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Weapons in the 10–11th century Carpathian Basin

Studies in weapon technology and methodology – rigid bow applications and southern import swords in the archaeological material

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I. Introduction

10–11th century AD weaponry has always been a preferred topic of Hungarian history: as early as the end of the 19th century, a great deal of attention was paid to the issue by military historians and amateur archaeologists. It seems pretty clear though that this affection rooted in the *Zeitgeist* of the era, which in turn determined the common view and overall historical interpretation of the topic, as the celebrations, devoted to the millennium of the Hungarian conquest of the Carpathian Basin at the very end of the 9th century, attracted nationalist pride and secured the ruling ideology.

After World War II former scientific traditions were abruptly aborted as dramatic changes in the political and ideological structure of modern Hungary took shape during the late 1940s and 1950s. On the other hand, an undeniable though peculiar development of the so-called "archaeology of the conquest period" in the second half of the 20th century provided that more and more specific questions and topics were investigated – mostly on the basis of objective archeological methodology without any ideological add-ons. Thus – primarily due to the works of L. Kovács, L. Révész and A. Ruttkay[1] – a considerable portion of the *Typenspektrum* of the weaponry in question had already been discussed. Among others, axes, sabers and quivers were the subject of detailed research. Kovács also managed to summarize in depth the current state of the research a few times.[2] Hence it is fair to say that the second half of the 20th century saw the rise of an independent archaeological research.

However, with the advent of the reenacting movement in Hungary in the early 1990s the situation changed considerably: a rapidly growing stratum of the modern Hungarian society generated a hitherto unknown interest on the weapons of the "ancient *Magyars*". Many of these people are deeply attracted to the idea of the powerful Magyar bow, the *Wunderwaffe* of the ancestors, thus creating identity through triumphant history, maintaining and reassuring self-confidence. This in turn gave birth to the revival of horseback archery, bowyery and archery in general. As a result, the Magyar bow became one of the most important symbols of

1 See for example Ruttkay 1975–1976; Kovács 1977; 1978–1979; 1981; 1993; Révész 1985; 1991; 1996.
2 Kovács 1976; 1986; 2003.

national pride and commitment (it is thus fair to draw a compelling parallel between the late 19th and early 21th century social phenomena). However, the academic world, i.e. in our case, archaeology, failed both to recognize the situation and to realize its own potential. Consequently, a somewhat grotesque, mostly ignoring relationship has evolved between the two sides. Entrepreneurs on the other hand responded quickly and decisively: a thriving market of replica weaponry and equipment took shape to match the needs of customers. Unfortunately these replicas are generally not authentic or exact copies of the archaeological material. The Magyar bow, of which countless variants are sold as a niche product of the market, serves as an excellent example. However, no progress has been made in the research of the bow since the pioneering study of K. Cs. Sebestyén in 1932,[3] though the amount of related archaeological material has increased tenfold. Although reconstructions and physical modeling made by Gy. Fábián[4] and G. Szőllősy[5] have expanded our understanding of rigid type bows in general, due to the unprocessed state of archaeological material at hand, it is fair to conclude that not only specific but even main features of the 10th–11th century "Magyar bow" are yet unknown.

The original aim of the thesis was to cover all aspects and all types of Magyar weaponry. However, after learning the quantity and quality of the relevant archaeological material, the unfeasibility of that aim became obvious mainly due to limitation in length of the present work. Thus in the light of the overall state of research and the above mentioned social demand, a reduction of the topic was necessary. Further, it seemed more reasonable to challenge and elaborate more specific issues, reaching new evidence and conclusions. Finally, the two main topics of the thesis were determined in accordance with the precondition that they ought to have strong connections to current topics of international weapon research. First of all, the main emphasis of this work is the recognition of all structural and constructional aspects of the bow of the ancient Magyars on the base of elaborate attribute-analyses and careful structural-functional classification. As no material of comparable quantity has yet been processed in similar detail, and since the international research is fairly diverse due to the lack of common terminology and methodology, it was necessary to deal with these issues in a separate chapter. However, the topic of bow grip applications were omitted from the discussion, as they bear less or insignificant information on the construction and technology of the bow. Keeping in mind the problematic nature of the source criticism of burial assemblages, the evaluation of certain aspects of rigid bow applications in graves (position, quantity and combinations) were also skipped.

The issue of 9th–11th century Byzantine/Islamic swords in the Carpathian Basin and their Mediterranean typological relations has provided the second topic: although the reevaluation of Byzantine material culture and swords in particular is on the rise again, papers offering detailed comparative analyses are unfortunately scarce. Hence my efforts to define representative attributes of both the hilt and the blade contribute notably to the international research, by creating a comprehensive classification that enables – even in the lack of archaeometallurgical analysis – an unambiguous determination of swords forged and hilted in the Eastern Mediterranean. The comparative evaluation of Scandinavian-European and Byzantine/Islamic sword attributes led to important conclusions regarding questions about industrial history in general, and about the receptivity of foreign products in the Early Middle Ages.

3 Sebestyén 1932.
4 Fábián 1967; 1984.
5 See for example Szőllősy 1987–1989; 2002.

The applied method of work was necessarily objective and rested on all observable attributes of the artifacts. According to the contained information, be it functional, structural or anything else (like chronological, chorological or cultural, etc.), a hierarchy of attributes could be ascertained. Thus the 'quality' of attributes enabled a classification that produced types – though artificial, but – interpretable on archaeological, weapon historical, cultural grounds. The thesis focuses only on these types, subtypes, variants and their mutual correlation. The aspects and problems of the burial context, like correspondence of the weapons to other artifacts and phenomena (bioarchaeology, physical anthropology, funerary practice, etc.) are not discussed here as these questions are beyond the scope of this study. However, future research into these topics is also inevitable.

II. Rigid bow applications and bows in the material culture of the 10th–11th century in the Carpathian Basin

II.1. Introduction to the archaeology of pre-Mongol rigid bows of Eurasia: terminological and methodological considerations

At the beginning of the chapter, an attempt is made to find a suitable, unambiguous term for the bows surveyed here, through an epistemological analysis of the terminology of bows in general.[6] As the structure of the arms (complex or simple) and the reflex or deflex of the bow cannot be unequivocally ascertained on the basis of the archaeological data alone, the initiation of the 'rigid' term seemed appropriate, as it properly describes the main characteristic of the archaeological record. Concerning the terminology of rigid bow applications, different Russian, English, German and Hungarian terms were unified into a coherent system, emphasizing certain related theoretical problems of function (strengthening versus decoration or structure) and material (bone versus antler). Thus an objective terminology was proposed, which, besides the main formal characteristic of the application (plate or rod), also indicates its location (grip or tip) and position (frontal, dorsal or lateral).

The subsection concerning source criticism and research methods starts with the usage of artistic sources. In order to demonstrate the general unrealism, abstraction and thus inapplicability of the artistic depictions, the finds from Kurgantepe (Uzbekistan)[7] were analyzed, where both pictorial and archaeological evidence were unearthed in the same grave. The types, quality and general 'worth' of information (fabrication, structure, function, use-wear traces, etc.) derived from the archeological record (i.e. rigid bow applications) were discussed in greater length. Furthermore, from the fact that rigid bow applications were once part of a complicated and complex mechanical machine, arose the epistemological question, whether these applications can be understood and discussed separately or only as parts of the whole entity, i.e. the bow. For it makes real difference, if one classifies and evaluates the application or only the bow itself. The aim of the prolonged theoretical discussion of the chapter is to provide a firm methodological base for the analysis of the 10th–11th century material in the Carpathian Basin. At last, to demonstrate the enormous importance of well-preserved bow finds, i.e. the ultimate source of research, a list of all pre-Mongol period rigid bow finds in Eurasia was compiled and evaluated. Thus the chronological and chorological aspects of well-preserved bows were given, while overall source critical problems (archaeological context, available information, state of preservation, etc.) were also concerned.

