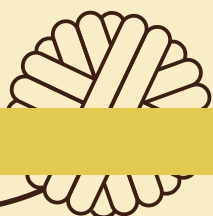


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ARCHAEOLOGICAL TEXTILES NEWSLETTER



Spring 2010 issue

Archaeological Textiles Newsletter

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ATN has reached an important landmark – the current is the 50th issue of the newsletter, marking a quarter of century of publication that started out being made “on a kitchen table” by and for archaeological textiles enthusiasts, and is now being sent to every continent save Antarctica. We hope the readers will find the selection of articles and news in this issue interesting, stimulating and reflecting of the wide interests of the field. Issue 50 includes articles about new and old finds from Egypt, Israel, England and Denmark, as well as information about a new research project about cloth cultures in prehistoric Europe. There are also many new publications and announcements of forthcoming conferences.

The new digital format of the newsletter and the establishing of the homepage for circulation of information and online subscription service have been a tremendous help for the current editors of the newsletter and secure that the publishing of ATN is still possible. Many new subscribers have found their way to the homepage and we have today subscribers from all around the world including Japan, New Zealand and Australia, all over Europe and the United States. Unfortunately, at the same time, some old members have not renewed their subscription. Year 2010 is to be a turning point for ATN, and regardless of the world financial crisis, the future survival of ATN depends on an increased number of subscribers. We therefore encourage all members to spread the word, and make sure that libraries keep subscribing to the newsletter.

In ATN 49 the closing of the Textile Conservation Centre in Southampton was announced. In this issue we are happy to report that the Textile Conservation Centre will reopen in a new format and in a new location at the University of Glasgow, with the first student intake planned for September 2010. We congratulate the Textile Conservation Centre Foundation (TCCF) and the University of Glasgow on making the decision to support the important work of TCC. Likewise, we are happy to announce the continuation of the Danish National Research Foundation's Centre for Textile Research (CTR) for another five year period (2010-2015).

The editors have decided that a new folder on the ATN homepage will be dedicated to publication lists of textile researchers. The first list by Orit Shamir, Israel will be made available on the homepage in July. We encourage researchers to send in bibliographies. For administrative reasons the homepage will be updated twice yearly (end June and December). We hope that this service will increase the usefulness of and visits to the ATN homepage and above all make textile research more visible and easily accessible.

In October 2009, Margarita Gleba moved to London, where she is carrying on her work at the Institute of Archaeology, University College London as a Marie Curie Intra-European Research Fellow. She remains the corresponding editor of ATN.

The Annual General Meeting for 2010 was announced to take place the 22 April at 16:30 at the Centre for Textile Research, University of Copenhagen in conjunction with the 13th International Aegean Conference. Unfortunately, due to the Icelandic volcanic ash affecting air traffic, the meeting was postponed and instead it took place in Bolton, UK on the 29 May in conjunction with the 5th General Meeting of the DressID project.

Present:

Margarita Gleba, Eva Andersson Strand, Ulla Mannering, Marie-Louise Nosch and several of the DressID participants.

As no additional proposals were sent in by the members, the agenda was as following:

1. Election of a chairperson, if somebody so wishes: Ulla Mannering elected as chairperson of the board.
2. The report of the board for the period since the previous annual general meeting: Two issues for 2009 have been published. We are currently examining the costs of making reprints of ATN issues 1-45. We hope to have them for sale on the webpage by the end of the year.
3. Presentation and approval of the revised account of 31st of December 2009.
4. Decisions concerning individual and institutional subscription fee for 2010: the board will apply for funding at NOS-H to cover the costs of production. If funding is granted by NOS-H the subscription rate will remain unchanged for 2011, 2012 and 2013. Otherwise the yearly membership fee for individual and institutional will be raised with 5-9 €. This decision will be announced in the next ATN issue and on the homepage.
5. Election of 3 members of the board and 1 deputy member for the current financial year: Eva Andersson Strand, Margarita Gleba, Ulla Mannering remain as board members, Carol Christiansen remains as deputy. Karina Grömer is ad hoc scientific board member.
6. Election of an auditor and 1 deputy auditor member for the current financial year: Marie-Louise Nosch and Lauritz H. Gregersen stay as auditor and deputy.

The editors



Dominique Cardon, Adam Bülow-Jacobsen and H el ene Cuvigny

Recent textile finds from Dios and Xeron

New mines of archaeological textiles

Since 1994 a program of systematic excavations in the Eastern Desert of Egypt has focused on small Roman fortresses (*praesidia*) built during the 1st century CE. They are scattered at a regular distance of approximately 30 km along two caravan roads leading from Koptos (now Quft) on the Nile, respectively to Myos Hormos (Quseir), and to Berenike, two important harbours on the Red Sea Coast at the beginning of the Christian era (Fig. 1). These military sites had a double function: to keep the roads safe from the desert Bedouin and to provide travellers, particularly caravans, with an adequate supply of water (Cuvigny 2003; Cuvigny forthcoming).

In those sites where rubbish heaps have been preserved in good condition, great numbers of ostraca (inscribed pieces of broken pottery), have been discovered (Fig. 2); they have provided a lot of information about everyday life in the *praesidia* of the Eastern desert (Cuvigny 2003, 2005; B ulow-Jacobsen 2003; Fournet 2003). They present these places as small garrisons of about fifteen soldiers, mostly infantry, but with a few horsemen for the postal service. The soldiers were all detached from auxiliary units. Officers were low to middle-ranking and the local commander of the fort, the curator, was typically a *signifer*. Some of the military staff had women with them. They were all surrounded by a satellite group of civilians providing commodities ranging from fresh fruit, vegetables and wine, to prostitutes. Numerous letters found at Dios show that vegetables were grown and sold at Compasi, the fort just north of Dios, where water was plentiful. A number of letters further tell us that clothes were sent there for washing.

Large quantities of textile fragments have also been found. Their study, together with that of textiles from other contemporary sites in the Eastern Desert, is contributing to new insight into the textile technology in the ancient world during the three first centuries CE (Cardon 1998; 1999; 2001; 2003; 2006; Bender J orgensen 1990 a; 1990 b; 1999; 2000; 2004; 2008; Ciszuk 2000; 2004; Mannering 2000a; 2000b; Wild and Wild

2000; 2001; Wild 2002). A forthcoming publication discusses a substantial selection of clothing textiles discovered in Didymoi – a *praesidium* on the road to Berenike, occupied from AD 76/77 to about 240 – from another point of view: dress and identity in the Eastern parts of the Roman Empire (Cardon *et al.* forthcoming a). These finds are made particularly useful for the historian by the meticulous study of the stratigraphy of the deposits by the archaeologists of the team and the discovery of dated *ostraca* and inscriptions on stone (Brun 2003, 61-72; Brun *et al.* forthcoming). As a result, fairly secure and precise dates can be provided for most textile fragments. This is equally precious for our research into the dye sources and dyeing technology connected with the production of the textiles. This part of the project has benefitted from the generous permission granted by the Supreme Council of Antiquities of Egypt to take samples of small lengths of threads for dye identification and from the support of the French Institute of Oriental Archaeology (IFAO). The results of two series of dye analyses concerning six different categories of textiles have already been published or are forthcoming (Cardon *et al.* 2004a; 2004b; Wouters *et al.* 2008; Cardon *et al.* forthcoming). One of the categories consisted of textiles with a purple ground or with tapestry decorations including weft threads dyed in the broad range of shades that was aptly defined as “intended for purple” by Rodolphe Pfister and Louisa Bellinger, in their publication of the archaeological textiles from Dura Europos: that is, from greyish mauve to dark violet (Pfister and Bellinger 1945, 4, 11). One aim of our research was to check whether true purple obtained from marine molluscs – the most prestigious and expensive dye of the time, also called, somewhat misleadingly, ‘Tyrian purple’ or ‘imperial purple’ – could have been used in textiles from these sites that we know were inhabited mostly by ‘ordinary’ people, military and civilian. Another aim was to understand what alternative dyestuffs and dyeing processes were used to produce this range of shades, in order to obtain cheaper imitations of true purple. As a result of these analy-

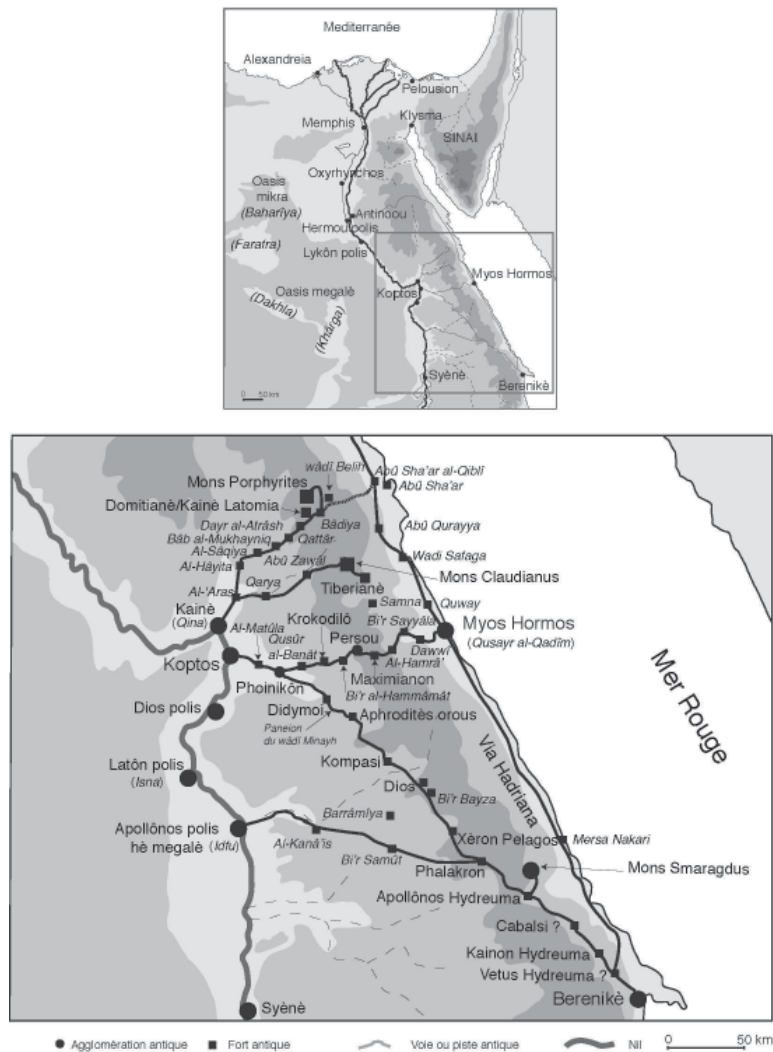


Fig. 1. Map of Egypt with location of praesidia mentioned in the text. © J.-P. Brun (CNRS-Centre Jean Bérard).

ses, true purple was identified in 13 different textiles from Maximianon, Krokodilò and Didymoi. Our research provides new ground for a reappraisal of the economic and social importance of purple in Roman Egypt during the three first centuries CE (Cardon *et al.* forthcoming b; forthcoming c).

We now report on work in progress on textiles from the rubbish heaps of the two most recently excavated *praesidia*, both situated further than Didymoi along the road from Koptos to Berenike: Dios, excavated by our team between 2005 and 2008; and Xeron, in which the first campaign started in December 2009, ending in January 2010. As an example of the kind of information that can be obtained from this type of corpus, as compared with textiles and clothing from burial sites, we publish and discuss the techni-

cal analyses of fragments from semicircular hooded cloaks found in different layers of the main rubbish heap of Dios and in the first excavated squares of the dump at Xeron: they come as complements to Hero Granger-Taylor's seminal publications on woven-to-shape semicircular cloaks in two recent issues of *ATN* (Granger-Taylor 2007; 2008) and to the section of our forthcoming chapter on clothing textiles from Didymoi where we publish fragments from two cloak hoods decorated with tapestry bands in true purple (Cardon *et al.* forthcoming a).

Dios and Xeron

The names we use for the sites have been established, or confirmed, by our study of the ostraca. Before this series of excavations, the toponyms of the *praesidia*



Fig. 2. Greek ostrakon. Here part of an amphora with an address 'To Xeron pelagos' followed by the name and the unit of the soldier to whom it was sent. Infrared photo © A. Bülow-Jacobsen.

on the road from Koptos to Berenike were known thanks to three itineraries from antiquity, transmitted through mediaeval tradition: the *Antonine Itinerary*, the *Tabula Peutingeriana* and the *Ravenna Cosmography*. The three sources do not always agree, either between them, or with the ostraca discovered on the sites. In the case of Dios, the *Antonine Itinerary* mentions the site as *Iovis* (i.e. [*praesidium*] of Jupiter). This name has been generally used by modern historians and it has also been found by us on one ostrakon written in Latin. However, all the ostraca written in Greek that mention the name of the site call it Dios (i.e. [*praesidium*] of Zeus »), which is also the name used in the *Tabula Peutingeriana*. The name most often found for the other site considered here is *Aristo-*

nis, which is a medieval Latin distortion of the Greek Xeron (i.e. 'dry') (Bülow-Jacobsen forthcoming). The name *Aristonis*, as found e.g. in the *Itinerarium Antoninianum* and on many modern maps (including, regrettably, the Barrington Atlas), but not in the *Tabula Peutingeriana*, is thus never found in any of the ostraca from the sites. The full name in antiquity was *Xeron Pelagos*, i.e. 'The Dry Sea'.

Dios

According to an inscription found on the site, Dios (Fig. 3) was founded in 114/115 CE, that is 38 or 39 years later than Didymoy. It apparently replaced an earlier *praesidium*, Bi'r Bayza, (the ancient name is not known) which is situated 7 km further along the road towards Berenike. A brief excavation campaign in January 2008 provided evidence that Bi'r Bayza was abandoned before the end of the 1st century CE. Dios was occupied until c. 250 CE: the latest dated ostrakon in the rubbish heap mentions the 3rd or 6th year of the reign of Philip the Arab (245/6 or 248/9 CE).

The rubbish dump occupied a surface of circa 600 m² and its maximum height, in the centre, was approximately 1.30 m. As compared with the rubbish heaps at Maximianon on the road to Myos Hormos, and at Didymoi, on the same road as Dios, organic remains here were less well preserved. The environment of the site may have been less dry. It is now surrounded by a sparse vegetation of spiny bushes. The bulk of the deposit was more compact, heavy and sandy, the stratigraphy consisting of a succession of layers of sand, straw, gravel, alternating with solid lenses of



Fig. 3. Dios fort with rubbish dump to the right (the small heap in the front is the excavation area and the bigger heap behind it is the radim, where the sand and gravel from the excavation is dumped). © A. Bülow-Jacobsen.



