CRAFTING BONE – SKELETAL TECHNOLOGIES THROUGH TIME AND SPACE

Proceedings of the 2nd meeting of the (ICAZ) Worked Bone Research Group

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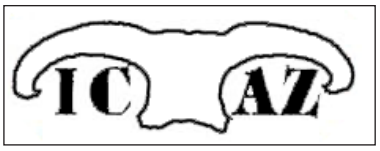

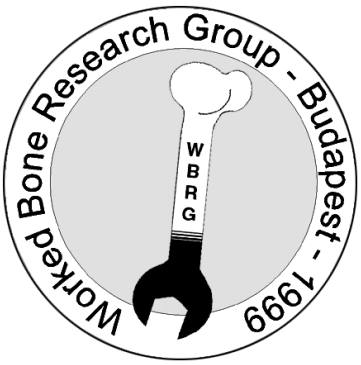

Worked Bone Research Group 2nd Meeting
Budapest 31 August – 5 September 1999

BAR International Series
2001

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Special Assemblages

Participants in the WBRG 1999 Budapest conference (left to right): Ülle Tamla, Elisabeth Brynja, Tina Tuohy, Liina Maldre, Karlheinz Steppan, Heidi Luik, Gitte Jensen, John Chapman, Alice Choyke, Janet Griffitts, Andreas Northe, Noëlle Provenzano, Jörg Schibler, Nerissa Russell, Colleen Batey, Lyuba Smirnova, László Daróczi-Szabó, Daniella Ciugudean, Mária Bíró, Kordula Gostenčnik, Eszter Kovács, Christopher Morris, Sabine Deschler-Erb, Ans Nieuwenberg-Bron, Katalin Simán, Isabelle Sidéra, Mickle Zhilin

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Introduction

Archaeologists and Archeozoologists, both study worked osseous materials (bone, antler and tooth, including ivory, in short all referred to as "bone"). Such reports, however, are often buried at the very back of faunal analyses appended to site reports. Furthermore, the two groups of specialists have had little chance to interact, even within Europe since they tend to attend different conferences and write for different fora.

At the root of this problem lay the arbitrary, largely institutional division between pre- and proto-historians, often imposed on bone manufacturing experts by nothing but formalism in research tradition. The most exemplary series of studies n this field is entitled: "*Industrie de l'os neolithique et de l'age de metaux*" (Bone industry *from the Neolithic and Metal Ages*). Another classic, a book, is sub-titled "The Technology of Skeletal Materials *since the Roman Period*". In very early prehistoric assemblages, attention is often focused on the question of whether a particular piece of bone was worked or not. In later assemblages, it is the intensity of manufacturing that often renders objects zoologically non-identifiable, so that important aspects of raw material procurement, including long distance trade, remain intangible.

The history of raw material use, however, is continuous and many of the constraints and possibilities inherent in skeletal materials are the same whether one is dealing with Paleolithic or Medieval artifacts. Indubitably, the organization of manufacture, the function and value of bone artifacts (as well as some technological innovations such as the regular use of metal tools or lathes), differ substantially between simple and complex societies through time. On the other hand, fundamental questions of tensile characteristics, procurement strategies, style and certain technological requirements are not only similar diachronically, but also open up new vistas when apparently unrelated periods are compared. The function of these objects as social markers, for example, remains remarkably constant through time, even if details vary. The papers in this volume reflect these conceptual similarities and differences as did the papers delivered at the conference itself.

The first meeting of what was to become the Worked Bone Research Group (WBRG) was organized by Dr. Ian Riddler in the **British Museum, London, in January 1997**. The committment and enthusiasm of that first workshop has greatly inspired subsequent efforts in recruiting a wide range of bone specialists, capable of contributing to discussions concerning bone manufacturing.