6 Former approaches: Gaunt 1983; Савин – Семенов 1995.

7 For a new analysis of the find, see Mode 2006.

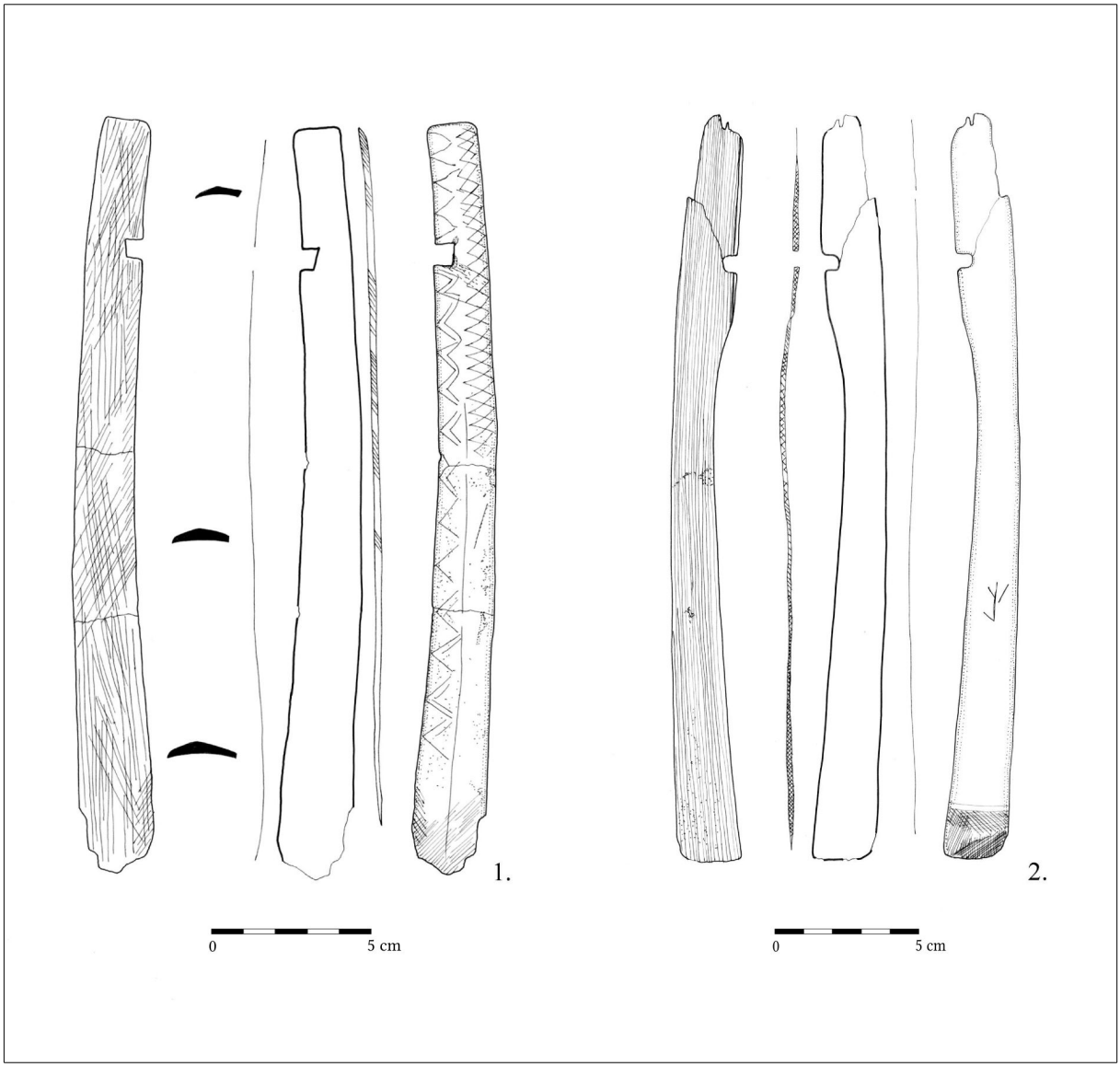

Fig. 1. Lateral tip plate types: 1. Type I: Békés-Povádzug, burial No. 45. 2. Type II: Hajdúszoboszló-Árkoshalom, burial No. 248 (drawings by the author).

II.2. External source critical aspects of 10th–11th century rigid bow applications in the Carpathian Basin

The uniqueness and great quantity of 10th–11th century bow applications in the Carpathian Basin required a separate, full chapter to deal with the so-called *äussere Quellenkritik* of the archaeological material. Since archaeological theory has yet failed to give a coherent methodological model that would adequately describe source critical problems, an attempt was made here to define and differentiate external and internal source criticism according to the formation and continuous information-degradation of the archaeological record, partly on the basis of former notions of H. J. Eggers, M. K. H. Eggert and M. B. Schiffer.[8] External source critical analysis is fundamental, as it defines the reliability of the inherent information of the record – whether and to what extent can it be evaluated and interpreted.

8 Eggers 1959; Schiffer 1996; Eggert 2005.

The analysis of 10th–11th century rigid bow applications provided an elaborate picture on the quality and shortcomings of publications, and on the context and temporal distribution of the findings. The general tendency of mending documentation techniques on excavations must be emphasized as the grave and its burial phenomena (e.g. the position and correlation of rigid bow applications) are literally destroyed during the excavation. The discussion of disturbance is also of fundamental importance, since the fragmentary state, location, position and mutual relation of bow applications in a burial provide information on the related funeral practice, and in certain cases, on the structure or dimensions of the bow. I also drew attention to the fact that 10th–11th century bow applications are frequently found in unexpected location and position in the graves, even when the burial is assuredly undisturbed. However, the relatively high number of undisturbed burials offers great possibilities for future studies of correlating artifacts, burial phenomena and thus for relative chronology. In order to determine, which graveyards are eligible for horizontal stratification or seriation, the complete population of cemeteries with bow applications and the percentage of burials with bow applications in each cemetery were studied. As a conclusion, it must be emphasized that though the general characteristics of bow applications (thin, fragile and often overlooked objects) have a negative effect on the quality of the archaeological record, the overall picture looks fairly favorable.