Fig. 4. The site of Xeron Pelagos, "the Dry Sea", seen from SW before the excavations were begun. The rubbish dump is partly hidden behind it to the right. © A. Bülow-Jacobsen.

ashes or lime. Botanical remains were less abundant than in Didymoi, very few leather objects were found and ostraca were mostly in rather poor condition. Textiles also appeared less well preserved, and less abundant at first, but even in comparatively 'poor' sites, textile fragments are counted by the hundreds.

In the end, the textiles discovered in Dios fill two big metal boxes, the first of which contains 283 bags (each bag containing all the textile fragments recovered from a particular stratigraphic unit in the rubbish dump). Sorting of the textile remains started in January 2009 with Dominique Cardon in charge of the

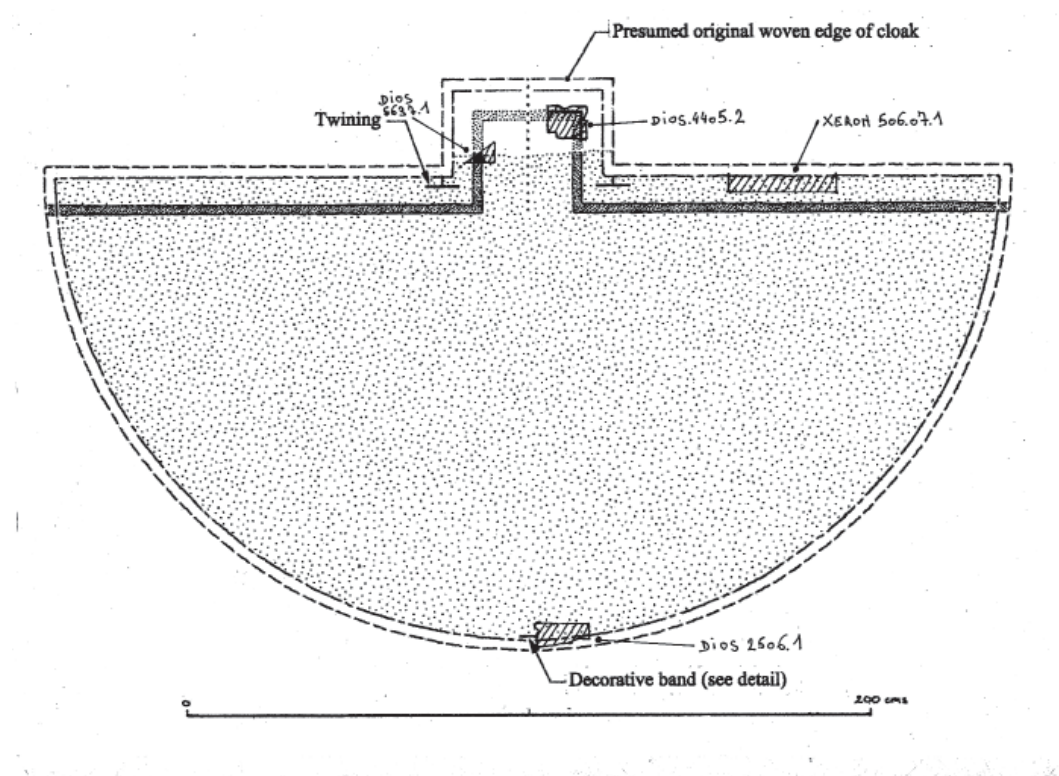


Fig. 7. Ideal plan of a hooded cloak marked with the possible position of the Dios and Xeron textile fragments. Drawing by J.M. Tarrant and H. Granger-Taylor (plan of cloak) and D. Cardon (inserted fragments).



Fig. 5. Stratigraphy of a fully excavated square in the rubbish dump of Xeron at the end of the first excavation campaign. © D. Cardon.



Fig. 6. Upper corner of a cloak hood, Dios.4405.2.
© D. Cardon.



Fig. 8. Fragment from the side of a cloak hood with a vertical band in tapestry, Dios. 5637.1.
© D. Cardon.



Fig. 9. Lower edge of a semicircular cloak with notched bar in tapestry, Dios. 2506.1. © D. Cardon.



Fig. 10. Close-up of the notched bar in tapestry, Dios. 2506.1. © D. Cardon.



Fig. 11. Re-used piece from the upper edge of a semicircular cloak with sewn edge, Xeron.506.07.1. © D. Cardon.



Fig. 12. Close-up of the sewn edge, Xeron.506.07.1. © D. Cardon.



textiles and Dany Nadal responsible for their preparation and conservation. The contents of a first lot of 48 bags were sorted in January and February 2009, while the remaining 235 bags were examined in January and February 2010. The textiles in the other metal box have not been examined yet. Each bag examined contained between one and ten different textiles. After being cleaned of earth and dust, they were sorted, placed in new bags and grouped by categories in big transparent envelopes for future study. As cleaning and sorting progressed, some particularly interesting textiles were selected and fully studied to allow a quick publication.

Like in the previously studied *praesidia*, the main bulk of textile remains consists of small to very big pieces of goat hair fabrics that served as matting and soft furnishing, or parts of animal equipment. Pieces of felt, mostly undyed and much yellowed, but occasionally dyed nice green (originally blue?) or orange (originally pink?) shades are also present in many bags, from all parts of the rubbish heap. Like in other *praesidia*, linen textiles, extremely rare, only appear here as small fragments of coarse, badly preserved tabby textiles.

Wool textiles are numerous and diverse, and the range of types recognised so far corresponds to what has been found in previous *praesidia* for comparable dates, although they are generally less well preserved and of smaller dimensions than at Didymoi. There are some fortunate exceptions, however: among the 34 already fully studied textile pieces from Dios a complete and well preserved 'slipper/sock' with separate big toe made of wool cloth was found. It has been beautifully conserved by Nadal in 2009 and presented at the recent Conference of the research group "Textiles from the Nile Valley" at the Headquarters of Katoen Natie in Antwerp, Belgium, in October 2009. Its details will be presented in the forthcoming conference publication on *Dress accessories* (Cardon forthcoming in de Moor and Fluck, eds). Here we present detailed analysis of two fragments from cloak hoods and a fragment from the bottom part of a semicircular cloak.

Xeron Pelagos

'Xeron' is built on a low hill in the middle of the wide, flat sandy plain of a wadi, hence probably the name 'Dry Sea' (Fig. 4). Its foundation can quite safely be dated to the second half of the 1st century CE, from the ceramic remains found in the layers corresponding to the digging of the well, and it was probably occupied, like Dios, until c. 250 CE: the material in the latest layers in the rubbish dump corresponds to the second half of the 2nd and beginning of the

3rd centuries CE. The fort is small, compared to most *praesidia* of the Eastern Desert, in contrast with the huge rubbish dump situated, as usual, in front of the gate. During the recent first campaign, the rubbish dump was divided into squares with sides of 5 m. This season, squares 407, 408, 506 and 607 were excavated, revealing that the dump there was more than 2 m high (Fig. 5). Its stratigraphy is well preserved and mainly consists, as in the other sites, of layers of chaff, sand and ashes. The most remarkable feature is the presence of thick layers of gypsum and gravel which reveal repeated cleanings of the well. The abundance of gypsum in this part of the wadi must have contributed to fill continuously the well with mud. This is mentioned in a poem on an ostrakon found in square 506 (like the fragment of semicircular cloak published below), which celebrates the well of Xeron and its *gypsophoros* water. The dump is disappointingly poor in the usual categories of material, even ceramic. The relative humidity of the area, that allows a scattered vegetation of acacia trees and spiny bushes to grow around the fort, could explain the paucity of textiles and leather, but not of ceramics and glass. This can only be due to a lower number of persons living in the fort. The general atmosphere and social life may have been different and less agreeable in this little fort, where the well was always on the verge of silting up, than in large *praesidia* such as Dios or Didymoi. In a curious letter found at Dios in 2007, a prostitute who has been sent to Xeron urgently asks to be allowed to come back to Dios. She argues that the horsemen who bring the official letters to Xeron have the impression, when they arrive in this garrison, to see *mimoi* (buffoons)!

Textiles did not fare better in the rubbish dump than poor Serapias during her exile in the fort. They come out crumpled and squashed, impregnated with whitish earth or coated with dried grey mud, which complicated the textile analysis considerably. Nevertheless, all textile fragments discovered this year were examined and sorted, and a selection of 41 textiles were cleaned and fully studied. As usual, the main bulk of textile remains consists of a variety of fabrics in brown goat hair and numerous pieces of yellowed felt. Fragments of wool textiles are not only far less numerous than at other *praesidia*, but also generally much smaller and badly worn. Moreover, those discovered so far do not cover such a wide range of categories/types. Some of the dense twill fabrics made of single or plied z-spun yarns have apparently been helped by their excellent quality to withstand the unfavourable conditions in the rubbish dump at Xeron and have survived better than the thin tabbies. This permits to add a textile from Xeron to



the following small collection of fragments of hooded, semicircular cloaks.

Hooded semicircular cloaks from Dios and Xeron

The identification of the following fragments as characteristic parts of hooded semicircular cloaks, and more precisely in the two first cases, as parts of hoods, would not have been possible without Granger-Taylor's recent discussion on the technical details of a hooded semicircular cloak discovered in a grave in the Nubian site of Ballana, completed by her identification of fragments of cloaks from Qasr Ibrim as parts of a hood. The shape she proposed for a semicircular cloak and for the hood have helped us to identify textile fragments from Didymoi as belonging to two cloak hoods (Granger-Taylor 2008, figs. 7, 8; Cardon et al. forthcoming a, fig. 322). They also allow identifying where on a typical semicircular hooded cloak the fragments from Dios and Xeron published below would have been located.

Dios. 4405.2. Fragment of upper corner of hood, undyed, decorated with a purple right-angle in tapestry (Fig. 6)

Date: discarded mid-2nd c. CE.

Description

10 x 11.8 cm; purple stripe *c.* 0.5 cm wide in vertical part of tapestry angle, running parallel to vertical torn edge, at *c.* 2 cm from it; horizontal part of purple right-angle *c.* 0.4 cm deep, running parallel to horizontal torn edge, at *c.* 1.1 cm from it; one stabbing stitch in white linen ending in knot, more or less in the middle of the fragment in warp direction; much worn, torn across vertical part of purple angle, several holes; encrusted dirt; preservation medium, purple contrasting weft slightly faded and discoloured.

Technical characteristics

Wool, tabby weave, balanced, fine and close texture, crêpe effect, and very good quality. Tapestry in purple right-angle woven in extended tabby: warp ends paired both in vertical and horizontal parts of right-angle; in vertical part, 4 groups of paired warp ends; in horizontal part, warp threads grouped with crossed threads, 2:2:2:2, etc. and margins of 2 picks of main weft on grouped threads above and below purple band; purple weft paired in vertical part of right-angle, single in horizontal part; the vertical joins between purple and ground wefts are woven in interlocking tapestry weave.

Warp: undyed and unpigmented, now creamy to yellowish, tight s-spin, *c.* 19 ends per cm (abbreviated epcm below); 8 ends in 0.5 cm in vertical band.

Ground weft: same colour as warp, medium s-spin,

c. 17 picks per cm (abbreviated ppcm below).

Contrasting weft: greyish purple, slight z-spin, paired in vertical part of angle, *c.* 18 ppcm (= 36 threads); single in horizontal part, 15 picks in 0.4 cm.

Dye identification of purple weft: the results of dye-analysis are not available yet.

Construction

Stabbing stitch, white linen, s-spin 2Z-ply.

Discussion

The presence of a big stabbing stitch in white linen thread in the middle of the fragment, makes it likely that this torn hood ended up in the rubbish heap as part of a *kentron*, that is in a swatch of recycled rags used to mend worn clothes, or as filling for cushions or saddles. In this hypothesis, the hooded cloak it originally belonged to, could have been woven somewhat earlier, during the first part of the 2nd century CE or even before, and would probably not have been worn by any of the fort dwellers. This is also the case for fragments of a cloak hood from Didymoi (D98.4404.1 A+B), discarded between 176 and 210 CE as part of a *kentron* (Cardon et al. forthcoming a). In Figure 7, the position of the fragment is shown on the outline of the plan of a cloak based on the Ballana cloak as reconstituted by Granger-Taylor and Nobuko Kajitani, from the Metropolitan Museum of Art (New York, USA). It could belong to either of the two upper corners of the hood but not to a bottom one, because it does not include any remains of reinforcement of weft twining, while such reinforcements are present at the bottom corners both on the Ballana cloak and on the Didymoi fragments. As compared with the Ballana cloak, this fragment has a much narrower purple band, like the band of the hood fragments from Didymoi. Other similarities with the cloak from Didymoi are: the ground weave in tabby; S-spin threads used for both warp and weft in the ground weave; identical warp counts; in both textiles, warp and contrasting weft are paired in the vertical part of the purple bands. But there also are significant differences between the two cloaks: not only in the tapestry technique used in the vertical joins between ground and band, and the spinning direction of contrasting wefts (z-spin in the fragment from Dios, s-spin in Didymoi). Most importantly, the dye – which has faded and changed colour at the surface of the fabric – and the thinner contrasting weft in the fragment from Dios, betray its lower quality as compared with the brilliance of the true purple identified in the hood from Didymoi and the amazing thinness of its purple-dyed contrasting weft, approximately 150 threads of which can be counted per cm.



Dios. 5637.1. Fragment of side of cloak hood, orangey-brown with purple vertical band in tapestry, discoloured to blue in places (Fig. 8)

Date: discarded during the 2nd c. CE.

Description

6 x 9.3 cm; width of purple band: c. 1.9 cm; distance from band to torn edge more or less parallel to warp: 3.5 to 4.2 cm; distance from band to point of angle formed by the two other torn edges: 3.15 cm; much worn, insect holes, encrusted in places with a whitish substance (lime?) that has made the wool brittle and has had a dramatic effect on the dye of the contrasting weft, turning it from its bright violet colour (particularly visible at margins of holes) into sky blue; preservation poor.

Technical characteristics

Wool, 1/2 twill weave (diagonal of the twill in Z direction on weft face) and tapestry in purple vertical band. Ground weave densely weft-faced, quality fine and dense. Purple vertical band woven in extended tabby: 34 warp threads are paired for band, and purple weft threads are also paired; at the vertical joins between purple and ground wefts, paired threads of purple weft and single threads of ground weft alternately turn back around the same paired warp, creating a toothed effect.

Warp: orangey-brown, s-spin, shiny, c. 13 epcm.

Ground weft: same colour as warp, z-spin, c. 28 ppcm.

Contrasting weft: bright purple (mid blue in stained places), z-spin, paired, 24 ppcm (= 48 weft threads).

Dye identification: results of dye-analyses of ground yarns and contrasting weft not available yet.

