

# Archaeological Textiles Newsletter

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2011 has seen much activity in the field of archaeological textiles, including many conferences and workshops, numerous valuable publications and exciting new discoveries. Issue 53 includes two articles that demonstrate how textiles may inform our understanding of other technologies in the past, in particular pottery making technology in the Neolithic Europe and steel forging in the Islamic Central Asia. The issue also includes a couple of new discoveries – the first detailed analysis in English of the important textile finds from the Viking-Age site of Gnezdovo in Russia and the publication of a 16<sup>th</sup>-century silk find from Finland. And finally, an article about textile tools from southern Italy.

We want to remind the readers that at the Annual General Meeting of Friends of ATN held on the 11<sup>th</sup> of May 2011 in Esslingen, Germany, it was decided that from 2012 the newsletter will change its name to **Archaeological Textiles Review** so Issue 53 is the last Archaeological Textiles Newsletter. We hope it will be an important new step in the evolution of the journal and raise its profile.

It was also decided that from 2012 the review will only be published **once a year**, so please remember that there will be no issue in June and the next issue 54 will come out in November 2012 which however will be in a much larger format, i.e. the usual two issues will be combined into one. We will focus more on the scientific articles, while most of the newsletter items (calendar, reviews, bibliographies, new publications and queries) will be posted on a

rolling basis on the Friends of ATN website, which should ensure an even faster dissemination. We regret having to change to one issue per year, which will certainly disappoint many subscribers/members, but the constantly increasing workload has made the publication of two issues per year no longer feasible. The change should also keep the constantly rising costs down.

In the beginning of 2012 the first two issues published in Copenhagen, Issues 46 and 47 from 2008, will be accessible in a full colour pdf format for free on the ATN homepage. Back issues will continue to be published online with a three year delay. Printed back issues will still be available via the website.

Please make sure to renew your membership at the beginning of 2012. The ATN/ATR is edited and produced by volunteers, all subscription fees go towards the essential costs of printing and distribution. We would also like to encourage the contributors to send their articles throughout the year to spread the editing workload. The peer review system which is necessary for the high standard of ATN requires more time in the editorial process. The absolute deadline for contributions for 2012 will be the **1<sup>st</sup> of September 2012**. We very much look forward to your contributions as ultimately the aim of the ATR is to disseminate new research in this fascinating field.

The editors



Francesco Meo

# Rediscovering ancient activities: textile tools in a 3rd - 2nd century B.C. context from Herakleia (Southern Basilicata, Italy)

The following contribution introduces preliminary results of a PhD project in Ancient History started in April 2010 at the University of Salento, Italy, entitled *Breeding and wool industry between III and I century B.C. in Southern Italy through literary sources and archaeological data; Herakleia, its territory and the ionic coast between Taranto and Sinni river.*

This study had its starting point in the hypothesis advanced by L. Giardino (2004), according to which the archaeological data, as well as literary and epigraphic evidence, demonstrate that sheep husbandry in the surrounding territory (*chora*) of Herakleia and wool weaving in its urban areas were among the most important economic activities of the site in the 2<sup>nd</sup> century B.C. Herakleia was a second generation Greek colony of Southern Italy (*Magna Graecia*). It was founded in 433 B.C. by the Greek colonies of Taranto and Turi along the Ionic arc on a high ground between Agri and Sinni Rivers. Material in this study has been recovered during the excavations carried out by L. Giardino in the western district of the Castle Hill of Herakleia (Figs. 1-2) in the early 1970s. Specifically, the material comes from blocks (*insulae*) I, II, IV and VI, and several closed contexts (houses individualized inside such *insulae*) have been analyzed (Fig. 3). Furthermore, the material from Herakleia is compared with three sites located in the *chorai* of Metaponto and Herakleia: Masseria Durante, San Biagio and Bosco Andriace (Fig. 1).

In this article, the first morphological and weight typology of the over 500 loom weights found at Herakleia and examined to date is presented, followed by a more detailed examination of finds from two closed contexts. The greatest quantity of loom weights examined to date (468 of 536 samples) are of discoid circular type with few rare variations of convex discoid circular (4 samples) and hemispherical weights (27 samples). Truncated pyramidal loom weights are relatively few (19 samples) as are flat trapezoidal ones (16 samples); the pinched weights are even rarer (just 2 samples).

## **Discoid circular and hemispherical loom weights**

All discoid circular loom weights (here designated Type PD2) have two holes and can be separated in two subtypes: Type PD2a with both faces flat, except in those cases in which a decoration is slightly projecting outward (Fig. 4); and Type PD2b in which both faces are convex (fig. 5).

Type PD2a is the commonest and the thickness, measurable for almost all examples, ranges between 1.8 and 2.2 cm, while the weight, measurable only for a part of the samples, ranges between 100 and 200 g; the diameter ranges between 7 and 9 cm.

Fewer than 13% (63) of Type PD2a loom weights are decorated and over 29% of the total (154) have one or more stamps, while only about 4% (18) of the total have one or more inscriptions consisting of one or more Greek letters. Decoration, usually present

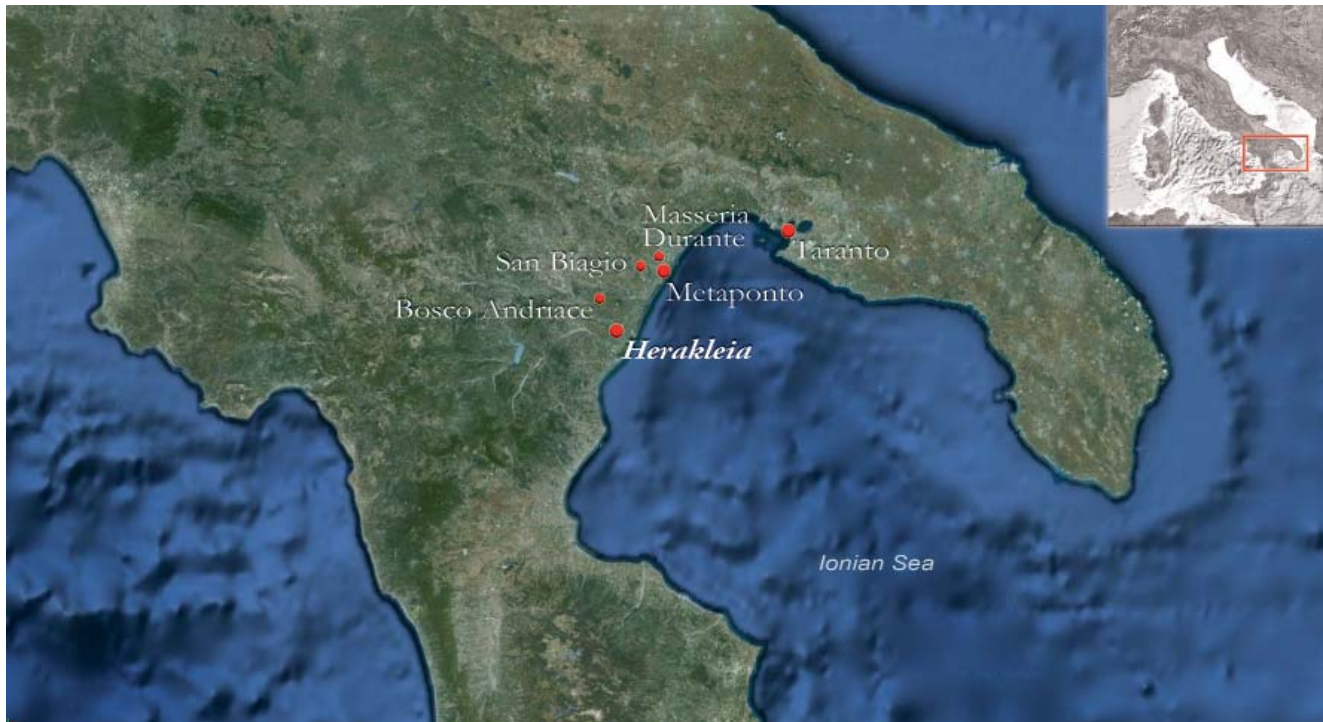


Fig. 1. Southern Italy. Main towns of Ionic arc and the 3 sites in the territory to be analyzed together with Herakleia during the research.



Fig. 2. Herakleia. In the northern part the Castle Hill with the western quarter in red. In the eastern part the modern town of Policoro

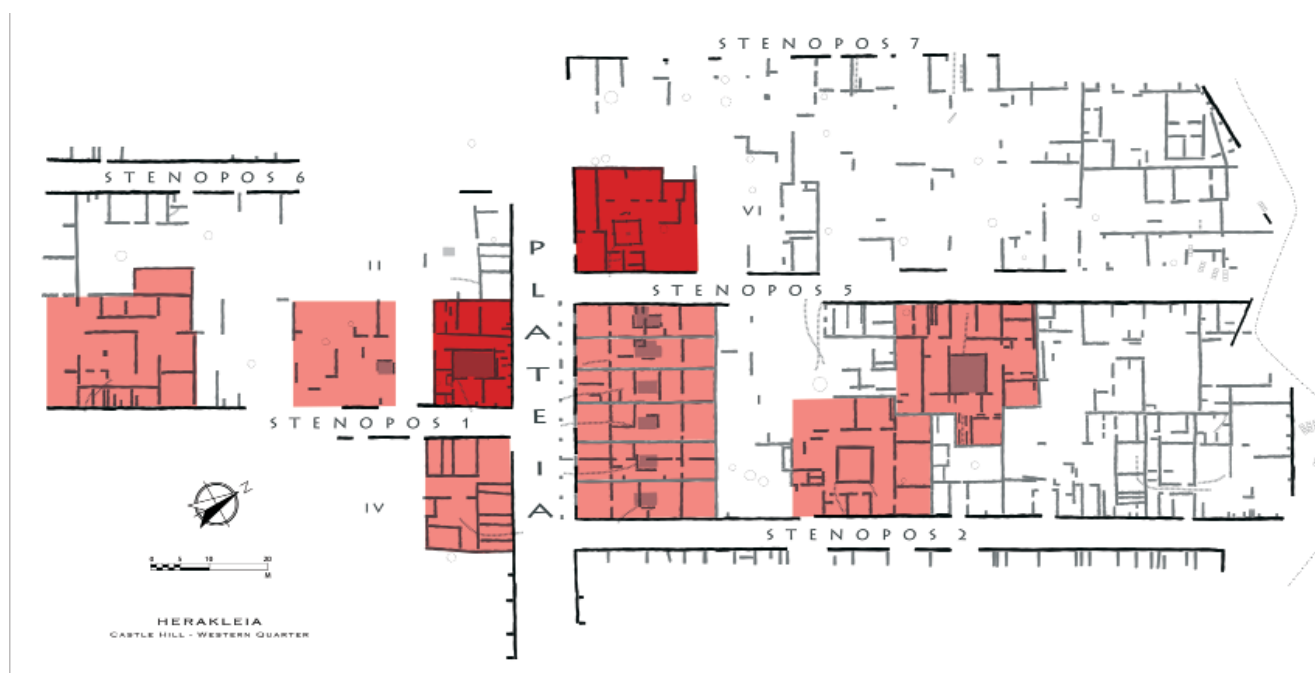


Fig. 3. Detail of the excavated blocks of the Western quarter of the Castle Hill of Herakleia: the two houses presented in the article in red.

just on the face, and stamps are moulded, while inscriptions are both moulded inside a rectangular stamp, or, more frequently, incised before firing. All discoid circular loom weights of Type PD2b have two holes and differ from the Type PD2a weights in having convex faces and a slightly larger thickness, between 2.7 and 2.8 cm. None of them has inscriptions, stamps or decoration. The presence of a very limited number of examples (4 to date) does not allow further considerations regarding this type of loom weight.

All hemispherical loom weights (Type PF2) also have two holes and are a variation of Type PD2 (Fig. 6): the upper part is discoid or elliptical while the bottom one is cut horizontally to form a flat base. Also in this case, their limited number allows only a partial analysis of the data and it is possible only to establish a range of thickness between 2 and 2.6 cm. The common characteristic of all Type PF2 weights is to have at least one decorated face with moulded and embossed motifs; in five cases the decoration is present on both the faces.

#### Truncated pyramidal and flat trapezoidal loom weights

The situation is much more complex in the case of truncated pyramidal loom weights. Despite the limited number of examples, three different types are present: 8 truncated pyramidal loom weights with one hole (Type PTP1); and 11 truncated pyramidal

loom weights with two holes (Type PTP2), which are further subdivided into Type PTP2a weighing up to 300 g (7 samples) and Type PTP2b weighing between c. 500 and c. 600 g (4 samples).

Of the truncated pyramidal loom weights analyzed to date, 4 have one or more stamps (2 of Type PTP1 and 2 of Type PTP2a); 1 of Type PTP2a has a single incised letter, while no weight is decorated.

All flat trapezoidal loom weights have two holes and are a version of the truncated pyramidal ones (Fig. 7). Their number is limited but we however have two types: Type PTR2a weighing up to 300 g (2 samples); Type PTR2b weighing between c. 750 g and c. 1.7 kg (14 samples). Of the flat pyramidal loom weights analyzed to date, 4 have one or more stamps (2 of Type PTR2a and 2 of Type PTR2b) and 1 of Type PTR2b has a single incised letter.

#### Pinched loom weights

The last type of loom weight at Herakleia is the pinched weight (Fig. 8); these have an ovoid shape with convex faces, central hollow in the middle of both faces and two lateral pinches placed in the median part. Of the two recovered samples one has one hole (Type PP1) and one has two holes (Type PP2).

#### House A of Block II

Following this general morphological typology of loom weights used in Herakleia, interesting data was



Fig. 4. Examples of Type PD2a weights.



Fig. 5. Example of Type PD2b weight.

Fig. 6. Example of Type PF2 weight.



Fig. 7. Example of Type PTR2b weight.



Fig. 8. Example of pinched weight (Type PP1).

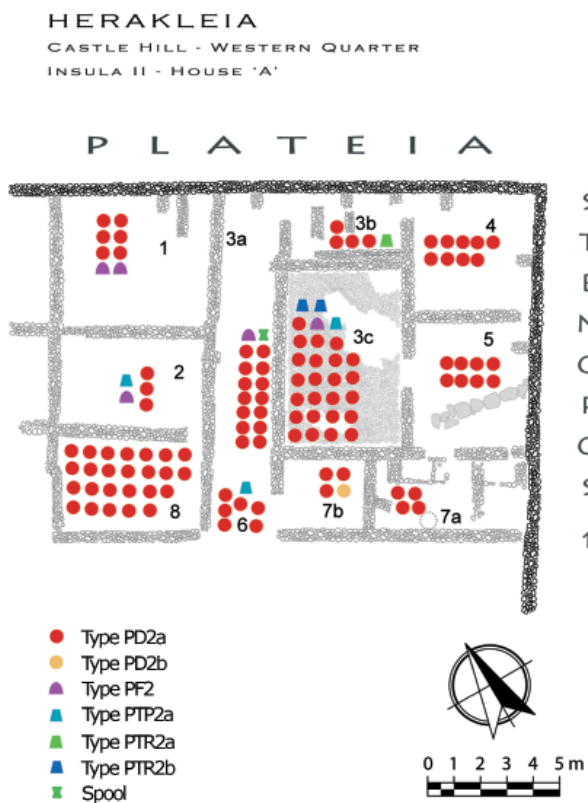


Fig. 9. Distribution of loom weights from the first cut, just without the surface layer.

obtained from two closed contexts in which loom weights have been found. Analysis of the spatial distribution of weights was carried out for these contexts room by room, excluding the surface finds. Since the excavation was not carried out using locus (*unità stratigrafica*) system, more detailed special distribution analysis is not possible.

The first context is House 'A' of Block II (Fig. 3): this is a 'courtyard house' built at the beginning of the 3<sup>rd</sup> century B.C., and continuously occupied throughout the entire 2<sup>nd</sup> century B.C., with traces of occupation in the early imperial times (Giardino 1996, 142-150, fig. 7; Giardino 1998, 177-183; De Siena and Giardino 2001, 144-145; Giardino 2004, 402-402, fig. 7). Inside the house, a total of 158 loom weights have been discovered: the vast majority are of Type PD2a (144 samples) while Types PD2b (1 sample) and PF2 (7 samples) are rare; the number of truncated pyramidal (3 of Type PTP2a) and flat trapezoidal (1 of Type PTR2a and 2 of Type PTR2b) loom weights is very limited.

It is possible to individualize two main areas in which loom weights have accumulated: Room 8 and the courtyard (Room 3c), for which there is a notable dispersion material from West toward East (Fig. 9). Morphological analysis of Type PD2a weights shows a presence of two distinct groups of objects: the first group of weights present in Room 8 (23 in total)

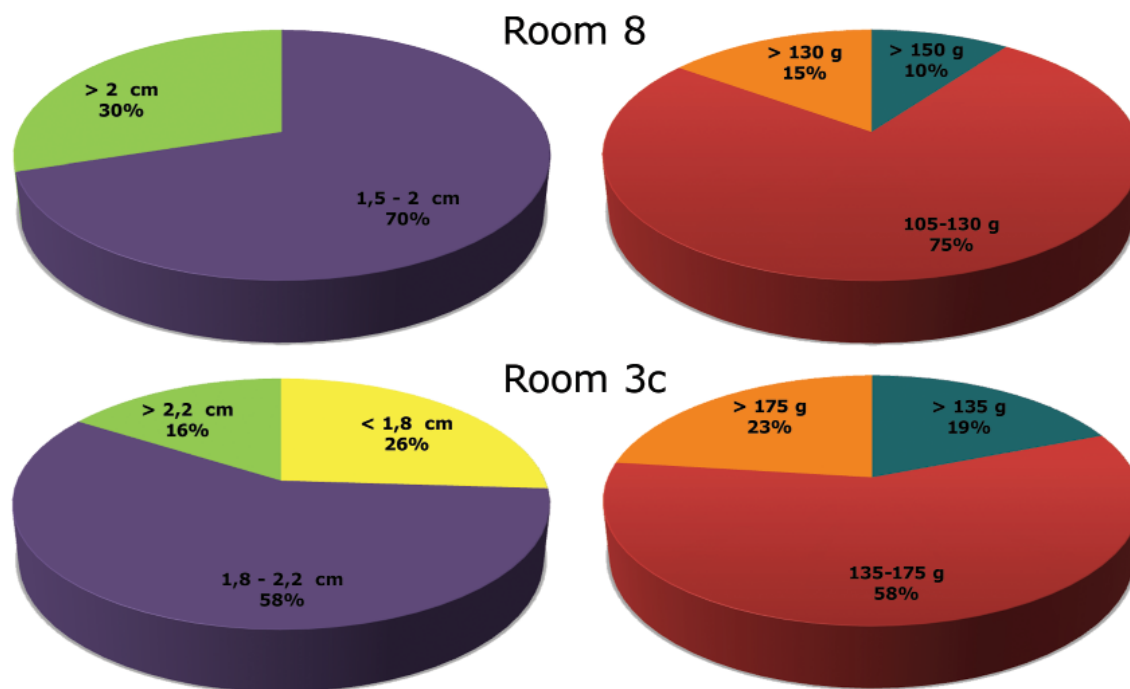


Fig. 10. Herakleia, Block II, House 'A': thicknesses and weights of the two groups of discoid circular loom weights.

has thicknesses between 1.5 and 2 cm and weight between 105 and 130 g; the second group, recovered in the courtyard (38 in total), consists of weights with thicknesses between 1.8 and 2.2 cm and weight between 135 and 175 g (Fig. 10). As warp quality and thickness of a textile depend on weight and thickness of loom weights, these two groups are likely to represent the remains of two looms with which two different warps have been worked: the first one in Room 8 would have been used to weave finer fabrics in comparison to those produced using the second group of weights in Courtyard, Room 3c.

From the latter area 2 Type PTR2b weights were also recovered, weighing over 700 g and over 1.4 kg respectively; unfortunately the fragmentary state of both pieces does not allow to establish their exact weights.

The Courtyard also yielded a spool (Fig. 11) with concave body and flat extremities (Type B1 in Gleba 2008, 143-144, fig. 99), the only such object recovered to date among all the investigated areas. It is about 4.5 cm long and is 3.9 cm wide at the two extremities and 2.1 cm wide at the centre of the body.

#### Peristyle house of Block VI

The second closed context examined here is a peristyle house of Block VI (Fig. 3), built at the beginning of the 2<sup>nd</sup> century B.C. and in use between

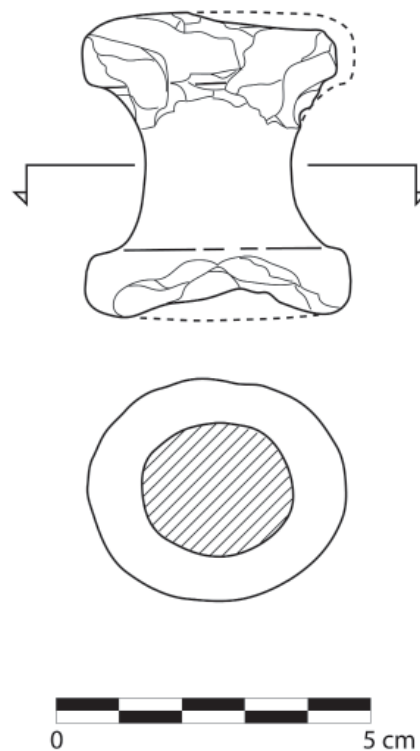


Fig. 11. Spool from House 'A' - Block II. (Drawing: C. Bianco).



HERAKLEIA  
CASTLE HILL - WESTERN QUARTER  
INSULA VI - PERISTYLE HOUSE

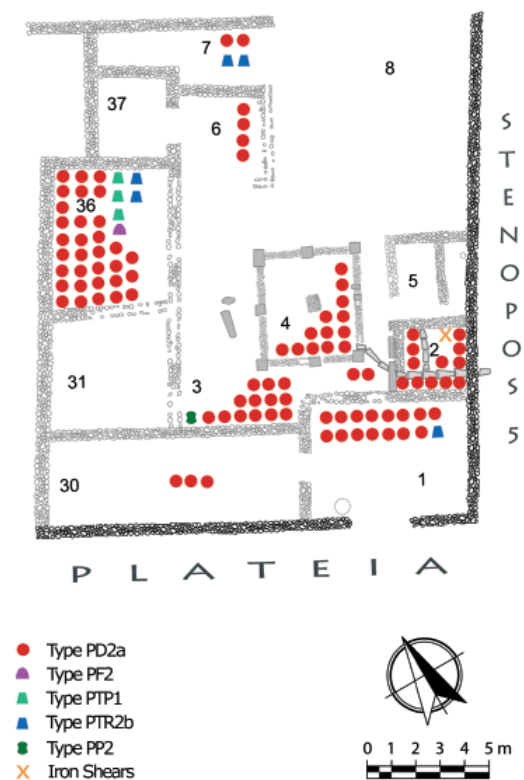


Fig. 12. Distribution of loom weights from the first cut, just without the surface layer.

the 2<sup>nd</sup> and the 1<sup>st</sup> century B.C. (Giardino 1996, 152-156, fig. 14; Giardino 1998, 177-183). Inside this house, 126 loom weights have been found. In this case, too, the majority of loom weights are of Type PD2a (114 in total, with two more samples of Type PF2), while the truncated pyramidal and flat trapezoidal loom weights are only 8 (of which 3 of Type PTP1 and 5 of Type PTR2b), and 2 are pinched weights. The spatial distribution of the weights inside each room (Fig. 12) also indicates presence of two separate groups: the first one in Room 36 and the second near the peristyle (in Rooms 1, 2, 3 and 4).