II.3. Lateral tip plates in the 10th–11th century Carpathian Basin

As lateral tip plates are the most typical and change-sensitive artifacts of all bow applications under discussion, their formal groups and variations were analyzed in particularly high detail. Personal observation ascertained that a whole lot of formal attributes can be defined on each plate. Since the abundance of attributes, a precursory decision was made that the classification should be based only on major attributes, which are already striking at first sight. The most significant formal variation proved to be the presence or absence of a certain protrusion (i.e. 'head') on the frontal edge of the plates. Thus the two main types of lateral tip plates are easily differentiated *(Fig. 1)*. Albeit the shape and size of the 'head' can be fairly discrepant, all plates with 'head' (henceforth type II) agree that their frontal edges are cut outward, while the cut plane is scraped or scored (the shaping of the frontal edge at the protrusion is usually uncut and unscored). In accordance with former assumptions of K. Cs. Sebestyén,[9] A. M. Savin and A. I. Semënov,[10] it is highly probable that the outward cut and scored frontal edges provided a gluing surface for the end of the sinew band of the flexible arm. As a rule however, most of type I plates (i.e. lateral tip plates without a 'head') have uncut and unscraped frontal edges. It is a fairly common phenomenon though that one plate of a pair has inward cut and scraped frontal edge – however this correlates with a specific tip structure, which will be discussed below. Uncut and unscraped surfaces of the frontal edges thus exclude the possibility of sinew-mount on the tip. Furthermore, it was evident that the formal classification unambiguously coincided with significant structural and manufacturing differences (see below). These in turn confirm the precursory, artificial typological scheme. It was also possible to differentiate further subtypes and variants in each type, but they are less interpretable and relevant from a structural point of view.

9 Sebestyén 1932, 185–186.
10 See for example Савин – Семёнов 1992a.

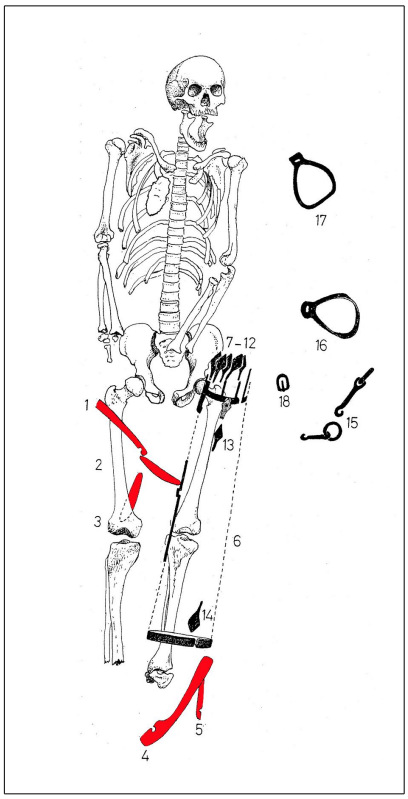

Fig. 2. Different types of lateral tip plates in a burial: Letkés-Téglaégető II. cemetery, burial No. 71. (after Bakay 1978, 115).

The proportion of types I and II showed an interesting picture: the number of burials with lateral tip plates of type I significantly overwhelm the amount of graves with type II tip plates. Furthermore, there are only five burials, where both types were unearthed. However, in three cases it could be established that plates originating from at least two different bows were placed in the pit during the funeral *(Fig. 2)*, while the remaining two burials were poorly documented due to their early excavation at the beginning of the 20th century. Despite this sharp division there is unfortunately no way to define any difference between the two types in terms of chronology or chorology as attested by a series of cemeteries, where both types were extant and concurrent. Most interestingly, type II lateral tip plates only appear in cemeteries where type I plates are also found. On the other hand, there is a fair number of cemeteries, where only type I plates were present. Another subsection of the chapter deals with the problem of asymmetry and symmetry of bow tips on the basis of metric analysis of lateral tip plates. The results point out that essential differences in the size of opposite tips of the same bow are encountered in only in extreme and few cases in the 10th–11th century Carpathian Basin. A special group formed of lateral tip (and grip) plates with an angular external surface should be mentioned as well, since these markedly cluster around the present town of Szeged in South Hungary, which might denote a local workshop or bowyer tradition *(Fig. 3)*.

In order to properly define and refine the typological aspects of 10th–11th century lateral tip plates of the Carpathian Basin, a short outline and analysis of eastern typological relations was more than necessary. First of all it could be ascertained that the former notion[11] of an affiliation between the so-called Khazar type and Magyar II type tip plates is false, since these two types show crucial dissimilarity in terms of both formal and structural attributes. A direct typological contact is thus rather unlikely, though it can be assumed that both types had a somewhat common origin. Due to my classification of the hitherto published 9th–10th century lateral tip plate material from the North Caucasus *(Fig. 4)*,[12] closer parallels could be identified in the late Alanic material. In accordance with the latest results of K. A. Mikhailov and S. Yu. Kainov[13] however, perfect parallels of Magyar type tip plates can be identified only in the elite *druzhina* burials of the old Rus. In one case furthermore, due to perfect attributional and structural conformity with Magyar plates of type II, it was possible to assume that the fabrication of the bow took place in the Carpathian Basin.

11 Szőllősy 2002, fig. 2.
12 Тихонов – Хафизова n.d., Рис. 3.
13 Mikhailov – Kainov 2011.

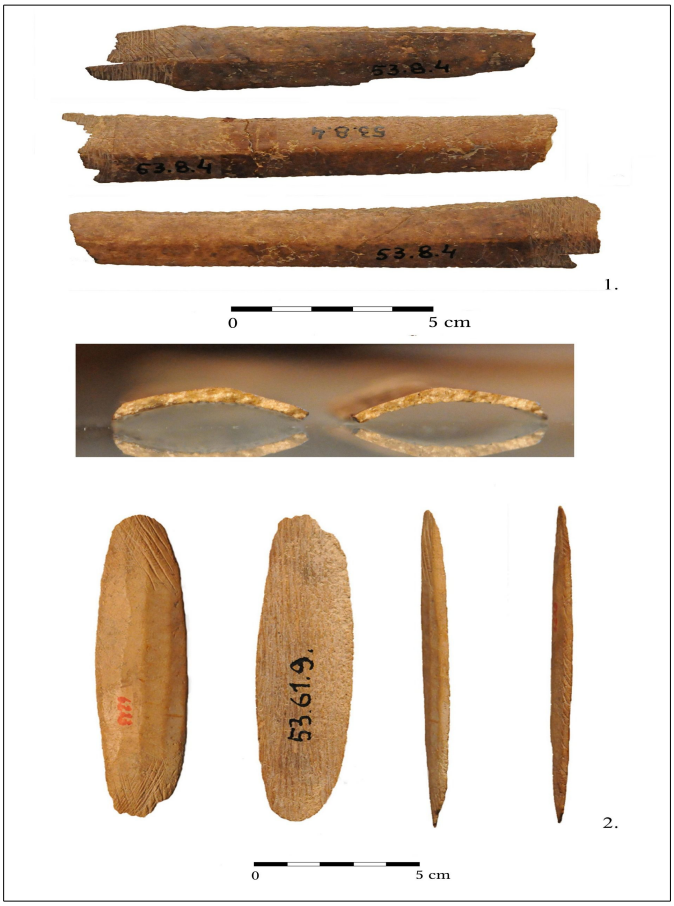

Fig. 3. Lateral tip and grip plates with segmented external surface: 1. Kiszombor cemetery F, burial No. 1. 2. Szatymaz-Jánosszállás, Gróf Árpád földje, burial No. 3 (photo by the author).

