bled district (Slovenia).* Stray find (1985) under a massive pile of stones; weight: 5.976 kg; contains 24 items: 1 horse-bit with straight ends, 2 bucket handles, 1 chisel, 1 hook, 1 knife, 3 iron rings, 1 plowshare A1 Henning (IVB1 Krasnov), 4 socketed shares, 2 sickles H2 Henning, 2 spearheads, 2 stirrups IAa Bartošková, 2 wimbles, 1 unidentified object (awl?).
Pleterski 1987.
70. *Semice, Nymburk district (Czech Republic).* Stray find; contains 11 items: 1 horse-bit with S-shaped ends, 1 axe IIAa Bartošková, 1 axe IIICa Bartošková, 1 knife, 1 scraping tool P2 Henning, 1 plowshare A4 Henning (IIIB2 Krasnov), 2 scythes I5 Henning, 2 sickles H2 Henning, 1 spearhead; National Museum, Prague.
Bartošková 1986: 50–51.
71. *Sklabina, Martin district (Slovakia).* Stray find (1958); contains 8 items: 2 axes IIAa Bartošková, 1 chisel, 1 coulter E1 Henning, 1 mattock K10 Henning, 1 plowshare A1 Henning (IB4 Krasnov), 1 spearhead, 1 socketed share; Slovak National Museum, Martin.
Bartošková 1986: 51–53.

72. *Smolnice, Louny district (Czech Republic).* Stray find; contains 4 items: 1 coulter E1 Henning, 1 plowshare A3 Henning (IБ2 Krasnov), 1 plowshare (IБ1 Krasnov), 1 wimble; City Museum, Prague.
Bartošková 1986: 53.
73. *Stambolovo, Mikhalci county, Ruse district (Bulgaria).* Stray find (1979); contains 39 items, all deposited in a large ceramic pot: 3 axes IIAb Bartošková, 1 billknife G5 Henning, 1 wooden bucket fitting, 2 cramps, 1 iron ring, 4 hook-shaped keys, 1 plane, 4 plowshares A1 Henning (2 IVB3 Krasnov, 1 asymmetrical, 2 IVB4 Krasnov), 1 socketed share, 11 scythes I5 Henning, 2 sickles H2 Henning, 6 sickles H4 Henning, 2 plowshares B2 Henning, 1 fragment of a sword blade, 1 unidentified object; Local Museum, Veliki Tărnovo.
Stanchev 1985.
74. *Staré Mesto, Uherské Hradište district (Czech Republic).* Found in a pit in the early medieval hillfort; contains 18 items: 2 bucket handles, 2 millstones, 14 axe-shaped bars; Old Slavic Museum, Staré Mesto.
Bartošková 1986: 53–54.
75. *Staré Zámky, Brno-mesto district (Czech Republic).* Found in a pit in the early medieval settlement; contains 23 items: 4 bucket handles, 1 handcuff, 1 hook-shaped key, 4 knives, 1 plane, 2 sickles H1 Henning, 1 sickle H2 Henning, 1 bone skate, 4 millstones, 2 unidentified objects; Archaeological Institute, Brno.
Stana 1961.
76. *Stoil Voivoda, Sliven district (Bulgaria).* Stray find; contains 2 items: 1 pick mattock L1 Henning, 1 plowshare A3 Henning; Local Museum, Nova Zagora.
Henning 1987: 148.
77. *Strezhevo, Bitola district (Macedonia).* Found in a ditch near a sixth-century basilica; contains 31 items: 3 horse-bits with straight ends, 1 chisel, 1 cross, 1 hammer, 1 mattock K11 Henning, 2 hook-shaped keys, 1 plane, 1 drag-hoe with 5 tines, 1 sickle H2 Henning, 15 stirrups I Kirpichnikov, 1 trowel, 2 wimbles.
Janakievski 1980.
78. *Svépravice, Praha-východ district (Czech Republic).* Stray find; contains 5 items: 2 knives, 1 plowshare A1 Henning (IB4 Krasnov), 1 saw, 1 bronze earring; City Museum, Prague.
Bartošková 1986: 57.
79. *Șieu, Bistrița-Năsăud district (Romania).* Stray find (1970), in a ditch three feet deep; weight: 42 kg; contains 10 items: 3 axes IIB Bartošková, 2 coulters E1 Henning, 2 coulters E2 Henning, 2 plowshares A1 Henning (IVB4 Krasnov), 1 knife.
Dănilă 1972.
80. *Tutrakanci, Provadiia county, Varna district (Bulgaria).* Stray find; contains 2 plowshares A1 Henning.
Henning 1987: 152.
81. *Tvarožná Lhota, Hodonín district (Czech Republic).* Stray find (1901); contains 7 items: 1 mattock K10 Henning, 1 iron ring, 1 scythe I5 Henning, 1 sickle H6 Henning, 1 sickle H2 Henning, 1 sickle H1 Henning, 1 spur; Moravian Museum, Brno, and National Museum, Prague.
Bartošková 1986: 57.
82. *Verkhnia Viznica, Mukachëvo county, Zakarpatska region (Ukraine).* Stray find (1932), in a ditch, under a large stone; contains 3 items: 2 scythes I5 Henning, 1 sword.
Peniak 1980: 121 and 125.
83. *Vlashko Selo, Staliiska makhala county, Mikhailovgrad district (Bulgaria).* Stray find; contains 5 items: 2 coulters E1 Henning, 2 mattocks K10 Henning, 1 sickle H2 Henning.
Henning 1987: 154.