In keeping with the aims of the Worked Bone Research Group, since 2000 an official working group of the International Council for Archaeozoology (ICAZ), an effort was made to present these papers on the basis of what *connects* them rather than segregating them by archaeological period or region. Contributions mostly include articles based on papers delivered in September 1999 at the second Worked Bone Research Group meeting in Budapest, organized by the editors with the unfailing support of the Aquincum Museum (Budapest) and its staff. Several people who were unable to be present at this conference were also asked to contribute papers. Finally, five of the studies in this volume, originally delivered at a symposium on bone tools organized by Dr. Kitty Emery and Dr. Tom Wake, entitled "*Technology of Skeletal Materials: Considerations of Production, Method and Scale*", at the 64th Annual Meeting of the Society for American Archaeology (Chicago 1999), were added thereby expanding the academic spectrum both in terms of research tradition and geographic scope.

There are a total of 36 papers in this volume. Research was carried out on materials from Central and North America to various regions of Europe and Southwest Asia. The authors represent scientific traditons from Estonia, Hungary, Romania, and Russia, European countries in which, until recently, ideas developed in relative isolation. Other European countries represented include Austria, Denmark, France, Germany, Great Britain, Greece, and Switzerland. Last but not least, the North American scholarly approach is also represented here.

Schools of thought may be said to be exemplified by what used to be Soviet research, well known for pioneering works on taphonomy, experimentation and traceology. Bone manufacturing was first brought to the attention of Western scholars by the publication in 1964 of the translation of S. A. Semenov's *Prehistoric Technology*, published originally in 1957. Scholars in France have also carried out decades of co-ordinated work on operational chains in the manufacturing process from the selection

of raw materials to finished products, with special emphasis on prehistoric modified bone. An entire working group, "Unspecialized Bone Industries/Bone Modification", is directed by Marylene Patou-Mathis. This working group itself is part of a larger research program on bone industry "*La Commission de Nomenclature sure l'Indistrie de l'Os Prëhistorique*" headed my Mme. H. Camps-Fabrer. Several specialists such as Jörg Schibler in Switzerland, have created laboratories where ground laying work has been carried out for years on worked osseous materials, especially from Swiss Neolithic Lake Dwellings and Roman Period sites. Language barriers have often prevented these important bodies of work from being as widely disseminated as they deserve. Arthur MacGregor in England, writing in English, has had a decisive influence on specialists working on more recent Roman and Medieval worked bone assemblages in Europe.

The work of all of these groups as well as certain individual scholars is well known within limited circles. Otherwise, however, the overwhelming experience of most researchers on worked bone have been feelings of isolation and alienation from most archaeological or archaeozoological work related, most importantly, to the absence of an international forum where their often specialized work can be presented and problems discussed.

In spite of the fact that there have been many practical obstacles to information flow between specialists in this field, there are really remarkable similarities of approach which should ultimately lead to the development of more compatible paradigms in research. Agreement on methodologies will have a positive feedback on communications, helping the field to grow and develop properly.

It seems that, at last, archaeologists and archaeozoologists and other specialists are talking to each other and sharing methodologicial points of view. One striking example of this can be seen in the the emphasis on raw materials studied in parallel to types found in the majority of papers in this volume. Previously studies often concentrated on typo-chronological questions, ignoring the questions of raw material morphology and availability. The series published by the *Centre National de la Recherche Scientifique*, edited by Mme. Henriette Camps-Fabrer in France is largely to be credited for beginning this new trend. It contains many papers concentrating on understanding manufacturing sequences and, indeed, from Europe to North America there are papers which explicitly deal with manufacturing sequences in individual assemblages.

There is also a consistent emphasis on experiment and manufacturing techniques present in much of the work in this volume. The related but fraught question of function continues to tantalize and frustrate most specialists. A number of articles attempt to apply techniques of hard science, such as scanning electron microscopy or light microscopy, together with experiment to get objective, "processual" answers to this important group of questions. Other researchers rely deductively on analogy, archaeological context, gross morphology, and textual sources as they try understanding how these objects were used.