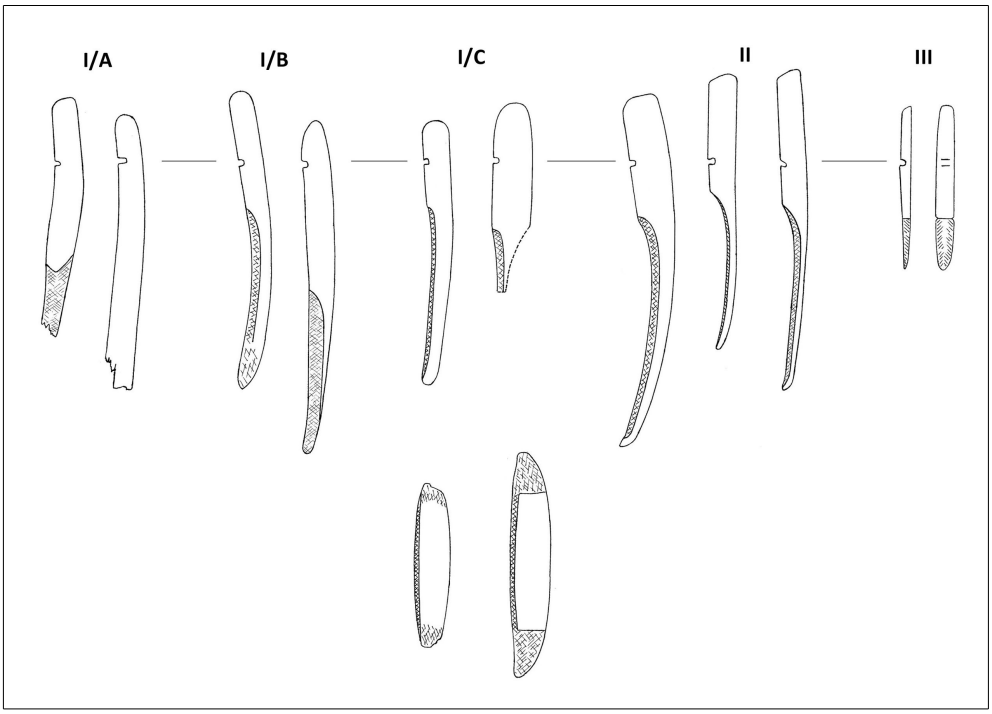

Fig. 4. Classification of hitherto published lateral tip plates from the North-Caucasus, 9–11th century AD (after Тихонов-Хафизова n.d.)

Fig. 5. Intact lateral tip plate without carved nock for the bowstring: Biharkeresztes-Bethlen Gábor utca 25, burial No. 2 (photo by the author).

Fig. 6. Traces of secondary modification, repair of lateral tip plates: Békés-Povádzug, burial No. 58 (photo by the author).

A separate subsection deals with various pre-depositional damages and damage types, though the interpretation of the phenomena lead to the domain of funeral (symbolic) activities and intentional manipulation. Intact lateral tip plates without a carved nock for the bowstring were also meticulously analyzed, which raised the question of symbolic, afunctional bows *(Fig. 5)*. Secondary tinkering (with a functional aim) was identified only in two cases in the material – a striking dissimilarity with tip plates of the Avar period, which provides an interesting insight into the general attitude towards bows and bow plates of the period *(Fig. 6)*.

II.4. Dorsal tip plates in the 10th–11th century Carpathian Basin

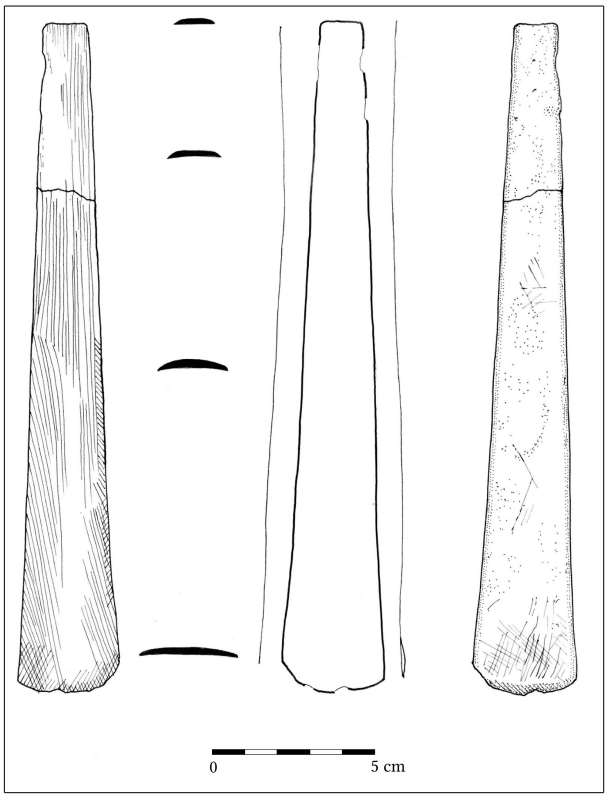

Fig. 7. Dorsal tip plate: Sárrétudvari-Hízóföld, burial No. 80 (drawings by the author).

According to their typological status and importance regarding tip structures, a separate chapter was devoted to dorsal tip plates, despite their drastically low number in the 10th–11th century Carpathian Basin. These plates of isosceles triangular or trapezoid form are carved from antler and were mounted on the dorsal side of the bow tip *(Fig. 7)*. As lateral tip plates are sometimes damaged and broken to a triangular form, the problem of unambiguous identification of dorsal tip plates was also addressed in detail. Recognizing the general (typological and structural) significance of the type, the appearance and diffusion of dorsal tip plates in Eurasia were also studied, emphasizing their total absence in Inner Asia. According to the results, the invention of dorsal tip plates took place in Western Turkestan, while the innovation spread westwards to Eastern Europe. However, dorsal tip plates never became widespread: their most frequent usage was in the Avar period Carpathian Basin.

II.5. Frontal tip rods in the 10th–11th century Carpathian Basin

As the position and function of frontal tip rods were already identified in 1986 by K. B. Nagy and L. Révész,[14] only the presentation and comparative analysis of the latest finds was necessary here *(Fig. 8)*. However, in order to properly understand the origin and context of Magyar type frontal tip rods, an overview of Eurasian frontal tip applications in the pre-Mongol era was given, discussing both Inner Asian and Eastern European (Uzuntal, Saltov, Zolotaya Niva, etc.) types. The study was catalyzed by the concept of Nagy and Révész, who thought that there was a general evolution of frontal tip applications, where Magyar type tip rods would indicate the first step of development by placing the rigid application to the frontal side of the tip. In a later phase, the length of the applications would have reduced considerably (Saltov type), while the thickness of the head would have grown (so-called bumper type).[15]