The two groups of weights of Type PD2a have meaningful characteristics (Fig. 13). The weights of the more homogeneous group (of 33 samples) found in Room 36 have a thickness mostly included between 1.9 and 2.2 cm, while it is not possible to identify a precise range for their weight. The weights of the group recovered around the peristyle (55 in total) have instead a wider range of thickness,

between 1.8 and 2.3 cm, but a well defined and narrow weight range, between 200 and 220 g. Hence, in this case, too, it is possible to hypothesize the presence of two looms and in the case of the peristyle group it likely that they were used to produce a fabric different from that produced in House A.

The Type PTR2b weights come from the same areas where the two groups of Type PD2a weights have been found (except the 2 samples from the room 7 recovered from the less reliable surface cuts): 2 from Room 36 and 1 from Room 1, near the peristyle. The weights of Room 36 weigh 700 g and 1.3 kg respectively; the weight from the Room 1 weighs 700 g; the weights from Room 7 are 1 and 1.3 kg.

**Shears**

In addition to loom weights, a pair of iron shears was found in Room 2, near the peristyle (fig. 14). The shape is common to all shears datable between the 5<sup>th</sup>- 4<sup>th</sup> and the 1<sup>st</sup> century B.C. recovered in Italy: two triangular blades (knives) with rectangular tank attached on to simple U-shaped spring (Gleba 2008, 93-97). The blades are about 11 cm long while total length of the shears is about 20 cm. At the moment this is the only example of shears found in Herakleia and the only one along the entire Ionic arc which comes from a house context. Two examples of published to date come from female burials: grave T 76 of Pantanello, in the *chora* of Metaponto, datable hypothetically between the end of the 5<sup>th</sup> and the beginning of the 4<sup>th</sup> century B.C. (Carter 1998, 266 no. 51, 817-818 H8s, Fig. 20.19); and grave 6 of Taranto, dated to the second half of the 4<sup>th</sup> century B.C. (De Juliis 1984, 407 XXXIXs no.4).

**Conclusions**

Based on the data presented above a series of preliminary conclusions can be drawn:

- In terms of chronology the examined contexts attest the presence of discoid circular loom weights in levels dated to the 3<sup>rd</sup>- 2<sup>nd</sup> centuries B.C. and their absence of contexts dated to the second half of the 4<sup>th</sup> century B.C. in the investigated area. This is in contrast to the generic dating of 4<sup>th</sup>- 3<sup>rd</sup> century B.C. for this type in the archaeological literature.
- Contextual and special analysis of the various types of loom weights suggests that Type PD2a weights (with the varying Type PD2b and PF2), replace in Herakleia the truncated pyramidal loom weights. Furthermore, the detailed investigations of the two houses indicate presence of at least four looms.

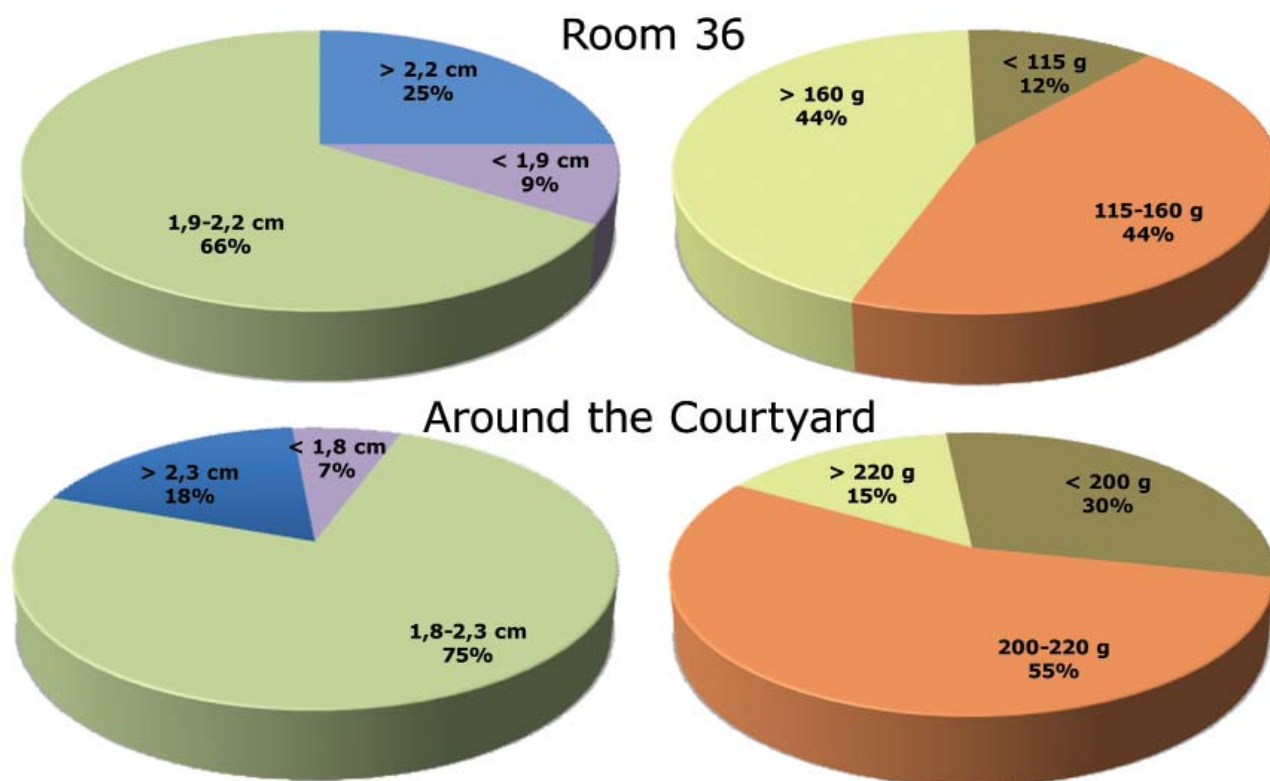


Fig. 13. Herakleia, Block VI, Peristyle House: thicknesses and weights of the two groups of discoid circular loom weights.

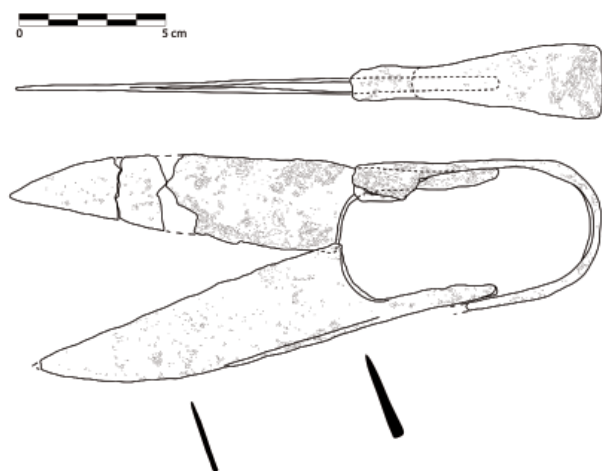


Fig. 14. Iron shears from Peristyle House - Block VI. (Drawing: C. Bianco).

- The contextualization of loom weights inside the houses and, more specifically, inside specific rooms allows also to clarify the organization of wool working: the presence of two looms for each house seems to show that it happened inside the houses and not in special ateliers. It is further possible to hypothesize that wool working was not only a simple domestic activity but a real economic activity. Also, in this case such considerations need further research.
- Type PTR2b weights to date have been usually recovered in pairs in the various rooms; such pairs always consist of pieces with different weights. This situation is common to the other Type PTR2b and Type PTP2b weights found outside the houses too. The presence of paired weights and their very limited number suggest that it is impossible to think them as part of heavy weights looms. However, it is really difficult



to imagine how they could fit with a loom using discoid circular weights. They could have been part of a pit treadle loom (Broudy 1970, 109-111), where just one or two heavy weights were necessary for stretching the warp. But, again, this kind of loom was used in chronologically and geographically distant contexts and its presence has to be demonstrated.

At this moment it is not yet possible to securely understand their use and further investigation of other contexts is needed.

- As far as the iron shears are concerned, their recovery in the room of a house where a loom has been identified and the length of the blades which are too much short to be used for shearing animals (Wild 1970, 22; Alfaro Giner 1984, 41; Gleba 2008, 93), suggests a connection to the weaving process rather than to fibre procurement. However, comparison of the dimensions of the shears recovered in Southern Italy with the dimensions of those recovered in northern Italy (Gleba 2008, 96-97, tabb. 3a-3b) may indicate that in the Southern regions a smaller model and with relatively shorter blades was used.
- A note, finally, about the spool: the presence of a single example and its weight (around 50 g), and much lighter in comparison to the range for the loom weights of the courtyard of House 'A' of block II, allows me to hypothesize that in this case it was used as a spool rather than as small weight (Mårtensson et al. 2007b; Gleba 2008, 140).

Preliminary results of the analysis of the materials presented here confirm that textile production can be considered as one of the main economic activities in Herakleia and in its territory in the 3<sup>rd</sup>-2<sup>nd</sup> centuries B.C.

These conclusions are just a part of a series of wider questions the doctoral research aims to ask:

- was sheep husbandry in Herakleia territory and in general along the Ionic arc transhumant, sedentary, or both?
- whether discoid circular and all the other types of loom weights were used during weaving for producing different products (e.g. as demonstrated for other types of loom weights by Mårtensson et al. 2007a; Mårtensson et al. 2009) and were in use in the same historical period?

- whether textile production activities were carried out only on household level or if there is evidence for workshop production?

- whether the presence of such production can be connected with the stipulation of the *prope singulare foedus* with Rome at the beginning of the 3<sup>rd</sup> century B.C. (Cicero, *Pro Balbo*, 22, 50; Sartori 1967, 81-88; Lombardo 1996, 25; Giardino 2003, 182)? Even if we lacked the text of this treaty of alliance, it had to be on such favorable terms for Herakleia that, when in 89 B.C. *Lex Plautia Papiria* conferred to its inhabitants the right to become Roman citizens, they hesitated long because of the better conditions of the treaty.

- was wool production at Taranto was connected with Herakleia, the colony of Taranto (Morel 1975, 293-300; Morel 1978)?

Textile production is an activity which leaves few traces in the archaeological and documentary records (for a preliminary analysis of the historical sources see Meo in press). In answering these questions my research is unique in the systematic studies of loom weights and other textile tools from sites in Southern Italy and allow us to establish textile production as a key part of economic activity.

#### Acknowledgements

I would like to thank Prof. L. Giardino for her fundamental support during all the research for this project; Dr. A. De Siena for facilitating the study of materials in the capacities of Director of Metaponto Museum and Soprintendente per i Beni Archeologici della Basilicata; Dr. M. Gleba for her courtesy and availability afforded to me since the 'Roman meeting'; Prof. M.-L. Nosch for the wonderful welcome at CTR; Prof. E. Andersson Strand for her important suggestions in the research development; Dr. C. Bianco for her patient help with drawings and images; Prof. G. Tagliamonte for his continuous important inputs; Dr. A. Quercia for our discussions about loom weights; Prof. M. Lombardo and Prof. F. Frisone for their constant supervising activity in the PhD Course.

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Sanna Lipkin and Anna-Kaisa Salmi

# A 16th Century Silk Fabric Fragment from Northern Finland

A small piece of silk was found in an archaeological excavation at a farm site in Liminka, northern Finland (Fig. 1). Only rarely textiles are encountered in archaeological excavations on settlement sites in northern Finland, and this is the first piece of silk found to date. In the 16th century, Liminka was a relatively densely populated village with some 80 farms situated on the mouth of the River Liminganjoki on the shore of the Liminka Bay (Luukko 1954, 338–339). The excavation was conducted on a 16th century farm site on the bank of the River Liminganjoki. During the excavation, cultural layers associated with a wood-encased stone foundation of a hearth were investigated. The hearth had been a part of a building measuring *ca.* 3 x 6 m or more. The finds included the silk fragment, animal bones and a few pieces of red earthenware; they originate from the earth mixed with the hearth stones.

A small piece of silk fabric gives us a glimpse of textiles used by the dwellers at Liminka in the 16th century. This time period is considered as the late Middle Age in Finland. During this time the settlements were small and agricultural in nature. Only in the following century the Swedish Crown established towns in Northern Ostrobothnia. The towns, such as Oulu (established in 1605), soon became local centres of trade and inhabitants of the neighbouring areas moved into those. Previously Oulu had been a part of the parish of Liminka. Liminka is situated less than 30 kilometers from Oulu and in the 17th century Oulu had gained the position Liminka had in the preceding century.

This particular fragment consists of fine silk threads going back and forth in one system only, and at the first sight there does not seem to be any regularity. When looked at closer, it appears that silk threads once used to form one set of a woven textile, and the other system has disintegrated. It was probably of plant fibre (flax?), which survives poorly in Finnish acidic soil. For example in the church yard of the Oulu Cathedral only one piece of linen textile has survived. The others are of silk or wool. Silk threads have been loosely twisted, and for the most part it is not possible to differentiate them from the bunch of fibres. The piece of textile is partly encrusted with sand, making technical analysis difficult. Thus, it is difficult to calculate the thread density, but the general appearance is that it has not been very dense (perhaps around 14 to 16 threads/cm) with respect to the fibre (*ca.* 0.05 mm) and thread (*ca.* 0.2 mm) thickness.

Using linen or wool along with silk makes the fabric less expensive (Rothstein 2003, 528), but still the textile was partially made of silk. The textile fragment has two cut edges forming a triangle. It is quite difficult to say what kind of textile it belonged to. It is also possible that it was a refuse piece from a fabric that was cut and sewn into a cloth. However, everything was most likely recycled whenever possible. Textile's largest dimensions are 6.2 x 5.4 cm, which means that it is quite small to be used for any other purpose than decoration. Perhaps it was meant to be a leaf or other small part of a headdress.

Some pieces of silk fabric have survived in burial



Fig. 1.

contexts in Oulu which date to the 17th and 18th centuries. These burials have been excavated in the church yard of the modern Oulu Cathedral (built in 1711–1797, largely renovated after the fire of 1822), where the previous church (built in early 1610's) made of wooden logs was located. Some of the silk fragments have been found in chamber burials that belonged to the families of higher social rank within the town. In single coffin burials silk is often used in caps; flowers and leaves in headdresses made of bronze; belts around the waists of children; socks; and once in a separate man's collar. Here, silk is definitely a marker of high social status. Most of the burials have no other remains than needles that were used to attach the funeral dress, fragments of woolen textiles or iron nails from the coffin. Most of the graves have no other remains than nails. Textiles along with other small items that were used to attach different costume parts, such as buttons or fasteners, play a significant part in the display of the social identities of the deceased in the grave yard.

Such conclusions are more difficult to be made based on the settlement site materials. But the fragment of silk textile gives us here an opportunity to reflect

upon the relationship of social identity and costume in the 16<sup>th</sup>-century Liminka. Silk was an expensive import material in the 16<sup>th</sup>-century Finland, and it was certainly not available for everyone (Pylkkänen 1956, 72–86). Riitta Pylkkänen (1956, 72–86) estimates that only small quantities of silk fabrics were imported to Finland in the 16th and 17th centuries and that most of these fabrics were ordered for the needs of the court and the aristocracy. Most of the silks were imported from the European Hansa towns to the towns of Turku and Viipuri in Southern Finland. Carelian tradesmen also imported some silk fabrics to northern Finland from the east. The latter silk imports may have been Persian in origin (Pylkkänen 1956, 76). The aristocracy and burghers used silk in many of their clothes, for instance dresses, vests and socks (Pylkkänen 1956). It is also known that the wealthy farmer-tradesmen of Ostrobothnia (where Liminka is located) dressed handsomely in the manner of the aristocracy (Pylkkänen 1956, 358), perhaps using silk as well. Silk was also used in folk costume, especially for scarves, bonnets, caps and various decorations (Lehtinen and Sihvo 1984).



The piece of silk fabric found at the Liminka farm may have been a part of a wealthy farmer's or his wife's costume, but it is not necessarily linked to high status as we know that silk was used for decorating and accessorizing the folk costume as well. Once out of fashion, silk fabrics might have been given or sold to poorer people, or made into children's clothing (Rothstein 2003, 529). The small fragment of silk fabric from Liminka may have been a re-used piece of a worn-down garment, or a refuse piece used for decorating the costume. Re-using and recycling materials was a common practice in northern Finland at that time, not necessarily connected to poverty or low status but practiced by everybody (Nurmi 2011).

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Rahil Alipour, Margarita Gleba and Thilo Rehren

# Textile Templates for Ceramic Crucibles in Early Islamic Akhsyket, Uzbekistan

## Introduction

The Fergana Valley, located in the eastern Uzbekistan was an important area of textile production since the beginning of the Common Era. Located on the Silk Road, this area was likely a crossroads of the Central Asia, which absorbed eastern and western influences. The finds of archaeological textiles in Uzbekistan are, however, exceedingly rare. Some of the earliest textiles have been excavated at the Bronze Age site of Sapallitepa in southern Uzbekistan, dated to the 17-14<sup>th</sup> centuries BCE (Askarov 1977, 173-174). Numerous silk fragments were found in the Karabulak cemetery in southern Fergana and date the last centuries BCE and 1<sup>st</sup>-2<sup>nd</sup> centuries CE (Litvinskiy 1972, 133-136). Recently a large number of textiles from the Munchaktepa cemetery near Pap dated to the 5<sup>th</sup>-8<sup>th</sup> centuries CE have been published (Matbabaev and Zhao 2010). The vast majority of the surviving textiles are silks but cotton and wool textiles were also present. On the basis of this material, Matbabaev and Zhao (2010, 227) suggest that silk production in the Fergana Valley was already developed at the beginning of the Common Era under the influence of China. Looking at the wider region of Central Asia, most textile scholarship has focused of the often spectacular patterned silk finds (e.g. Schorta 2006 with extensive bibliographies), while little is known about the more mundane and utilitarian textiles made of other materials<sup>1</sup>.

An investigation of a large number of crucibles excavated at Akhsyket, a city in the Fergana Valley of eastern Uzbekistan dated to the 9-12<sup>th</sup> century AD, revealed numerous textile impressions. Olga Papakhristu (1985; 1993) was the first scholar to discover that these crucibles must have been made

by means of a textile mould. This paper follows up on her research by looking more closely at the textile impressions left on the crucible fabric, advancing our understanding of a highly standardized, industrial scale manufacture of crucible steel. It further brings to focus textiles used for utilitarian purposes in a region where few textiles have been found.

## Textile Impressions

Impressions of textiles and basketry have long been investigated for the information they may provide about the perishable materials that left them. Impressions are negatives of the original fabrics, created, for example, when the fabric comes in contact with clay objects or surfaces before they are fired. Some of the earliest evidence for woven fabric, in fact, survives in the shape of such imprints, as in the case of the Upper Paleolithic Czech site of Pavlov I (Adovasio *et al.* 1996; Soffer *et al.* 2000). During the Neolithic period, several ceramic traditions existed, which used cords, baskets and textiles for pottery decoration and entire cultures have been named after this custom, for example the Corded Ware Culture. Recently, results of some archaeological experiments were published, demonstrating the importance of such impressions for our understanding of the past fibre technologies (Grömer and Kern 2010). To our knowledge, textile impressions on metallurgical crucibles have never been investigated before. They open a new field of inquiry into the use of textiles and the economy of their production in the past in contexts where textiles themselves no longer survive.

## Methodology and Materials

More than 150 crucible fragments from Akhsyket were investigated in this study, and 30 samples



with fabric impressions were selected for further analysis. Impressions were easily identifiable with a naked eye but could be observed more clearly under a magnifying glass with a raking light. The textile fabric impressions were photographed using a Dino-Lite USB digital microscope. In an attempt to identify the fibre and further microscopic features of the textiles, Vinyl Polysiloxane casts of selected impressions were made for SEM analysis. To our knowledge, this method has not been used before for the study of textile impressions on ceramics. However, unlike other types of textile impressions which in some cases preserve the microstructure of the fibres (Good 2001, 215; Grömer and Kern 2010), the crucible surface vitrified (Fig. 1) when they were heated over to temperatures reaching 1400-1500 °C (Rehren and Papakhristu 2002, 70), thereby obliterating any more detailed information left by the fibres.

#### Akhsyket

Akhsyket is located in eastern Uzbekistan, Central Asia (Fig. 2). During the early Islamic period and until the Mongol invasion in the early 13<sup>th</sup> century AD, it was the political and industrial capital of the Fergana Valley (Papakhristu and Rehren 2002, 69; Rehren and Papakhristu 2000, 56; 2003, 395). During the Samanid dynasty (AD 892-998),

Fergana became a trade market for steel weaponry and armour (Papachristu 1985, 123). The city structure of Akhsyket is typical for the Sassanid era, comprising three main parts: Quhandizh or Ark, a fortification, which is surrounded by the main city or Shahrstan, and then the suburb areas or Rabat which included the industrial quarters. The industrial scale of crucible steel production in Akhsyket is demonstrated by the thousands of crucible fragments excavated at the site, dated from the 9<sup>th</sup> to 12<sup>th</sup> century AD (Papachristu and Swertschkow 1993; Papakhristu and Rehren 2002, 69; Rehren and Papachristou 2003, 395). The crucible fragments included in this study come from both stratified and surface contexts. The stratified contexts, however, do not provide a firm chronology, therefore we are unable to discuss the chronological variations of the crucibles.

#### Crucible Steel and Crucibles

The manufacture of crucible steel is a highly specialised process during which iron is transformed into steel. During this process iron is carburized with a variety of organic materials, *e.g.* wood or charcoal, all of which are placed in a crucible which is then sealed with a lid and heated to very high temperatures in a furnace (Srinivasan 1994, 56; Juleff 1998, 11; Rehren 2000; Craddock, 2003, 242; Rehren 2003, 210). While the metal within the

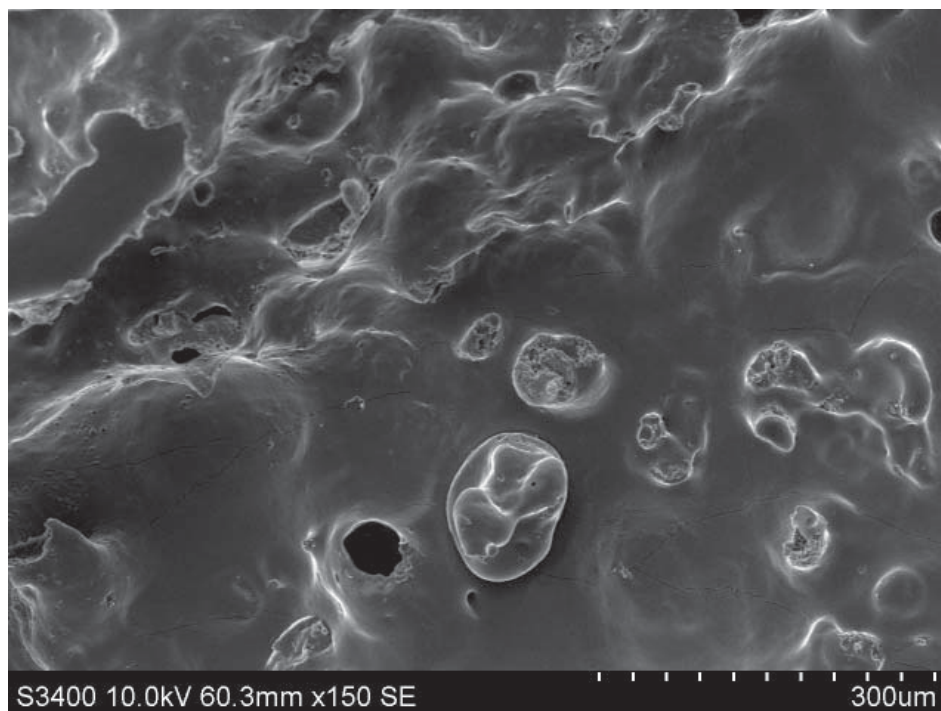


Fig. 1. SEM image showing the vitrification of the inner surface of the crucible fragment No.1.