84. *Vršac, Voivodina region (Serbia).* Stray find near the city (site Ciglana); contains 11 items: 2 axes IIAb Bartošková, 2 axes IIB Bartošková, 1 axe IIIAb Bartošková, 1 mattock K10 Henning, 4 plowshares A1 Henning (IB4 Krasnov), 1 sickle H2 Henning.
Barački 1960.
85. *Vršac, Voivodina region (Serbia).* Stray find (1956) near the city (site Crvenka); contains 21 items: 1 axe IVAb Bartošková, 1 axe IIIB Bartošková, 1 axe with asymmetrical blade, 1 chisel, 2 hammers, 1 mattock K5 Henning, 1 knife, 1 pick mattock, 1 plowshare A2 Henning (IIB2 Krasnov), 1 scythe, 1 horseshoe, 4 sickles H2 Henning, 1 spade iron F2 Henning, 1 stirrup IX Kirpichnikov, 1 scraping tool P2 Henning, 1 pair of tongs, 1 unidentified object.
Barački 1960.
86. *Vršac, Voivodina region (Serbia).* Stray find (1958) near the city (site Crvenka); contains 6 items: 2 ingots, 1 sickle H2 Henning, 2 tanged shares, 1 plane, 1 unidentified object.
Barački 1960.
87. *Vršatecké Podhradie, Považská Bystrica district (Slovakia).* Stray find (1965); contains 20 items: 3 anvils, 1 axe IIAb Bartošková, 1 axe IIB Bartošková, 1 axe IVAb Bartošková, 1 chisel, 1 coulter E2 Henning, 1 mattock K9 Henning, 1 mattock K10 Henning, 2 planes, 1 plowshare A4 Henning (IБ1 Krasnov), 1 scythe I5 Henning, 4 pairs of tongs, 1 axe-shaped token, 1 unidentified object; Local Museum, Nitra.
Bartošková 1986: 58–60.
88. *Zadiel, Košice district (Slovakia).* Stray find (1878); contains 3 items: 2 coulters E1 Henning, 1 asymmetrical plowshare A1 Henning (IVB1 Krasnov); State Museum, Uzhgorod.
Bartošková 1986: 60.
89. *Zlatar, Dragoevo county, Shumen district (Bulgaria).* Found on the territory of the early medieval settlement; contains 6 items: 1 billknife G3b Henning, 1 mattock K11 Henning, 1 sickle H4 Henning, 1 socketed share, 2 tanged shares.
Totev 1966.
90. *Žabokreky, Topol'čany district (Slovakia).* Found in a pit in the early medieval settlement (1961), together with ceramic potsherds; contains 14 items: 1 iron bucket, 1 coulter E1 Henning, 1 plowshare A1 Henning (IB2 Krasnov), 2 scythes I5 Henning, 3 sickles H2 Henning, 6 axe-shaped bars; Archaeological Institute, Nitra.
Bartošková 1986: 60–61.
91. *Žabokreky, Topol'čany district (Slovakia).* Found in a pit in the early medieval settlement (1962), next to the previous hoard; contains 40 items: 1 axe IIIA Bartošková, 1 bucket handle, 2 chisels, 2 coulters E1 Henning, 1 mattock K10 Henning, 1 hook-shaped key, 1 iron ring, 1 plane, 2 scraping tools P2 Henning, 2 plowshares A1 Henning (IB4 Krasnov), 2 plowshares A4 Henning (IБ1 Krasnov), 4 scythes I5 Henning, 9 sickles H2 Henning, 1 wimble, 10 axe-shaped bars; Archaeological Institute, Nitra.
Bartošková 1986: 61–62.
92. *Žitavsksá Tôn, Komárno district (Slovakia).* Stray find (1936) in a ditch eight feet deep; contains 9 items: 1 axe IIB Bartošková, 1 axe IIAc Bartošková, 1 axe IIIC–IVCa Bartošková, 1 axe IIICb Bartošková, 1 axe IVCa Bartošková, 2 coulters E1 Henning, 1 scythe I5 Henning, 1 unidentified object; Danube Museum, Komárno.
Bartošková 1986: 64.

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