14 Nagy – Révész 1986.
15 Nagy – Révész 1986, 131.

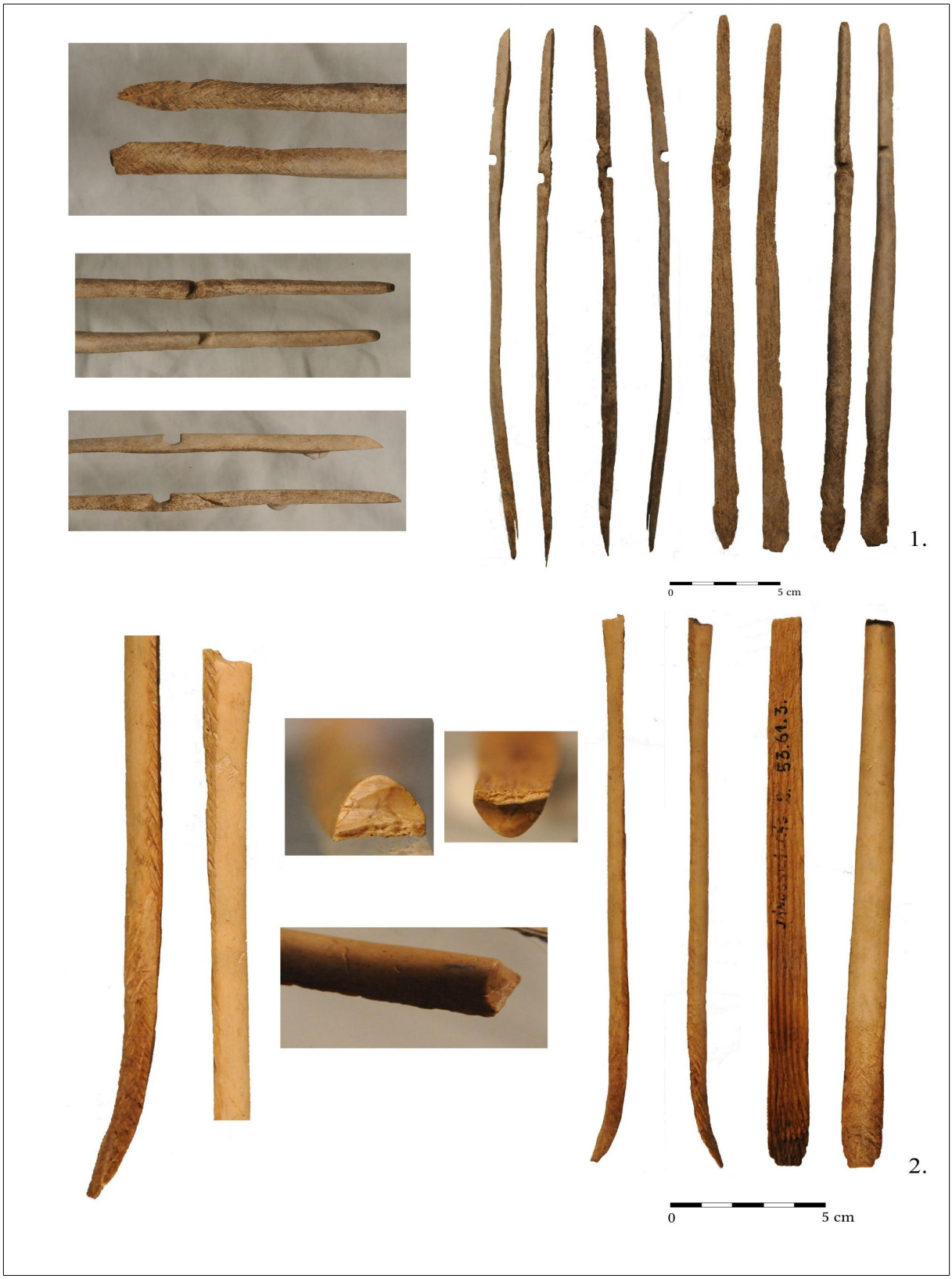

Fig. 8. Frontal tip rods: 1. Hódmezővásárhely-Nagysziget, burial No. 63, 2. Szatymaz-JánoSszállás, Gróf Árpád földje, burial No. 2. (photo by the author).

However, as there is a fair number of frontal tip rods in the Altay region dated variably from the second half of the 5th century A.D. to the 7th–8th centuries (Uzuntal type), and since Saltov type frontal tip applications are known as early as the 8th century, the frontal position cannot be understood as the invention of the 9th–10th centuries. The bumper type is known mostly from the 12th–14th centuries and occurs both in Inner Asia and Eastern Europe. Besides chronological dissimilarity, all above mentioned frontal tip application types show essential typological differences to the Magyar type tip rods. Saltov and bumper type frontal tip applications vary for example not only in length but also in other essential attributes related to tip structure, like the sinew band mounted on the lower section of the applications. It is fair to conclude that Magyar type tip rods have typological relations neither to Saltov, nor to bumper type applications, apart from their similar position on bow tips. Uzuntal type applications on the other hand, are much more comparable to the Magyar type, both in terms of form and tip structure. Due to the great chronological and geographical gap between the two types, it would be misleading to assume any typological relation. The site of Zolotaya Niva in the mid-Volga region yielded however two tip rods, which according to I. L. Izmajlov are direct parallels of the Magyar type.[16] Although it must be mentioned that the external surface of Zolotaya Niva tip rods are scored – which assumes a mounted sinew band on the tip – the formal similarity is striking. The 8th–9th century dating of the finds furthermore enables the supposition of a direct link to the Magyar material in the Carpathian Basin.

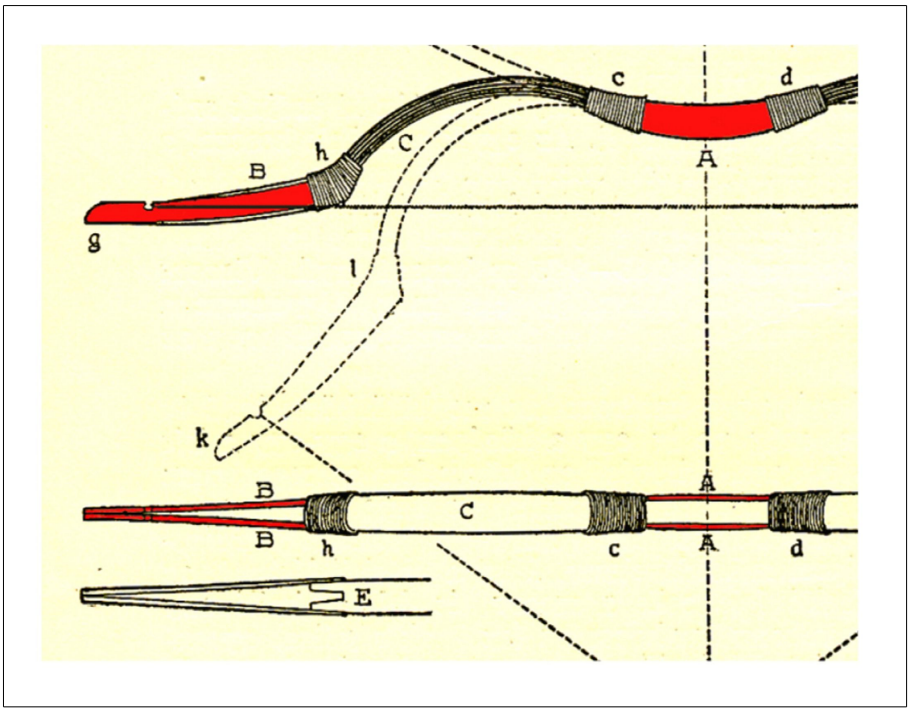

Fig. 9. Bow tip reconstruction by K. Cs. Sebestyén (after Sebestyén 1932, fig. 4).

It seems that all Eurasian frontal tip applications of the pre-Mongol period, with the exception of Saltov type, are generally small in number and quantity. The low rate of occurrence unambiguously refer to secondary solutions, thus it would be misleading to suppose that frontal tip applications were the main specification of a brand new, more efficient bow type

16 Измайлов 1998.