When editing the volume, we tried to concentate on the underlying main concepts represented by each paper rather than grouping them diachronically or by geographical region. As a result, contributions follow a line from the theoretical through the problems of raw material selection, manufacturing techniques, experimental work, technical function and socio-cultural interpretations. Obviously many of these papers deal with several of these aspects simultaneously. Finally, analyses of assemblages are grouped to show the current state of general application of these principles as illustrated in papers in the rest of the volume. Reports on bone tool types will ultimately benefit from more unified typologies and also provide researchers with comparitive databases from regions beyond their own.

Finally, a word on the organization of papers in this volume. Although the editors have tried to group these papers by what they see as the main theoretical and methodological thrust of the authors it should be understood that most papers, to a greater or lesser extent, overlap between these artificial sub-titles. Happily, almost all these works include considerations of raw material exploitation, manufacturing and functional analyses and all make some attempt to consider the social context from which these artifacts emerged. It is exactly this cross-cutting of boundaries which allows us to hope that the study of worked osseous materials is well on the way to developing into a discipline in its own right.

In addition to the generous support given by our sponsors and technical editors for this volume, organizing the conference would not have been possible without the active help of numerous colleagues. Special thanks are due to Paula Zsidy, Director of the Aquincum Museum, Katalin Simán, archaeologist and two students from the Institute of Archaeological Sciences (ELTE, Budapest): László Daróczi-Szabó and András Markó. The Hotel Wien, Budapest and its efficient manager provided a comfortable setting for our discussions at a reasonable price. Last but not least, help with abstract translations by Cornelia Becker, Noelle Provenzano as well as Marjan Mashkour and Turit Wilroy should also be acknowledged here.

THE REMAINS OF MEDIEVAL BONE CARVINGS FROM VISEGRÁD

Péter Gróf and Dániel Gróh

Abstract: Houses and workshops of craftsmen were located on both sides of the medieval settlement of Visegrád. A bone carving workshop was discovered near the remains of a medieval glassworks in the 14th-15th c. levels of the settlement. Interestingly, it appears that both dice (for a prohibited game) and rosary beads were produced here.

Keywords: Medieval Visegrád, workshop, dice, rosary beads, bit head, manufacture techniques

Résumé: Maisons et ateliers d'artisans étaient implantés dans les deux parties de la ville médiévale de Visegrád. Un atelier de travail de l'os a été mis au jour à proximité d'un atelier de verrier dans les niveaux des XIV et XVe siècles. Il est intéressant de noter que ce sont à la fois des dés (destinés à un jeu prohibé) et des perles de chapelets qui étaient ici fabriqués.

Mots-clés: Visegrád, Moyen Age, atelier, matrices, perles de chapelets, éléments de tour, techniques de fabrication

Zusammenfassung: In beiden Teilen des mittelalterlichen Visegrád wurden die Häuser und Werkstätten von Handwerkern lokalisiert. Nahe den Überresten einer mittelalterlichen Glasswerkstatt aus dem 14.-15. Jahrhundert wurde die Werkstatt eines Knochenschnitzers entdeckt. Interessanterweise scheinen hier sowohl Würfel (für ein verbotenes Spiel) als auch Rosenkranzperlen hergestellt worden zu sein.

Schlüsselworte: Mittelalterliches Visegrád, Werkstätten, Würfel, Rosenkranzperlen, Fräsekopf, Herstellungsmodus

The structure of the medieval settlement of Visegrád changed in many ways after the 1241 Mongol Invasion. The bailiff's castle built on Sibrik Hill, the High Dean Church, the *suburbium* settlement in Várkert and the plebeian church were finally destroyed in 1241. The defense system of the castle was established by King Béla the 4th at the end of the 13th century in a now built-up area. The town might also have become a *hospes* settlement, according to historical sources.