Fig. 2. Satellite view of Uzbekistan and Ferghana Valley (Wikipedia 2010).

crucible absorbs carbon, the melting point of the alloy decreases and it liquefies, allowing the slag and alloy to separate so that a very clean steel ingot solidifies in the crucible (Rehren 2003, 210-211).

The Akhsyket crucibles are tall (28-30 cm) and thin (8 cm diameter) cylindrical vessels with lids (Fig. 3). Their specific characteristics include use of a particular type of clay and the mould-made shape which is atypical for the domestic pottery, the presence of corrugations on the outer surface, and most importantly, textile impressions on the inner and sometimes the outer surface of the crucible. Papachristu (1993) was the first to propose that the crucibles had been made using textile moulds, based on the presence of textile impressions on the inner surface of the crucible walls. The suggested process of making the crucibles started with a textile mould which was most likely filled with sand to give it a cylindrical shape. The crucible was then built around the mould. Once the clay was leather-hard, the sand inside the mould was discarded and the flexible textile mould was retrieved for reuse, leaving the textile impressions on the clay. Subsequently the crucible may have been fired before being used.

Thus, the textile impressions on the inner surface of the Akhsyket crucibles are negatives of the original textile moulds impressed onto the clay used to make the crucibles and as such are a result of 'indirect textile trace formation' (Good 2001, 215).

The textile impressions are mostly found on the fragments of upper parts of the crucibles, but rarely if ever in the lower parts. This is due to the fact that during the carburization process the liquid steel and the slag were present in the bottom two-thirds of the crucible, destroying these delicate impressions. Thus, only the upper one-third section of the crucible which

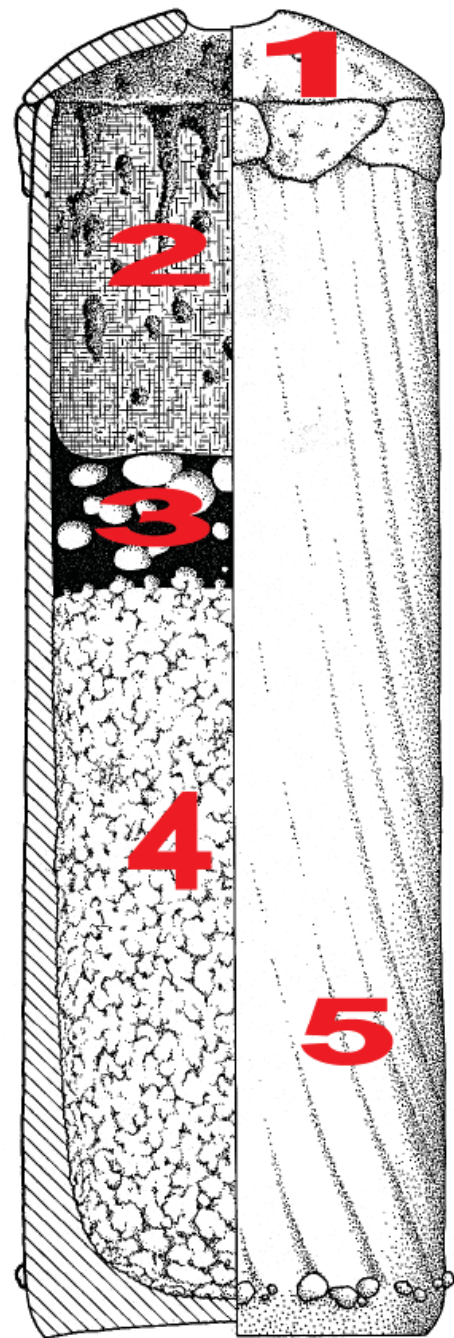


Fig. 3. Reconstruction of the Ferghana Crucible from Akhsiket:

- 1: Fine Lid
- 2: The upper crucible wall with remains of textile impression on the inner surface
- 3: Slag
- 4: Crucible steel ingot
- 5: Outer surface of the crucible showing corrugations and textile impressions.



No.	Context	System 1 Thread Count/cm	System 2 Thread Count/cm	Other features	Stitches/ cm
1	23-10a	12	14	seam	2
2	23-10b	18	14	seam	
3	23-Various Layers	16	18	seam	2
4	23-2-9	10	10		
5	23-12	18-20	16		
6	23-19	18	18		
7	23-20	14	14		
8	23-17	12-14	12-14		
9	23-18	14	12		
10	21-3	12	12		
11	23	10-12	10-12		
12	23-21a	12	10		
13	23-21b	12	12		
14	9-3	10	10		
15	Surface	12-14	12	seam	3
16	N5 lower west	10	8		
17	Surface	12	16		
18	WN Lower	16	16		
19	6872-8971	14	16		
20	6070-8158	12	12		
21	Surface	18	18		
22	Surface	12	14-16		
23	Surface	14	12		
24	Surface	16	12		

**Fig. 1. SEM image showing the vitrification of the inner surface of the crucible fragment No.1.**

was not in contact with the slag and liquid steel retained the impressions. These impressions provide much information about the nature of the textiles used to make the moulds for the crucibles, and it is this information that we present here.

### Analysis and Results

#### *Inner surface impressions*

Twenty-four crucible fragments with impressions on their inner surface were available for study. All the impressions are from relatively balanced tabby weaves (Table 1). Since none of the impressions preserve evidence of the edges, the thread system perpendicular to the height dimension of the crucible

was designated System 1. The thread system parallel to it, which also had a more distinct and regular visual appearance and was parallel to the seam (where present), was designated system 2. The thread counts range between 8 and 20 threads/cm, with approximately the same number of threads in each system (Table 1). The average thread count for system 1 is 13.5 threads/cm (standard deviation 2.8), and for the system 2 it is 13 threads/cm (standard deviation 2.6). The majority of the samples have thread counts of 12-16 threads/cm (Fig. 4). The thread counts are relative, since we do not know the percentage of clay shrinkage. It was not possible to measure the yarn diameters accurately.

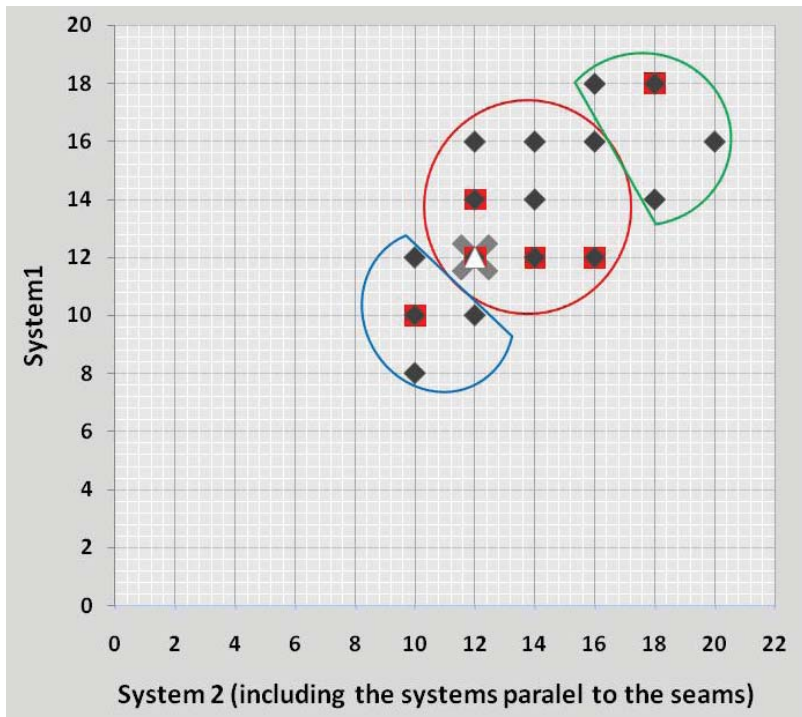


Fig. 4. Thread counts of the inner textile impressions of the crucibles in both systems. (Each diamond corresponds to a single textile impression; note that in several points on the graph (diamonds combined with squares) correspond to 2 or more textiles indicating that 12 threads/cm is the common thread count).

No.	Context	System 1 Thread Count/cm	System 2 Thread Count/cm
16	N5 lower west	16	-
17	Surface	18	-
19	6872-8971	20	-
24	Surface	14	-
25	Surface	10	14
26	Surface	14	-
27	Surface	20	-
28	AxN5	16	-
29	AxN5	14	-
30	Surface	10	16

Table 2. Outer Textile Impressions of the Akhsyket crucible fragments. The thread counts are relative, since we do not know the percentage of clay shrinkage.

#### Outer surface impressions

A closer examination of the crucible fragments revealed the hitherto unknown presence of textile fabric impressions also on some of the outer surfaces of 10 fragments (some of which also had inner surface impressions; see Table 2). In the majority of the cases a fuel ash glaze has obliterated the impressions, but on some of the crucibles which had light or no fuel ash glaze, the impressions survived. Due to the faint nature of these impressions it was only possible to measure the thread count in System 1, which ranges from 10 to 20 threads/cm, with an average of 15.2 mm. This is slightly higher than in the case of inner surface impressions. Outer surface impressions appeared finer visually as well.

#### Distinctive weave features

Some of the textile impressions have distinctive features such as unusual weave elements, seams or stitches. One of the impressions is unusual due to the coarseness of the fabric (No. 16 inner side, Fig. 5). The system (system 2) parallel to the seam is more pronounced and has only 8 threads/cm, with yarn diameter measuring over 1 mm; the other system has 10 threads/cm; the yarn diameter could not

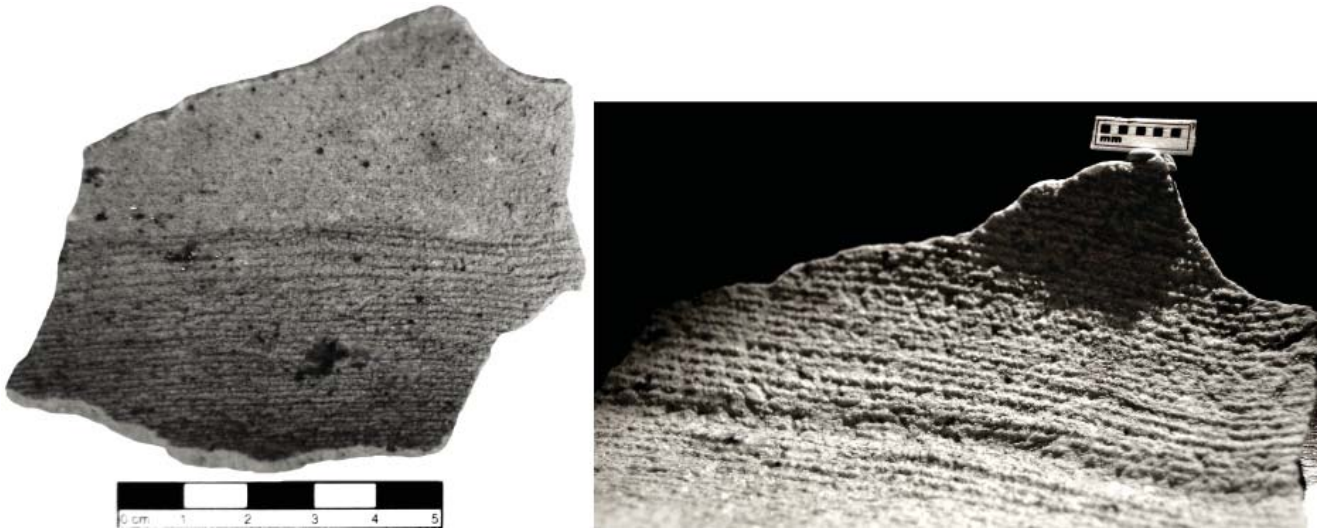


Fig. 5. Crucible-wall fragment No.16 with the coarsest textile fabric impression.

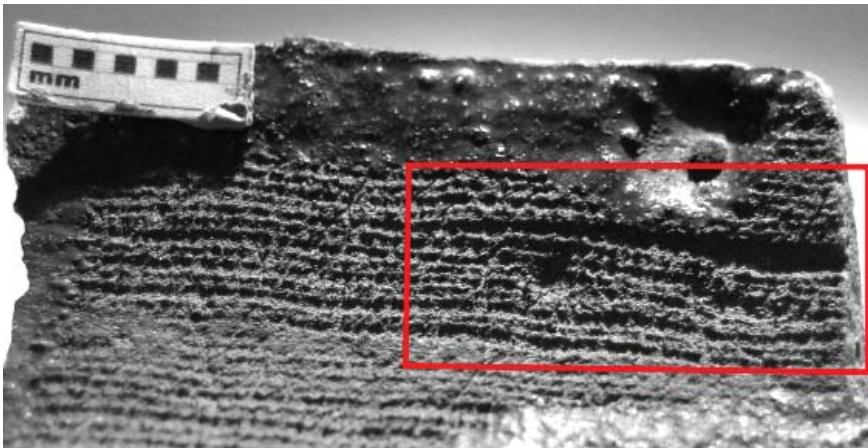


Fig. 6. Crucible-wall fragment No.18 with a weaving fault.

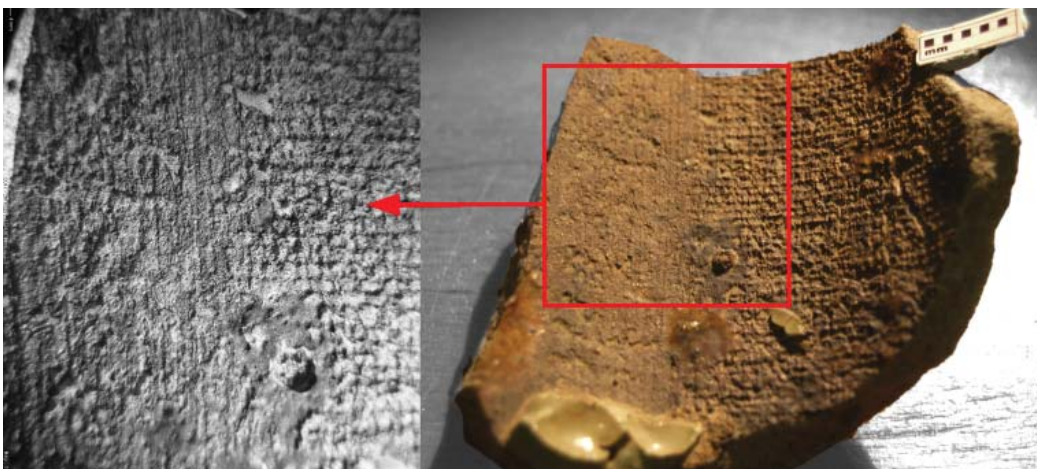


Fig. 7. Left: Photo microscopy of the fragment No.4 with different textile patterns and possible border. Right: Photograph of the fragment.

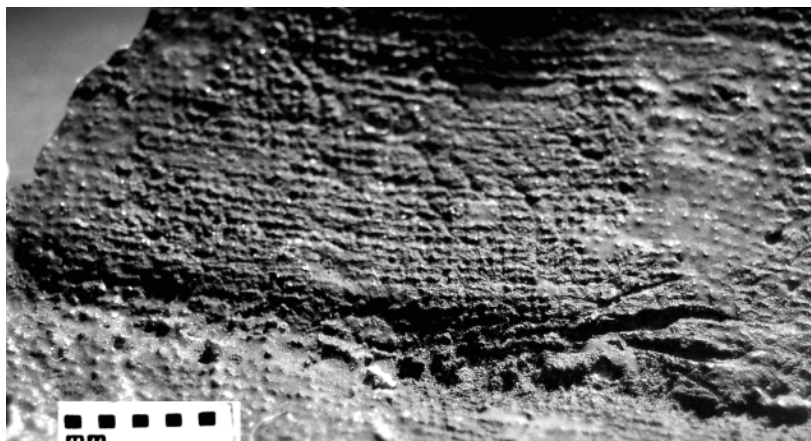


Fig. 8. Fragment No.2 with the seam and textile fabric impressions on the inner side.

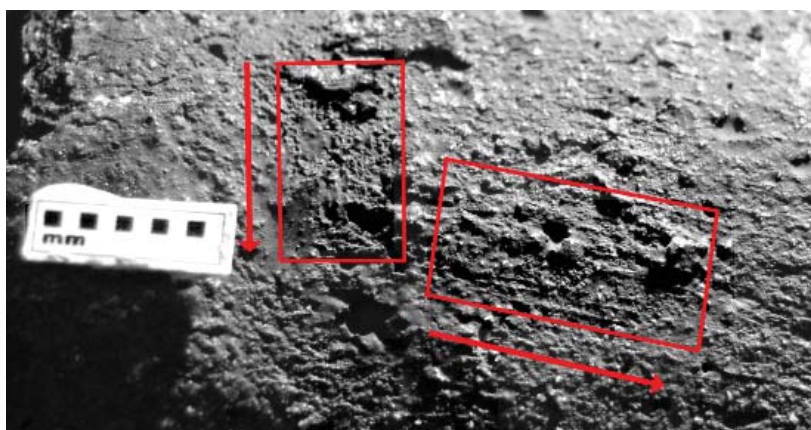


Fig. 9. Fragment No.2, the outer surface bearing textile fabric impressions.

be measured but should be just under 1 mm. The fragment has textile impressions on the outer surface as well. The thread count for the outer impressions is 16 threads/cm, which is clearly different in quality from the inner surface impressions.

Fragment No. 18 has the same thread count of 16 threads/cm in both systems, but one system is more pronounced. In one area the impression has an irregularity in the more pronounced system which may be a weaving fault or a much thicker thread (Fig. 6).

Fragment No.4 with textile impression on the inner surface has two different patterns. It is likely that one part of the impression is the textile border with either a denser thread system or different yarns, while the rest of the impression is the ground weave in simple balanced tabby with 10 threads/cm in both systems (Fig. 7). Visually, the diameter of the yarn of the ground weave appears thicker than the yarn of the border. In fact, the yarn in the border part appears thinner than the yarn of the ground weave. The yarn of the perpendicular system, which could not be measured and differentiated in either part of the

imprint, appears to have the same diameter in both parts. This fragment also has textile impressions on the outer surface, which are finer in terms of thread diameter than those on the inner surface.

Fragment No.2 has distinctive impressions both on the inner and outer surfaces. The inner textile fabric is tabby with a seam running along the fragment. The thread count for the system parallel to the seam line is 14 threads/cm, while the other system has 18 threads/cm. Thus, while the yarn diameter is the same, one of the systems is woven more closely. The outside surface textile impression is again finer than the inner, with an average thread count of 20 threads/cm (Figs 8-9).

Fragment No.17 also has textile impressions on both sides. The textile on the inner surface has 12 and 16 threads/cm in the two systems. The outer surface impression appears finer and has 18 threads/cm. Furthermore, the binding might not be a tabby, as one system is completely indiscernible (Fig.10). Apart from all the crucible wall fragments with textile impressions, one lid fragment (No.21) was found to have textile impressions with thread count



of 18 threads/cm in both systems. It may suggest that textile moulds were also used to manufacture a particular type of crucible lid (fine lid) (Fig. 11).

#### **Seams**

Crucible fragment No.15, preserved impression of a seam with regular stitching and 3 stitches/cm. It has two parallel ridges along the stitches creating an area lower than the surface of the other parts of the crucible, suggesting the presence of an open seam (Fig. 12). Another seam, with 2 stitches/cm, is present on the fragment No.3. The surface at both sides of the seam line is uneven and one side of the seam appears to be raised and more pronounced than the other one, suggesting a raised seam (Figs 13-14). Fragment No.1 has a seam similar to an open seam but both wings of the excess fabric were stitched to the body of the mould with diagonal hem stitches which are visible in the crucible impression (Fig. 15).

#### **Discussion**

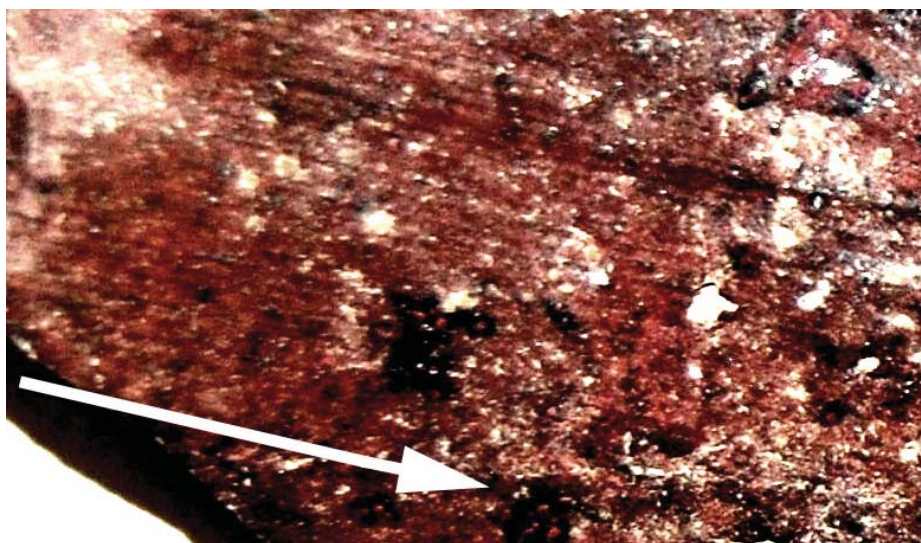
Textile fabric impressions on the crucibles are evidence of the functional and technical processes of crucible making. Their investigation allows us to retrieve information about technology and organization of not only the steel industry but also textile production in the Fergana region during the Early Islamic period. The use of a mould is indicative of a highly standardized craft and is a response to a demanding, specialized and sophisticated production process.

The clay for making crucibles contains a high amount of quartz temper, which would have been abrasive

on the hands of the potter. This factor and the very narrow tubular shape of the crucible would have made it almost impossible to produce the vessels by hand and on a wheel. In fact, none of the crucibles preserve any wheel marks. A solution to make such crucibles would have been to prepare a mould of a sand-filled textile to manufacture large quantities of standardised crucibles. At the same time, the clay is relatively fine, so a relatively dense and smooth textile template was required in order for the clay to be shaped around it without filling the empty spaces between the threads of the textile. Analysis of the textile impressions indicates that fabrics used for making the moulds are well woven, without any obvious mistakes and with very even yarns. They are all relatively balanced tabbies in a relatively narrow range of qualities. The thread counts of the impressions lead to the categorization of the textiles into three qualities (Fig. 4), also discernible visually:

- Medium (8-10 Threads/cm): 5 fragments (Nos 4, 11, 12, 14, 16).
- Medium fine (12-16 Threads/cm): 14 fragments (Nos 1, 7, 8, 9, 10, 15, 17, 19, 20, 22, 23, 24, 27, 28)
- Fine (18-20 Threads/cm): 5 fragments (Nos 2, 3, 5, 6, 21)

The relatively narrow range of the thread counts in both systems might suggest that the textiles were made or at least selected for the purpose. Furthermore, the outer surface are generally finer than the textile impressions of the inner surface of the



**Fig. 10. The outer surface of a crucible-wall fragment No.17 with unusual fabric impressions.**



Fig. 11. Lid fragment No.21 with textile impressions of tabby weave.

crucibles, indicating that the textiles which left traces on the outer surfaces were different from those used for the moulds.

The textiles on the inner surface of the crucibles are all tabbies but they have subtle visual differences. Hammarlund (2005) has classified different tabby textiles based on their visual characteristics. Three of these visual classes could be matched to the textile impressions on the inner surface of the crucibles:

- Tabby-‘Character’ (Fig. 16): both systems are straight and balanced (Hammarlund 2005, 92-93). The majority of textile impressions investigated can be classified under this category.

- Tabby-‘Movable’ (Fig. 17): in this visual category one or both systems are moving two-dimensionally and there are noticeable spaces between the yarns (Hammarlund 2005, 94-95).
- Tabby-‘Flat’ (Fig. 18): in this type, the binding is not very obvious since one system is loosely spun (Hammarlund 2005, 100-101).