– as former research assumed. Eurasian frontal tip applications should be understood as marginal phenomena, where crucial chronological and chorological gaps between different types *a priori* exclude the possibility of a general typological, typochronological change or evolution. Magyar type frontal tip rods should also be evaluated according to the overall Eurasian picture, as a local and insignificant phenomenon.

II.6. Tip construction types in the 10th–11th century Carpathian Basin

The chapter deals with the identification and definition of various tip constructions on the basis of detailed analyses of rigid tip applications. First of all, I demonstrated that the tip reconstruction by K. Cs. Sebestyén (a structure of short semi-core with overlapping lateral tip plates above the nock: *Fig. 9*)[17] was not based on the archaeological material. Due to the lack of firm observations, Sebestyén simply applied the Avar tip model for Magyar bows. The main goal thus was to specify, what kind of tip structures can be unequivocally reconstructed from 10th–11th century Magyar lateral tip plates. Given the intentionally objective character of the thesis and according to the methodological considerations (internal source criticism) presented in the first chapter, the applied method of these tip-structure analyses were based solely on attributional studies. Infrequent *in situ* photos taken during excavations and personal observations in the grave were not considered from various reasons.

Fig. 10. Remains of riveted lateral tip plates: Székesfehérvár-Rádiótelep, burial 'A' (photo by the author).

Fortunate, i.e. *in situ* preserved and/or riveted finds were analyzed first, since the relation and precise position of plates could be easily identified in these cases *(Fig. 10)*. The results enabled the definition of various tip structure types, and a detailed discussion of their attributes (e.g. shaping of frontal and dorsal edges) manifested on relevant lateral tip plates. Thereby finds with less fortunate internal source critical status also became interpretable in terms of tip structure. Reusable adhesive putty was used to recreate the core of the tip and to mount the plates on the core in order to check the validity of the theoretically determined construction types (*Fig. 11)*. Results show that in five 'fortunate' cases of type I lateral tip plate finds, the tip structure had an isosceles triangular cross-section with or without a rigid dorsal tip plate.

According to the analysis of attributions related to tip construction, four structural subtypes could be defined on the basis of the shaping of dorsal and frontal edges in each set of lateral tip plates of type I: plates with (inward) cut and scored frontal & dorsal edges (I/b-f type); plates with (inward) cut and scored dorsal edge (I/a-f type); plates without cut and scored edges (I/a-0 type); and plates with (inward) cut and scored frontal edges (I/b-0 type). These types are usually paired in a set as follows: I/a-f + I/b-f or I/a-0 + I/b-0 or I/a-f + I/a-f or I/a-0 + I/a-0. Tip construction of triangular cross-section can be reconstructed with great certainty in the case of I/b-f and I/b-0 types as the rounded and unscored frontal edge of the other plate usually fits perfectly onto the inward cut & scored plane of the frontal edge.

17 Sebestyén 1932, fig. 4.

Fig. 11. Reconstruction of a bow tip structure: Kiszombor cemetery B, burial No. 217 (photo by the author).

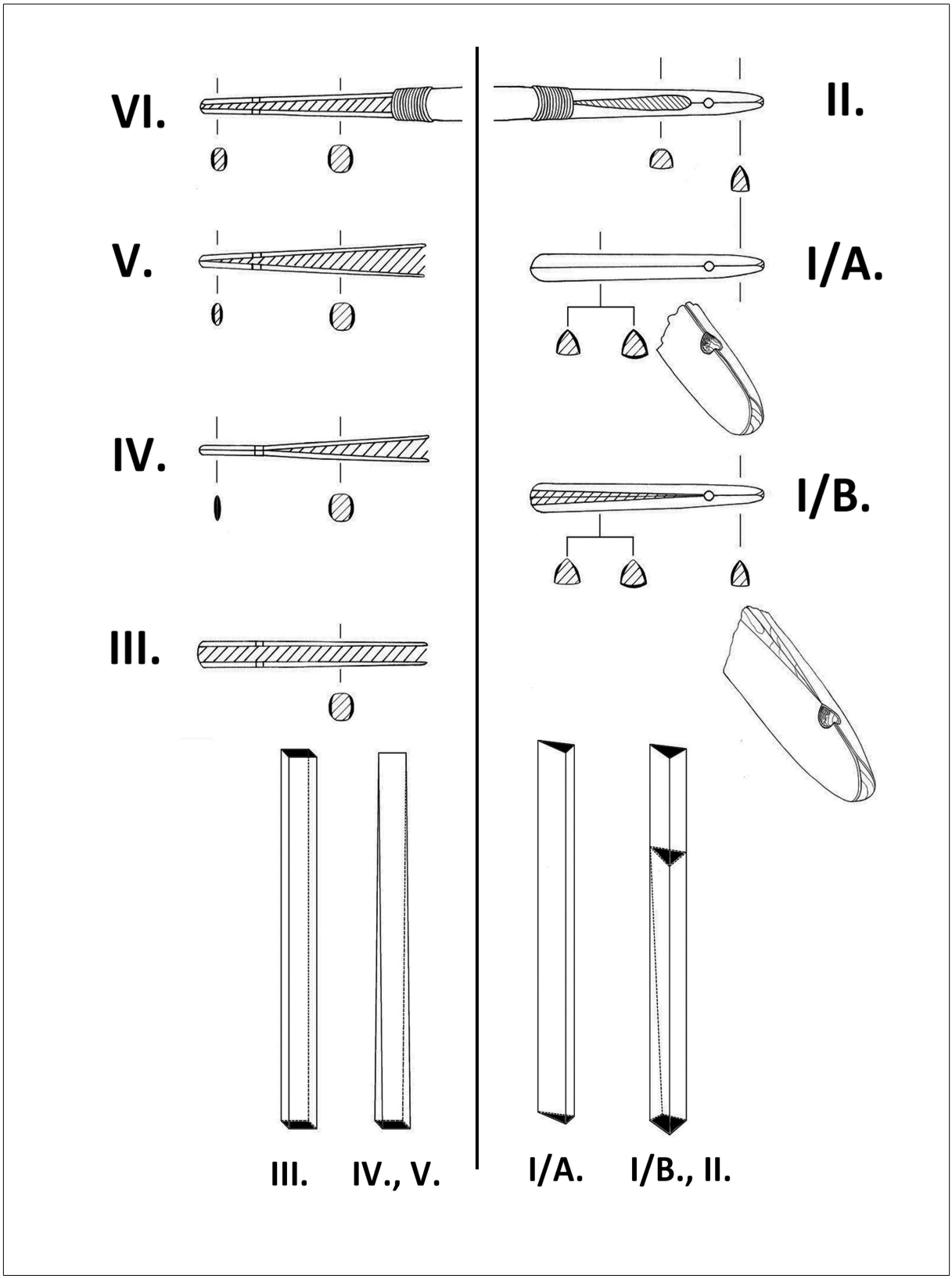

Fig. 12. Confirmed bow tip construction types in the Carpathian Basin, 9–11th century AD (drawing by M. Éber).

In the absence of cut and scored frontal edge, only the tally of cut planes on the dorsal edges of the plate pair can lead to a (precarious) solution. Finally, lateral tip plates of I/a-0 type are the least informative from this point of view, as they are mountable to a whole range of various tip structures.