After King Charles Robert of the House of Anjou moved his royal court to Visegrád, the area of the present day village developed into an urban settlement because the royal residence was established there (fig. 1). Expert opinions about the exact location of the medieval town, settled by Germans and Hungarians, differ because possibilities for archaeological research are limited (Laszlovszky ed. 1995:9-10, 19-21).

According to historical documents the king, his noblemen, high ranking church officers, citizens and craftsmen inhabited the stone houses. Mansions, the houses of citizens and the churches were built in an outlying territory (where the present day village center is situated), whereas we know of only two stone houses near the Danube and Highway 11. Houses and workshops of the medieval craftsmen were located on both sides of the settlement. This was the situation in Visegrád in the 14th-15th century. Here, finds from a bone carving workshop were discovered near the remains of a medieval glassworks.

On "Bene Lot" at 36 Fő Street, the 20-40 cm humus layer was removed with machines in 1985. Under the humus we found fragments of a mold and ceramics from the 14th century. A 30 m long and 70 cm wide test trench was put down in a NW-SW direction. Several finds were discovered in the quite heavy ground at the southeastern end. Under this stratum we found three uneven, mixed layers. There is no evidence to tell us exactly how they were formed. Under the removed stratum the ground was full of beads in their thousands as well as pieces of bones for making dice.

The process of manufacturing bone beads could be reconstructed because of a lucky find: a three pronged iron bit with three points that came to light here is a 5.5 cm long, 0.9 cm wide rectangular tool. Its middle point is the longest, exceeding the two side points by 4 mm (fig. 2). The end of the bit, placed in the axle of the lathe, had a wedge form. The bit's long middle point was used to perforate the bones, while the two side points of the tool partly engraved the bead. Thereafter, the bone blank was turned over and the middle point was inserted in the central hole drilled from the opposite side. The work was then again carried out from this latter direction. Two halves of a raw bead with a truncated cone shape were thus created from both sides of the blank. Ten to twenty beads could thus be made from one piece of bone for further processing. Several bits must have been used in the Visegrád workshop as may be seen from the proportions of holes in the bone débitage. The bone beads were polished and then strung as rosaries. This assumption is supported by a bone blank in which bone beads, not cleanly separated, were found (fig. 6; Gróf 1988: 195-197), as well as recent finds

from, for example, Belgium (Ervynck et al. 1992: 53) and southern Germany (Röber 1994: 118, Abb. 13; Spitzers 1997: 106).

We know a lot about the workshops from earlier descriptions of how the bow lathe was used since Ancient times. We can follow the process of bead manufacturing in German engravings (figs. 4-5). In a coeval picture, the craftsman holds the piece of bone to a three-pronged bit. Meanwhile he turns the axle with the bow and holds the instrument with his leg. A gradual effort and a certain way of moving of the bow are very important, otherwise the gimlet can slip off (G. Sándor 1961: 141-149). We tested all these technicalities using an experimental replica of the iron bit.

Such simple tools were easily installed even in houses with a half roof. If the number of customers declined, the craftsman could move his entire workshop. It is unlikely that there was a permanent workshop in town, even if there are many finds of worked bone from Visegrád.

In addition to the beads, the process of making another group of objects, dice, could also be observed. Pieces of equal sizes were cut from the quadratic bone blank. The numbers (1 to 6) were engraved in their surfaces in such a way that the sum of the opposite sides always came to 7 as in today's dice. Dice making is shown by the bone blanks which were marked incorrectly because they were cut once or twice as well as by the discovery of 28 totally incorrect dice. They were considered incorrect because some flakes had been knocked off from their edges that were never cleaned or smoothed. Such dice were used only by tricksters. We could also find two intact dice, with measurements not differing from those of the other, fragmented specimens. Both dice were used as may be seen from their dull and darkened edges (fig. 6).

Dice games are not only famous from medieval descriptions, but also because the game was placed under an interdict. That is why it is so interesting that dice used in a prohibited activity were made in the same place as rosary beads (Petényi 1994: 10-35 and 58-61).