Discussion

This fragment could come from the middle part of either of the two sides of a cloak hood where the decorative purple band runs parallel to the warp (Fig. 7), like in fragment A from a hood found in Didymoi (D98.4404.1 A). The ground weave is different: tabby in the fragment from Didymoi, 1/2 twill here (like in the fragments of cloaks from Qasr Ibrim identified by Granger-Taylor). The tapestry technique used in vertical joins between ground weave and vertical band, and the weave in the band, are the same here as in the textile from Didymoi. The spinning direction of warp is the same in both textiles but the spinning directions of both ground and contrasting wefts are different. The dyes may be different: in the Didymoi cloak, the band is dyed with true purple. In this fragment, the variations in hue (from bright purple to sky blue) in the contrasting weft – that are also found in the following fragment – are intriguing. It is hoped that dye-analysis will bring an explana-

tion for this phenomenon.

Dios. 2506.1. Fragment of bottom part of semicircular cloak, orangey-brown with remains of a blue to mauve notched ornament in tapestry (Fig. 9)

Date: discarded at the end of 2nd or beginning of 3rd c. CE.

Description

7.7 x 15.3 cm; height of blue and mauve notched tapestry motif preserved: c. 1.4 cm; distance from last pick of mauve/blue weft to torn bottom edge of fragment: c. 2 cm; depth of best preserved tooth: 0.35 cm; width of weft between teeth: c. 0.3 cm; much wear, torn at the side of tapestry teeth and in mid depth of the lower tooth; preservation poor; the colour of the tapestry weft now varies from sky blue to mauve.

Technical characteristics

Wool, 1/2 twill weave (diagonal of the twill in Z direction on weft face), and tapestry in preserved part of blue/mauve ornament. Ground weave densely weft-faced, quality fine and dense. Tapestry ornament woven in extended tabby (basket weave): warp threads are paired, and both contrasting weft threads, and ground weft threads between the blue-mauve teeth, are also paired (Fig. 11). Contrasting ornament, and ground weft between the teeth, woven in interlocking tapestry weave: one single ground weft and one paired tapestry weft interlocking between adjacent warp ends.

Warp: orangey-brown, s-spin, 2Z-ply, shiny, c. 10.5 epcm.

Ground weft: same colour as warp, z-spin, shiny, c. 24 ppcm in ground weave; paired in each pick between the two teeth, c. 17 ppcm (= 34 threads per cm).

Contrasting weft: mid blue to mauve, loose s-spin, 2Z-ply, paired, 20 ppcm (= 40 threads/cm).

Discussion

This fragment must come from the same bottom part of a semicircular cloak as the small notched bar on the Ballana cloak (Fig. 7 and Granger-Taylor 2008, 8 Fig. 3). Considering the distance between the bottom part of the toothed motif and the torn edge, it could actually be a piece of the original, frayed edge of the cloak. The spinning direction of warp and contrasting weft, and the ground weave are different from those of the Ballana cloak, however. The fragment is more similar to the fragments of cloaks in fine brown weft-faced 1/2 twills found in Qasr Ibrim and to the preceding textile. The two 1/2 twills from Dios, however, each have different spinning systems both in warps and in contrasting wefts, and the tapestry technique used at the vertical joins between purple and ground wefts is also different. The interlocking technique found in this fragment is also used in the fragment of hood corner Dios. 4405.2, described above. The varia-

tions in hue (from sky blue to mauve) in the contrasting weft, also found in the preceding fragment, are intriguing and would have deserved a dye analysis. However, the remains of tapestry ornament are so small that, in this case, we have to wait for progress in non-destructive techniques of dye identification to look for an explanation of the phenomenon.

Xeron. 506.07.1. Re-used off-cut of very fine and dense, light golden-beige 2/2 twill, probably from the upper edge of the “wing” of a semicircular cloak, with sewn edging along the top edge parallel to the weft (Fig. 11)

Date: discarded 2nd century CE.

Description

C. 4.7 x 18.5 cm as presently folded (a portion, 13 cm wide, of the fragment is folded twice and sewn to upper layer); the total width of the fragment if it was unfolded would be 31.5 cm; some holes; the corded sewn edging has become worn and torn in places and the frayed edge has been coarsely mended; preservation of textile very good.

Technical characteristics

Wool, 2/2 twill, densely weft-faced, fine, very good quality. The sewn edging along the straight edge parallel to the weft is composed of three fine adjacent cords, z-twisted, each made of 3 s-spin threads, attached by whipping stitches which pass between the twisted threads (Fig. 12). There are c. 6 stitches per cm. The sewn finish created in this way is 0.35 cm wide.

Warp: golden beige, z-spin 2S-ply, c. 14 epcm.

Weft: same colour as warp, z-spin, c. 47 ppcm.

Construction:

Sewing thread in needlework edging, wool, beige, z-spin 2S-ply; Z-plied edge cords, beige, made of three s-spin yarns.

One end of the fragment is folded twice on itself in the weft direction and the three layers are sewn together by big stabbing stitches 1.5 cm apart. Stabbing stitches light linen, s-spin 2Z-ply.

Discussion

The identification of this fragment as part of a semi-circular cloak is based on close technical similarities with the Ballana cloak: it has the same spinning system, the same ground weave, and most importantly, the sewn edging along the straight edges parallel to the weft, in the Ballana cloak, is nearly identical to the sewn edging in this fragment (*cf.* Granger-Taylor 2008, 9, fig. 5). Ground weave and spinning systems are also similar to those of hood fragments from Didymoi, D99.1516.1A + B, discarded between 125 and 140 CE. In the fragments from Didymoi and Xeron, the warp and weft counts are slightly lower

than in the Ballana cloak, but they all three undoubtedly belong to the same type of high quality garment, particularly appreciated in the Roman army. It is difficult to figure out what was the purpose of folding and sewing this long off-cut in such a way, but it may show that cutting and re-use may have taken place on the site. Another sign of this is, that the fragment was not as crumpled and squashed as if it came from a torn-open *kentron*. In this hypothesis, the hooded cloak it originally belonged to could have been worn by one of the fort dwellers. It is somewhat of a surprise to find the remains of a garment of such quality in this fort where the soldiers are described as looking like “*mimo!*”. Maybe it was bought second-hand: the sewn edging along the top edge shows that the original edge of the cloak had already been cut away and repaired. On the other hand, elaborate decorative edging added during successive refurbishment processes are often found in fragments of such valuable pieces of clothing. This is the case in the Ballana cloak.

Conclusion

The study of this small collection of fragments from hooded cloaks in different weaves and qualities, but presenting common technical characteristics, very aptly illustrates the invaluable information – as well as the limitations - of the type of corpus the textiles from rubbish dumps constitute, as compared with textile finds from burial sites. To understand the function of the small rags exhumed from the rubbish heaps, we must rely on the information supplied by discoveries of whole garments and pieces of soft furnishing in tombs in other contemporary sites, and complete this evidence by the study of contemporary paintings and sculptures. On the other hand, the exceptional quantity and diversity of textile fragments found in the *praesidia* provide a wealth of examples for many types of textiles, considerably enriching our knowledge on the technical variations which could be found in apparently similar products, and our understanding of the importance of cross-influences between textile traditions from Europe and the Near East. This is due to the two main ways through which textiles were discarded into the dumps. As remains of soldiers’ belongings, some textiles provide examples of foreign fashions and foreign textile techniques, because of the mixed ethnic origins of the soldiers that spent some time in the forts. The multitude of rags from *kentrones*, on the other hand, offer examples of a wider range of textiles, which were originally used by all kinds of people of diverse economic means and social status and were probably produced mainly, but not only,



in Egypt. From the thorough analysis of such a rich mine of documents which can be related to fairly precise dates, a more complex but also more complete vision of the evolution of textile techniques and fashions in the first centuries of the Roman Empire is gradually emerging.

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Nahum Ben-Yehuda and Terence Murphy

Rope from the Christmas Cave: In search of the Talmudic hemp

Introduction and Background

The "Christmas Cave" (later in this paper - CC), located in the Judean Desert on the west bank of the Dead Sea, in the Qidron Valley, 1 km south of Qumran, has no connection to the life of Jesus Christ. Its name simply commemorates the day on which it was discovered by John Allegro in 1960 (Allegro 1965, 6-15 *passim*). In 2007, the cave was surveyed again by Ro'i Porat and Hanan Eshel (Porat R. *et al.* 2007). They confirmed that the finds have no connection to the Qumran Caves. Human activity in the cave began in the Chalcolithic Period, and continued as a hiding place for refugees at the end of the Great Revolt in 73 CE and again in the Bar Kokhba Revolt in 135 CE. Among the archaeological finds from this cave are wool and linen textiles from various periods. This assortment of textiles, in contrast to those found in Qumran, is similar to those found in Masada (Belis 2003, 211, 219). According to Orit Shamir, comparison to the textiles found in The Cave of Letters is more exact, those being generally coarser than the Masada textiles (personal correspondence).

This site is not considered part of, nor related to the Qumran complex of caves. Therefore some of the nomenclature used in Humpert and Gunneweg (2003) under the title "Qumran textiles", is misleading. Gunneweg, in his introduction (p. XIX) under the subheading "textiles", does not mention the Christmas Cave at all, notwithstanding its textile finds being included in the chapters he subsequently describes. The CC finds all appear numbered as category "QCC" (= "Qumran Christmas Cave"), and some have been given a parallel "QUM" number (Belis 2003, 221; Muller *et al.* 2003, 277). In the above volume, Penelope Walton Rogers reports her analysis of some of these fibres, referring to them simply as coming from "a site in the Dead Sea region", which is correct under any circumstances.

These ropes and fabrics were stored since their discovery at the Rockefeller Museum in Jerusalem, ex-

amined at École Biblique et Archéologique Française de Jérusalem (EBAF), and only recently relocated to the Israel Antiquities Authority. The articles had been bundled in batches from the various loci within the CC. It is likely that most or all of the articles investigated in this research paper are from the Roman period. Indeed, the sizes of the DNA templates of all the samples are about the same, in that they were under 1000 base pairs and over 180 base pairs, suggesting similar periods of decay. Nevertheless, certain characteristics present in a number of these items give the possible impression that they are from an earlier time period. These suppositions of periodisation should be confirmed in the future by radiocarbon dating.

It is generally accepted, based on both literary sources and archaeological finds, that the primary fibers in use at that time (1st-4th centuries CE) in the Land of Israel were lamb's wool, goat and camel hair, and flax-linen (1). Cotton had not yet appeared. Silk is mentioned in contemporary literary sources but has not been corroborated by archaeological finds of the period.

This research project focuses on the genetic identification of vegetable fibers constituting Roman period ropes and fabrics found in the CC. It has always been assumed that the fiber used in articles of this type is flax, which is well known as being widespread in the Land of Israel in this period, and is mentioned numerous times in the contemporary Rabbinic literature (Mishnah, Toseftah and the Jerusalem Talmud) (2). This assumption has been validated in the past by optical microscopy (Walton Rogers 2003) (3) and X-ray testing (Muller *et al.* 2003). Nevertheless, it is extremely difficult to discern between quite similar cellulosic bast fibers, such as flax and hemp, by these means, and all the more so when they are ancient, having suffered the damaging and deteriorating effects of time. The genetic fingerprint on the other hand should enable one to determine what is really

in there (Dunbar and Murphy 2009). Samples of these ropes from CC, in addition to selected “linen-look” fabrics have been tested by genetic means in order to correctly determine the fibers of which they are made.

Hemp (*cannabis*) is mentioned in the Talmudic literature as an existing, albeit marginal, textile product in the Land of Israel, similar - albeit inferior - to flax. Both flax-hemp blend and wool-camel’s hair blend (possibly central Asian Bactrian camel hair - which is soft and suitable for garments - and could have been imported - as opposed to the local coarse haired Dromedary, as suggested by Michael Ryder in personal correspondence), are mentioned in Mishnah Tractate Kil’ayim 9, 1 and Tractate Nega’im 11, 2. The indication is that the two fibers blended together are quite similar. Hemp as an inferior, and therefore invalid, substitute for linen is mentioned in Toseftah Tractate Menahot 9, 17. The adulteration of flax with hemp is a possible means of deceit, as flax is more expensive (Oakley 1928, 167-169). Blending flax with hemp may be practiced to obtain rope which is both soft and strong (Weindling 1947, 286).

Although linen cordage (rope or twine) (4) is mentioned (Jerusalem Talmud Tractate Sukkah, ch. 1 and Tractate ‘Eruvin, ch. 5), it is possible that hemp was also used in these products as well as in other coarse textiles (Weindling 1947, 286; Barber 1991, 15; McKenna 2004, 4-5). Up until now, no archaeological

textile finds in the Land of Israel have been identified as hemp.

As opposed to the fabric and nets found in the Land of Israel which have typically been the focus of extensive research, the cordage finds have not yet been thoroughly examined. An additional aspect of this research will look into the cordage found in the Judean Desert and its possible uses, as reflected in the Talmudic literature.

Where were the ropes and fabrics manufactured, and where did the raw materials come from? A probable candidate is Beth Shean (which is mentioned in the Deocletian’s Edict by merit of its superior linen products, but referred to by its Roman name “Scythopolis”), 77 km further north, and was ‘the’ famous center in this period for flax growing and manufacture of fine linen garments, and is frequently mentioned as such in Talmudic sources. Flax is mentioned in the Biblical period in nearby Yeriho (Joshua 2, 6) from c. 1200 BCE. In adjacent Hesban, Yeriho, ‘En Gedi and Masada textile, manufacturing implements have been unearthed from the relevant time periods. The distance from the Dead Sea to Jerusalem is 38 km. Rope-making does not require special implements, and could have been done at the location in which they were found, in this case the Christmas Cave. Talmudic literature mentions rope-making in several contexts, one of which is the halakhic injunction against using (even) a derelict synagogue (which



Fig. 1. Photographs of selected rope and fabric samples used in this analysis. © Authors.



is particularly suitable, being a long building) as a rope walk (Mishnah Tractate Megillah 3, 3) due to the site's holiness. Others include rope making done by two halakhically impure individuals (Mishnah Tractate Zavim 3, 2), and the injunction against making rope in a city of refuge, in order to deter the avenger of blood from going there (Toseftah Tractate Makot 3, 10). Apparently, rope is an essential commodity, made only in certain locales (see also Herzberg 1924, 140-146).

Hemp in an agricultural context is mentioned only once in the Mishnah (Tractate Kil'ayim 2, 5). According to Felix (1967, 220-222) the text is corrupt (5) and should be read "caraway". Amar (2000, 336, and personal correspondence) believes that the printed text can be accepted as is, but in any case hemp was definitely a very marginal crop. The Jerusalem Talmud (Tractate Kil'ayim 9, 7) mentions that garments made of hemp (possibly mixed with wool) were imported from "overseas" (perhaps from the Aegean and Asia Minor regions) (6) through the ports of Caesaria and Tyre and their respective vicinities. Perhaps fibers and/or yarn for weaving and rope manufacture were also imported, not locally grown.