The careful and regular stitching of the seams also indicates a careful and possibly specialised production of moulds. The mould would have required a high quality textile with sufficient strength and density to keep the sand. It is likely, thus, that the textiles were either produced for the purpose, or

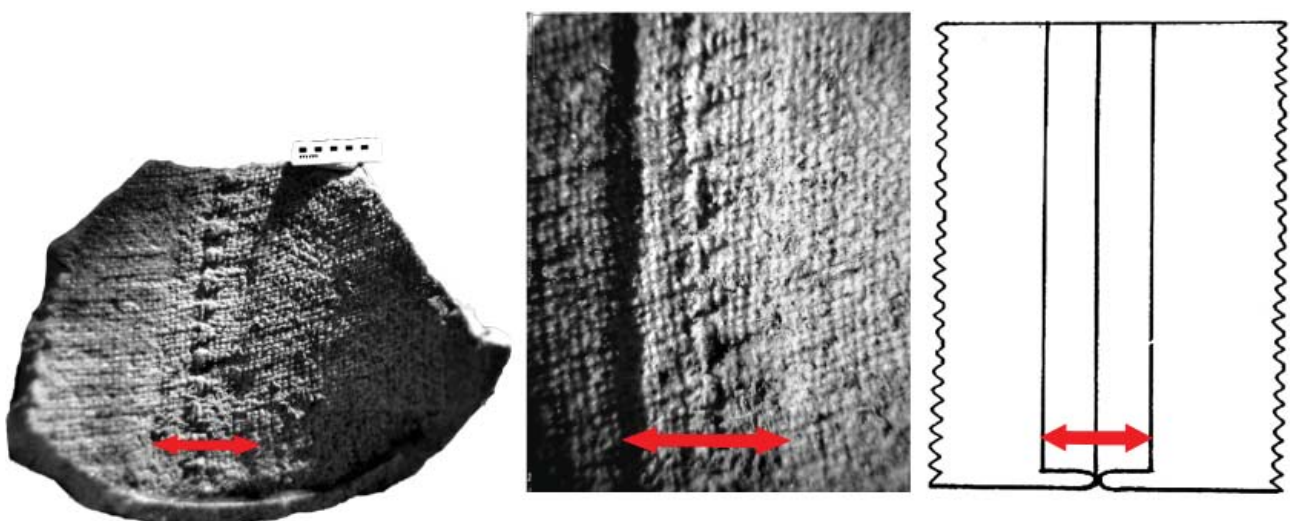


Fig. 12. Left: Crucible-wall fragment No.15 with an open seam. Middle: Photo microscopy of the seam. Right: drawing of an open seam. (After Morell n.d. 15).

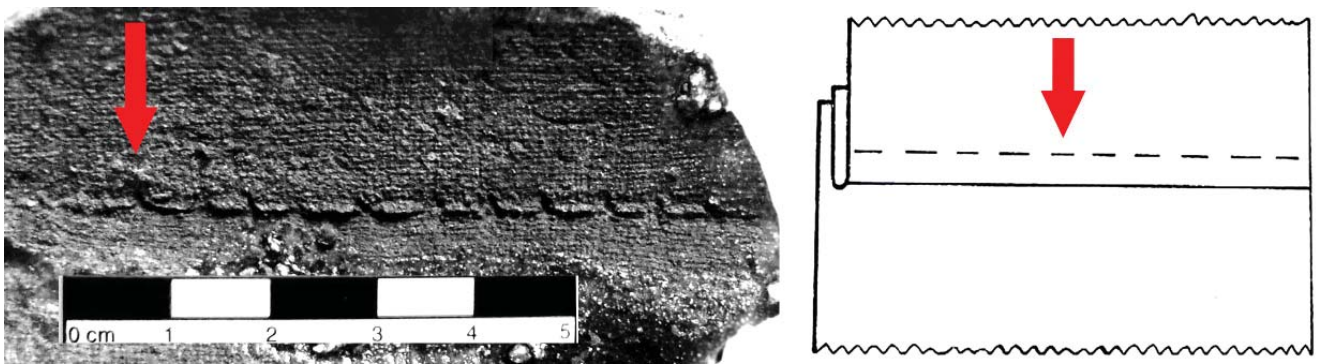


Fig. 13. Left: Fragment No.3 with a raised seam. Right: drawing of raised seam (After Morell n.d., 15).

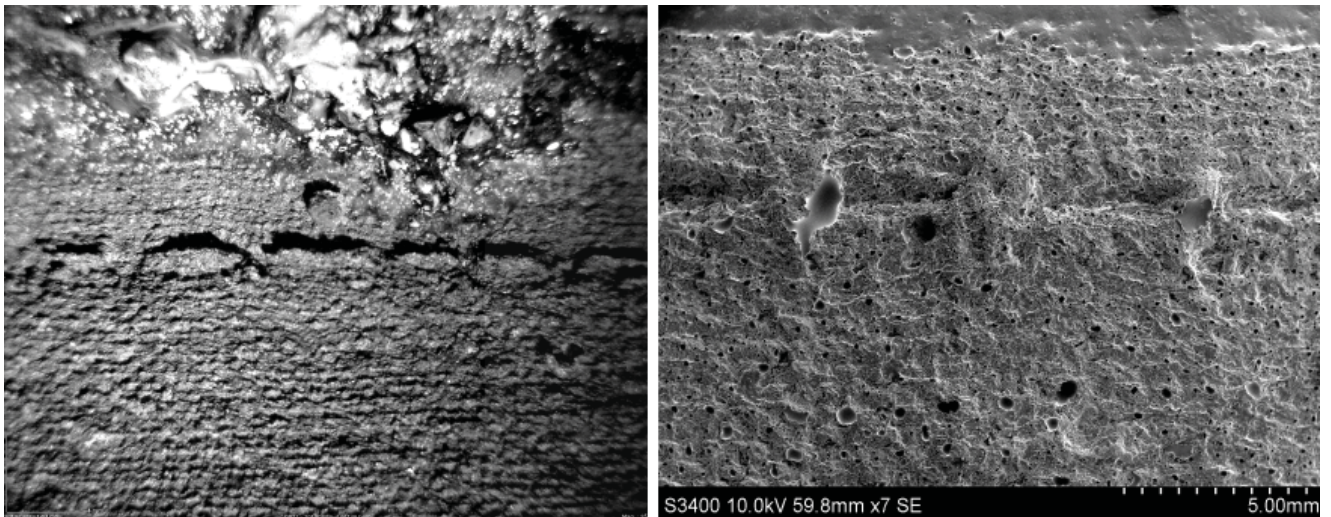


Fig. 14. Left: Photo microscopy of the raised seam of the fragment No.3. Right: SEM picture of the raised seam.

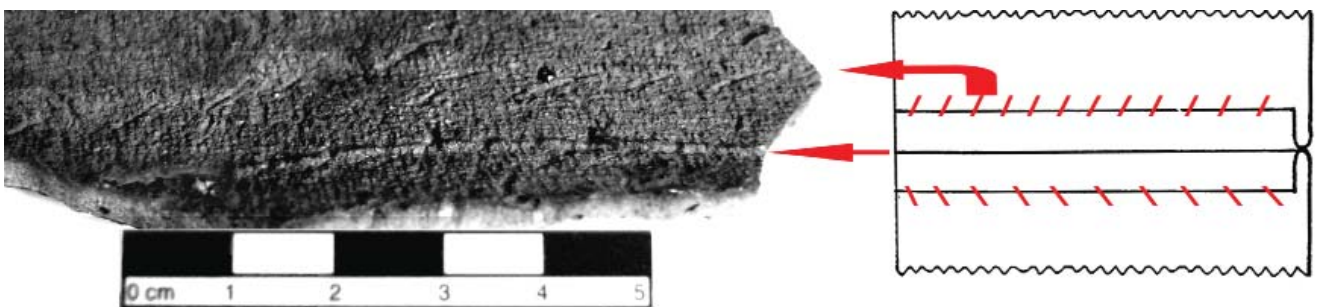


Fig. 15. Left: The crucible wall fragment No.1 with an open seam and hem stitches on both excess wings (After Morell n.d., 6).

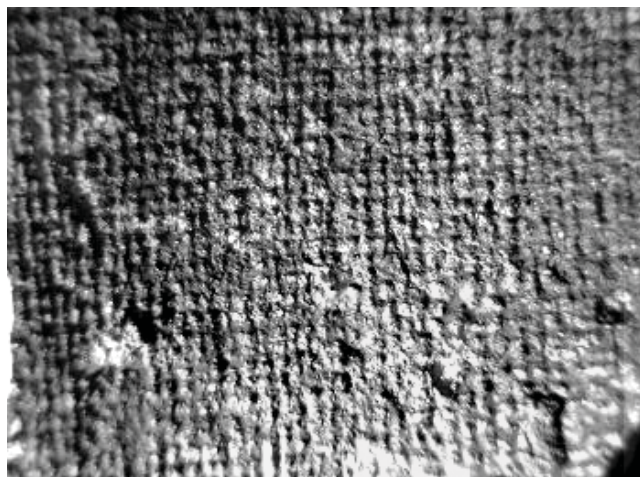


Fig. 16. Photo microscopy of an example of tabby - character impression, No.13.



Fig. 17. Photo microscopy of a tabby - movable impression, No.22.

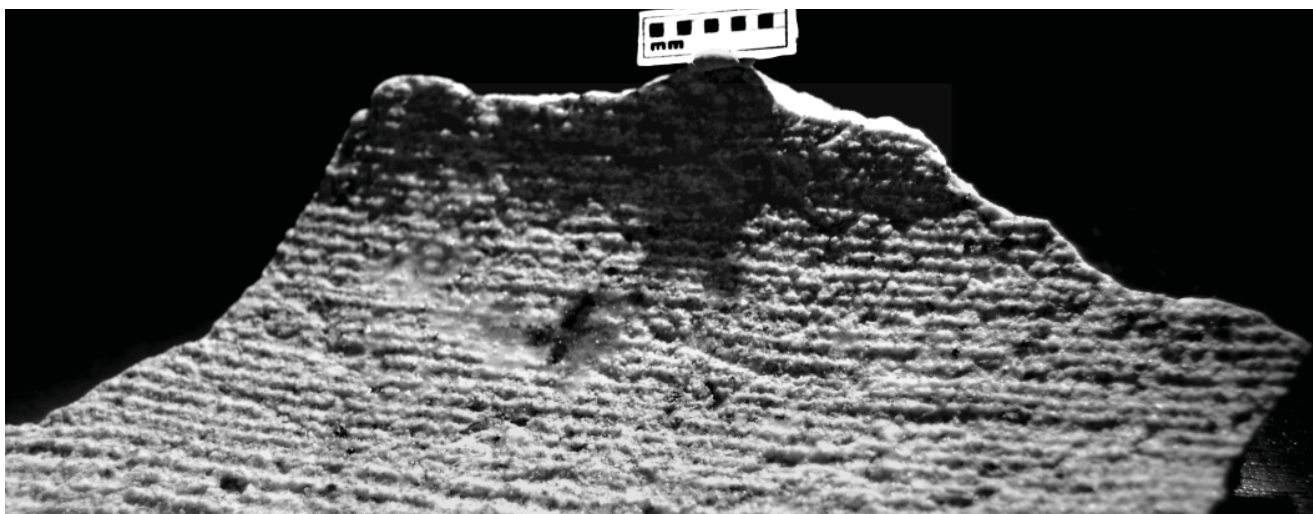


Fig. 18. Photo microscopy of a tabby - flat style impression, No.16.

selected from new or used textiles of specific quality. The later possibility seems more likely. Since the workshops involved in the manufacture of crucible steel were probably only few(2 or 3) at any one time or period, and the moulds used to make the crucibles were likely to be reused and lasted for some time, it is unlikely that the textiles used to make them were produced for the purpose. As and when textiles for moulds were needed, buying a suitable piece of cloth was probably more practicable than producing a small amount of textile especially for this purpose; however more information is needed regarding the organisation of production in order to make further conclusions. The differences in the thread counts of the textiles indicate that they do not belong to the same production, although individual preferences of the craftspeople and chronological differences also must be kept in mind.

The small differences in the textile qualities are probably due to random variation in the textiles chosen, rather than evidence for different workshops for making textiles for crucible manufacture. These slight deviations have no functional effect for the moulds and are in line with fabric variability overall. However, the differences in seams could suggest either a chronological deviation in practice or that each crucible-making specialist was making/stitching each mould personally.

As noted above, due to heavy vitrification of the crucible surfaces, fibre identification is no longer possible. However, some possibilities may be suggested. Akhsyket was a centre for silk production, and one possibility is that textiles used for steel crucible production were made of silk. Silk fabric is very strong, elastic and does not tear easily – all



qualities which would have made it perfect for the purpose. Another possible fibre is cotton. While not as strong as silk, it is less elastic which may have been an advantage in this case. Cotton was used in Uzbekistan since prehistoric times and is the most likely material used for the crucible templates. Only very few comparisons could be found. The cotton fabrics from Munchaktepa, dated 5<sup>th</sup>-8<sup>th</sup> century BCE and supposedly produced in the Fergana Valley were tabbies with 12 threads/cm in warp and weft (Matbabaev and Zhao 2010, 217), which are comparable to the ones presented here.

### Conclusions

The textile impressions on the inner and outer surfaces of crucible fragments have not been analysed before. This survey gives a new direction both for textile and crucible studies. Investigating these textile impressions is important because, even in the absence of surviving textiles, much can be learned not only about the textile characteristics used in a specific industry but also about the economy, organization of crucible production, the skills and preferences of the craftspeople involved in crucible making.

It is noteworthy that along with metalwork, textiles were important commercial goods for Uzbeks, and the Fergana valley had very active textile workshops during Early Islamic times, typically located in a 'Tim', a bazaar, which was a centre of a highly specialized and intense production area of the city (Knorr and Lindahl 1975, 50). The textile impressions on crucibles possibly provide a glimpse of these local products. They also document utilitarian fabrics, as opposed to the better investigated luxury silks.

This study suggests that the fabric used in making the moulds is relatively fine, typically a balanced tabby weave with around 13 to 14 threads/cm in both warp and weft. Systematic differences in thread counts between inner and outer impressions suggest a conscious selection of textile quality, matching divergent requirements for the two. The largest variability was seen in the stitching of the moulds, suggesting that this was not done by a standardised procedure or professional tailor, but probably *ad hoc* by the mould makers.

Although the actual fibres did not survive, applying the visual analysis of the impressions led to the visual categorization and specification of textiles used in the manufacture of moulds. The methodology used for this study can be used in the similar cases for other industries.

### Acknowledgements

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### Notes

1. Several cotton fragments are known from the 11<sup>th</sup> century AD settlement of Bazardara, located in the south-eastern Pamir, in the neighbouring Tajikistan. One simple tabby fragment has 15.5 threads/cm in both systems; numerous others, mostly reps, vary in thread count and patterning and represent clothing remains (Bubnova 1985).

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Paula Mazăre

# Textiles and pottery: Insights into Neolithic and Cooper Age pottery manufacturing techniques as revealed by the study of textile imprints from Romania

## Introduction

Numerous studies have revealed the importance of textile imprints, especially in those areas that are lacking actual textile remains (Schlabow 1960; Carington Smith 1977; Wild 1988; Adovasio 1977; Barber 1991; Adovasio et al. 1996, 1997; Good 2001; Makkay 2001; Cybulska and Maik 2007; Marian 2009). Besides the usual technical information they offer a new perspective upon the usage of textiles in prehistory.

Most imprints are placed on the flat bottoms of vessels and they usually come from mats, even though the textile imprints were also created by other two-dimensional textile structures (sheets of fabric) made by linking, knotting, knotless netting, twining, weaving etc. (Petkov 1965; Bagolini *et al.* 1973; Carington Smith 1977; Makkay 2001; Adovasio and Maslowski 1988; Tringham and Stevanović 1990; Adovasio and Illingworth 2003; Ljaško *et al.* 2004; Văleanu and Marian 2004; Lüning 2005; Kaczanowska 2006; Mazăre 2008; Richter 2005, 2009; Chmielewski 2009; Marian 2009).

In addition to imprints on the bases of the vessels, textile imprints have also been identified on the walls and within the walls or bases of the vessels (Carrington-Smith 1977, 116, Pl. 90/167, 201;

Kostelníková 1985, 197, Fig. 1; Lüning 2005, 219, Fig. 374; Kaczanowska 2006, 108; Richter 2005, 143, Fig. 8, 2009, 212, Fig. 34.1; Chmielewski 2009, 228-229, Fig. 126).

Such textile imprints located inside of three pedestal foot vessels were recently identified on two Neolithic and Cooper Age sites in Romania. Alongside other similar findings, they attest the specific role and the intentionality of textile usage in Neolithic and Cooper Age pottery manufacturing. On this basis it was possible to reconstruct the production stages of the pedestal foot vessels.

## The Textile Imprints

The three textile imprints were identified within three fragments of pedestal foot vessels. Two of them are twined textile imprints identified inside the fragments of two Neolithic pedestal foot vessels (type A) of Vinča tradition discovered at Turdaş (ca. 5100-4700 BC; Figs. 1-2). The third one is a mat imprint situated inside the fragment of a Cooper Age painted pedestal foot vessel (type B) found at Sebeş-Valea Janului (Petreşti Culture, ca. 4450-4300 BC; Fig. 3). They have the following characteristics:

- a. *Diagonal S-twist weft twining* (warp thread diameter: 0.85-1.4 mm; weft thread diameter: 0.9-

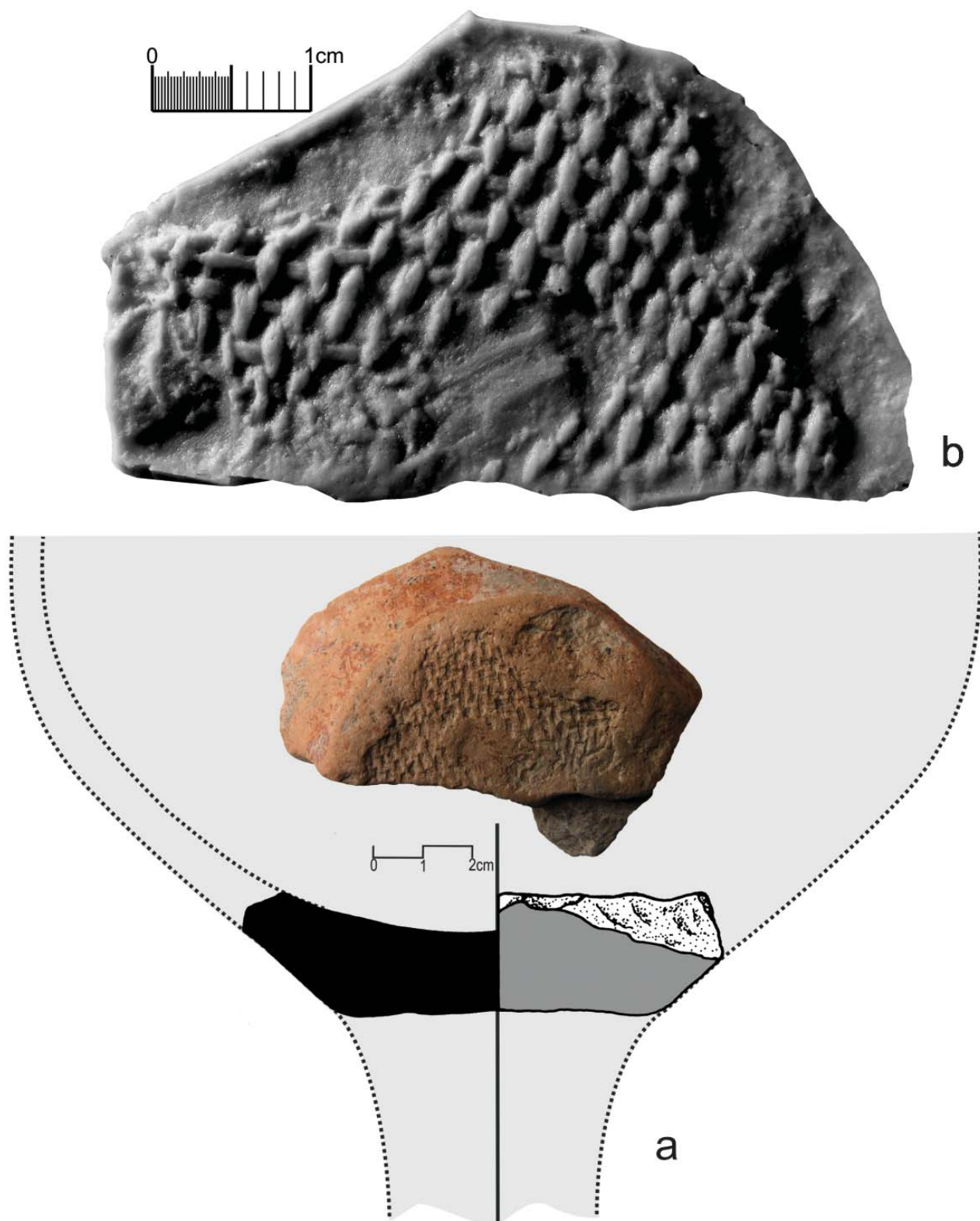


Fig. 1. Negative textile imprint on the base of a Vinča/Turdaș pedestal foot vessel (type A):  
a. The pottery fragment. Turdaș site. National Museum of Transylvanian History, Cluj;  
b. The cast of the textile imprint (© P. Mazăre).

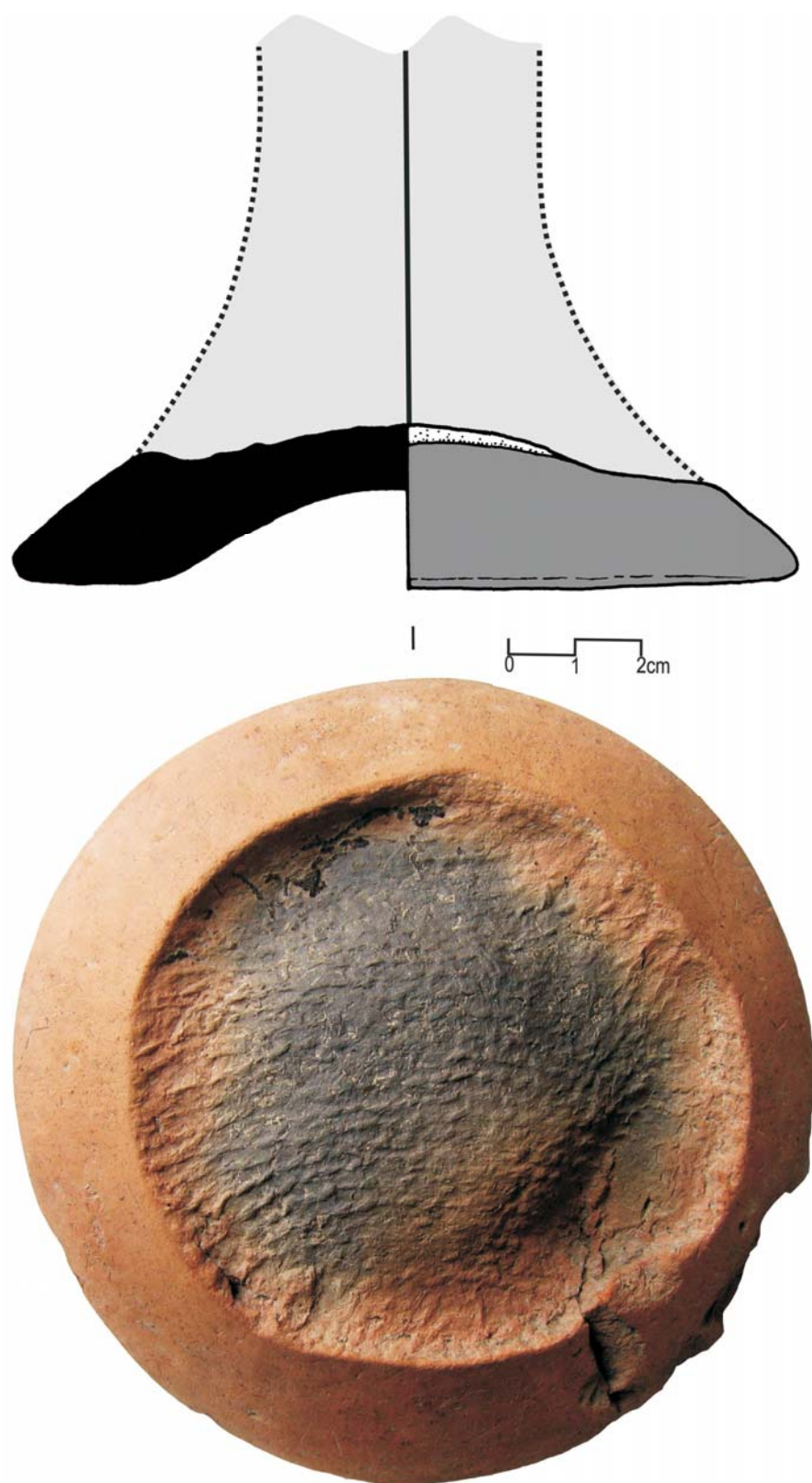


Fig. 2. Positive textile imprint inside the pedestal foot base of a Vinča/Turdaş vessel (type A). Turdaş site. National Museum of Transylvanian History, Cluj (© P. Mazăre).