During the 1990s, a 70 cm wide medieval wall was found when a drainage ditch was dug near the "Bene Lot". Research here revealed a 10 by 10 m stone house, not far from the bone workshop. There were several finds worth mentioning: in addition to ceramics, there was a *Denarius* by Louis the Great decorated with a Saracen head, a coin from Queen Mary, iron tools, a belt decorated with bone inlay, animal bones and baleen from the flooring of the house. These artifacts indicate that the bone workshop might have operated between the last third of the 14th and the beginning of the 15th century.

In our opinion, the finds from this bone manufacturing workshop not only enrich our knowledge of medieval Visegrád (which was the royal capital of Hungary in the 14th 15th century), but show the importance of archaeozoological finds as well.

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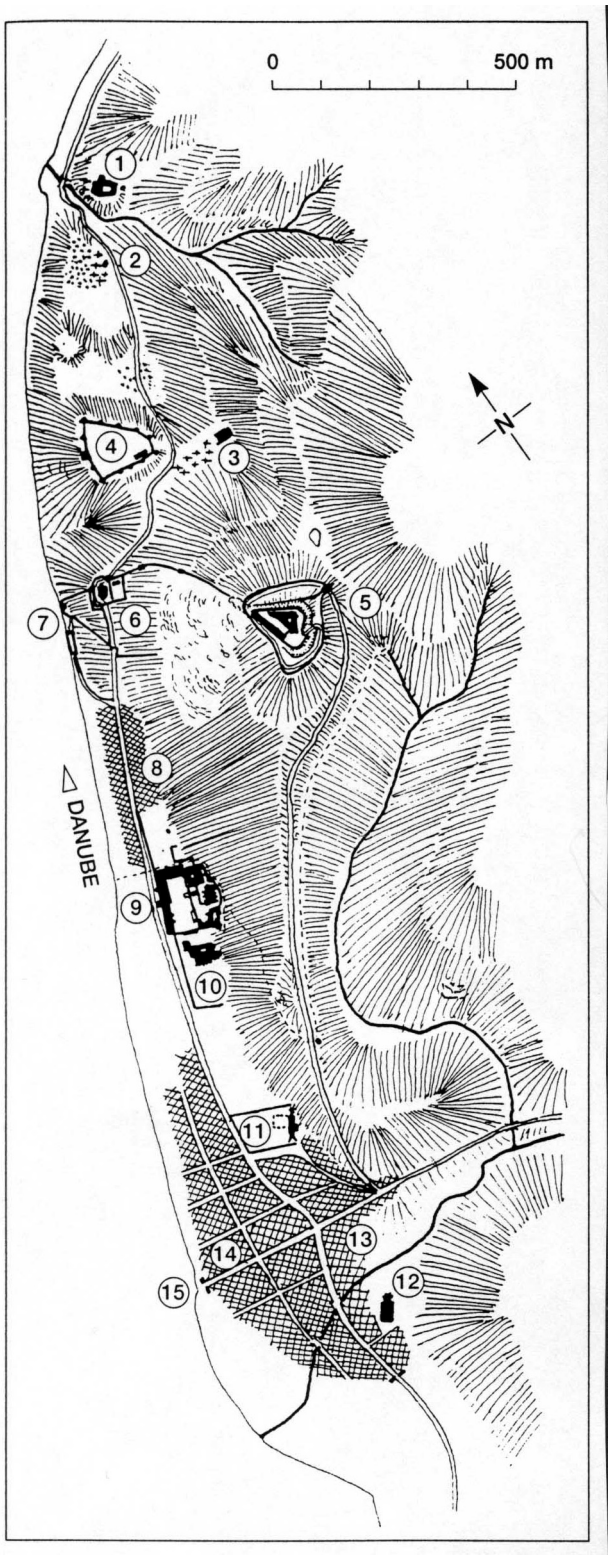