Rope (both laid and braided) was certainly used in antiquity for a multitude of purposes. Indeed many rope finds have been retrieved from CC and other sites in the Land of Israel. The vast majority of these ropes are made from palm frond fiber; additional ropes are of goat and camel hair; and the distinct minority is of bast fiber, which has always been assumed to be flax.

Following are the various uses for rope mentioned in Talmudic literature, any or all of which may very well have existed at CC.

Mishnah

- To cordon off an area (Pe'ah 4, 5 *passim*)
- A leash for an animal (Shabbat 5, 3 *passim*)
- A handle for a basket (Shabbat 8, 2 *passim*)
- A sailor's knot (Shabbat 15, 1)
- A cameleer's knot (*ibid.*)
- Tied to a bucket for drawing water from a cistern (Shabbat 15, 2 *passim*)
- To secure a burden to an animal's back (Shabbat 24, 1)
- To measure the "t'hum", the distance permitted to walk on the Sabbath ('Eruvin 1, 9)
- Rope bed or stool (Pesahim 4, 9 *passim*)
- To measure a parcel of land (Baba Batrah 7, 2-3)
- To bind an animal's legs (Parah 3, 9)

Toseftah

- To secure a person who is going to immerse in water - a "lifeline" (Shabbat 1, 18)

To bind bundles of branches (Betzah 3, 10)
Used for shade, placed on the roof of a booth (Sukkah 1, 4)

To climb up to the roof (Makot 2, 6)
To check the water level in a cistern - a "dipstick" (Makhsirin 9, 6)

With that introduction in mind, we have applied DNA technology to identify the fibers of samples of rope and cloth found as the archeological site of CC. We expected the use of DNA sequence information to confirm the identity of the major component (as flax), but also to indicate whether fibers from hemp or another plant species form a detectable fraction of one or more samples. Our data do indicate that flax-linen dominates in every sample tested, and that there is a small amount of hemp DNA in many samples.

Methods and Results

Samples of rope and fabric from CC, part of the Israel National Treasures Collection, were obtained from the Israel Antiquities Authority. Rope samples were numbered I.A.A. 582928 (herein abbreviated 928), 582931 (931), 585795 (795), 585796 (796), and 637538 (538), and 582955 (955) [thread?]. Fabric samples were numbered 582812 (812), 583019 (019), 585440 (440), and 585786 (786) (Fig. 1). Two samples of modern rope were included: one stated to be of linen from Japan, and another from the United Kingdom. A positive control sample of flax, *Linum usitatissimum L.*, was obtained from the garden of the Plant Sciences Department, University of California at Davis, USA. Positive control samples of hemp, *Cannabis sativum L.*, (as drug quality marijuana) were obtained from the police department of Bakersfield, California, USA. DNA was extracted from the samples of rope, fabric and control plant samples and purified by adsorption on and elution from glass filters.

Identification of the plant species that contributed fibers to the rope and fabric samples began with the polymerase chain reaction (PCR)-amplification of the ribulose biphosphate carboxylase-oxygenase large subunit (*rbcL*) gene (GeneBank accessions: flax: FJ169596.1; hemp: GQ436331.1). This gene is specific for photosynthetic organisms and thus its use avoids confusion from the presence of animal or fungal DNAs. We used two primers designed to generate a 184 bp DNA fragment of the *rbcL* gene. The fragment of flax could be distinguished from that of hemp, because the amplified hemp fragment contained a *BamHI* restriction site that allowed its cleavage into two specific fragments.

The PCR products obtained using the template DNA extracted from the ancient rope and fabric samples all contained strong bands of approximately the cor-

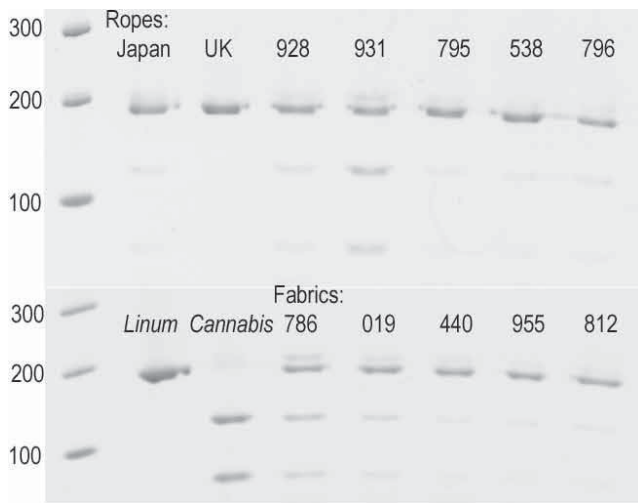


Fig. 2. Restriction analysis of DNA from rope and fabric samples. PCR amplifications were conducted in 20 µl of solution containing 12.1 µL of water, 4 µL of 5x Green Go Taq Buffer (Promega Corporation, Madison, WI, USA), 1.6 µL dNTPs (2.5 mM of each dNTP), 0.125 µL Taq DNA Polymerase (Go Taq, 5u/µL, Promega), 0.6 µL of each primer (forward and reverse, 20 µM), and 1 µL of template DNA. PCR conditions were 96°C for 1min; 35 cycles of 94°C for 45 sec, 60°C for 45 sec, and 72°C for 1 min; 72°C for 5 min; 4°C hold. Following PCR amplification, DNA was subjected to cleavage by *Bam*H1 restriction enzyme. As shown in the lower frame, control DNA from hemp was completely cleaved, whereas DNA from flax was not. DNAs from modern linen (Japan) and (UK) ropes were not cleaved. Rope 931 and fabrics 786 and 019 showed significant cleavage. Numbers at the left show the size of DNA fragments in base pairs.

rect size, 184 base pairs (Fig. 2). The band produced using authentic hemp DNA template was cut over 90% by *Bam*H1, yielding fragments of 115 and 69 base pairs. In contrast, the bands from most of the ancient samples were not cut significantly by *Bam*H1, indicating that they contained little if any hemp DNA. Rope sample 931 and fabric sample 786 were the most notable exceptions, both showing substantial amounts of cutting. However, repetitions of the PCR reaction and restriction digestion, particularly of sample 786, did not consistently show the smaller bands produced by *Bam*H1.

A second set of primers, specific for chloroplast gene *trnL* (leucine transfer RNA), was used to confirm the presence of hemp in the ancient samples. Using these primers, amplification of the flax gene gives a 311-base pair fragment; the hemp gene, a 180-base pair fragment. Using these primers, all rope samples

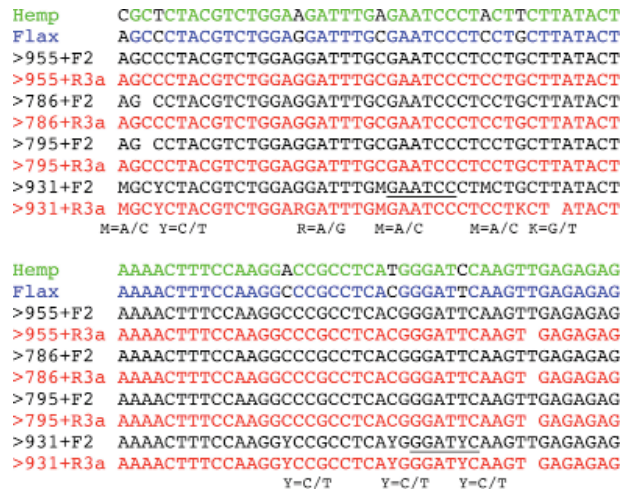


Fig. 3. Base sequences of PCR-amplified *rbcL* DNA from representative samples of rope and fabric, with corresponding flax and hemp sequences for comparison. Sequences 795 and 931 are from rope samples; sequences 786 and 955 are from fabric samples. All samples were amplified using forward (F2) and reverse (R3a) primers. The sequencing procedure was performed with each primer; the results from both primers are shown. Base differences in the hemp and flax DNA are shown in boldface black and the corresponding superpositions in sample 931 are indicated by code letters (M,Y,R,K).

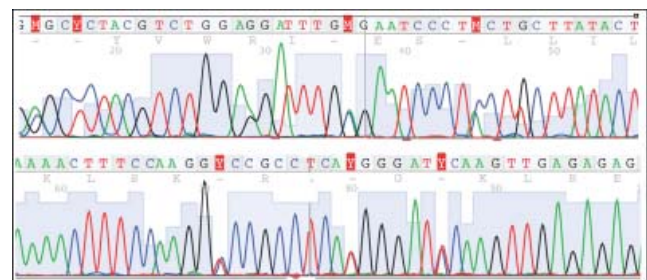


Fig. 4. Chromatogram showing superpositions in the DNA base sequence of sample 931. Bases marked M indicate superpositions of A (green) and C (blue); bases marked Y indicate superpositions of T (red) and C. This chromatogram shows the sequence read using the forward primer (F2); the chromatogram produced by the reverse primer (R3a) showed additional superpositions.



except 538 and all fabric samples except 955 showed a hemp band. Interestingly, although the template DNAs from modern rope samples showed a flax band, those from the ancient samples (assayed approximately five months after DNA extraction) did not, suggesting that the *trnL* gene of flax was more unstable to cleavage than that of hemp. DNA templates from a second set of samples (assayed soon after extraction) gave both hemp and flax bands. The base sequences of most of the ancient samples confirmed their identity as flax DNA fragments (Fig. 3). Within the 184-base pair amplified DNA of the *rbcl* gene, there was a stretch of 86 base pairs in which accurate sequence determinations could be obtained by sequencing in both directions, giving double assurance of the results. Within that region were nine sites at which the sequences of the flax and hemp genes differed. The sequence of rope sample 931 showed two bases at all nine sites (from at least one reading direction; Figs. 3-4), confirming that this sample contained a significant amount of hemp DNA. Other samples lacked those indications. Fabric sample 786 did not show indication of hemp sequence (Fig. 3), indicating that there was much less hemp DNA in this sample than in sample 931. A few other indications of two bases at one site, e.g. K (=G/T), or a present/deleted base (=T/-), occurred near the ends of the 86-base pair stretch, but probably represented sequencing errors rather than the inclusion of a variant flax or another species, since in each case these indications were found with only one primer. However, one of the indications in sample 931 indicated C/T, whereas the sequences of flax and hemp at that position were C and A, respectively. It is possible that the ancient hemp differed from the modern control species.

Conclusions and Questions Remaining Open

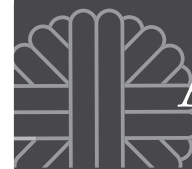
DNA sequences of the 184-base-pair bands confirmed their identities as flax *rbcl* and in the case of sample 955 confirmed the presence of hemp *rbcl* also. The PCR data using *trnL* primers indicated the presence of hemp DNA in that sample and most other samples, and the sequences of *trnL* bands also confirmed their identities. The sequence information would have indicated the presence of other fibers, such as palm or cotton, but none was detected. We note that the lack of linearity inherent in standard PCR makes it impossible to estimate accurately the relative amounts of template components. This is particularly true for the amplified sequences from *trnL*, the flax and hemp representatives of which differ greatly in size and composition. This also explains why replications of PCR using 931 and 786 DNA templates showed

different amounts of hemp *rbcl* product. With the amplified sequences from *rbcl*, which are identical in size and very similar in composition in flax and hemp, semi-quantitative PCR, combined with restriction analysis, should give reasonable estimates of their relative amounts, and we anticipate performing these experiments soon. The quantification is important, since if the amount of hemp is very small, it may not have been incorporated intentionally into the item, but acquired, perhaps as dust, during fabrication, use, storage, or archeological discovery and investigation.

Acknowledgements

Our sincere thanks to Dr. Orit Shamir, senior organic materials curator of the Israel Antiquities Authority, for allowing us ample access to the textile collection and for very courteously answering our numerous questions.

- (1) See: ASTM D 6798-02 *Standard Terminology Relating to Flax and Linen* (2003) West Conshohocken, PA. "Flax" refers to the plant and its fiber. "Linen" refers to the products produced from spinning onwards in the production process. Both the Hebrew and Aramaic languages do not discern between these two designations, often causing ambiguity.
- (2) The Mishnah, Toseftah and Jerusalem Talmud are all works redacted in the Land of Israel. Documentation of material culture appearing in all of them should be relevant to our research. The Mishnah (and probably Toseftah) represents 225 CE *terminus ante quem* and probably long before 70 CE *terminus post quem*. The Jerusalem Talmud, which is a work expounding on the Mishnah, is 350 CE *terminus ante quem*.
- (3) Pioneer research in the field is in Catling 1982, 12-17, 65-69. Chemical identification is outlined in: Oakley 1928, 166-169.
- (4) See Denton and Daniels 2002: "Rope" is an article of cordage more than approximately 4 mm in diameter", and "twine" is twisted cordage less than 4 mm in diameter. The Talmudic term for rope is "hevel", and for twine is "meshiha". Our examples are border line in their diameters. Toseftah Tractate 'Eruvin 2, 2 mentions rope of 8 cm in diameter, for measuring the *t'hum*. In Tractate Zavim 1, 11 a rope 50 m long is mentioned.
- (5) The printed text reads "*knbs*", while variants including the Jerusalem Talmud read "*krbs*". A perennial plant is necessary for the Mishnaic textual context. This designation fits caraway ("*krbs*"), not cannabis.



(6) See: Fleming and Clarke 1998 (map of Europe - "Type of Physical Evidence and Estimated Age"), and Herzberg 1924, 95-97.

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Joy Boutrup

Analysis and interpretation of braids from the London excavations

Introduction

The Museum of London conducted a number of excavations along the north bank of the river Thames in London in the 1970s and 1980s. The medieval textile finds from these excavations were collected and described in "Textiles and Clothing c. 1150 – 1450" by Crowfoot, Pritchard and Staniland in 1992 and republished in 2001. Most of the chosen sites are dated quite exactly based on contexts and circumstances of deposition. Braids only take up a small part compared with all the other important textiles in this book. It is however pointed out in the text that accessories, such as purses and trimmings in which braids are abundant, were very important in proclaiming a person's status at the time.

The braids are classified in two groups in the book, loop braided and plaited. It is not clear though from the text how this distinction was made and no attempt was made at further structural analysis of the braids at the time.

Since the publication of the book, much new knowledge has been gained on braids in general and on loop braiding in particular. Noémi Speiser's (2000) pioneering work interpreted and located documents with braiding instructions and described the principles of loop braiding. Some of these instructions are from the first half of the 15th century and thus contemporary with the latest of the textiles found in London excavations.

It is therefore interesting now to analyse the braids from the excavations and compare them with written sources as well as with contemporary objects preserved elsewhere. Such objects are mainly relic purses kept in different European church collections. The textiles in these collections are generally well preserved both with regard to structure and colour, providing a better understanding of the finds and their probable application.