1.5 mm; warp thread count: 5-7 threads/cm; weft thread count: 4-5 threads/cm; unspun fibres). Negative imprint on the bottom of a pedestal foot vessel (type A) (Fig. 1). Its positioning indicates that the imprint was invisible when the vessel was unbroken because it was covered by the vessel's foot.

- b. *Diagonal S-twist weft twining* (warp thread diameter: 0.6-1.4 mm; weft thread diameter: 0.7-1.6 mm; warp thread count: 6 threads/cm; weft thread count: 4 threads/cm; unspun fibres). This is the most interesting imprint. It is actually the positive cast of a negative textile imprint located

within the base foot of a pedestal vessel (Fig. 2). This indicates the fact that it was produced by contact with the vessel's pedestal, which already had a textile imprint on its lower part. The cast accuracy demonstrates that the negative imprint of the pedestal was hard enough to not deform under the pressure exerted by attaching the base foot to the pedestal.

- c. *Twill 2/2 plaited mat* (width of the element/strand: 2.5-5.7 mm). The imprint was located inside of a pedestal vessel (type B), in the contact area between the base and the vessel's pedestal (Fig. 3).

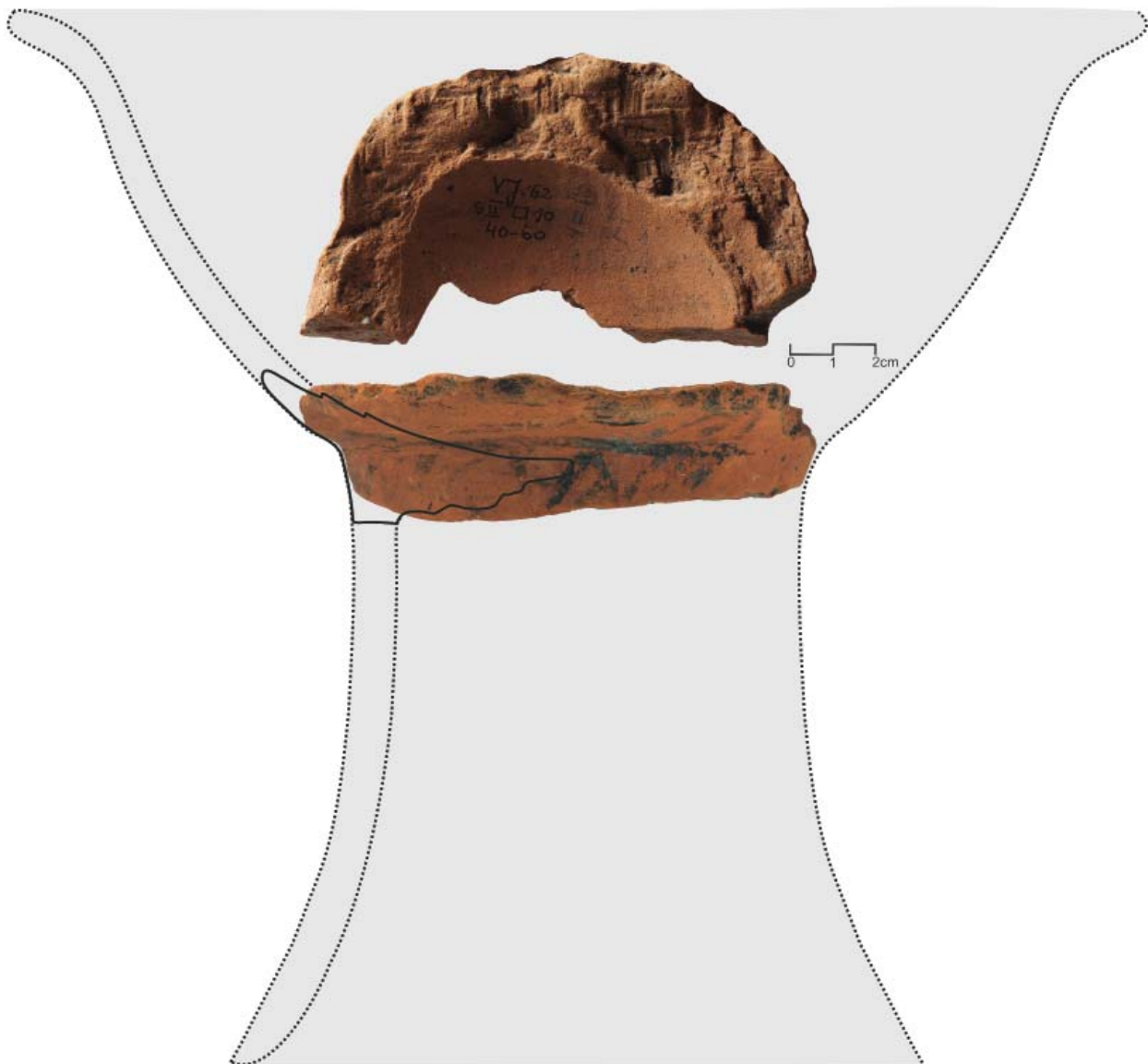


Fig. 3. Mat imprint inside the base of a Petrești pedestal foot vessel (type B). Sebeș-Valea Janului site. "Ioan Raica" Museum, Sebeș (© P. Mazăre).



### Reconstruction of Pedestal Foot Vessels Manufacturing Stages

Studies dedicated to pottery technology and ethnographic examples show that vessels with complex shapes are made by combining several components, built in sequential steps (Balfet 1984, 185; Shepard 1985, 55-56; McCurdy 2004). In some cases, shaping of the bases or feet is a final stage, them being added to the upper part of the vessel after, previously being shaped and partially dried (Balfet 1984, 181; Leeuw 1993, 245-246). Merging different parts requires special attention, because attaching still soft and moist clay surface to a hard partially dried surface is problematic as the different parts could separate during drying or firing. A technical solution to this problem is to create intentionally grooved or scraped surfaces for better adhesion, allowing perfect bonding of the different parts (Vitelli 1987, 121; McCurdy 2004, 27, Fig. 1). Some textile imprints found in the inner part of the ceramic fragments, more precisely in the merging area of the vessels' components indicate of the fact that this process was known to Neolithic potters. Examples of such pottery fragments with textile imprints are those from Luleč, Czech Republic (Linear Pottery culture; Kostelníková 1985, 197, Fig. 1); Hesserode, Germany (Linear Pottery culture;

Lüning 2005, 219, Fig. 374), Kraków-Nowa Huta-Cło, site 65, Poland (Modlnica group; Kaczanowska 2006, 108) and Zimne, Poland (Funnel Beaker culture; Chmielewski 2009, 228-229, Fig. 126).

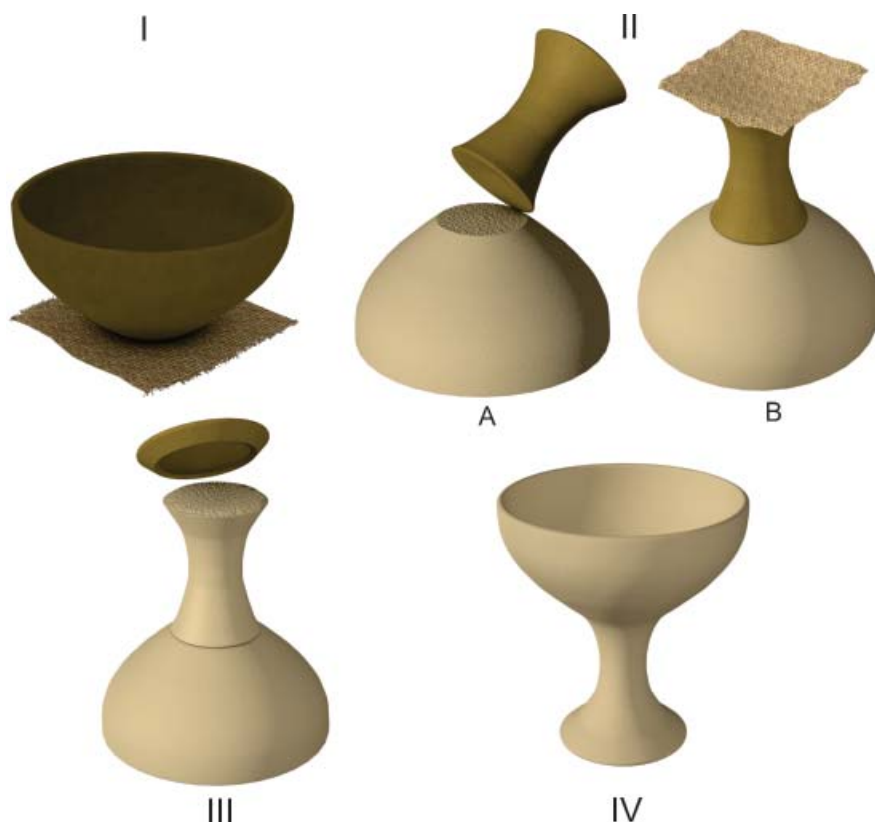
Based on these examples and the characteristics present in our imprints we attempted to reconstruct the type A pedestal foot vessels. Even though some of the technical details of the actual construction remain unknown, it can be suggested that the vessels were built in three stages starting with the upper part (the actual vessel itself), and ending with the pedestal foot (Fig. 4):

Stage I - the vessel's body was shaped on a textile support, and so the bottom displays, not necessarily intentionally, an impressed surface to be used in the next stage to bond the pedestal foot;

Stage II - the pedestal was constructed and attached after the vessel was partially dried. In its lower part, an imprint was produced intentionally by pressing a textile into the soft clay, so as to ensure good connection to the base of the foot;

Stage III - the base of the foot was shaped and attached after the pedestal had hardened<sup>1</sup>.

In a similar way the Type B vessel could have been created, except that it would have been made of only two parts (the hollow pedestal and the actual body of the vessel).



**Fig. 4. Reconstruction of manufacturing stages for a type I pedestal foot vessel (Graphics ©: T. Muntean).**



## Discussion

Depending on their location (on the bottom, on the wall or within the vessel's wall), textile imprints can be interpreted differently with respect to the method of their production, whether or not they were intentionally created, as well as the functional role of the structure itself that left those imprints. While the wall and bottom imprints can be seen more or less as an indirect consequence of the pottery manufacturing process<sup>2</sup> (Vitelli 1987, 119; Yiouni 1996, 61), the inner wall imprints are considered proof of an intentional and planned use of textiles.

Pre-Pottery Neolithic B finds from Nahal Hemar (ca. 7000 BC) and Ali Kosh (7<sup>th</sup>-6<sup>th</sup> millennium BC) have demonstrated that worked fibres and textiles were used for making containers before the invention of pottery (Schick 1988, Pl. XIV/1, 3; Barber 1991, 131-132). It is interesting that this tradition prevailed and was also used on pottery, as proven by inner wall imprints on pottery fragments found in Neolithic and Cooper Age sites. For instance, J. Carrington Smith (1977, 115) demonstrated that in the case of the imprints from Kephala, Greece cloths were incorporated into the walls of pots as a form of temper to strengthen the vessels.

In the case of our imprints, the textiles had two possible functions. Besides serving as the support structure role in which case the vessels were shaped on them, they were used deliberately to produce the grooved adhesive surface necessary to bond the different parts of the vessel together. As our reconstruction pottery manufacturing model is based on these isolated findings, we cannot conclude whether it represented an exception or a widely used practice of shaping Neolithic or Cooper Age pedestal foot vessels. The breakage of the base foot may be an indication that the practice of separately shaping the pedestal and the base foot, and subsequent joining of the two, was not very effective and could be subject to failure. More careful studies on textile imprints and Neolithic and Copper Age pedestal foot vessels could provide further clues in that regard.

## Notes

Our assumptions regarding the stages of producing vessels were confirmed by an experimental study on the use of textile structures during the manufacturing of ceramics. For more details see Mazăre *et al.* in press.

<sup>2</sup> There are two different archaeological interpretations concerning the imprints on the vessels bases: a) they were produced during the shaping phase, using mats or coarse textiles as supports for rotating and easier building of the vessels (a

primitive variant of turning devices); b) they are a passive consequence of placing the vessels on mats or sheets of fabrics in order to dry after they were shaped. Another explanation regards the textile imprints found on prehistoric vessels' walls as ornamental. They show an intentional usage of the textiles, but their function does not strictly concern the technological process of manufacturing pottery, but rather the treatment of the surface of the already shaped product.

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O. Orfinskaya and T. Pushkina

# 10th century AD textiles from female burial LI-301 at Gnëzdovo, Russia

The Gnëzdovo archaeological site dated to the 10<sup>th</sup>-11<sup>th</sup> century A.D. comprises several barrow cemeteries and a settlement. It is situated on the bank of the Dnieper River near the village of Gnëzdovo, some 12 km west of the city of Smolensk, which lies 378 km southwest of Moscow. It is one of the most important medieval sites in Russia.<sup>1</sup> The population of the settlement consisted mainly of Scandinavians and Slavs. Among them there were artisans, e.g., smiths, jewelers, potters and bone-carvers, warriors and merchants. Ethnic and social attribution of the dead persons buried under the Gnëzdovo barrows is based on the analysis of mortuary practices and grave goods.

In Gnëzdovo barrows cremations prevail over inhumations. Textile remains have been encountered and recorded in 12 of the total of 116 excavated inhumations. The overall majority of these finds are minute fragments having survived owing to contact with metal. The only exception is the discovery of a bundle of fabrics in a burial excavated by the Smolensk archaeological expedition of Moscow State University in 1982. The materials of the burial were included in a publication dealing with the three most

interesting chamber tombs of Gnëzdovo known by the late 1980s (Avdusin and Pushkina 1989, 190-205), while fabrics from the site were studied partially in M.V. Fechner's work (Fechner 1999, 8-10).

It is worthwhile to describe once more the barrow burial LI-301 in connection with new finds from cemeteries of Kiev and Pskov where chamber burials have been found whose rites and grave goods are similar to those of Gnëzdovo (see Mikhailov in *ATN* 47), and to outline the characteristics of textiles found in it.

Barrow LI-301 was situated on the southern boundary of the Central Barrow Group of the Gnëzdovo site.

The barrow was a low, slightly eroded sand mound, circular in plan, with a small hollow on the top.

The latter was taken at first for a trace of a 19<sup>th</sup>-century excavation pit. The barrow mound covered a rectangular pit measuring 3x3x0.8 m which was dug after scorching the earth or burning a small fire. Remains of a dovetailed timber structure measuring 2.3x2.25 m were revealed on the bottom of the pit.

An uninterrupted layer of wood decay up to 0.1 m wide was traced along the contour of the walls to the height of 0.3 m. The structure was probably



even higher since separate areas of wood decay were recorded in the upper layers of the pit filling. It was apparently covered with wooden planking, in a north–south orientation. Planks are 0.1–0.2 m wide and up to 0.03 m thick. The better preserved flooring of the chamber was fully cleared. It consisted of planks 0.15–0.25 m wide and up to 0.05 m thick placed directly on the virgin-soil bottom of the pit (Fig. 1). The chamber floor had been seemingly covered with birch-bark whose remains were traced in the northern part of the structure. Scattered beads (50 items), a cross-shaped pendant cut of sheet silver with *poinçonné* decoration, and a fragment of a bronze equal-armed brooch in a very bad state of preservation were lying on the floor almost at the centre of the chamber. Southwest of the necklace remains, near the west wall of the timber structure, there were the handle, iron hoops and loops of a truncated-cone-shaped wooden bucket lying on its side, and a small wheel-thrown pot with a linear decorative pattern. The remains of two birch-bark discs, one whole and one halved, measuring 27 cm in diameter, lay to the southeast of the ornaments. The discs are displaced with respect to one other, and both have small holes along their edges, as if for

attaching the cloth walls, resulting in a combination-material box. The halved disc was partially covering the fabric bundle put in the box. The upper layer of the bundle was visually identified during the excavation as a coarse wool fabric. Inside the bundle, there were fragments of an oval bronze brooch and an imprint of a small round cup, probably of wood. Near the bundle but somewhat nearer to the southeast corner of the burial chamber, there were two wax candles standing vertically almost to the height of 0.05 m over the upper planking. Judging from a very thin ring of wood decay some 25 cm in diameter traced around the candles, they were originally placed in a hollowed out wooden vessel. Nine additional candles, either intact or broken, were found on the floor in the eastern part of the timber structure. The majority of candles had a melted end. The burial was identified as a female one of Scandinavian type, with the corpse in a sitting position, and was dated to the 970s AD (Avdusin and Pushkina 1989, 200, 203).

#### Methodology

- Microscopy in non-polarized light (МБС-10) with 10<sup>x</sup> to 40<sup>x</sup> lenses was used to determine the structure

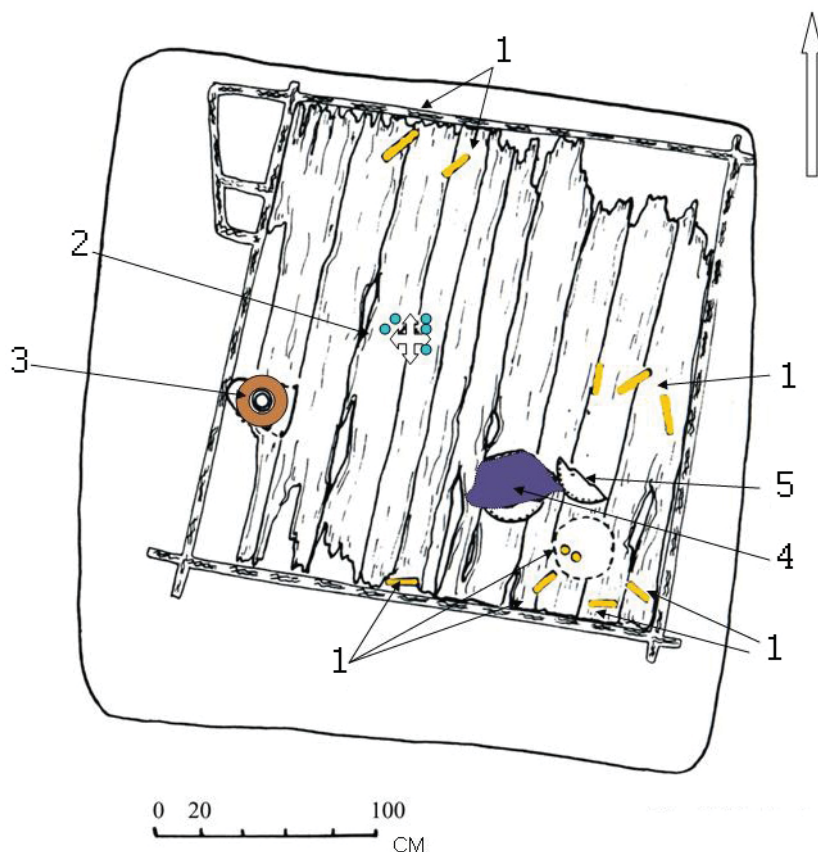


Fig. 1 Plan of II-301 burial at Gnëzdovo – 1982:

- 1: candles;
- 2: necklace with cross;
- 3: bucket and pot;
- 4: textile;
- 5: fragments of two beech-bark discs.



of fabrics and plaited articles.

- Optic microscopy in reflected and transmitted polarized light (ПОЛИАМ-Р-212) with 100<sup>x</sup> to 400<sup>x</sup> lenses was used to determine the nature of textile fibres. Permanent immersion preparations in Canada balsam were made for the purpose.

- Organic base of gilt threads was studied by histochemical, microchemical and microscopic methods. Investigations were carried out by O. Lantratova, leading research fellow of the Restoration Department of the State Historical Museum (Moscow).

- Textile dyes were analysed by E. Karpova at the N.N. Vorozhtsov Novosibirsk Institute of Organic Chemistry using high performance liquid chromatography (HPLC), in extractions of mixture ethanol:water:complex DTPA and dimethylformamid.

- The chemical composition of metal was defined by means of remote X-ray-fluorescent method with the aid of ArtTAX device (Röntgenanalysen-Technik). The analyses were carried out by N. Eniosova at the Archaeology Department of the History Faculty of Lomonosov State University (Moscow).

### Material

Investigation included the following: Fragments of Brocade Dress 1, Fragments of Brocade Dress 2, fragments of brocade fabric, fragments of silk trim of an unidentified article, fragments of a linen dress, fragments of a linen article in the *sprang* technique, and fragments of wool fabric.

### Fragments of Dress 1

Dress fragments were restored by A. Elkina, the restorer of the Russian Research Institute of Restoration, so by the time of analysis we had to deal with washed, smoothed out items, which were reinforced with white thread. Their drawing enabled us to reconstruct the main outline of the dress (Fig. 2). It was a tunic-shaped waisted gown with widening skirt and long sleeves with cuffs. A collar fragment 8 cm high has survived on its back. Its width with sleeves was slightly over 2 m.<sup>2</sup> The full length of the dress cannot be determined; the maximum length of the surviving part is 89 cm. The dress is made from a fabric with a decorative pattern embroidered with gilt threads. The main pattern is placed on front and back parts above the waist while the skirt bears patterned horizontal stripes. Similar stripes run along the sleeves. The entire right sleeve consisting of two parts measuring 40 and 20 cm respectively has survived. As to the left sleeve, its surviving part measures 50 cm in length. A deep pleat is visible on the back.

Collar and cuffs were cut from undecorated parts of fabric along warp ends. A small inner fold divides the collar in two parts in the proportion of 1:2.

While the reconstruction of the back is secure, that of the front part is not as straightforward. The major issue is the shape of the neck. A surviving fragment of its left piece measuring 12 cm ran along the central axis of the article, at a distance of 12.5 cm from the shoulder line. Fabric, slightly folded at this place, bears traces of a seam, which is indicative of a lined selvage. The bottom part is fully spread and has punctured holes along the line of fold. It enables us to surmise that the dress had a vertical slit at the centre going down for some 24-25 cm from the shoulder line. It is worth noting, however, that fragments of the garment were restored and any folds smoothed out. It is therefore not inconceivable that the garment could either have been worn open or have an additional flap on the right side.

The right flap has a seam running across it at a slight angle to the horizontal line below the sleeve and slightly below the main decorative pattern. The surviving part of the seam measures 2 cm, which does not permit us to reconstruct the juncture line with certainty.