Fig. 1 The topography of medieval Visegrád
1. St. Andrew's monastery; 2. Visegrád-Várkert, medieval village, parish church and churchyard; 3. High Dean's church and churchyard; 4. Sibrik-hill, Roman fortress, Árpád-period castle; 5. Upper castle; 6. Lower castle; 7. Port; 8. Suburbium; 9. Royal palace; 10. Franciscan friary; 11. St. Ladislaus' monastery; 12. Parish church (Holy Virgin); 13. Hungarian Town; 14. German Town; 15. Ferry to Nagymaros

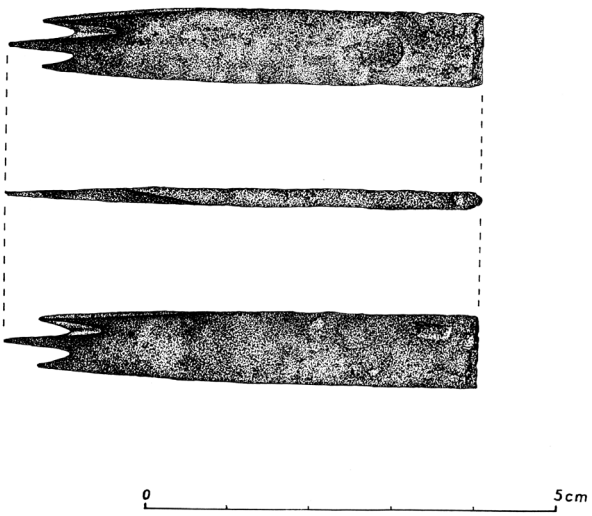

Fig. 2 The iron bit from a bone lathe found at Visegrád–Bene Lot

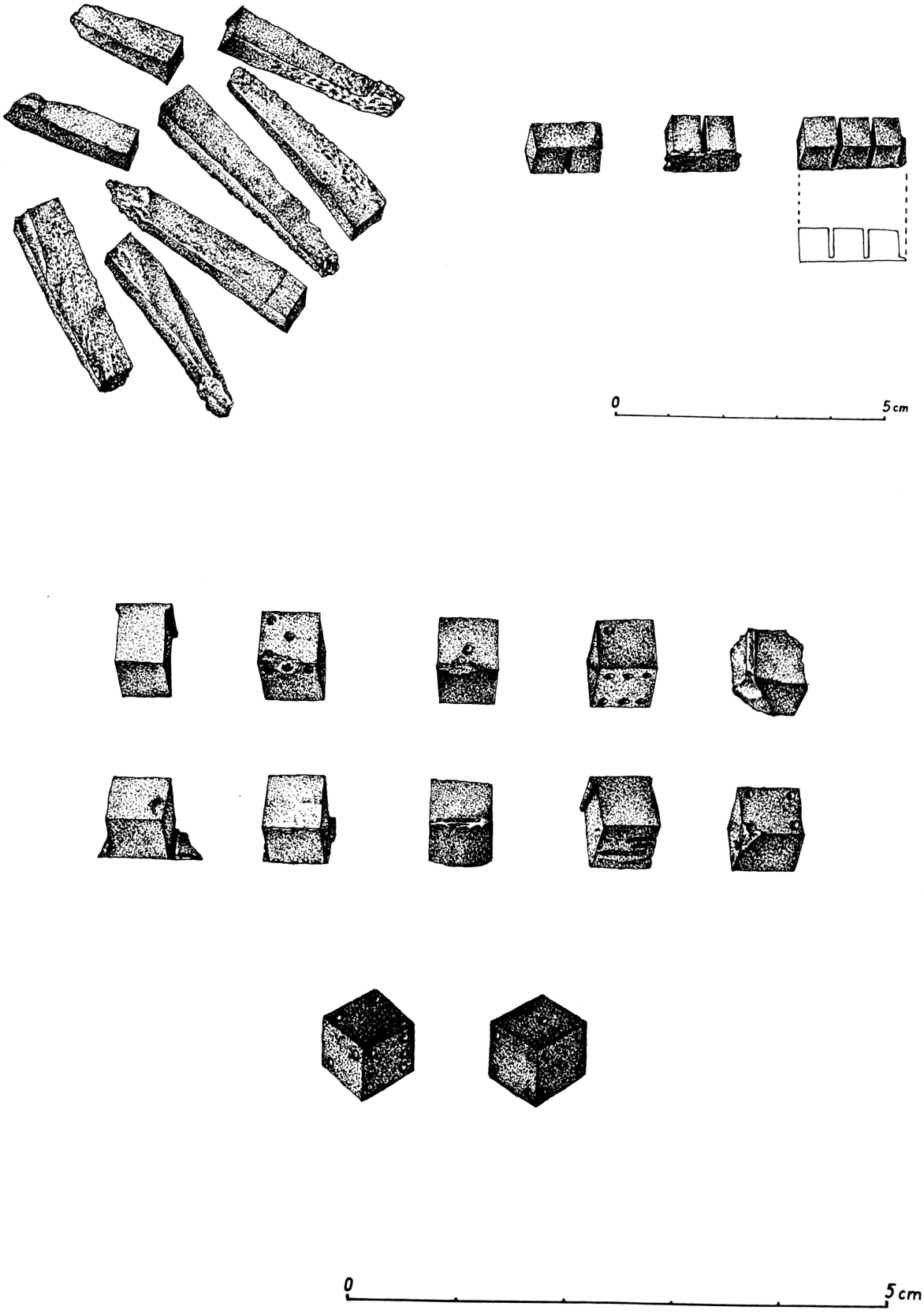

Fig. 3 Complete and failed dice from Visegrád-Bene Lot

Fig. 4 Craftsman making beads with a bow lathe (Redrawn from a 15th century source, Nürnberg)

Fig. 5 Bone manufacturing in a 17th century workshop

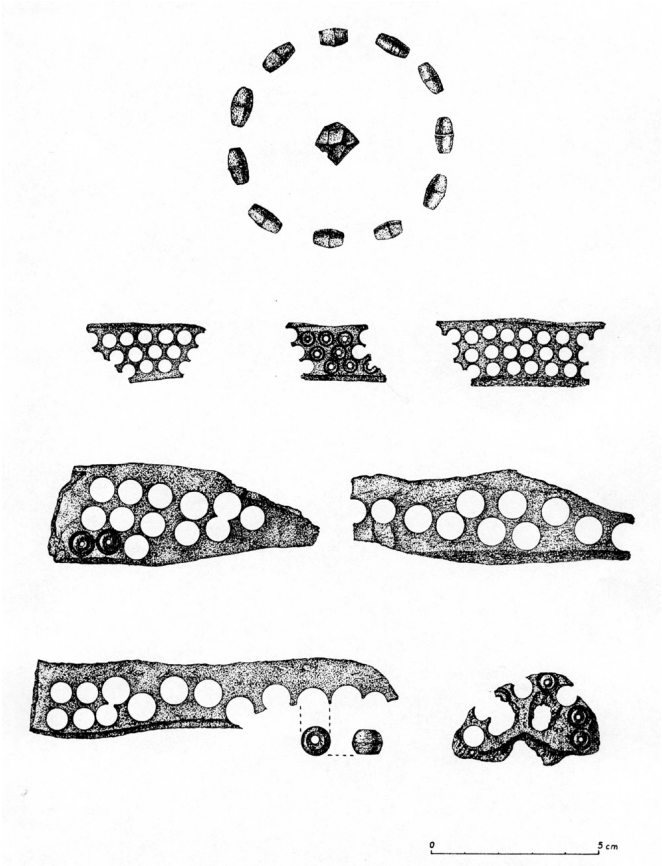

Fig. 6 Beads and debris from the workshop