Noémi Speiser and I have in recent years analysed many braids in European collections and have come

to the conclusion that loop braiding is by far the most commonly used method for making fine, silk braids during the Middle Ages and Renaissance. The ease and speed of loop braiding, when handling delicate, thin silk and many strands, seem to be preferable to the more time-consuming and complex method of braiding with open ends (plaiting). Regrettably, the early braiding methods do not leave any tools which could help identifying the methods and the structural indications of the possible production methods can only be supported by iconographical and written evidence.

I investigated half of the braids described by Crowfoot, Pritchard and Staniland (1991), approximately an equal number from each of the two types. These are classified in terms of technique, structure, number of elements, loops and number of persons involved in the braiding (Table 1). The probable original use of some of the braids can be suggested by comparison with objects in other collections and with medieval frescos.

Description of the types

Tubular and flat 4-ridge braids

Tubular and flat 4-ridge braids belong to the basic structures of loop braiding. It is characteristic for production with loops that the ridges never can be of the same size. Tubular structures produced by plaiting with open ends can be absolutely symmetrical with all ridges of the same size when made with numbers of elements divisible by 4, for example 8 or 12 elements. Other numbers of elements will give the same asymmetry as found in the loop braided structures. All the tubular structures among these braids have ridges of different sizes. It can thus not be said with certainty whether these are made with loops or not, but the fineness of the silk speaks for loop braiding. Flat 4-ridge twill will always have one ridge wider than the others near the middle if braided with loops and all the flat 4 ridge braids show this feature

(Fig. 1). The division of many of these braids into tails of two 2-ridge braids is a further argument for loop braiding as this transition is easily made just by taking the loops differently and thus producing both tails simultaneously (Fig. 2). Tollemache and Harley manuscripts from the first half of the 15th century have instructions for 4-ridge flat and tubular braids, as well as two 2-ridge braids, which are among the earliest in these two collections of loop braiding instructions.

Compact braids

There are two compact, round braids produced by 8 loops both dating from the second half of the 14th century. The two braids are similar in looks and production method but structurally they are not completely identical. These structures can be produced by two persons holding 4 loops each. The braiding procedure is orthodox and simple but the inner hands of the two workers have to be crossed. They work only their own loops and there is no exchange of loops involved in the braiding procedure. These two braids were formerly classified as plaited with

8 elements. We have found several of these types of braids in other collections but have no original written instructions.

One braid (BC72 [150] <4007/3>) was made by taking the loops open and each worker thus producing two 2-eyed tracks. The structure forms characteristic grooves along the length of the braid. The same structure was found on Philip of Schwabia's belt from 1208 (Historisches Museum Rheinland-Pfalz, D 334), on a sealed document from 1590 (Boutrup 2008), and on hand reins in horse gear from 1673 (Kungliga Gåvan, 1673, Royal Armory, Stockholm).

The other braid (BC72 [55] <1787>) was made by taking the loops crossed, each worker producing a 4-eyed track. This braid has no grooves but is smooth and round. The same structure is found on a 14th century sudarium from Halberstadt in Germany now in V&A (Speiser 2000, 66) but there it is made with 10 loops and 4 different colours (Figs. 3-4).

Century	Museum number	loops	tails	structure	Tail Structure
13th(4)	TL74[2532]<2435>	10		4 hands unorthodox passages, unorthodox exchange, 10 loops	
14th(1)	CUS73[12]<1245>	10	2	4 hands unorthodox passages, unorthodox exchange, 10 loops	Unorthodox, 5 loops
	CUS73[12]<592>	10	2	4 hands unorthodox passages, unorthodox exchange, 10 loops	Unorthodox, 5 loops
14th(4)	TB585[150]<3231>	5		Unorthodox, 5 loops	
	BC72[89]<2368>	10		4 hands unorthodox passages, unorthodox exchange, 10 loops	
	BC72[55]<1849/2>	5	4	Unorthodox, 5 loops	2 two-ridge, 5 loops
	BC72[55]<1557>	5	4	4 ridge twill, 2232	2 two-ridge, 5 loops
	BC72[89]<4099/2>	10	2	4 hands unorthodox passages, unorthodox exchange, 10 loops	Unorthodox 5 loops
	BC72[55]<1659>	15	2	6 hands unorthodox passages, unorthodox exchange, 15 loops	Unorthodox 5 loops
	BC72[55]<1867>	15	2	6 hands unorthodox passages, unorthodox exchange, 15 loops	Unorthodox 5 loops
	BC72[55]<3753>	15	2	6 hands unorthodox passages, unorthodox exchange, 15 loops	Unorthodox 5 loops
	BC72[55]<1643/3>	20		8 hand unorthodox passages, unorthodox exchange, 20 loops	
15th(1)	TL74[275]<1154>	15		6 hands unorthodox passages, unorthodox exchange, 15 loops	
13th (4)	TL74[2532]<2434>a	5		2 ridges, 5 loops	
	TL74[2532]<2434>b	5		Unorthodox 5 loops	
14th(2)	BC72[150]<4007/3>	8		Compact round 8 ridges	
	BC72[55]<1787>a	5		Tubular 4 ridges, 2332, 5 loops	
	BC72[55]<1787>b	8		Compact, round braid, 8 ridges, 8 loops	
	BC72[83]<1915>	5?		Tubular 4 ridges, different sizes of ridges	
	BC72[150]<3615>	5?		Tubular 4 ridges, different sizes of ridges	
	BC72[150]<4007/1>	5		Tubular 4 ridges, 2332, 5 loops	
	BC72[150]<4007/2>	5		Tubular 4 ridges, 2332, 5 loops	

Table 1.

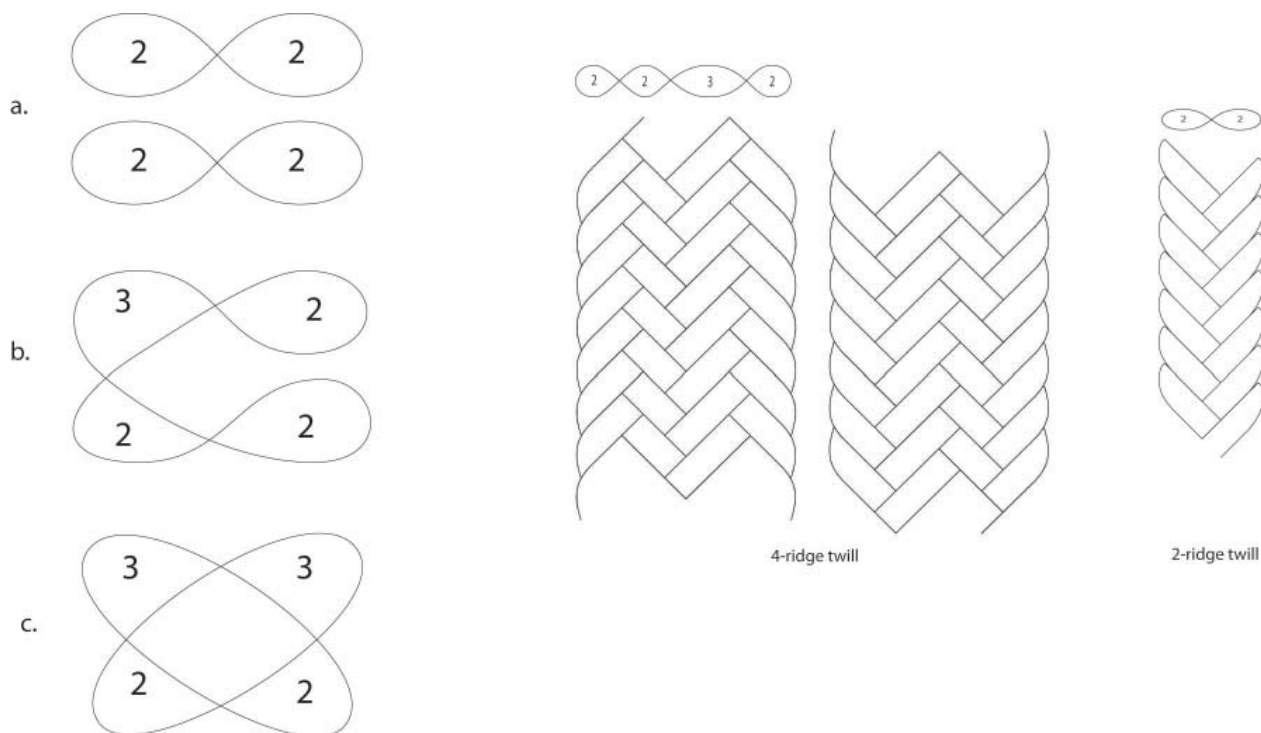


Fig. 1. Left: (a) both hands take the loops open; (b) left hand takes the loop crossed and the right hand the loop open; (c) both hands take the loops crossed. Right: the flat four-ridge braid when structure (b) is unfolded and the two ridge braids produced by (a).



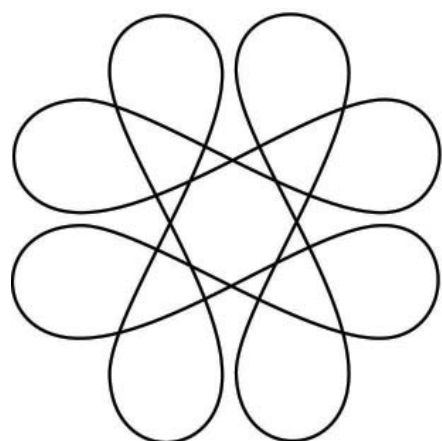
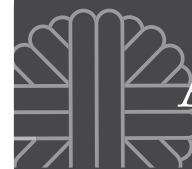
Fig. 2. Flat braid dividing into two two-ridge braids (BC72[55]<1557>, (Museum of London, Department of archaeological collections and archive).

Braids with unorthodox passages

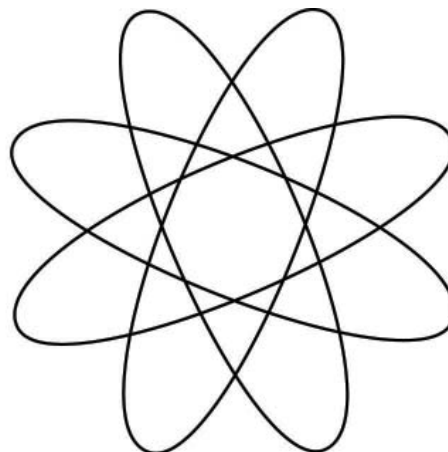
By “unorthodox passages” is meant that some loops are passed over and not penetrated during braiding. The structure is different on the two faces of the braid and this structure is only found in connection with loop braiding. All the braids classified as loop braided by Crowfoot, Pritchard and Staniland (1991) belong to this type. The unorthodox braiding procedure is the most widespread of all loop braiding methods and the most long-lived. In most places where loop braiding is still practiced such as Sweden, Denmark and Iceland, this is the only method known.

There are several braids of this type dividing into two ridge braids at one or at both ends and it is also found as tails on more complex structures (Fig. 5). Braids with unorthodox passages and unorthodox exchange.

These braids are based on the unorthodox structure mentioned above but made by two or more persons cooperating and exchanging loops in a special way. Characteristics of these braids are that the two faces of the braids are different. The obverse looks like a hopsack (panama) structure while the reverse has the look of irregular twill. They are dense and flat



Structure a



Structure b



Fig. 3. Trackplans and photos of the two compact round braids (a) made with open loops and (b) made with crossed loops. The trackplan of (a) shows the characteristic grooves in this structure.

and with shorter floats than braids produced with orthodox exchange. Only recently have these structures been understood through analysis of some early braids on relic purses in church collections of Sion, Switzerland, and Tongeren (Liege) and St. Truiden, Belgium. These braids are made by two, three or four persons co-operating. Each person is handling 5 loops and loops are exchanged between the workers after each braiding cycle. The braids are braided with unorthodox passages and unorthodox exchange of loops between the workers. The expression “unorthodox exchange” means that the two loops involved in the exchange both receive a half twist due to the exchange method. These twists give rise to extra ridges on both faces of the braids and shorten the floats. Braids with orthodox exchange from before 1400 have not yet been found and there are none among the braids investigated here.

Although there are manuscripts with loop braiding instructions dating from the mid-15th century, these structures are not described there and are only found in the Nun’s Book from the 17th century. The details

of procedure and structures are described in detail in “Orthodox and Unorthodox Exchanging of loops in cooperation” (Speiser and Boutrup 2009). The combination of these two unorthodox procedures results in rather complicated structures although the braiding as well as the exchange is very easy and simple to perform (Fig. 6). In other finds from the 13th to 15th century we have found many examples of this unorthodox combination produced by two persons. From later centuries there are also braids made by three and four persons (Speiser and Boutrup 2009, 26-32). The occurrence of not only five two-person braids but also four three-person braids and one four-person braid of this type among the investigated braids is thus remarkable. Several of the above braids have short remains of tails braided with 5 loops and unorthodox passages (Fig. 7).

Suggested applications for braids with tails

Several of the excavated braids are dividing into two tails at one or both ends as can be seen in Table 1. In loop braiding it is easy to split a braid into two braids. When two people are cooperating and the



Fig. 4. Compact round braid with structure a. used as seal string 1590 (Princess Anne of Denmark and Jacob VI of Scotland, Ratification of marriage contract 1590, Danish National Archives).

exchange of loops between the workers is stopped, each will make independent braids. It is just as simple to split the braid into two when just one person is working. If the loops are taken open instead of crossed in orthodox braiding with 5 loops, two separate 2-ridge braids are formed simultaneously, each with 5 elements.

A large number of the well preserved relic purses kept in churches in Switzerland and Belgium have loop braided strings as handle and drawstrings. Not only are the drawstrings and handles loop braided but the seams are often adorned with braids, sometimes with small Turkish knots or beads, and the upper opening reinforced by twined sewing. The latter is often referred to as tablet woven, which indeed is a possibility but the edge could just as well have been made using loops for the twining, as illustrated in a Dutch drawing from the 17th century (Zimmermann 2007, 399) and in a fresco in Florence from 1405 (Museum of Santa Croce, Maria and child, Giovanni Tani Fei).