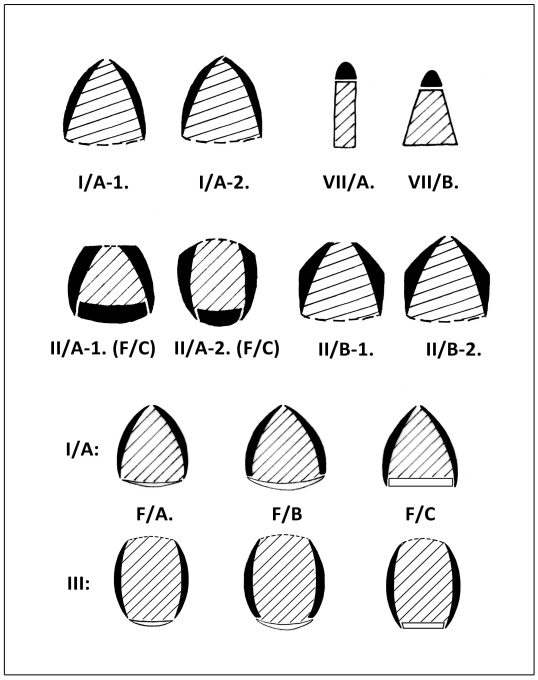

Fig. 13. Cross sections of bow tip types (drawing by M. Éber).

Compared to type I, type II lateral tip plates in the Carpathian Basin present more problems, as most of these plates are uninformative or insignificant from a structural point of view. Since the frontal edges up to the protrusion never overlap, the space between the two edges and their angle can be estimated roughly. Only the shaping of the dorsal edges and the top section of frontal edges could refer to any kind of specific tip structure. There are only two sets of lateral tip plates in the Carpathian Basin, where criteria for tip reconstruction are ideal: i.e. both the dorsal and the top section of the frontal edge are cut and scored (II/b-f type). Both sets proved to belong to hybrid tip cores of triangular/trapezoid cross sections. II/b-0 type tip plates, which differs from the former only in the uncertainty of the dorsal covering, are also few in number. Lateral tip plates without any cut and scored edges (II/a-0 type) are the least informative, just like I/a-0 types. However in two cases I could unequivocally identify the tip structure due to intact, *in situ* riveting – both sets were mounted on cores of rectangular cross-section. Besides discussing the possibility of the generalization of this recognized tip structure and a reconstruction built of plates with an angular external surface, it was also possible to prove the lack of Sebestyén's tip structure in 10th–11th century Magyar material *(Fig. 12)*. A final, short subsection of the chapter deals with the questions of dorsal covering of Magyar tip structures in general, which resulted in the identification of three different covering types (types F/A, F/B and F/C) *(Fig. 13)*.

II. 7. Comparative analysis of 8th–11th century well-preserved bows in Eurasia

Keeping in mind the enormous importance of well-preserved bows, which has been already praised in the first chapter, and that there is no way that an intact Magyar bow would come to light in the future due to the pedological and climatic character of the Carpathian Basin, it was imperative to evaluate contemporary well-preserved bows in order to understand whether these bows show mutual features, correlations in technical or structural sense that cannot be deducted from rigid bow applications alone. These generalizations would henceforth provide an insight into yet unknown parts of the Magyar bow as well. Therefore thorough analyses of four Caucasian, late Alanic (1974 and 1978 finds from Moshchevaya Balka; Podorvannaya Balka; Gogops) and five Inner Asian bows (Xinjiang: Mazār-Tāgh; Mongolia: Jargalant; Arcat-Del; Duguy-Cakhir; Chonot-Uul) are given here on the basis of the hitherto

published photos, drawings and various data.[18] I discussed in detail the symmetry-asymmetry of the bows, their inner, wooden construction, the relation and correlation of rigid applications and the rigid parts of the bow, etc. Inner Asian finds even enabled the review and critique of former notions on certain aspects of the general evolution of bows. The comprehensive evaluation of 8th–11th century well-preserved bows will hopefully contribute considerably to the international bow research as well.

II. 8. Comments on bow reconstruction: prospects, challenges and limits of the reconstruction of the Magyar bow

Since the chapters so far considered mostly the cognitive basis of the 10th–11th century Magyar bow by introducing available sources and discussing their information value, an actual reconstruction is presented here in order to outline the prospects and limits of the general reconstruction and definition of the Magyar bow. It was already mentioned that while a well articulated stratum of modern Hungarian society is overly interested in the ancient Magyar bow, replica products are far from being authentic. Former reconstructions with more or less scientific aim are also prone to crucial errors, as they were not based on detailed analysis of archaeological data. Therefore this chapter also provides a summary of the most important conclusions on the Magyar bow known from the archaeological record. Finally, beside the presentation of the archaeological basis of our reconstruction (a tip plate pair from the cemetery Magyarhomorog-Kónyadomb), the reverse engineering process of the reconstruction and various manufacturing observations and experiences are given here by P. Bencsik bowyer.

III. Byzantine spathia in the Carpathian Basin? The problems of 9th–11th century Byzantine and Muslim swords

At the beginning of the chapters evaluating the second main topic of the thesis, a brief overview of methodological problems of the identification of Byzantine artifacts is given. It is followed by highly detailed artifact analyses of all swords thought to be of Byzantine provenance in the Carpathian Basin.[19] The hilts and blades of Kunágota, Garabonc, Sfintu Gheorghe (Romania) and Čierny Brod (Slovakia) were discussed as well as two unique blades unearthed in Püspökladány-Eperjesvölgy *(Fig. 14–15)*. As a next step, diverse attributes of these swords were evaluated in a comparative way, which led to the mapping of the inner typological relationship of the group. Finally, the comparison of 'Byzantine' attributes to the main characteristics of continental-Scandinavian swords resulted in the diagnosis of essential differences between the two group. Due to the analysis, the unambiguous and determinative attributes of both Byzantine hilts and blades could be ascertained. These were cross-checked and compared with the unfortunately scant pictorial and archaeological evidence known from the territory of contemporary Byzantium, Near East and eventually, the Eastern Mediterranean. As the blades in question are unusually uniform, I prepared a classification and distributional analysis of all hilt finds of the Eastern Mediterranean. According to a typological change in certain functional attributes, the following hilt types were defined among others: Kunágota-Serče Limanı type (formerly known as the „cuffed guard"), Pliska – al-Rabadhah type (i.e. socket with fake-bar), Čierny Brod type (reduced socket), Garabonc type (so-called transitional, curved sockets with an ∩ shaped cut), etc. Finally, an Eastern Mediterranean *koine* of sword making is supposed on the basis of the uniformity and coherence of Muslim and Byzantine sword material.

18 Савин – Семёнов 1992b; Ierusalimskaja 1996; Тихонов – Хафизова n.d., etc.
19 Kiss 1987; Szőke 1992.