A small fragment of the same fabric without decorative pattern (13x10 cm) has a tucked selvage and remnants of a hidden seam, 7 cm from the edge; it is indicative of a closed vertical edge of a lined article. The fragment bears no decoration, so it was situated either above or below the narrow decorative stripe. It has a selvage, so it cannot be a slit at the centre of a weaving piece. Having analyzed several alternatives, we chose the most obvious explanation: the fragment is a part of a side vent. We hence conclude that the gown was long, had two decorated stripes on the skirt and side vents (Fig. 3). The surviving parts of the hidden seam on the fragments under consideration and on the sleeves imply that the article was lined; the lining covered the reverse side completely but did not survive.

The decorative pattern is distributed top to bottom as follows: the area with the main decoration is 75 cm long, then there is an area without decoration 33 cm long, followed by a decorated area 18 cm long, after which the surviving cloth ends. The main image is placed symmetrically along the vertical axis of the cloth. The composition is arranged around a disc, which can be regarded as a celestial body, either the moon or the sun, or as a big pearl. The most visible figure is that of a sitting griffin, a mythical beast with the head and wings of a bird of prey and the body of a lion. A scaled 'stripe' runs near its jaws; it is probably a part of the body of another

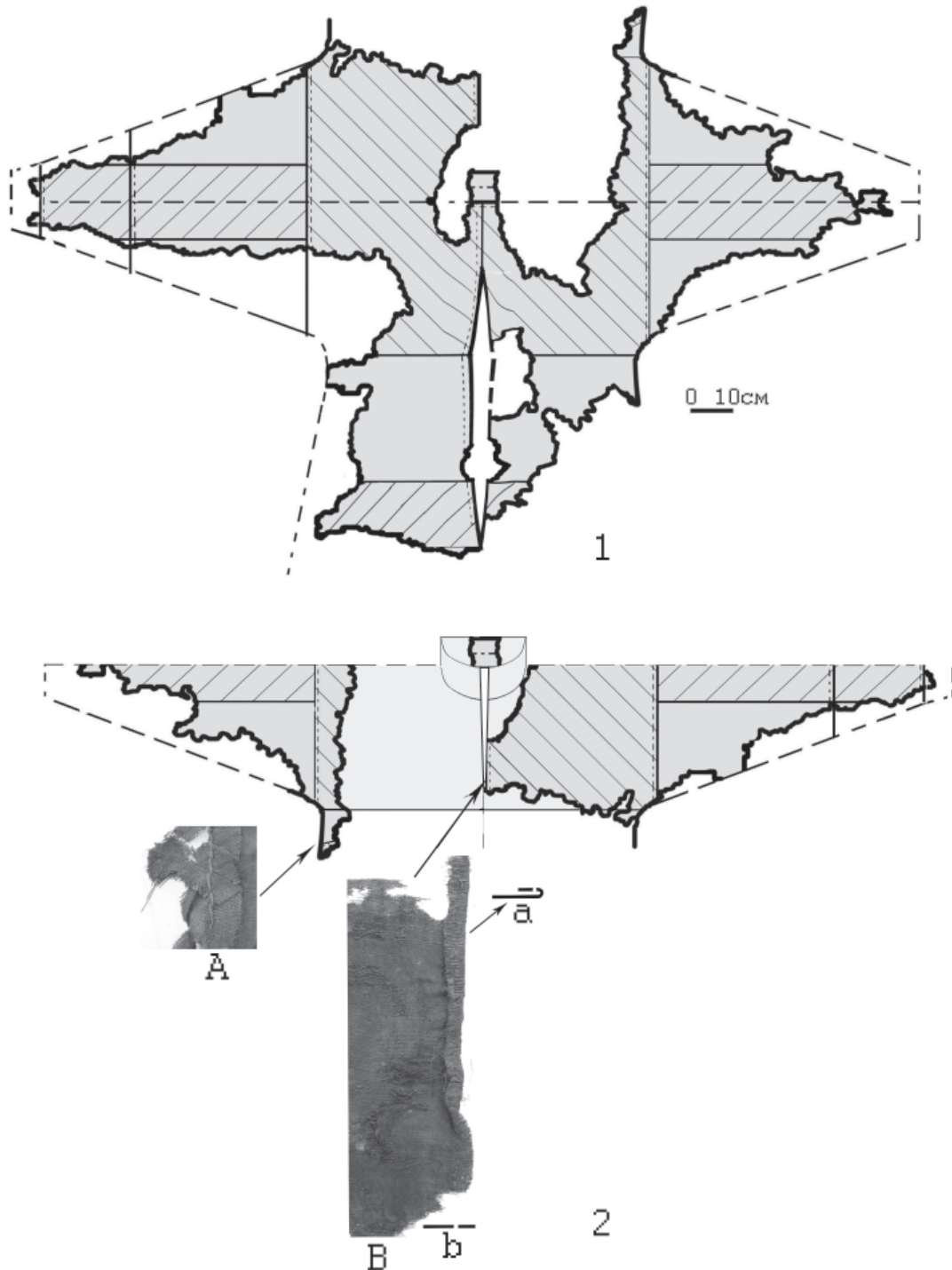


Fig. 2. Dress 1

1. Drawing of surviving fragments and reconstruction of cut.

2. Reconstruction of the front part of dress.

A. Fabric section with seam running across right flap.

B. Fabric section along the line of central vent.

a. Tucked selvage bearing holes punctured with needle;

b. Unfolded selvage with holes running along the line continuing that of tucking of the upper part the selvage.

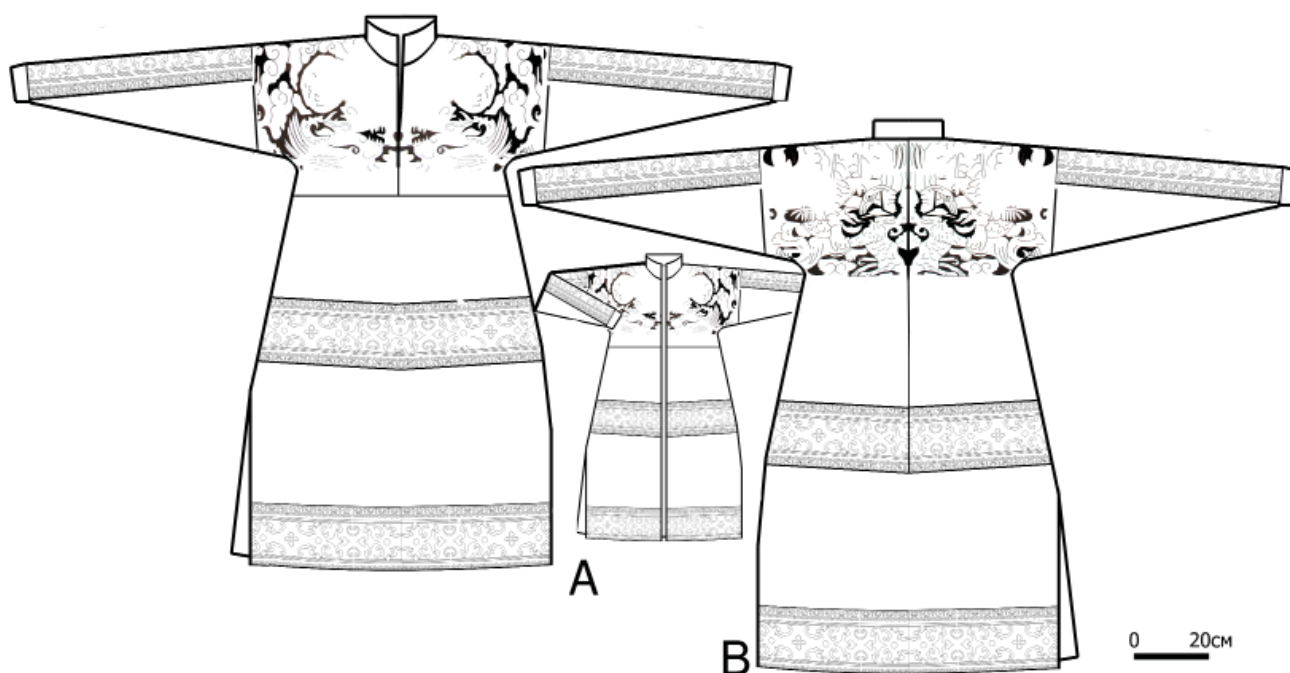


Fig. 3. Alternative reconstructions of dress: A – Two variants of front view; B – Back view.

mythical creature, a dragon. The dragon disappears in the clouds above the griffin, and reappears on the other side of the disc. The head of the dragon is depicted showing its mouth, an ear, a horn and 'hair' behind the ears. Other parts of the head cannot be identified with certainty. Thus, the fabric design features the sitting griffin probably holding a paw of the dragon flying into the clouds (Fig. 4). The griffin has characteristic Mediterranean traits while the dragon is typical of China. The amalgamation of the two traditions is only natural since the adoption of occidental ornamental motifs by Chinese silk weavers began already in the first centuries of Common Era (Lubo-Lesnichenko 1994, 189-211; Liu 1996, 18). The decorated stripe consists of five narrower bands: two composed of figurative festoons, two narrow and plain, and a central band bearing floral decoration (Fig. 5).

It seems likely that the same pattern was used in decoration of a Chinese gown of the Yuan period (Fig. 6), where the bodice is covered with decoration featuring dragons down to the waist, while decorated stripes run over the skirt and along the sleeves (Feng and Lin 2005, 219). A stripe some 20 cm wide runs over the shoulders of many surviving Mongolian gowns of the 13<sup>th</sup> century AD. Usually such a stripe bears decoration featuring a pseudo-Kufic inscription. The original style called 'intertwined Kufic' was elaborated in eastern provinces of Iran



Fig. 4. Partial reconstruction of large stripe decorative pattern.

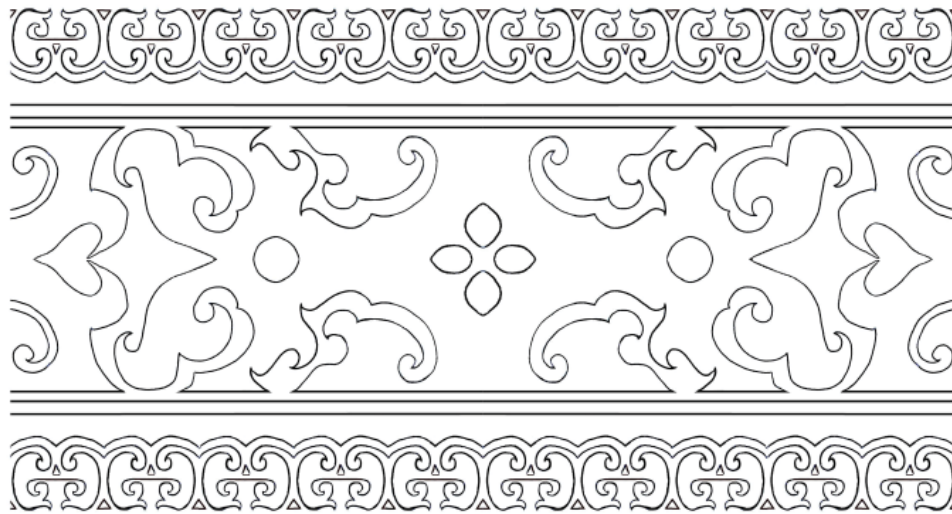


Fig. 5. Drawing of narrow decorated stripe.



Fig. 6. Mongolian noblewoman (After Silk 2005, 219).

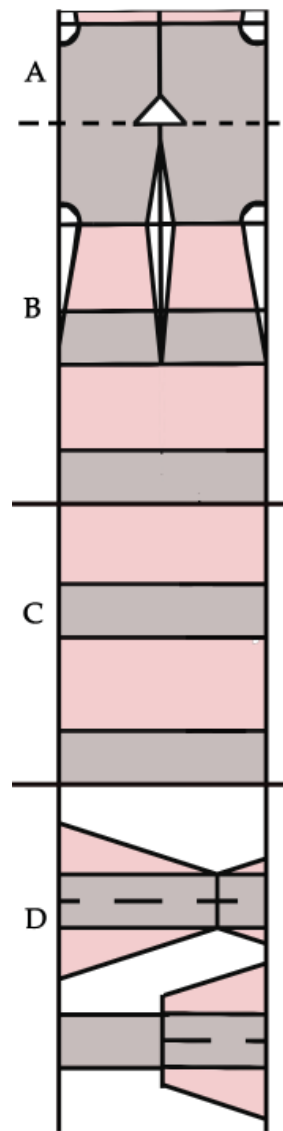


Fig. 7. Reconstruction of apportionment of dress cut on fabric. Fabric width 80 cm, length 4 m.

- A: front
- B: back
- C: front part of skirt
- D: sleeves.



in the 11<sup>th</sup> century AD (Folsach 1993, 45). A study of a female gown from the Marjani collection has shown that a cloth piece with starting and finishing border<sup>3</sup> was used to make the garment. The stripe with a pseudo-Kufic inscription runs at 10 cm from the end of the woven piece. It can be surmised that a similar stripe on the 10th-century AD garment under study was wider and illustrated a particular story. In this case the wide stripe showing the dragon and the griffin would have been placed at the end of the weaving piece. Therefore a horizontal seam whose remains have survived on the left flap would have run somewhere near the waist on the front of the gown. With this assumption, all narrow decorative stripes would have been spaced evenly. Then, if there were two of them on the skirt, the gown was approximately 1.40 m long (Fig. 7).

Structurally the cloth of the gown belongs to the fabrics with additional stripes of gilt weft introduced in the ground weave. Gilt threads cover the background of the main decorative design almost completely. The image is outlined by thin threads of the warp-faced weave. The distribution of ground and supplementary threads in the decorative stripe is approximately even.

*Technical analysis of the Dress 1 fabric (Fig. 8).*

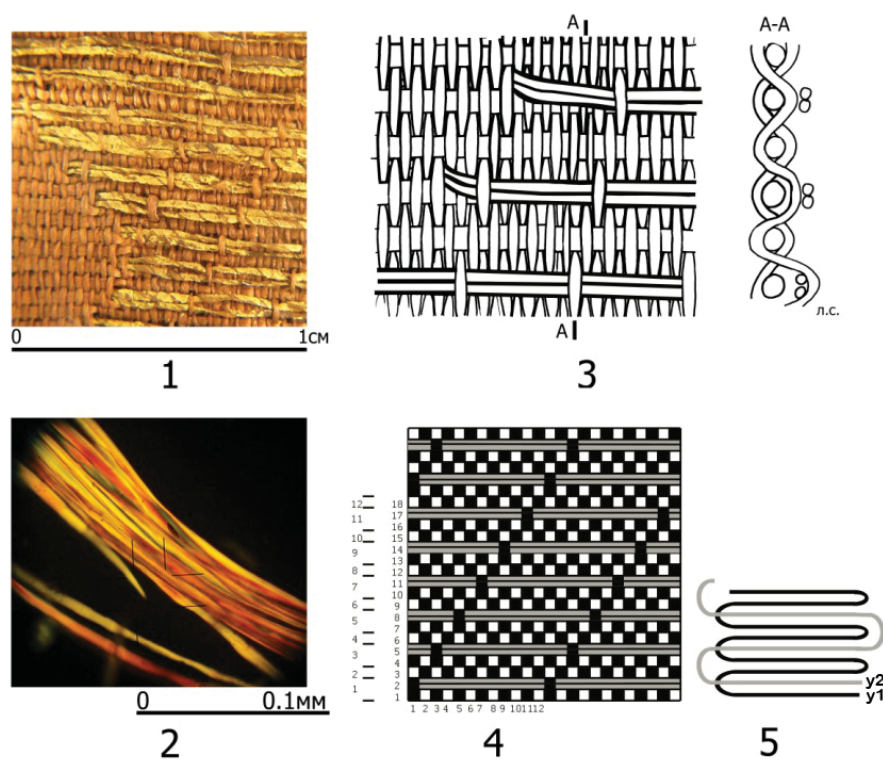
*Warp:* red silk, single, z-twisted, 0.1-0.3 mm thick.

*Décochement:* 2 ground warps. Thread count: 40 threads/cm.

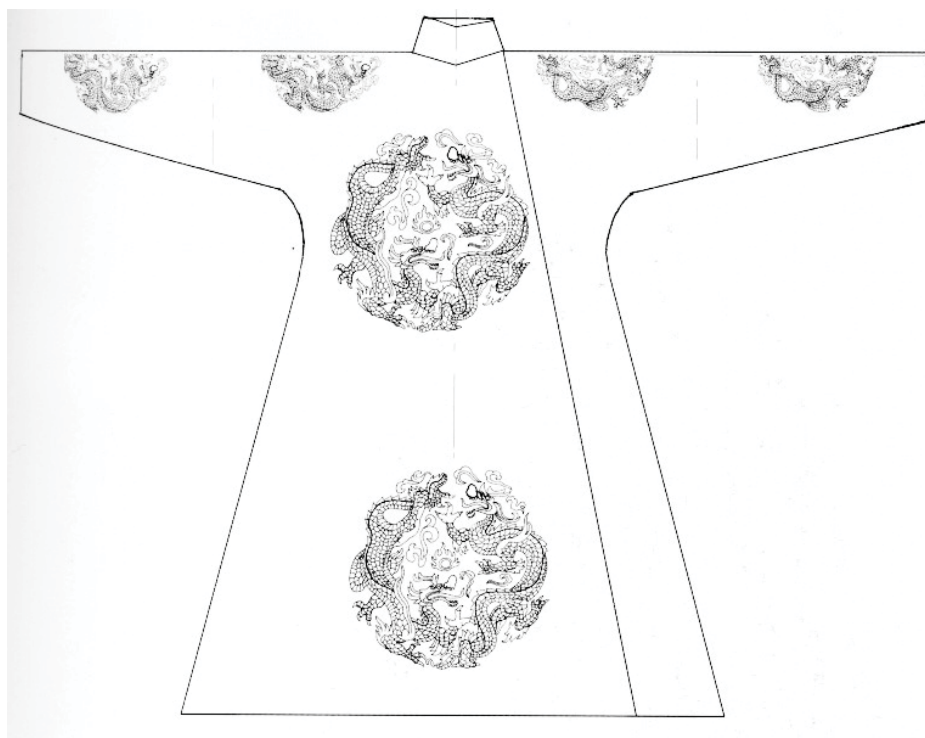
*Weft:* Ground: red silk, without twist, 0.3-0.5 mm thick. Thickness of threads is uneven, at some places weft threads are up to 0.8 mm thick. Supplementary: gold thread composed of gilt strips of serous membrane of animal intestines (thin and somewhat translucent) Z-wrapped around a yellow silk core, z-twisted. The diameter of the thread measures 0.3-0.5 mm, gilt strip is 0.5-0.6 mm wide. Threads function in pairs. Proportion: 2 ground threads/a pair of supplementary weft threads. Pick: 1 ground weft, a pair of supplementary weft threads, 1 ground weft. Thread count: 18 threads of ground and 9 paired threads of supplementary weft per cm.

*Weave:* weft-patterned. Ground: tabby.

Supplementary: weave of even warp threads with the supplementary weft 1/5 Z twill (gold wefts bound in pairs). Gilt threads are not fastened on the reverse side. Selvages: weft threads were cut along the edge of the piece yet some gilt threads were left uncut (loops). The selvaige, equipped with loops and fringe, implies that the width of the fabric on the loom was regulated by the outer thick threads of the warp, removed after the fabric was taken out from the loom. A thin stripe of gilt threads runs along the selvaige on the patterned areas. The same technique and design can be seen on 13th-century AD brocade fabrics, for



**Fig. 8. Brocade fabric of Dress 1**  
1: Microphotograph of fabric (right side).  
2: Microphotograph of silk fibres.  
3 and 4: Diagram of twills;  
A-A – section towards warp threads.  
5: Diagram of passéé; 1 – gilt threads; 2 – silk weft threads.



**Fig. 9. Drawing of wraparound dress of the Liao dynasty (After Rossi and Rossi 2004, 17).**



**Fig.10. Fragment of doll dress from the Astona cemetery (After Min 2006, 224 Fig. 160).**

instance, those from the Maiachnyi Bugor II cemetery (kept in the State Historical Museum, Moscow; see ATN 52).

Silk warp and weft threads are red. The fibre was dyed with madder before being spun. The cloth contained 74 % of alizarin, 24 % of purpurin and 0.8 % of anthragallol. Thus, the original colour of the fabric was red with a warm orange tint. The core of gilt threads was left undyed.

*The provenance of the fabric*

In the 10<sup>th</sup> century AD, silk fabrics could have been manufactured in China, India, Central Asia, Asia Minor, Iran and Byzantium (Liu 1996, 20-22, 124). Different gilt threads, however, were used for brocades in different regions, and their characteristics have been used as a guideline in attribution of provenance to fabrics (Falke 1921, 50-57). Thus, fabrics with gilt threads of serous membrane of animal intestines do not appear in the West before the 11<sup>th</sup> century AD (Sobolev 1934, 53-54; Fekhner 1982, 64; Blanco 1998, 20), therefore the cloth under study could not have been manufactured in Byzantium. Persian brocades<sup>4</sup> (Owen-Crocker 1986, 187) could have reached Northern Europe at that time. It is believed, however, that it was not pure gold but gilt silver or other alloys that were used for making gilt threads in Iran (Bolshakov 2001, 259-260; Watt 1997, 127-141; Wardwell 1992, 371), while the use of pure gold was typical for China (Wardwell 1992, 371;

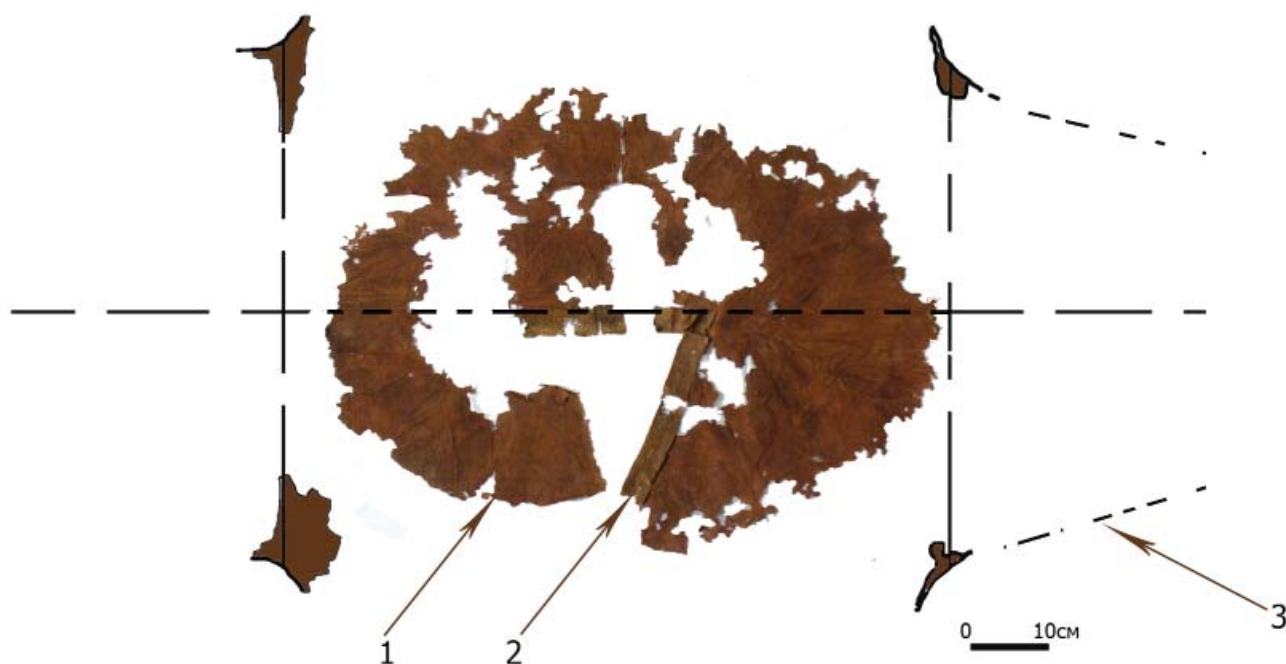


Fig. 11. Surviving fragments of Dress 2. 1: main fabric; 2: trimming fabric; 3: supposed outline of dress cut.