Several of the purses have the handle dividing into

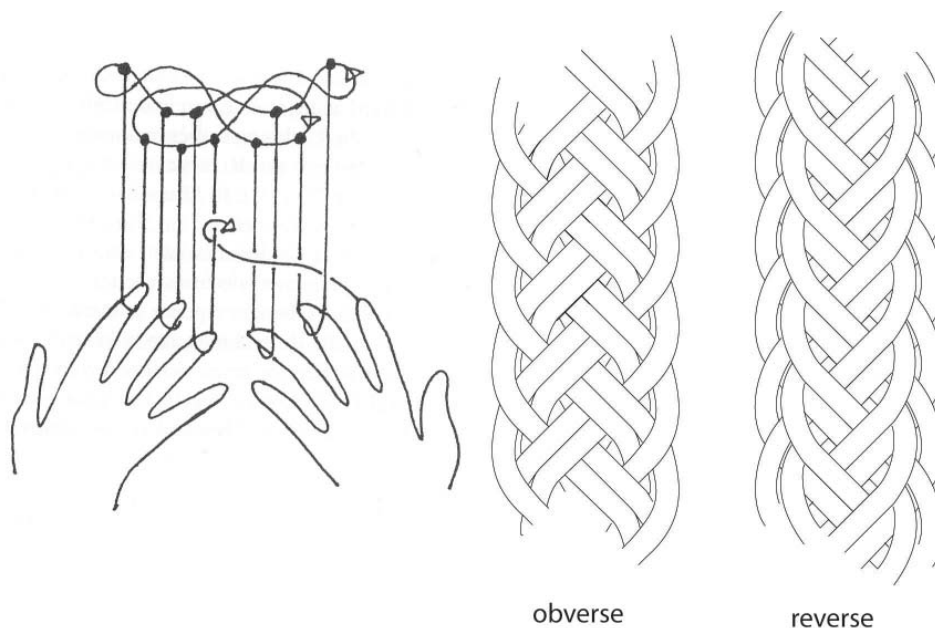


Fig. 5. Trackplan and the two different faces of the structure produced by unorthodox passages. Below a tail on a wider braid where the reverse face of this structure can be seen (Museum of London, Department of archaeological collections and archive).

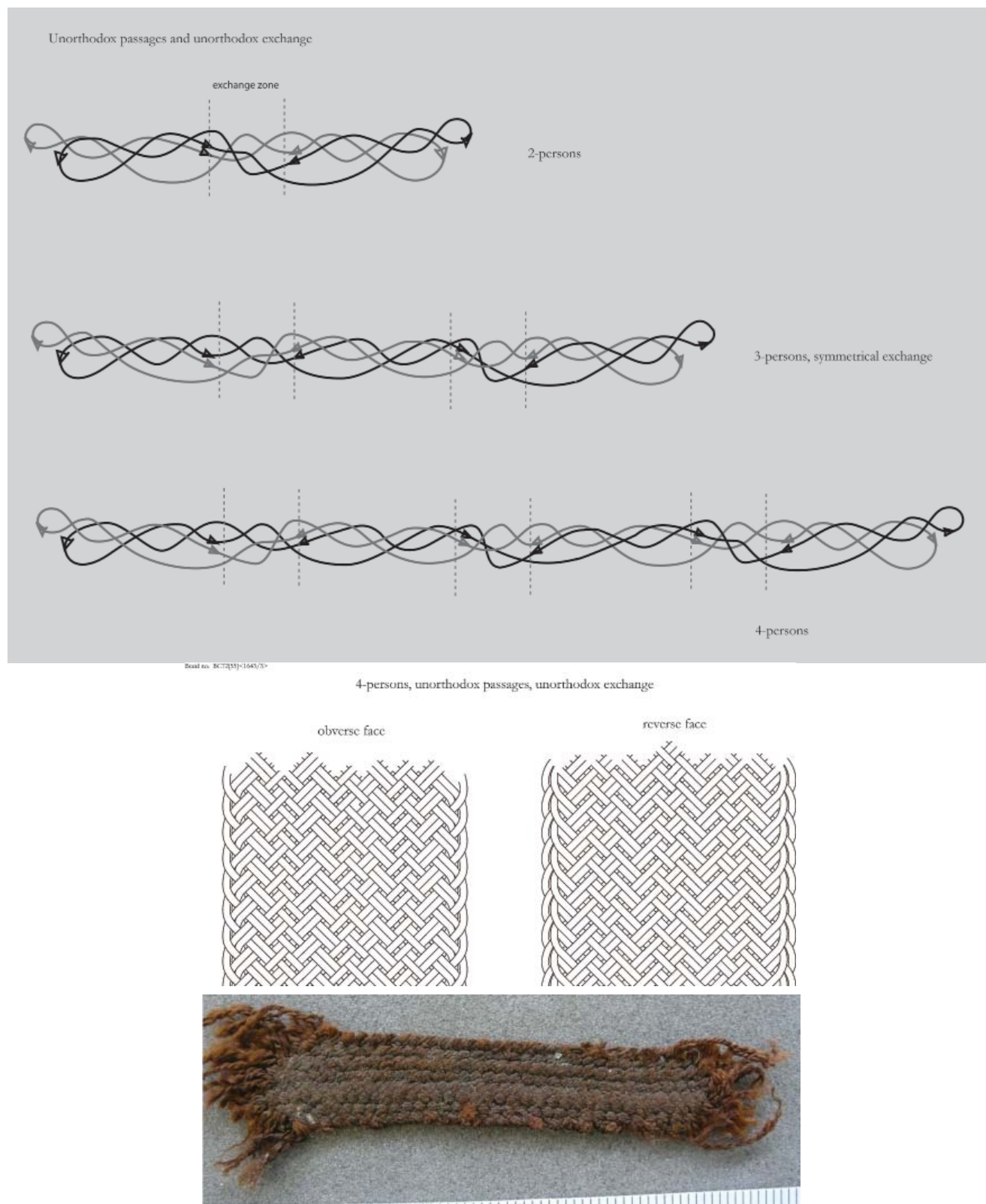


Fig. 6. Trackplans for the structures produced by two, three and four persons cooperating using unorthodox passages and unorthodox exchange. Below are the structural drawings of the two faces of the four-person braid and a photo of the obverse face of (BC72[55]<1659>), Museum of London, Department of archaeological collections and archive).



Fig. 7. Left: 14th-century purse from Tongeren (No. 43) showing the use of braids (Basilica of Tongeren, Belgium). Right: the two faces of a similar braid from the London excavations (Museum of London, Department of archaeological collections and archive).

two at both ends and thus continuing into the draw strings (Schmedding 1978; Sorber 1988). The transition is often covered with a Turkish knot. The purse would thus remain closed when hanging at the belt due to the pull at the handle by the weight of the purse. It is very probable that the excavated braids with remains of tails could have had a similar function. Some tails are not broken but still have the knot or wrapping usually connecting the draw-strings after the passage through holes in the fabrics (Figs. 8-9).

The connection between loop braiding and purses is evident in the dominant occurrence of loop braided strings on relic purses and other purses from the period in question. This connection is further supported by frescoes in the "Haus zur Kunkel" in Constance in Germany (Wunderlich, 1996). The "Haus zur Kunkel" translated into the "House of the Distaff" contains several frescoes. The frescoes are dated to before 1306 and are arranged in series. One series is the "weaver fresco" consisting of 21 scenes of women occupied in textile production, including spinning and weaving, purse making, loop braiding, tablet weaving, tapestry weaving *etc.*, and culminating with scenes of rest after these tasks. Four scenes in sequence show respectively cutting of fabric, purse making, loop braiding and tablet weaving clearly indicating the connection between these tasks (Fig. 10). Each scene has a sentence above in medieval German relating to the work at hand. The sentences are very short and rhymed. In the scene of purse making, the lady is sitting on a bench holding in one hand the purse she is working on while the other hand is reaching out for silk yarns in a basket on a stand.

Two finished purses are shown hanging on top of the stand. The following scene shows two persons, a young girl dressed in red and an older girl or young woman dressed in green. The young girl is holding the braid with her right hand and is beating the fell with the left. The young woman holds the loops and is in the middle of moving a loop from one hand to the other. The already braided part is hanging down on the left side of the red dress of the young girl. This scene was first interpreted as depiction of loop braiding by Frieda Sorber and later identified as really showing loop braiding by Masako Kinoshita and Noémi Speiser (Lmbric newsletter, No.1). Other scholars who have described the scene have been in doubt about the task depicted (Wunderlich 1996, 61-62) and assumed it was some sort of preparation for the tablet weaving shown in the following scene (Fig. 11). Over the loop braiding scene is written the sentence "Drgens sn wir vs nvt schame", the first word lacks two letters and should be "Dringen", which in medieval German means braiding. The connection of this word to loop braiding was later confirmed when it was found in the beginning of an instruction for loop braiding in a 15th century Heidelberg Manuscript (Cod. Pal. Germ 551, University Library Heidelberg, Germany). The later was identified by Ute Bargmann and presented at The Textile Society of America, 2002.

Conclusions

The separation of the braids into loop braided and plaited by Crowfoot, Pritchard and Staniland (1991) should be revised. Most of the braids with unorthodox features and all with tails were classified



Fig. 8. Braids with tails and the original knots (BC72[55]<1557> and TL73[2332]<2434> Museum of London, Department of archaeological collections and archive.

as loop braided by them and this corresponds exactly with the detailed analysis. The orthodox structures, though found in the other classification, are with very few exceptions probably also made by loop braiding. There are several features which support a general use of loop braiding:

- The delicate and thin silk strands make handling of free ends difficult.
- The division into two braids as well as the number of elements in the braids is consistent with loop braiding although some of them also could have been made by free end braiding.
- The many braids with unorthodox structures are further a clear indication of loop braiding as the production method. This structure only can be comfortably produced with loops.
- The finds of wide, flat braids made by two, three or four persons in the special structure produced by unorthodox passages and unorthodox exchange of loops correspond with braids found on contemporary relic purses.

The many braids with tails, some even with the tails knotted together make it probable that these braids were used as purse strings where the handle and the drawstrings are connected. Handles continuing into the drawstrings are found on many contemporary purses in different church collections.

There are no braids with orthodox exchange of loops. The method of orthodox exchange is explained in

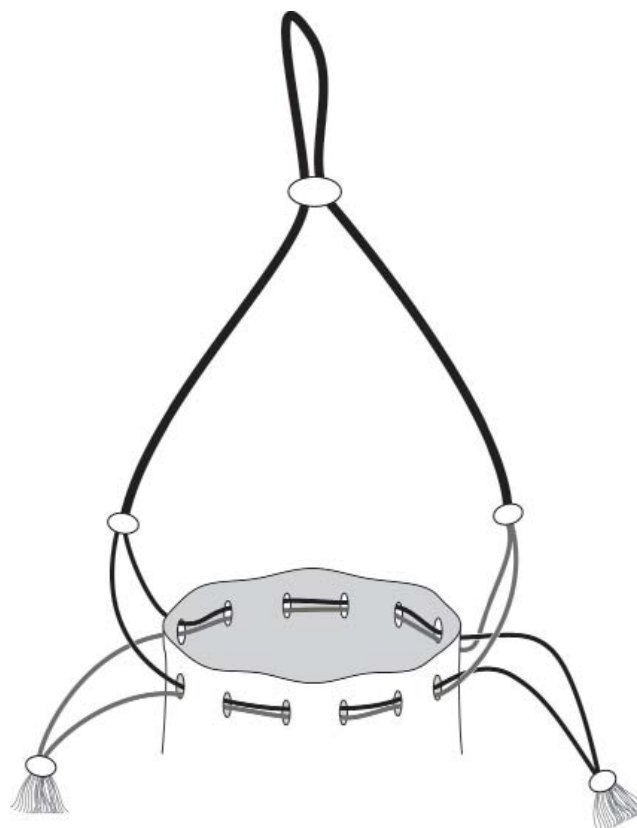


Fig. 9. Schematic drawing of the usual arrangement of handle and drawstrings on medieval purses.



Fig. 10. Left: a 14th-century relic purse from Turnhout, (Begijn Museum, Turnhout). Right: a 12-13th-century purse from Tongeren (No. 24), (Basilica of Tongeren, Belgium).

detail in the manuscripts from the first half of the 15th century. We have so far found no braids with orthodox exchange which with certainty are dated to before 1400. The frescos from Constance further confirm the medieval connection between loop braiding and purse making as the scene of purse making is followed directly by loop braiding.

Braids have been an important part of medieval and renaissance textiles but are often neglected in descriptions and analyses of garments, purses and decora-

tive embroideries. The studies of braids on purses and other items during the last years have brought new insight into the methods used in the workshops of the purse maker guilds. Loop braiding has for a long time been thought to be just one out of many possible methods of braiding, while recent investigations of the written evidence and extant braids including the braids from the London excavations demonstrate that it probably has been the prevalent braiding method at the time. The remaining



Fig. 11. Two scenes from "The Weaver Fresco c. 1300. To the left the purse maker and to the right a girl and a young woman loop braiding (Haus zur Kunkel, Stadt Konstanz, Baden Württemberg, Germany).



half of the braids described by Crowfoot, Pritchard and Staniland (1991) together with other finds from the 13th and 14th centuries will have to be analysed in order to get an overall picture of the applied methods.

Glossary

Loop braiding is a technique for braiding where the yarns are formed two and two into loops during braiding. In this way, many strands can be kept under tension and in order on the fingers.

Orthodox braiding is the standard method in loop braiding where all loops on the way are penetrated by the moving loop.

Unorthodox passages are braiding methods where one or more loops are passed over during the move.

Exchange of loops between braiders can be either orthodox, where the loops keep their direction or unorthodox where both loops receive a half twist after the exchange due to the method.

Trackplan is a projection of the track which each thread is following in the braid, a method of rendering structural features of braids

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Susanna Harris

Cloth Cultures in Prehistoric Europe: Project concept and approach

“Cloth Cultures in Prehistoric Europe” is a British Academy post-doctoral fellowship awarded to Susanna Harris at the Institute of Archaeology, UCL from 2008-2011. The aim of this research project is to bring together and examine the evidence for the cloth cultures of prehistoric Europe from 5500-1200 BC.

Classification concepts

Textile researchers are familiar with definitions and classifications of textiles that incorporate aspects of raw materials and technique, notably that cloth (fabric or textile) is made from interlaced fibres and threads (Barber 1991, 5; Good 2001, 209-10). Where people draw the line in these definitions varies; to some, textiles are strictly about weaving on a loom, to others, they incorporate a wider range of materials and techniques. These classification systems can be sub-divided according to weave or fabric structures (Emery 1966) and technique (Seiler-Baldinger 1994). Such terminologies are essential aspects of typologies, shared language and research analysis. Yet, wherever there is classification and sub-division there is also a separation of aspects that could otherwise be considered together and thus requires other definitions and grouping.

The concept of cloth cultures is based in the idea that all societies use cloth-type materials, but how they do this is specific to each culture. By cloth-type materials, I refer to those flexible, thin sheets of material that can be wrapped, shaped and folded and are used to cover, clothe and contain (Harris 2008). Although similar to definitions of textiles, this does not require the use of fibres and threads. Instead, cloth-type material is a term that can be used to include woven textiles, twining, looping, netting and animal skins, whether depilated or furry. It can also include more unusual materials such as sheets of bark, large leaves and fine, sheet metals. The purpose of considering cloth-type materials is, therefore, to embrace

the relationship between individual technologies and raw materials that are usually considered separately. How this is achieved in different societies of course varies, which means this needs to be considered as a cloth culture, specific to where it belongs in time and place.