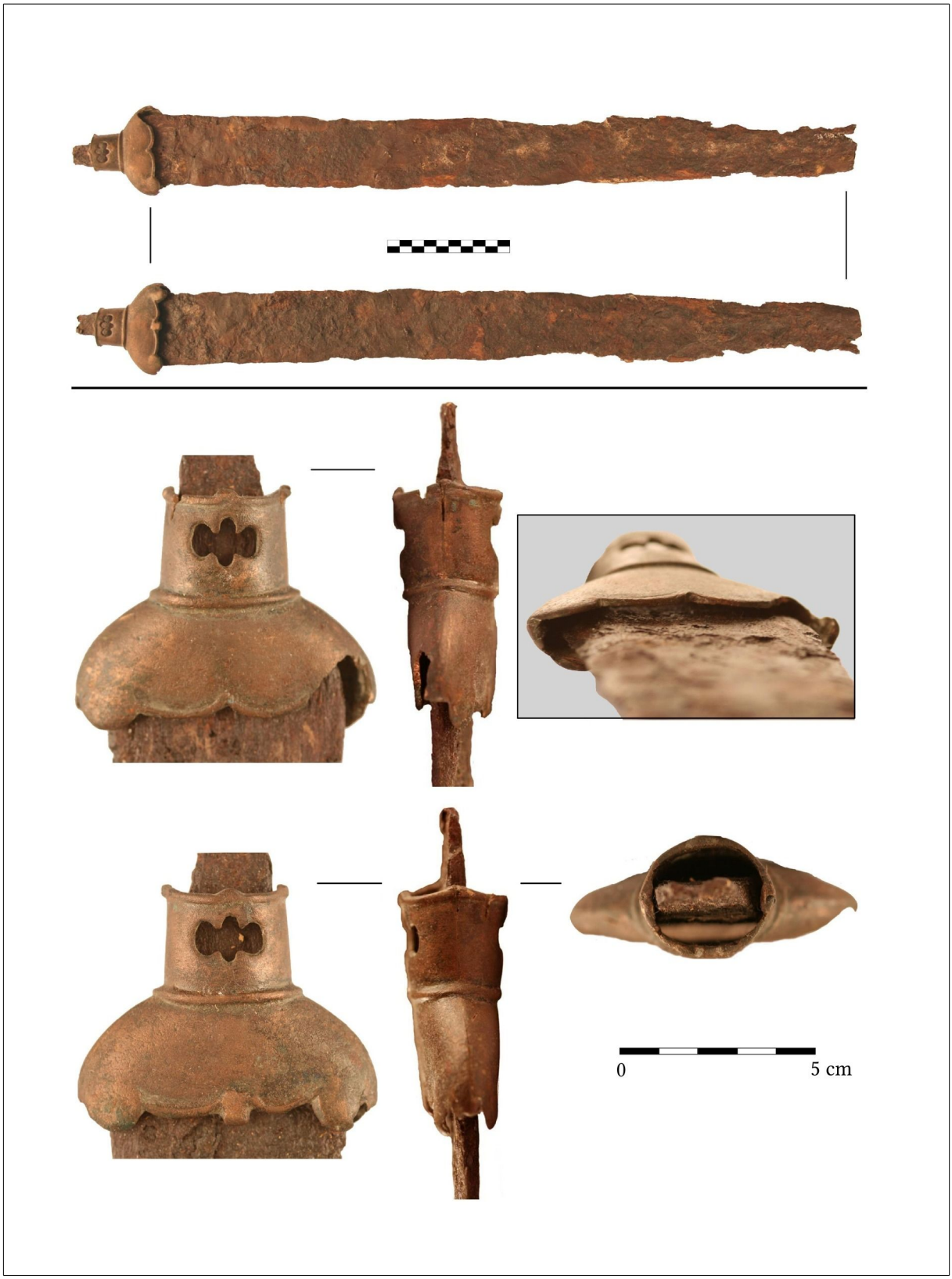

Fig. 14. Byzantine spatha: Kunágota, Boldog Antal földje, burial No. 1 (photo by the author).

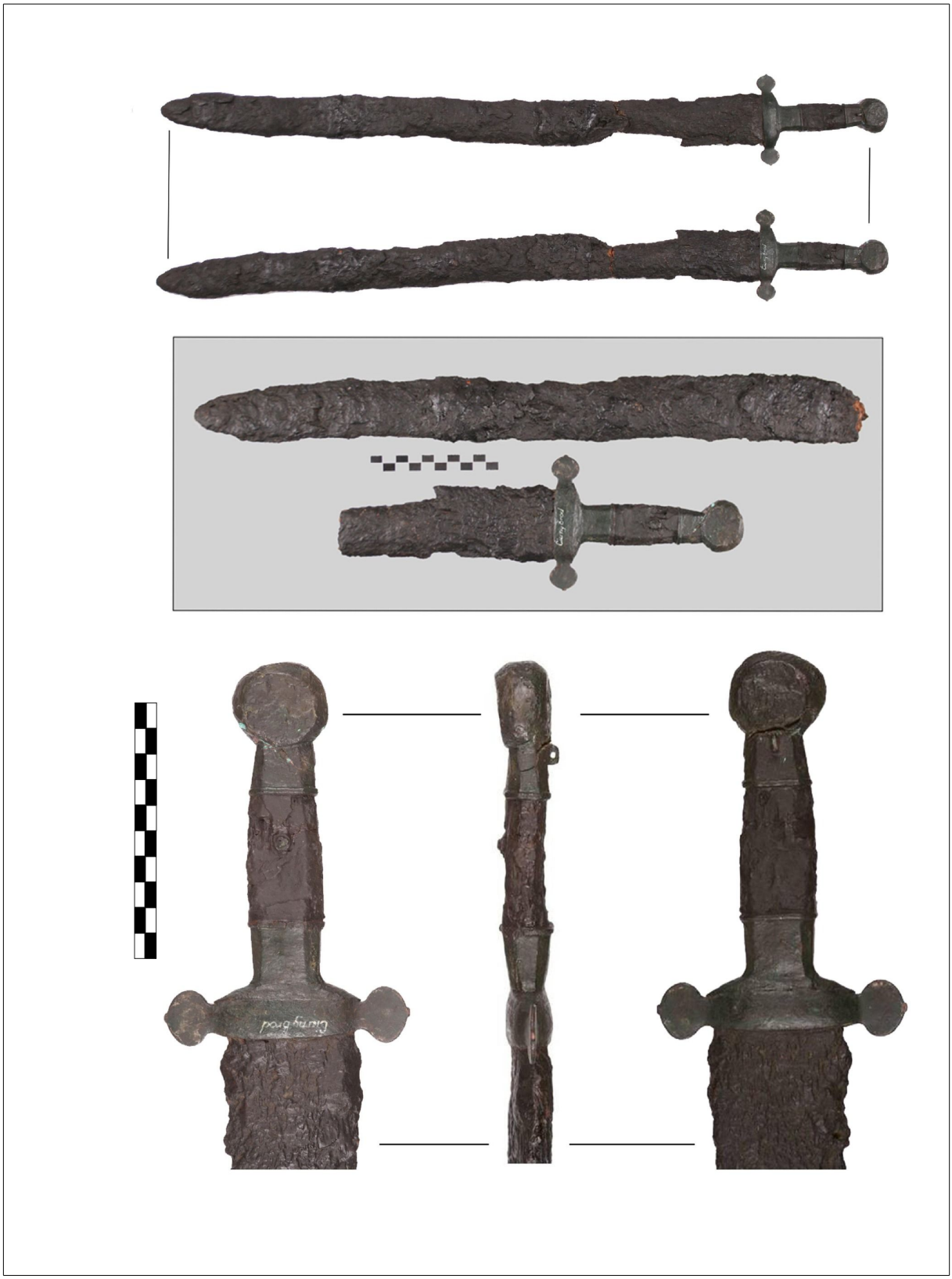

Fig. 15. Byzantine spatha: Cierny Brod, burial No. 2 (photo by the author).

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