Jinke 2006, 129-145; Lantratova *et al.* 2002, 245-249). Besides metal composition, the core thread used to wrap the gilt strip is an important characteristic of gilt threads. Thus, cotton thread could have been used for this purpose in Iran in the 7<sup>th</sup>-8<sup>th</sup> centuries AD (Lubo-Lesnichenko 1994, 202). However, this criterion cannot be used as a basic guideline for lack of information on the other centres of production. It is agreed that the *broché* (brocaded) and *lancé* (weft-patterned) techniques originated from China (Jonghe 1991, 100). To sum up, based on its technical characteristics, it can be surmised that the cloth was manufactured in North China.

The question of the place of making of the garment is no less intriguing. A search for analogies in the Chinese archaeological record led us to four gowns of the 8<sup>th</sup>-12<sup>th</sup> centuries AD (Rossi and Rossi 2004, 12-14; Zheng 2007, 98; Feng 2007, 99). Their outline is close to that of the garment (Fig. 9), yet they are unfastened wrap-around garments. A fragment of a doll's garment from Astana (Fig. 10) dated to the 9<sup>th</sup> century AD is also of prime interest in this connection (Min 2006, 224, Fig. 160). We have also succeeded in finding a triangular-necked non-wrap-around shirt-waist gown, although it is a more recent type (Gold 2005, 57). All the above comparisons enable us to surmise that the garment under study was made in China. However, non-wrap-around tunic-shaped 'oriental' form of garment with a flared outline was characteristic of contemporaneous Iran and

Byzantium as well (Norris 1999, 151, 259, 267, 274). Therefore, the possibility of the garment having been made from a Chinese cloth in Iran or the Byzantine Empire cannot be ruled out. Brocade garments from Byzantium are mentioned in Scandinavian literature of the 10<sup>th</sup> century AD (Krag 2007, 241). The garment is unlikely to have been made from a whole piece of brocade fabric in the northwest of Europe.

#### Fragments of Dress 2

Only a few fragments of the second red-fabric garment have survived in good condition. The two largest pieces can be recombined into a bodice with a marked/pronounced neckline (Fig. 11). There are small fragments of side seams connecting the bodice with sleeves, hence the conclusion that the garment had sleeves. A V-shaped neck is marked with a cloth strip 3 cm wide with a minute design. Lining fabric has survived on the reverse side.

The decorative pattern on the main fabric was probably embroidered with flat gilt threads, of which only traces of gilding have survived. Small holes of gilt threads are indicative of a complex design. Unfortunately, we have not succeeded in restoring it.

*Technical analysis of the Dress 2 fabric* (Fig. 12)

*Warp:* red silk, z-twist, single and paired, single threads are 0.1-0.2 mm thick. *Décochement:* unidentified. Thread count: 40 threads/cm.

*Weft:* Ground: red silk, without twist; 0.4-0.6 mm

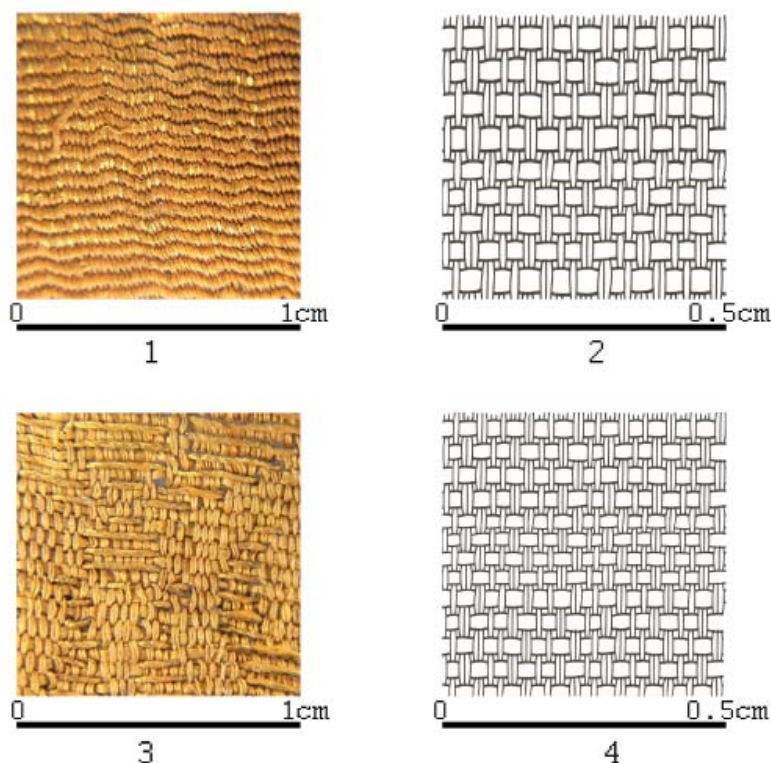


Fig. 12. Fabrics of Dress 2

1: Microphotograph of brocade fabric of Dress 2

2: Diagram of ground twill (threads of supplementary weft are lost but traces of gilt survived on remaining threads.)

3: Microphotograph of trimming fabric

4: Diagram of trimming fabric twill

thick. Supplementary: did not survive. The analysis of metal has shown that there is an admixture of lead in gold. Combination of wefts and the sequence of pick cannot be identified. Thread count: 18 ground weft threads/cm.

*Weave:* weft-patterned. Ground: louisine/extended tabby. Supplementary: unidentified. Warp threads are distributed as follows: two paired threads, two single; two paired, two single, etc. Selvages: 16 side threads of the warp consist of four threads each. In one of the selvages two thick threads on the border with the main cloth consist of 6 threads each. Weft threads turn along the edge of the cloth. Gilt threads probably turned before reaching the selvedge.

The material was with madder in the hank. The ratio of alizarin (78 %) and purpurin (19 %) is similar to that of the Dress 1 fabric.

The decorative stripe is three cm wide. We succeeded in partially reconstructing the design.

#### *Technical analysis of the trim of Dress 2*

*Warp:* red silk, weak z-twist, paired, the single thread is 0.1 mm thick. *Décochement:* 2 paired ground warps. Thread count: 46 threads/cm.

*Weft:* Ground: red silk, without twist; 0.4 mm thick. Thickness of threads is uneven, at some places weft threads are up to 0.8 mm thick. Supplementary: gold thread composed of gilt strips of serous membrane

of animal intestines Z-wrapped around a yellow silk core, z-twisted. The diameter of the thread measures 0.2-0.4 mm, gilt strip is 0.6-0.7 mm wide. The metal thread coat shows a small admixture of copper and bromine resulting from remelting. Threads are single. Proportion: 1 ground weft, 1 supplementary weft. Pick: 1 ground weft, 1 supplementary weft. Thread count: 18 threads of ground and supplementary weft per cm.

*Weave:* weft-patterned. Ground: tabby.

Supplementary: unidentified. Gilt threads have no additional fastening on the areas with minuscule design.

At present the fabric is brown but dye analysis has shown that it had been red and contained less alizarin (53 %) and more purpurin (36 %) than the main cloth. Consequently, the trim fabric was of more intense scarlet colour than the main fabric of Dress 2.

#### *Technical analysis of the lining of Dress 2*

*Warp:* light brown silk, weak z-twist, paired, single and paired threads, the single thread is 0.1-0.2 mm thick. Thread count: 48 threads/cm.

*Weft:* light brown silk, without twist; 0.2-0.3 mm thick. Thread count: 26 weft threads/cm.

*Weave:* louisine/extended tabby. Combination of warps is similar to that of the main fabric of this garment: two paired and two single threads.



The weave of the lining cloth has much in common with the ground weave of Dress 2. It is the similarity of the two different fabrics that enables one to surmise that both fabrics were manufactured at the same centre, having its own pattern of securing threads on the loom. And since two fabrics of the same provenance are combined to form a single garment, it seems likely that the article in question was made not far from the place of manufacture of these fabrics.

#### Fragments of the silk fabric 'with discs'

The fabric survives in two fragments. A decorative pattern in the shape of discs positioned at a distance of 9.5 cm from each other has survived on the larger fragment (8 x 23 cm). Flowers forming a 'life tree' are depicted within the discs (Fig. 13).

#### Technical analysis of the fabric 'with discs'

*Warp:* red silk, weak z-twist, single, 0.1 mm thick.

*Décochement:* 2 warps. Thread count: 32 threads/cm.

*Weft:* red silk, without twist; 0.3-0.6 mm thick.

Thickness of threads is uneven; it depends on the presence or absence of design in stripes.

*Supplementary:* gold thread is composed of gilt strips of serous membrane of animal intestines (thin and somewhat translucent) Z-wrapped around a yellow silk core, z-twisted. The diameter of the thread measures 0.2-0.3 mm, gilt strip is 0.5-0.6 mm wide. Threads are single. Proportion: 1 ground weft/1 supplementary weft. Pick: 1 ground weft, 1 supplementary weft. Thread count: 18 threads/cm.

*Weave:* brocaded on tabby. Selvedge: 8 warp threads are thinned out. Weft threads were cut along the edge.

It is impossible to reconstruct the garment to which the two above-mentioned fragments belonged. The fragments were washed and smoothed out and there are no traces of seams. If there was no sewing along the edge, the cloth could have been used as a shawl, scarf or veil.

#### A linen dress

Fragments of a linen cloth belong to a single garment made from undyed and dyed blue fabrics. All the fabrics were washed and partially smoothed out, which made them less informative. In the course of the analysis linen fragments were divided into groups according to their shape and type of fabric. Fragments of the first group are narrow stripes of a fine blue cloth with torn off ends and traces of numerous folds (Fig. 14). The overall length of the surviving fragments measures over 2 m along the weft.<sup>5</sup> Judging from the fragment in which the fabric measures 50 cm in length up to the selvedge, a piece was at least 50 cm wide. Traces of folds are unevenly distributed.

The second group is formed by two fragments which have two fabrics, a thick light and a fine blue one, sewn together (Fig. 15), with the thread passing through folded edges of the fabrics. Folds strengthened with additional seams were made on the fine cloth. The fragments show that the folds on the fine cloth are distributed unevenly along the line of joint with the undyed coarse fabric. It seems likely that these are fragments of the waist-part of the gown while the fragments of the first group belong to the skirt.

A fragment of a undyed thick cloth is attributed as belonging to the neck-part (Group 3). It has folds on

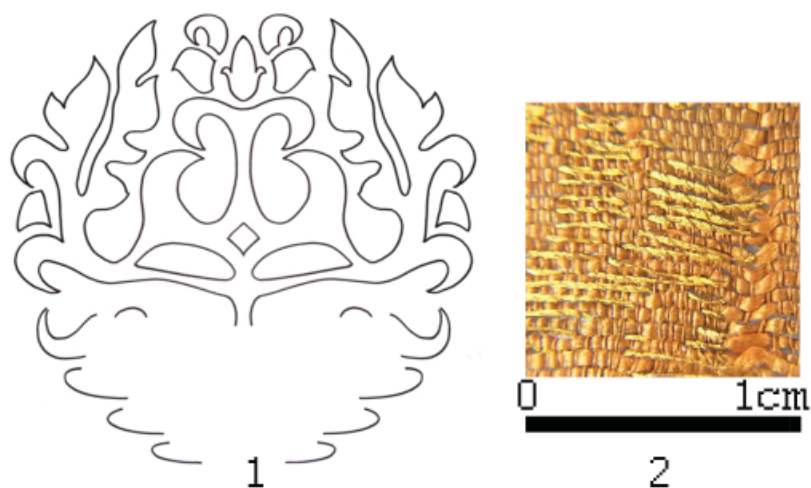


Fig. 13. Fabric with discs  
1: Drawing of decorative pattern  
2: Microphotograph of fabric (right side).



Fig. 14. Fragments of linen dress. Group 1.



Fig. 15. Fragment made of two fabrics. Group 2.

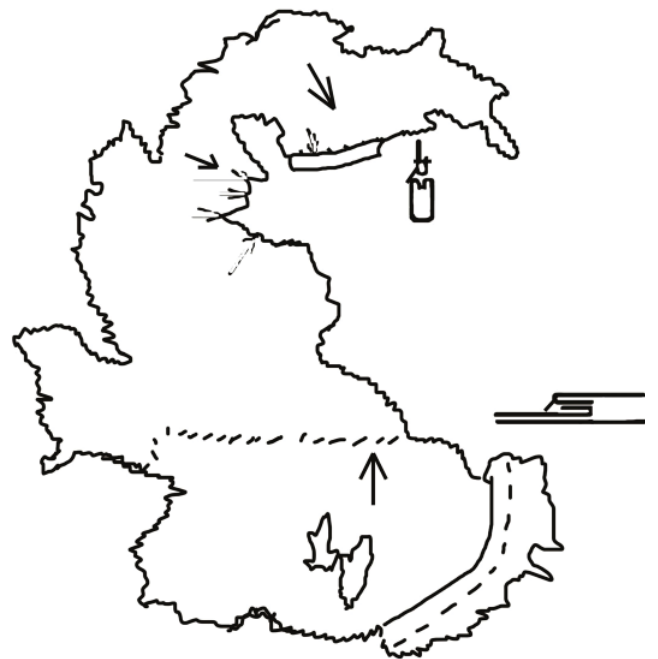


Fig. 16. Drawing of dress fragment. Group 3.



one side, seams and their remains. Two more layers of a similar cloth are sewn on the main fabric in the lower part of the fragment; these were probably patches (Fig. 16). The interpretation of this fragment is, however, debatable. A bow-shaped seam-line and the fact that the outer layer of the cloth is folded on the face cannot be explained. Remains of blue threads, probably of a blue-fabric bolster which underlined the edge of the cloth, have survived along the upper edge of the fragment with folds. A similar treatment of the neck is recorded for a linen gown from Pskov (Zubkova *et al.* 2009, 293-300). Group 4 includes fragments of the fine cloth not showing blue colour. The lack of colour may be accounted for by the fading of the dye due to the low quality of cloth dyeing. Fragments belonging to this group are generally torn off on all sides, yet one of them has a clear slanting cut. Such a cut could have been encountered on the bodice if the outline of the gown was similar to that of Dress 1, on the skirt if it had gores, or on tapering sleeves. The data available are not sufficient for an unambiguous reconstruction of the linen gown. We suggest the following provisional reconstruction. The gown is a shirt-waist with the junction either at the waistline or somewhat lower. Its upper part is light-coloured and the lower one is blue. The skirt is made from several, at least four, sheets of cloth made into small folds unevenly distributed along

the joint of skirt and bodice. Probably the main folds were concentrated on the sides. The sleeves were seemingly long and made from a fine blue fabric. The collar was folded into pleats and sewn onto a bolster of a fine blue cloth. Based on the dimensions of the neck cut in a straight line (35 cm along weft threads to one side), the gown had shoulder pieces. The use of fabrics of different quality implies that the upper part of the gown made from inferior-quality cloth was covered with another garment, allowing only the blue skirt and, possibly, the sleeves to be seen.

*Description of tabby fabrics (Fig. 17)*

The thick fabric

*Warp:* undyed linen, z-twist, single, 0.2-1 mm thick.

Thread count: 8 threads/cm.

*Weft:* undyed linen, z-twist, single, 0.2-1 mm thick.

Thread count: 8 threads/cm.

Warp and weft threads show a wide scatter of thickness and an uneven *décochement* of the twist.

Linen raw material is of poor quality; there are hard remains of plant stems in the threads.

The fine fabric

*Warp:* blue linen, z-twist, single, 0.2-0.5 mm thick.

Thread count: 16 threads/cm.

*Weft:* blue linen, z-twist, single, 0.2-0.5 mm thick.

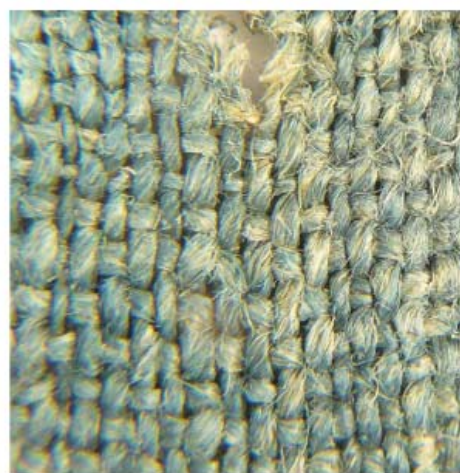
Thread count: 12 threads/cm.

The finished fabric was dyed with indigo, a blue vat



0 1cm

1



0 1cm

2

Fig. 17. Microphotographs of linen fabrics. 1: thick fabric; 2: fine fabric.



dye. The thickness of threads and the degree of twist are uneven, yet the quality of threads is higher than that of the thick fabric.

No complete 10th-century AD linen gowns have been found so far, but a comparison of the fragments of the two 10th-century AD gowns, one from Pskov (Zubkova *et al.* 2010, 293-300) and another from Gnëzdovo is given in Table 1.

Female shirt-waists made from two types of fabrics and dated to the 13<sup>th</sup> century AD were found at Toropets and Iziaslavl in Russia (Saburova 1987, 102, Table 86).

#### Fragments of samite silk fabric

Samite fragments are narrow strips some 5.5 cm wide. One side of a strip is folded, while the other is hemmed with an edging of the same cloth. A similar treatment of strips was recorded for the trim of a linen article from a chamber burial in Pskov (Zubkova *et al.* 2010, 161).

Samite: 1/2 twill S. The ratio of the main to binding warp is 2:1. There are at least two weft threads, one of which is either blue or green.

Characteristics	A gown from Burial 3 II-06-CTB <sub>3</sub> IV, Pskov	A gown from Burial II-301, Gnëzdovo
Fibre nature	flax	flax
Weave	Tabby	Tabby
Thread count	18/14 threads/cm	Fine fabric – 16/12 threads/cm Thick fabric – 8/8 threads/cm
Width of piece	Probably 40 cm; a seam joining two sheets runs at the centre of bodice	Fine fabric – no less than 50 cm. Thick fabric – if a piece was cut along the central axis, the sheet was at least 70 cm wide.
Blue dyeing	Dyeing in the cloth	Fine fabric – dyeing in the cloth Thick fabric – undyed
Collar design	Folds and a sewn-on cord. There is a central slit (selvage). The neck was tied up with the cord The gown probably had shoulder-pieces.	Folds and a sewn-on cord. A central slit, probably without selvage, no fastening is recorded. The gown probably had shoulder-pieces.
Length of sleeves	No data	No data
Overall length	No data	No data
Shape	No data	Shirt-waist, with a skirt widening owing to pleats
Silk trim	Probably silk cuffs and a trimming strip along the hem 4.5 cm wide. Remains of a blue linen cloth have survived on the reverse side of silk fabrics.	An isolated strip of silk trim 5.5 wide was found.
Sewing quality	High (judging from the neckline)	Low (judging from the neckline and the joint of the skirt and bodice)
Traces of repair	No data	There could have been patches

Table 1. Characteristics of two 10th-century AD gowns.



Fig. 18. Fragment of article in sprang technique.

#### Fragments of sprang

Two small fragments have survived. The article was made from linen threads (S2z-twist, 1 mm thick) in sprang technique (Fig. 18).

Excavated fragments of sprang have been encountered in Scandinavia on the sites dated as early as the Bronze Age. The technique was used mainly to make female headdresses. The fragments in question are, however, so small that it is impossible to say what article they belonged to.

#### A fragment of a wool fabric

2/2 twill Z (Fig. 19). A brown cloth is made from wool threads of uneven thickness and z-twist. The average thread count is 14/12 threads/cm.

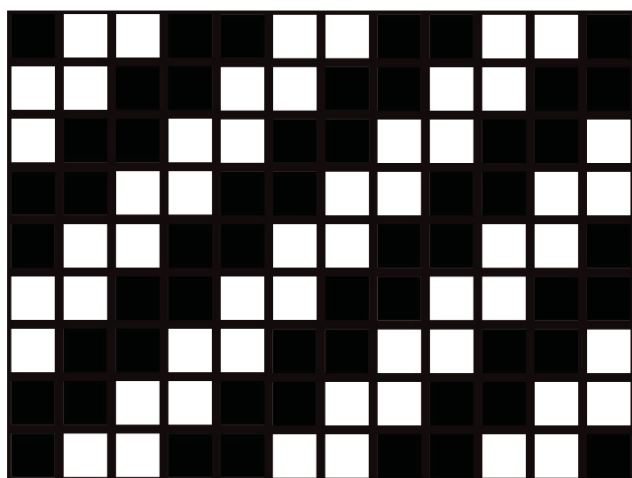


Fig. 19. Diagram of textile twill of wool fabric.

#### Summary

Our analysis suggests that the box from Burial II-301 contained three garments made from Chinese brocades. Two of them were probably gowns of Chinese manufacture, though they could have been made from Chinese cloth in Iran or the Byzantine Empire, while the third, showing no traces of cutting and tailoring could be a scarf, shawl or veil. There was also a linen shirt-waist gown with a blue skirt in the box. The gown was probably worn beneath a kind of blouse so that only the skirt was visible. It is not clear whether a samite strip is a trim of this gown, but, judging from the treatment of selvedge, if it were so the trim would run along the hem. Since the complete articles were not worn by the deceased but found in the box, it is unknown whether they make up a single set.

The wool fabric could be a part of a cloak/veil, but this interpretation is not unambiguous as the shape of the article cannot be reconstructed.

It is worth noting that the collar of the brocade Gown 1 is divided by an inner fold into two parts in the ratio 1:2. The same division is recorded for collars from burials in the Dmitrov kremlin dated to the 12<sup>th</sup> century AD (Orfinskaya *et al.* 2009, 10-16) and for trimming of gown collars of the Golden Horde period (Lantratova *et al.* 2002a, 26, 78, Fig. 6.1.14). It may be due to the influence of Chinese tradition adopted in the north and manifested in the treatment of certain costume details. Griffins<sup>6</sup> and dragons having come from the south could influence the depiction of local mythical beasts. This find demonstrates the complexity of interaction of occidental and oriental, northern and southern cultures.



### Notes

1. Information about the Gnëzdovo archaeological site is available on the websites [http://ru.wikipedia.org/wiki/Гнëздoвские\\_курганы](http://ru.wikipedia.org/wiki/Гнëздoвские_курганы) and [www.gnezdovo.com](http://www.gnezdovo.com).
2. The width of the bodice measures 80 cm and two sleeves measure 60 cm each. The width of the cuff cannot be determined.
3. A piece is a unit of cloth needed to cut a single long gown reaching down to one's ankles (Fekhner 1982, 57). Such a piece is woven whole and has the starting and finishing borders which, like side selvages, differ from the main cloth.
4. The term 'Persian' does not mean that these fabrics were manufactured in Iran. They could have been of foreign origin yet bought on the Persian market.
5. The length of the fragments is as follows:  $72+13+38+7+7+6+8+5+48+10 = 214$  см.
6. Northern Europe has yielded diverse fabrics with griffins (Owen-Crocker 1986, 187). These are mainly Byzantine samites.

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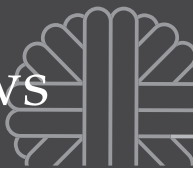
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Original text translated by S. Kullanda.