Grouped through broad shared properties, cloth-type materials have the potential to be used in similar ways, while also holding unique properties that may be understood through physical, chemical and aesthetic criteria, but also by culturally attributed values. Investigating these materials as cloth cultures, rather than individual technologies or techniques draws attention to the role and relationship between these materials in past societies and the comparative study of cloth cultures. This is important from the Neolithic to Bronze Age Europe where these relationships are poorly understood.

Chronological time span

The chronological time span of the project ranges from 5500 to 1200 BC and includes societies classified as Mesolithic, Neolithic, Copper Age and Bronze Age. This time span covers a number of well documented horizons of change including the introduction of domestic flax as part of the Neolithic package of plants. There is evidence for the earliest wool use, developments in weaving technology and the proposed role of wool as part of a secondary products revolution (Sherratt 1997). More recent claims incorporate the role of raw materials that were previously overlooked, notable the suggestion of a “(Deleted - tree) bast culture” in the late Neolithic of Switzerland (Rast 1995, 149; Rast-Eicher 2005, 119). Earlier claims that textiles replaced skins have been cast into doubt following the discovery of the Copper Age Iceman on the Italian / Austrian border which has opened up debates on the role of animal skins at this time (Spindler 1995, 132-134; Winiger 1995). More recent

finds from frozen deposits continue to add complexity to the understanding of organic materials in the past. This whole time period is therefore one where the relationship between textiles, animal skins and other cloth-type materials is varied and changing.

Method and approach

A major area of this research is to bring together the evidence for textiles and animal skins. There is now a well established field of textile research with defined methods and increasingly sophisticated techniques of research, resulting in an improved understanding of textile technology and chronology. By comparison research into animal skins is less cohesive, although this is improving all the time, partly due to new finds from frozen contexts. Evidence for tools associated with processing animal skins and from faunal remains needs to be brought together and looked at in comparison to preserved skins and the evidence for textiles. Another of the hindrances to understanding past cloth cultures is recognising the way these materials were used in the past. Here the underlying problem of the poor and fragmentary preservation of organic materials, makes it difficult to understand how the different cloth-type materials were used. This is especially the case with materials that are not commonly encountered in the present. In this project the nature of these materials will be investigated through a comparison to modern materials as understood by textile technologists, leather and fur technologies, craft practitioners and experimental archaeology. Ethnography and recent historical examples also provide avenues to investigating the potential role of materials such as twining, skins and bark sheets.

Case studies

In this project I will be looking at a number of case studies of cloth cultures. These incorporate sites where textiles and animal skins are present in the same preservation contexts, such as the Bronze Age Hallstatt salt mines and the Danish oak coffin burials. In these studies a sample of the animal skins will be examined for dimensions, thickness, stitching and seams and compared with the textile evidence. Studies are also drawn from contexts without organic preservation and include the middle to late Neolithic sites of northern Italy. Here twining and plaited basketry are preserved as impressions on pottery and processing animal skins has been detected through use wear analysis of stone and bone tools and faunal remains.

Through these and other regional studies, the aim is to bring together the range of cloth-type materials

that were used by past societies and stimulate discussion on the cloth cultures of prehistoric Europe.

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Margarita Gleba and Ulla Mannering

A thread to the past: the Huldremose Woman revisited

Introduction

Re-examination of old finds with new methods can often lead to surprising results. Recently, fascinating new evidence for the use of plant fibre textiles during the Early Iron Age came to light. The discovery came during analysis of a prehistoric bog body found in Denmark in the late 19th century: The Huldremose Woman. The research was done as part of the research programme "Textiles and Costumes in Danish Bronze and Early Iron Age Collections", conducted at the Danish National Research Foundation's Centre for Textile Research in Copenhagen.

Bog bodies have attracted the attention of archaeologists for a long time, both because of their spectacular preservation and the reasons for which they ended up in a bog. It is still debated whether bog people were sacrifices, executed criminals or simply unlucky travellers. The best preserved bodies have been found in Denmark and Northern Germany and date to the Scandinavian Early Iron Age (500 BC-AD 400) (van der Plicht *et al.* 2004; Mannering *et al.* 2010).

The Huldremose Woman was found during peat cutting in north-east Jutland in 1879 (Fig. 1). Almost 130 years after its discovery it remains one of the best preserved and best dressed bog bodies. The body was dug from the bog by the local authorities and brought to a nearby farm. At first it was suspected to be a crime case, so the chief police officer, the district medical doctor and a pharmacist were summoned. As the body was undressed, however, it became clear that it was quite ancient. The costume was very well preserved and included two skin capes and a wool scarf and skirt (Fig. 2). In the inner cape a pocket contained a horn comb, a leather thong and a narrow woven band (Fig. 2). It is important to stress that the large tubular garment, often referred to as the Huldremose peplos (Hald 1980) and now called Huldremose II tubular garment, is a single find not connected to the Huldremose female body (Huldremose I) (Mannering and Gleba forthcoming).

The body was buried in the local churchyard while the garments were kept by the local doctor. After a few days, however, on request from the National Museum in Copenhagen, the body was unearthened again and sent to the museum with all the costume items. Before the textiles were shipped to Copenhagen, they were washed and hung to dry, attesting to the extraordinary preservation of the cloth and making the 21st-century conservators and archaeologists cringe with horror.

The costume

The costume of the Huldremose Woman offers fascinating insights into Scandinavian Pre-Roman Iron Age dress design and technology. The items removed from the body in 1879 consist of two skin capes, a scarf and a skirt (Hald 1980, 47ff; Nørgård 2008; Mannering and Gleba forthcoming). According to the archaeological find description (Brothwell 1990), the outer cape was placed with the furry side out - the opening probably placed to the right. The inner cape had the furry side turned inwards and - according to the description - it did not cover any of the arms. Therefore, one may assume that it was placed with the opening to the left. In order to remove the inner cape from the body it was necessary to cut it open - today these cuts are difficult to locate, as the top part of the cape is quite damaged. In the find description it is further stated that a horn comb, a leather thong and a narrow woven band were found sealed in a pocket in the outer skin cape. These items were wrapped in a bladder. An X-ray examination of the capes has revealed the presence of the pocket in the inner rather than in the outer cape. Inside a large three-dimensional patch, which is now cut open, small pieces of the leather thong can still be observed.

The scarf was placed around the head or neck of the woman. In order to get the scarf off the body, it was necessary to cut it in two halves. Only then was it



Fig. 1. Huldremose Woman as she survives today (© Roberto Fortuna, National Museum of Denmark).

recognised that it had been fastened with a bone pin underneath the left arm. The lower part of the body was covered by a long skirt and the feet were bare. According to the find description, the long red hair was tied at the neck with a wool cord, which was also wound several times around the neck. The hair is now missing.

In spite of having been subject to quite a rough retrieval and more than 130 years of storage in the National Museum of Denmark, the costume items are very well preserved. The two skin capes are made from well prepared, curly fleeces. The outer cape measures 82 cm in height and 170 cm in width. It is constructed of five primary, rectangular skin pieces, with two minor triangular pieces under the yoke. Most pieces are of dark sheepskin, but on the fur side the cape has an insertion of four light goat skin pieces. On the flesh side it has an upper front lining of dark sheep skin, which is a unique detail.

The inner cape is slightly smaller, measuring 80 cm in height and 150 cm in width. It is constructed of 7-8 primary sheep skin pieces, mostly rectangular and 22 secondary patches of goat and deer skin. Both capes have an asymmetrical design with a slanting neckline.

The wool scarf measures 139-144 cm in length and 49 cm in width. It is made in plain, 2/2 twill with tubular tabby selvages. It is woven with a tubular warp and has closed fringes at both short ends. The yarn is s-twisted and there are 6-7 threads per cm in both thread directions.

The wool skirt measures 220-252 cm in length, which is the circumference of the garment and 81-84 in width, which is its length. It is woven in plain 2/2 twill. The yarn is s-twisted and the weave has 7-10 threads per cm in both thread systems. The skirt is woven in such a way that one of the selvages constitutes the garment's waist band. The other selvedge is tubular tabby. As the ground weave and the waist band are made in different bindings, twill and rep tabby respectively, and with a different thread density, it required significant technical know-how to make the waist band and the ground weave fit together seamlessly while weaving. It would definitely have been much easier to sew a separate ribbon onto the fabric once the weaving had been completed. The skirt was woven with a tubular warp, probably as a tube with a closing cord/stick. The weaving was not continued right to the end, as is seen in many other Danish bog textiles (Mannering and Gleba forthcoming). Instead the lock of a cord/stick was removed, creating a rectangular fabric, and the remaining warp ends were cut off and the edge hemmed. Afterwards the skirt was sewn together with regular feather stitches.

The narrow band found inside the inner cape measures 74 cm in length and 1.5 cm in width. It is a tabby with simple selvages in s-twisted yarn. It was woven with a tubular warp and has closed fringes at the two short ends. Two cords (S2z2z) attached perpendicular to the length of the band are 77 and 78



Fig. 2. Various costume items belonging to the Huldremose Woman. Top: the inner cape seen from the flesh side and a close up of the plant fibre weave adhering to the woman's back. Centre: The outer cape seen from the fur side and the objects placed in the inner cape. Bottom: The skirt and the scarf (© Roberto Fortuna, National Museum of Denmark).



cm long respectively. This item could have been used as a hair band.

Fibre analysis of the wool used in the Huldremose textile and skin costumes has demonstrated that their makers had access to very high quality raw materials. Judging by the fibre diameter ranges in the samples, it is evident that great attention was paid to the selection and sorting of the wool before spinning and weaving. The wool from the textiles is surprisingly fine and has given the textiles a nice drape and soft handle. Likewise the wool used in the textiles matches the fleeces in the skin costumes; thus it can be concluded that the same sheep variety was used for textiles and skin costumes (Mannering and Gleba forthcoming).

A very characteristic feature of the Huldremose scarf and skirt is that they are woven in checked patterns of darker and lighter yarn. Furthermore, recent dye analyses have demonstrated that the textiles were also coloured with plant dyes (Vanden Berghe *et al.* 2009; 2010). In the scarf, two warp threads had no dyes detected, while the other three had different combinations of two unknown dyestuffs (unknown 3 and 5), which would have given a red hue, in one case supplemented with rhamnetin, a yellow dye ingredient. The same applies to the weft threads. The skirt is checked in a regular pattern with the same light and dark natural pigmented threads in warp and weft. The light threads contained luteolin, indigotin and an unknown dye component (unknown 5), which lies in the spectrum of red dyes. The dark warp has the same dye combinations, whereas the dark weft only contained luteolin and unknown 5 (Vanden Berghe *et al.* 2009; 2010). How this combination of yellow, blue and red dyes may have looked like is difficult to determine. As luteolin, in contrast to the other dyes, is present in all threads, it is likely that this was the last applied colour, possibly used to refresh or change the appearance of the colour. The mentioned dye sources represent both mordant and vat dyes, and therefore it is not possible that the dyes were applied in one process. Furthermore, the Huldremose skirt tested positive for three dyestuffs, which would have given distinctive colours to the textile separately but are unlikely to have been used together in one process, as the resulting hue would have been a variety of brown. One possible explanation may be that as the textile lost its bright colour due to exposure to the elements, it was over-dyed with a different colour.

The new costume item

While the above mentioned costume items were kept in the National Museum of Denmark, in 1904 the

body was given to the Anatomical Institute, University of Copenhagen where it lay forgotten until 1976, when it was 're-discovered' in a box under a table. The body was then returned to the National Museum, but first it was carefully examined and x-rayed (Brothwell *et al.* 1990). At the same time, samples of peat for pollen analyses were taken from the body. The first 14C-analysis, which was performed on samples from the body, dated the body to somewhere between 200 BC and AD 350 (Tauber 1979, 76). The new 14C-analysis performed in 2007 on the textiles has provided a more precise result due to the improved analytical methods, and demonstrates that the Huldremose Woman lived and died sometime in the period 350-41 BC (Mannering *et al.* 2010), which corresponds to the Scandinavian Pre-Roman Iron Age (500-1 BC).

In 2007, the peat samples, kept in glass tubes, were re-examined and in some of the glass tubes fragments of a thin spun thread of plant origin were found (Frei *et al.* 2009b). There could be no doubt that the thread had been part of a weave since it preserved the wavy shape usually acquired by yarn when it is locked into a fabric structure. But was the thread ancient? Why did no one notice it before? Were the threads intrusive - perhaps contamination from packing material? After all, while a bog environment is conducive to the preservation of animal or proteinacious materials, such as wool, skin and fur, plant materials such as linen, nettle or hemp have not been preserved. In fact, the only prehistoric items in plant fibre that had been found in the bogs are cords and ropes made of tree bast. Until now, that is: examination of the threads under a microscope indicated that they are ancient since the fibre surface was severely degraded. The DNA analysis of a small sample led to the same conclusion: there was no DNA surviving in the sample, which is usually the case with material that was buried in a bog.

This tiny thread was thus the first indication that a textile of plant fibre formed part of Huldremose Woman's costume. It was imperative that the body was examined for additional remains of the precious thread. The first surprise came when distinct imprints of textiles were located on the chest and the shoulders of the body - something that had not been noticed in previous examinations. Most of these turned out to be twill impressions, most likely from the scarf, but some of the imprints were made by a tabby textile. Since both the scarf and the skirt are woven in a twill technique entirely different in structure and texture from tabby, these imprints confirmed a possibility that a third textile garment was present on the body originally. When the body was turned around and its



back examined, there was an even greater surprise: not only were imprints of a tabby present, but also several small but unmistakable fragments of a tabby textile still adhered to the lower back (Fig. 2). This discovery means that there can be no doubt that in addition to the wool scarf and skirt and the two skin capes, the Huldremose Woman had worn some sort of undergarment in plant fibre next to the skin which covered at least the upper part of the body. The tabby weave is made from z-twisted threads with 9-10 threads per cm in both thread directions. Advanced microscopic analysis will hopefully in the future be able to reveal which kind of plant was used for this textile: flax, hemp or nettle (Bergfjord and Holst forthcoming).