Author: orfio@yandex.ru



Henriette Koefoed

# Textiles from the Nile Valley Conference

Antwerp, October 7.-9. 2011

The meeting at Katoen Natie 'HeadqARTers' arranged by Cécilia Fluck, fulfilled the expectations of researchers and museum colleagues, and proved very interesting. The participants at the conference formed the audience at the reception, celebrating the opening to the public of the private collection of Coptic Textiles at Katoen Natie. The new grand room of tunics was truly breathtaking and the latest acquisition, a beautiful wall-hanging in tapestry technique picturing the Amazons and the Greeks, was impressive both in terms of motive and state of preservation. Sabine Schrenck delivered an illuminating discussion of this stunning new piece at the conference, which generated great positive debate.

The first conference day started with excavation reports. Dominique Cardon presented textiles with piles from the *praesidia* of the Eastern Desert (see her reports in *ATN* 50 and 52). Béatrice Huber presented recent finds from Qarara. Fleur Letellier-Wilemin gave an in-depth review of the embroidered tunic from Douch at the Kharga Oasis. John Peter Wild presented the first Indian pile carpet from Berenike and showed a reconstructed sample (produced by Lena Mårtenson), providing his paper with a stimulating tactile experience. Frances Prichard surveyed Egyptian textiles in the UK from 1913-14 excavations, based on the materials of the Egypt Exploration Society. Amandine Mérat could unfortunately not be present, but her paper on late antique and early Islamic embroideries was read out. Antoine De Moor enlightened us on radiocarbon dating of leather shoes and Chris Verhecken-Lammens gave a wonderful paper on the technical features of "flying threads" in Late Roman textiles. New scholars are always welcome, and at this conference we enjoyed Julia B. Krug-Ochmann

from Universität Bonn, who made a very convincing presentation of trousers in late antiquity and how we can use them to interpret the social status of the wearer, based on iconographic material from mosaics. More trousers came around when Anne Kwaspen presented her study of pattern cutting. Graham Sumner showed his brilliant hand again in the illustrations and observations of Roman military clothing together with Elaine Nobury. Petra Linscheid then covered the topic of early Byzantine headcoverings (see new publications in this issue for her recent book on the topic), and Kirstin South gave an outline of the changes in mummy ribbons, from which she intend to establish a chronology. The second day of the conference included a number of papers relating to the world of museums and iconography. Claudia Nauerth gave a presentation on 'Vergoldung', and Renate Rosenthal-Heignbottom spoke of nail- studded sandals, with particular emphasis on when not to wear them. We heard of maths and inscriptions in Museum of Islamic Art, Berlin from Giesela Helmecke and the latest computer technology was used to challenge the conventional ways of looking at textiles by Julia Galliker. Tineke Rooijekkers discussed crosses in Coptic garment decoration and Maya Müller presented her interpretation of the many and varied 'Dionysos in the tree' motifs. Two presentations from Russian museums followed, one on the *tabulae* with the ascension of Alexander (in the Great Pushkin State Museum) by Olga Lechitskaya, and another on the textile motifs of 'Coptic riders' (in the Hermitage Collection) by Olga Osharina. From Spain we were presented with the fruitful results of intensive registration of (all) Coptic textiles within Spain, a great task performed by Laura Rodríguez and Ana Cabrera.



# Dissertations

Joanne Elizabeth Cutler has been awarded a doctorate at the Institute of Archaeology, University College London, UK, for her work: *Crafting Minoanisation: textiles, crafts production and social dynamics in the Bronze Age southern Aegean*.

# Recent publications

***Wolle - Weber - Wirtschaft Die Textilproduktion der römischen Kaiserzeit im Spiegel der papyrologischen Überlieferung* by Kerstin Droß-Krüpe (2001, Harrassowitz)**

Textilien spielen zu allen Zeiten eine wichtige Rolle im sozialen und ökonomischen Gefüge von Gesellschaften. Zusammen mit Nahrung und Wohnung gehören sie zu den grundlegenden menschlichen Existenzbedürfnissen; sie schützen den Körper nicht nur vor extremen klimatischen Bedingungen, sie sind auch Ausdruck des geschlechtlichen, sozialen, beruflichen oder wirtschaftlichen Status' des Trägers. Auch im Imperium Romanum nahm die Textilökonomie einen besonderen Stellenwert ein - nach der Landwirtschaft stellte sie das zweitwichtigste Betätigungsfeld dar und bot für zahlreiche Personen Verdienstmöglichkeiten. Einsichten in die kaiserzeitliche Textilproduktion erlauben vor allem ägyptische Papyri, die wie keine andere Quellengattung Auskunft über das Alltagsleben und das ökonomische Handeln von Individuen und Staat geben.

Ausgehend von einem formalistischen Ansatz wirft die Studie *Wolle - Weber - Wirtschaft* neues Licht auf die kaiserzeitliche Textilproduktion. Kerstin Droß-Krüpe kann mit dem Einsatz von modernen ökonomischen Begrifflichkeiten und Denkmodellen als heuristische Kategorien Zusammenhänge innerhalb der antiken Textilökonomie sichtbar machen, die bisher verborgen geblieben sind. Zudem stellt sie neben die Analyse der Papyri Erkenntnisse aus der (experimentellen) Archäologie, um in einer interdisziplinären Annäherung die Abläufe dieses Wirtschaftssektors sichtbar zu machen und letztlich das Verständnis der antiken Ökonomie als Ganzes zu vertiefen. Am gut dokumentierten Beispiel

des römischen Ägypten werden so Modelle zur Funktionsweise der Textilproduktion entwickelt, deren Gültigkeit sich auch für anderen Gebiete des Imperium Romanum erwarten lässt.

ISBN: 978-3-447-06516-0

Price: €75

<http://www.harrassowitz-verlag.de>

***Le Tissage Aux Cartons dans L'Egypte Ancienne, by Arnold van Gennepe and Gustave Jequier, 1916. Cardweaving in Ancient Egypt, translation by Barbara Shapiro* (self published 2010)**

A serial translation of *Le Tissage Aux Cartons* originally appeared in the *TWIST* Journal in 2001-2003. Newly revised, the translation is now available in book form. *Le Tissage Aux Cartons* was published in 1916, and some of its conclusions - including those about the Ramses sash - created considerable controversy. The book describes and categorizes many decorative motifs from Egyptian tombs, statues, and paintings; considers whether the patterns represent cardwoven bands; and provides instructions for creating many of the designs with cardweaving. Illustrated with 6 color plates of cardwoven bands, 6 black and white plates, and 135 line drawings, this translation includes the entire text, including the extensive footnotes and notes on the plates.

Can be ordered for \$29.95 using a PayPal account.

<http://www.barbara-shapiro.com/book/le-tissage-book-order.html>

***Textiles and Textile Production in Europe from Prehistory to AD 400, edited by Margarita Gleba and Ulla Mannering (Ancient Textiles Series 11, Oxbow Books in association with the Centre for Textile Research, 2011)***



There is evidence that ever since early prehistory, textiles have always had more than simply a utilitarian function. Textiles express who we are - our gender, age, family affiliation, occupation, religion, ethnicity and social, political, economic and legal status. Besides expressing our identity, textiles protect us from the harsh conditions of the environment, whether as clothes or shelter. We use them at birth for swaddling, in illness as bandages and at death as shrouds. We use them to carry and contain people and things. We use them for subsistence to catch fish and animals and for transport as sails. In fact, textiles represent one of the earliest human craft technologies and they have always been a fundamental part of subsistence, economy and exchange. Textiles have an enormous potential in archaeological research to inform us of social, chronological and cultural aspects of ancient societies.

*Textiles and Textile Production in Europe* is a major new survey that aims to redress this. Twenty-three chapters collect and systematise essential information on textiles and textile production from sixteen European countries, resulting in an up-to-date and detailed sourcebook and an easily accessible overview of the development of European textile technology and economy from prehistory to AD 400. All chapters have an introduction, give the chronological and cultural background and an overview of the material in question organised chronologically and thematically. The sources of information used by the authors are primarily textiles and textile tools recovered from archaeological contexts. In addition, other evidence for the study of ancient textile production, ranging from iconography to written sources to palaeobotanical and archaeozoological remains are included. The introduction gives a summary on textile preservation, analytical techniques and production sequence that provides a background for the terminology and issues discussed in the various chapters. Extensively illustrated, with over 200 colour illustrations, maps, chronologies and index, this will be an essential sourcebook not just for textile researchers but also the wider archaeological community.

ISBN-13: 978-1-84217-463-0

Price: £48.00

<http://www.oxbowbooks.com/bookinfo.cfm/ID/91563>

*The Bayeux Tapestry: new approaches: proceedings of a conference at the British Museum*, edited by Michael J. Lewis, Gale R. Owen-Crocker and Dan Terkla (Oxbow Books, 2011)

The Bayeux Tapestry, perhaps the most famous, yet

enigmatic, of medieval artworks, was the subject of an international conference at the British Museum in July 2008. This volume publishes 19 of 26 papers delivered at that conference. The physical nature of the tapestry is examined, including an outline of the artefact's current display and the latest conservation and research work done on it, as well as a review of the many repairs and alterations that have been made to the Tapestry over its long history.

Also examined is the social history of the tapestry, including Shirley Ann Brown's paper on the Nazis' interest in it as a record of northern European superiority and Pierre Bouet and François Neveux's suggestion that it is a source for understanding the succession crisis of 1066. Among those papers focusing on the detail of the Tapestry, Gale Owen-Crocker examines the Tapestry's faces, Carol Neuman de Vegvar investigates the Tapestry's drinking vessels and explores differences in its feast scenes and Michael Lewis compares objects depicted in the Tapestry and Oxford, Bodleian Library, Junius 11. The book also includes a résumé of four papers given at the conference published elsewhere and a full black and white facsimile of the Tapestry, with its figures numbered for ease of referencing.

ISBN-13: 978-1-84217-976-5

Price: £45.00

<http://www.oxbowbooks.com/bookinfo.cfm/ID/89255>

*Qasr Ibrim: The Textiles from the Cathedral Cemetery*, by E. G. Crowfoot (Egypt Exploration Society, Excavation Memoir 96, 2011)

The dry height of the site of Qasr Ibrim above the Nile river has resulted in superb preservation of organic material. The textile collections from the excavations have already become one of the largest from any site in the middle Nile valley. They are unique as an unmatched sequence, dating from the Twenty-Fifth Dynasty to the Late Ottoman Period (750 - 656 BC) and ranging from the domestic remains of town life and tiny exotic imports of the site's great years to the cast off garments and furnishings, pitifully mended and re-mended, from ages of disaster and decline. The important textiles from the Cathedral Cemetery at Qasr Ibrim, including those from the burial of Bishop Timotheus, are published here with detailed descriptions and a photographic record of the most significant pieces.

Price: £35.00

<http://www.ees-shop.co.uk>

*Frühbyzantinische textile Kopfbedeckungen: Typologie, Verbreitung, Chronologie und soziologischer Kontext nach Originalfunden*, by

**Petra Linscheid (Wiesbaden: Reichert Verlag 2011, in German)**

The present book is dedicated to the recording, documentation and evaluation of originally preserved textile headcoverings. The author recorded more than 600 original textile headcoverings, most of them unpublished so far. The material comprises hairnets, scarfs, bonnets, hoods, caps and hats. Judging from their spread and chronology, these headcoverings were in use all over the Early Byzantine Empire.

The archaeological contexts of the finds give evidence, that some types of headcoverings were worn exclusively by women. The finds reveal that beginning with the 4<sup>th</sup> century - presumably with the rise of Christianity - women kept their head covered. The hairnet probably was a "must" for the Early Byzantine woman. Different shapes of hairnets can be traced back to various, sociologically rooted ways of wearing and hairstyles.

The book is divided into two sections. The first section includes 190 pages of text with 93 illustrations presenting the various types of headcoverings and their appearance, spread, dating implications, archaeological context, way of wearing, textile technology, pictorial and literal sources, precursor and successor. In the catalogue section each of the 610 headcoverings has its own entry, 336 items are illustrated in black and white, 20 items in colour.

ISBN-13: 978-3-89500-721-7

Price: €128.00

<http://www.reichert-verlag.de>

**Leather Tanneries: the Archaeological Evidence edited by Roy Thomson and Quita Mould (London: Archetype Publications, 2011)**

The papers in this volume go some way to correct some of the misinterpretations presently found in archaeological reports. Contributions cover many aspects of research into the evidence from prehistoric, Roman, medieval and early modern periods as well as descriptions of traditional techniques still used in different parts of the world today. Whilst the emphasis is on the interpretation of the evidence for leather tanning surviving in the archaeological record, other aspects such as standing tannery buildings are also considered. A range of information given in this volume summarises our current understanding of the evidence for the processing of hides and skins in the past, and also serves to challenge received views by considering some of the traditional methods still being practiced. These papers show it is important to consider the evidence of each potential tanning site on its merits

and not to dismiss the possibility of a tannery occurring in what, at first, might appear to be a less than favourable location. It is hoped that a better informed appreciation of the technologies involved in processing hides and skins will go some way to prevent some of the over-imaginative interpretations that still appear in the literature.

ISBN: 978-1-90498-261-6

Price: £32.50/\$75.00

**Decorated Surfaces on Ancient Egyptian Objects: Technology, Deterioration and Conservation edited by J. Dawson, C. Rozeik and M.M. Wright (London: Archetype Publications)**

From monumental tomb paintings to delicate ivories, ancient Egyptian objects are some of the most complex and fragile encountered by archaeologists, curators and conservators. Those who examine, analyse and treat them face a number of practical and ethical challenges. This volume of papers, by an international group of experts, focuses on decorated surfaces including polychrome wood, coloured basketry, patinated metal and painted textile. Aspects of technology, investigation and treatment are examined, as well as broader issues of preservation, storage and display. A comprehensive review of past and current treatments for organic objects is followed by thought provoking case studies, technical surveys and innovative solutions to conservation problems. Wide-ranging, authoritative and accessible, this book is essential reading for anyone concerned with the study and care of ancient Egyptian objects.

Proceedings of a conference held in Cambridge, UK on 7-8 September 2007.

ISBN: 978-1-90498-257-9

Price: £37.50/\$80.00

**Textiles: Critical and Primary Sources edited by Catherine Harper, 4 volumes (Berg Publishers 2012)**

*Textiles: Critical and Primary Sources* is a major multi-volume reference work that draws together 80 seminal texts on textiles. A key scholarly resource for any researchers involved in the study of textiles, as well as associated subjects, including studies in dress, costume and fashion; feminism and gender; art, design and cultural history; and sociology and anthropology.

ISBN: 978-0-85785-035-5

Price £495/ \$995

<http://www.bergpublishers.com/?tabid=15094>



***Dress Accessories of the 1st Millennium AD from Egypt* by Antoine De Moor and Cacilia Fluck (Lannoo 2011)**

This richly illustrated volume is the result of the 6th conference of the international research group "Textiles from the Nile Valley" held in Katoen Natie, Antwerp, 2-3 October 2009. It is the first comprehensive study about dress accessories of post-pharaonic Egypt represented by 16 papers of scholars specialized in ancient textiles. Moreover, the volume contains two papers dedicated to the famous mummy of the Lady Euphemia from Antinoupolis (Middle Egypt), now in the possession of the Royal Museums for Art and History in Brussels, and three further contributions dealing with the technique and dyestuffs of a special group of linen fabrics in compound weave.

ISBN: 978-9-02099-936-5

Price: €65.00

<http://www.lannoo.be>

***Mittelalterliche Textilien II. Zwischen Europa und China* by Karel Otavsky and Anne E. Wardwell (Abegg Stiftung, Riggisberg, 2011)**

Dass die Weberei schon im Frühmittelalter den technischen Stand vor Erfindung der Jacquardmaschine um 1800 erreichte, ist der Begegnung der vorderasiatischen und der chinesischen Webtradition zu verdanken. Die Vereinigung der unterschiedlichen Webtraditionen war eine Folge des blühenden Fernhandels, der das Mittelmeergebiet entlang der «Seidenstrassen» mit Persien, China und Zentralasien verband. Der vorliegende fünfte Band der Reihe «Die Textilsammlung der Abegg-Stiftung» ist die Fortsetzung des im Jahre 1995 erschienenen Katalogs «Mittelalterliche Textilien I». Ein besonderer Schwerpunkt liegt neben den chinesischen und zentralasiatischen Geweben auf der frühen italienischen Seidenweberei mit ihren orientalisches beeinflusste Dekors.

Der Katalog umfasst drei Teile, die jeweils mit einer überblicksartigen Einführung beginnen. Im ersten Teil bespricht Karel Otavsky «Frühmittelalterliche Stoffe zwischen Persien und China». Dazu gehören frühe chinesische und zentralasiatische Textilien, die der Abegg-Stiftung vor allem in den 1990er Jahren erwarb. Im zweiten Teil, «Textiles from Eastern Asia: Liao Dynasty, 907–1125», erläutert Anne E. Wardwell einige frühe Gewebe der Liaozeit, wobei der Schwerpunkt auf den unterschiedlichen Gewebetechneiken liegt. Im dritten und umfangreichsten Teil des Katalogs bearbeitet Karel Otavsk\_ mit «Seidengewebe des hohen und späten

Mittelalters», wobei hier weitere Höhepunkte der Sammlung der Abegg-Stiftung vorgestellt werden, so die Salzburger Mitra, der Amandusstoff oder die Stralsunder Dalmatik. Der Fokus erweitert sich auf die hochmittelalterlichen mongolischen, persischen und vorderasiatischen Textilien und ihren Einfluss auf die frühen italienischen Gewebe. Ein Anhang mit der englischen Übersetzung der Einführungen, einer Konkordanz der Inventar- und Katalognummern sowie einem ausführlichen Register und Literaturteil beschliessen das Werk.

ISBN: 978-3-905014-42-6

Price: CHF 280

<http://www.abegg-stiftung.ch>

***Didymoi I – Les fouilles et le matériel* edited by Hélène Cuvigny (Institut Français d'Archéologie Orientale, 2011)**

Includes a chapter by D. Cardon, H. Granger Taylor & W. Nowik entitled 'What did they look like? Fragments of clothing found at Didymoi: Case studies'.

ISBN 2-7247-0340-5

Price: €70.00

<http://www.ifao.egnet.net>

***People and Crafts in Period IVB at Hasanlu, Iran* edited by Maud de Schauensee (Philadelphia 2011)**

Includes the first detailed description of the charred textiles, and places these textiles in their archaeological contexts from the Iron Age site of Hasanlu, suggesting the roles that textiles may have played in daily life. Nancy Love: "The Analysis and Conservation of the Hasanly Period IVB Textiles" (pp. 43-56); Maude de Schauensee: "Contexts of Textiles from Hasanly Period VIB Destruction Level" (pp. 57-86).

ISBN: 978-1-93453-617-9

Price: \$69.95/£45.50

<http://www.upenn.edu/pennpress/book/14818.html>

***Coptic Textiles from Egypt in Ancient Times, Exhibition Catalogue, Curator Avshalom Zemer (The National Maritime Museum, Israel 2010)***

Price: NIC 90

<http://hma.org.il/Museum/Templates/showpage.asp?DBID=1&LNGID=1&TMID=87&FID=935&PID=2687>

***Weft-Faced Pattern Weaves: Tabby to Taqueté*, by Nancy Arthur Hoskin (Schiffer Publishing 2011)**

Travel beyond the traditional limits of boundweave with this comprehensive guide to weft-faced pattern weaves. Beginning and experienced weavers alike will learn how to plan, predict, and weave colorful, rhythmical patterns, charming folk figures, and



geometric designs in fabrics that are decorative and durable. Fifty-three projects range from simple to complex weaves. Directions, patterns, and tips are provided for the plain weave, twill, point twill, rosepath, overshot, taquetÃ©, and samitum. It also features Coptic taquete and samitum re-creations and patterns from the Tunic of Tutankhamun. Engaging and informative text accompanies diagrams, illustrated samplers, and drafts with threading, tie-

up, treading, and drawdowns. This is the definitive work on weft-faced pattern weaves and is a must-have reference and resource guide for weavers and crafters alike.

ISBN: 978-0-7643-3851-9

Price: \$39.99

[http://www.amazon.com/Universal-Stitches-Weaving-Embroidery-Other/dp/0295962747/ref=cm\\_cr\\_pr\\_pb\\_t/188-4266850-1466317](http://www.amazon.com/Universal-Stitches-Weaving-Embroidery-Other/dp/0295962747/ref=cm_cr_pr_pb_t/188-4266850-1466317)

## Textile Calendar 2012

**17 January-29 June 2012:** Exhibition *Colours of Hallstatt: Textiles connecting science and art*, Natural History Museum, Vienna.  
<http://3000yearsofcolour.nhm-wien.ac.at/main.html>

**28 January 2012:** Workshop "The State of the Arts: Early Textiles and their study", King's College, London, UK.  
<http://www.kcl.ac.uk/artshums/depts/chs/events/specialevents/Textiles.aspx>

**12 March-8 July 2012:** Exhibition *Byzantium and Islam: Age of Transition (7<sup>th</sup> -9<sup>th</sup> century)*, Metropolitan Museum of Art, New York.

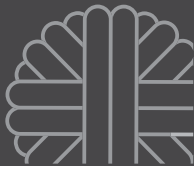
**18 March-27 July 2012:** Exhibition *Dress Code im Alten Rom. Kleidung und Identitat in der Antike*, Reiss-Engelhorn-Museen Mannheim. This exhibition is the outcome of a five-year EU funded project DressID.  
<http://www.dressid.eu>

**21-23 March 2012:** The second international Symposium on Hallstatt-Textiles, Museum of Natural History Vienna.  
<http://3000yearsofcolour.nhm.wien.ac.at/main.html>

**10-16 September 2012:** European Textile Forum: "Metals in the Textile Crafts", the Laboratory for Experimental Archaeology, Romisch-Germanisches Zentralmuseum (RGZM), Mayen, Germany.  
<http://www.textileforum.org>

**27-29 September 2012:** The 2012 Pasold conference "Innovation before the Modern: Cloth and Clothing in the Early Modern World", the Nordiska Museum in Stockholm, Sweden.  
<http://www.pasold.co.uk/index.php/conferences/conference-2012>

**2-4 November 2012:** International Conference "Textile Trades and Consumption in the Indian Ocean World, from Early Times to the Present", Indian Ocean World Centre (IOWC) McGill University, Montreal, Canada.  
<http://indianoceanworldcentre.com/textiles2012>



# General Information

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## Guidelines to Authors

The ATN aims to provide a source of information relating to all aspects of archaeological textiles. Archaeological textiles from both prehistoric and historic periods and from all parts of the world are covered in the ATN's range of interests.

1. Contributions can be in English, German or French.
2. Contribution may include accounts of work in progress. This general category includes research/activities related to archaeological textiles from recent excavations or in museums/galleries. Projects may encompass technology and analysis, experimental archaeology, documentation, exhibition, conservation and storage. These contributions can be in the form of notes or longer feature articles.
3. Contributions may include announcements and reviews of exhibitions, seminars, conferences, special courses and lectures, information relating to current projects and any queries concerning the study of archaeological textiles. Bibliographical information on new books and articles is particularly welcome.
4. References should be in the Harvard System (e.g. Smith 2007, 56), with bibliography at the end (see previous issues). No footnotes or endnotes.
5. All submissions are to be made in electronic text file format (preferably Microsoft Word) and are to be sent electronically or by mail (a CD-ROM).
6. Illustrations should be electronic (digital images or scanned copies at 600dpi resolution or higher). Preferred format is TIFF. Illustrations should be sent as separate files and not imbedded in text. Colour images are welcome.
7. All contributions are peer-reviewed by the members of scientific committee.
8. The Editors reserve the right to suggest alterations in the wording of manuscripts sent for publication.

## Please submit contributions by post to:

Archaeological Textiles Newsletter  
Centre for Textile Research  
University of Copenhagen

Njalsgade 102  
DK-2300 Copenhagen S  
Denmark

Or by electronic mail to the corresponding editor:

Margarita Gleba: margarita@atnfriends.com

Or to editors:

Eva Andersson: eva@atnfriends.com

Ulla Mannering: ulla@atnfriends.com

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