Provenance

The reason for examining peat samples, which lead to the discovery of plant fibre thread, was to conduct strontium isotopic tracing analysis of the Huldremose garments. The ratio of the strontium isotopes is a good indicator for provenance of archaeological textiles. A recent PhD research project conducted by Karin Margarita Frei at the University of Copenhagen has developed the methodology for strontium isotopic tracing of wool textiles, but other materials such as plant fibres and skin have also been tested (Frei *et al.* 2009a). Samples from the Huldremose scarf, the plant fibre textile, peat collected on the Huldremose Woman's body and a piece of her skin were analysed. The results indicate that the wool scarf has a local provenance, while the plant fibre textile and probably the Huldremose Woman herself have a non-local origin (Frei *et al.* 2009b). This means that the Huldremose Woman and her tabby inner garment came from an area geologically different from Denmark with a Precambrian terrain. The closest area with this geological composition is middle and northern Sweden, Norway and the island Bornholm in the Baltic Sea.

Conclusions

The results of the investigation of the Huldremose I find demonstrate the usefulness of re-examining old finds with new techniques, analytical methods and information available. Thus previously, it was believed that textiles from the Pre-Roman Iron Age in Denmark were not dyed (Bender Jørgensen and Walton 1986; Walton 1988), and that the patterns in the fabrics were made only by combining various shades of naturally pigmented wool: white, black, grey and brown. The new dye test results challenge this perception, and show that Danish Iron Age textiles and garments were much more colourful than

previously thought.

The non-local provenance of some of the items in the Huldremose I find, together with similar results for the Huldremose II find, based on strontium isotopic tracing, opens up new interpretations regarding exchange and circulation of raw materials, in these cases wool and plant fibres, in a period and area where self-sufficiency and local production is generally expected. No other characteristics in the analysed costume objects would have provided information on their provenance. It forces archaeologists to look more carefully into cultural connections and exchange routes over much larger distances than previously anticipated.

Finally, the discovery of the plant fibre thread has major implications for our interpretations of bog bodies, since it raises the possibility that other bog bodies may have been dressed in plant fibre textiles, too. For example, the two most famous Danish bog bodies - Grauballe Man and Tollund Man (Ashing and Lynnerup 2007; Fischer 2007) - have little or no clothing associated with them. The fact is, however, that the vast majority of Danish bog bodies have been found together with textile and skin garments and accessories, indicating that garments played an important part in the deposition ritual. Thus, the naked bodies are exceptional and now we must ask if perhaps originally they were not naked either? Could it be that, underneath his leather belt, Tollund Man also wore a plant fibre garment which did not survive burial in the bog? We may never know the answer to this question but at least we must consider the possibility that prehistoric people were better dressed than previously thought. A little thread may sometime lead to a big change in our understanding of the past.

Acknowledgments

The results presented in this article have been conducted in collaboration between the Danish National Research Foundation's Centre for Textile Research, University of Copenhagen and the National Museum of Denmark. We would like to thank Karin Margarita Frei, Irene Skals, Anne Lisbeth Schmidt, Anette Hjelm Petersen, Anna Nørgård, Roberto Fortuna, Pia Bennike, Niels Lynnerup, Lena Hammarlund, Martin Ciszuk, Jan Heinemeier, Bodil Holst, Christian Bergfjord and Ina Vanden Berghe who contributed to the analyses of this material.

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Iris Tzachili

Obituary, Youli Spantidaki 1946-2010

It is with great sadness that we announce the death of Youli Spantidaki, a well-known specialist in textile research, who passed away in March 2010 causing great sorrow to her friends and collaborators. Her death is a big loss for textile research.

Youli's scholarship encompassed a wide field. She worked on archaeological textiles, medieval and Byzantine textiles, and especially European lace from the 17th and 18th centuries. She was a person of exceptional culture as demonstrated by her research into textiles of various periods and regions. Her own special trait was an intuitive insight into textile structure and a capacity to understand the techniques and aesthetics in the broad context of a society.

She specialized in lace, primarily from the 16th century onwards, and she collaborated with museums and collections (Retournac, Saint Gallen, Benaki) helping with their conservation, study and display. When she published her work it was always in a holistic way, for example, in the publication of an exceptional tablecloth from the Louvre Museum, she combined technical details with the analysis of well-known Renaissance themes ("Une nappe du Louvre en depot au Musee de la Mode et du Textile", *Actes du colloque Dentelles* 2001, Le Puy en Velay 2004).

In the field of medieval and Byzantine textiles her special interest was the embroideries. In collaboration with the Musee des Tissus et Arts decoratifs de Lyon and the Byzantine Museum in Athens she helped to elucidate the complicated techniques and design, the colours, and the impact of these techniques on the composition of religious themes.

In the field of archaeological textiles her innovative work had a profound impact. Along with her close collaborator Christophe Moulherat, she analyzed tex-

tile remains from Attica, Corfu and Salamis. Using innovating techniques both with the electron scanning microscopy and light microscopy, they identified the micromorphological characteristics of mineralized textiles, of which most Aegean examples constitute. Thus they were able to show the fine qualities of the Classical, Hellenistic and Roman textiles, the raw materials, the extensive use of wool, and the purple dyes. Moreover, Youli, through her work in museums, lectures, conference presentations and articles, contributed to make the world aware that archaeological textiles *do* exist in Greece, and that they are of exceptional quality.

In a massive undertaking, Youli and Christophe studied the many remains of textiles, strings, ropes and nets in the Late Bronze Age town at Akrotiri, Thera. Their work must be considered in the context of already published tool remains and Linear A inscriptions dealing with textiles, thus offering a general view of the textile production in this Late Bronze Age town in the Aegean. This is the first glimpse into the "real thing", *i.e.* how the real garments, those we see depicted in the wall-paintings must have looked. A very important study is currently in progress for the identification of the vegetal and animal fibres in these textiles.

Youli abandoned us in the middle of important activities leaving much work in progress. The Centre of Textile Research and Restauration in Athens (ARTEX) of which she was an important member will publish her work in the review *Arachne* and elsewhere. We believe that this is the best tribute to her memory.



Errata for ATN 49

Pages 12-13. The captions for figures 1-14 were unfortunately not correct. The right captions are:

Fig. 1.

Amphora 2342, 430 B.C.

Munich, Staatliche Antikensammlung. (*Starke Frauen* 2008, cat. 7) © Archives Staatliche Antikensammlung, Munich.

Fig. 2.

Bowl 2644, about 480 B.C.

Munich, Staatliche Antikensammlung. (*Starke Frauen* 2008, cat. 21) © Archives Staatliche Antikensammlung, Munich.

Fig. 3.

Colour reconstruction of Paris as archer from the western gable of the Aphaia-Temple, c. 490–480 B.C., by V. Brinkmann 2003 Munich, Glyptothek. (Brinkmann 2004) © Archives Glyptothek, Munich.

Fig. 4.

Simple vertical stripes are obtained by interlinking, by intertwining the colours alternately one can obtain a small zigzag pattern. (reproduced by Drinkler 2007) © Drinkler.

Fig. 5.

Double zigzag pattern as found on the Paris sculpture, (reproduced by Drinkler 2008) © Drinkler.

Fig. 6.

Colour reconstruction of so-called Persian horseman in the Acropolis Museum in Athens, about 490 B.C., by O. Primavesi, 2008, (Brinkmann *et al.* 2008) © Dieter Rehm, Munich.

Fig. 7.

Two-layered sprang with long lozenges pattern as found on the Persian horseman, (reproduced by Drinkler 2009) © Drinkler.

Fig. 8.

Detail on amphora HA 120, approx. 500 B.C.

Würzburg, Martin von Wagner Museum, (CVA Würzburg 1981)

© Martin von Wagner Museum der Universität Würzburg (photo: K. Öhrlein), Würzburg.

Fig. 9.

Horizontal stripes with uneven borders, (reproduced by Drinkler 2008) © Drinkler.

Fig. 10.

Detail on bowl Pell. 278, approx. 450 B.C., Bologna, Museo Civico, (CVA Bologna 1960) © Archives Museo Civico, Bologna.

Fig. 11.

Circled patterns (unstretched) appear to be on a plain ground, (reproduced by Drinkler 2008) © Drinkler.

Fig. 12.

Detail on pelike 2351, 440 – 435 B.C.

Munich, Staatliche Antikensammlung, (*Starke Frauen* 2008, cat. 20) © Archives Staatliche Antikensammlung, Munich.

Fig. 13.

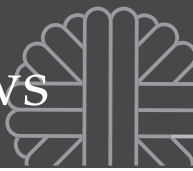
Uneven border in an one- and two-layered sprang alternately, (reproduced by Drinkler 2008) © Drinkler.

Fig. 14.

Hose worked in two-layered sprang in two colours. (reproduced by Drinkler 2009) © Drinkler.

Page 24.

The editors of the book *Clothing the House* are C. Fluck and A. De Moor.



Kirsten Toftegaard

CIETA 2009

28 September-1 October 2009, Musées
Royaux d'art et d'histoire, Bruxelles,
Belgium

The theme of the 23rd assembly of CIETA (Centre International d'Etudes des Textiles Anciens) was "Le Commerce des textiles (tissus, dentelles, tapisseries)". About 110 members from 18 countries in Europe, USA, Canada, Japan and India were present, and 34 gave lectures in English or French. During Monday and Tuesday the lectures were grouped as following: Textiles, trade, travels until the 18th century; Textiles, trade, travels the 18th-19th centuries - mostly printed textiles; Textiles, trade, travels - focus on political, philosophical and religious aspects. The topics ranged from textile trade between Milan and Genoa in the 15th century by Chiara Buss to European designed textiles produced in China and exported to Japan in the late 16th through early 17th century by Masako Yoshida from Japan and many more interesting subjects such as The Belgian State and the worldwide promotion of tapestries by Elsje Janssen - just to mention a few. The third day of the conference was dedicated to other topics. Four lectures dealt with archaeological textiles from the Eastern Mediterranean, among others Hero Granger-Taylor talked about the textiles from Masada, Israel. Others dealt with textile techniques and case studies, amongst whom Joy Boutrup gave new insight into the application of loop braiding (see article this issue).

After the daily lectures, museum collections, historical sights and ateliers generously opened their doors to the participants of the conference. On Monday, the City Hall, Grand-Place, hosted a reception for all members of CIETA. On Tuesday the official dinner was held at Musées Royaux d'art et d'histoire. Thursday contained three optional excursions. One tour went to Malines to visit the De Wit Manufacture Royale de Tapisseries, Lier to study vestments at The Sant Gommaire Church and a visit to Antwerp to the Katoen Natie Art Collection with its impressive collection of Egyptian Coptic textiles -

tunics, bonnets and fragments - and Persian Textiles from the Silk Road.

Another tour visited the towns of Liege and Tongeren. In Liege, the participants visited the fully renovated Cathedral cloister with the Cathedral treasure and the newly opened museum The Grand Curtius. In Tongeren, relics and relic pouches of The Notre Dame de Tongeren Basilica were presented to the participants. These textiles date back to the 10th century.

The third tour went to Tournai and Bruges to study tapestries and laces. In Tournai, the Musée de la tapisserie et Arts du Tissu and The Notre Dame Cathedral were visited especially for the purpose to study tapestries, and in Bruges, the Brugge Museum-Gruuthuse and the Hospital of Notre-Dame de la Poterie were enjoyed for their collections of laces and tapestries.

During the 23rd assembly in Bruxelles, the président du CIETA Pierre Arizzoli-Clémentel, Directeur général du musée et du domaine de Versailles, stepped back and the members elected as new president Birgitt Borkopp-Restle from the Institut für Kunstgeschichte der Universität Bern.

The next CIETA conference will take place in Copenhagen, Denmark, 3-6 October 2011 arranged by The Danish Museum of Art & Design together with The Danish National Research Foundation's Centre for Textile Research, University of Copenhagen. The theme of the conference will be "Cultural encounters in textiles and dress between Northern Europe and the World".



Cherine Munkholt

KOSMOS 2010

21-26 April 2010, Centre for Textile
Research, University of Copenhagen,
Denmark

The themes of the 13th Aegean conference were jewellery, adornment and textiles, including aesthetics, body adornment, colours, dyes and pigments, textile production, luxury and exotics, gender and femininity/masculinity, as well as their social, religious, ideological, economic, technological, administrative and philological connections in the Aegean Bronze Age. When the conference was due to open on the 21st April, less than 10 of the 135 registered international participants had been able to reach Copenhagen due to the Icelandic volcanic ash affecting air traffic. However the meeting between the Greek and Nordic pantheons created a synergy effect. Instead of chaos and cancellation, a new type of international conference was born.

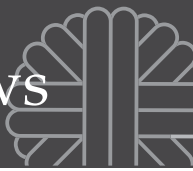
The conference organisers, Marie-Louise Nosch (CTR, Denmark) and Robert Laffineur (University of Liège, Belgium) together with conference coordinator Ingeborg Philipsen PhD (CTR, Denmark) received help from ITMEDIA (University of Copenhagen) and stranded participants of the online forum *Aegean-Net* to run a highly successful online conference. With the formal permission of the authors, their conference papers were read aloud by a team of volunteers comprising the few visiting participants and CTR staff and student helpers. Quite a few participants sent a recorded narration of their papers. In all other cases, the team of indefatigable readers had to read through and rehearse in advance before reading the papers aloud. Here an important factor was the length of the papers, which had to be no more than 20 minutes each when read out aloud. Those papers that exceeded this had to be shortened. Throughout the web presentations, the cameras alternated between the readers and the power point presentations sent by the authors.

To ensure maximum participation worldwide, the time of the online conference was shifted from morning to afternoon and evening (Copenhagen

time) on the first day. An audience from 28 countries worldwide actively participated through the online conference chat room. The stranded authors too were able to discuss their papers, answer questions and even provide links to other material in response to questions.

Over 1700 visitors from around the world, both researchers and students, followed the live stream and used the online chat possibilities to listen and participate in the live discussions over the 4 days. Although most participants would surely have missed the physical proximity of their colleagues, the virtual conference enabled a great many who may not have been able to afford the time or financial expense to travel to Copenhagen to participate. Only time will tell how many students it inspired to research into the fields covered by KOSMOS. The proceedings of the conference will be published in *Aegaeum. Annales d'archéologie égéenne de l'Université de Liège*. For further information and a day by day account of the process of turning a planned traditional conference in one city into an unanticipated worldwide online event please see:

www.ctr.hum.ku.dk/conference_and_seminars



Joanne Cutler

7ICAANE 2010

16 April 2010, Institute of Archaeology,
University College London, UK

During the 7ICAANE conference (International Congress on the Archaeology of the Ancient Near East) a one-day workshop entitled 'Textile Production in the Ancient Near East: Neolithic Age – Bronze Age – Iron Age' was organised by Eva Andersson Strand and Marie-Louise Nosch of the Danish National Research Council's Centre for Textile Research, Copenhagen; its aim was to discuss the background for the introduction of textiles in the region and the subsequent development of tools, fibres and techniques, as well as to consider the social and symbolic aspects of dress in the societies of the Ancient Near East. The fifteen papers presented approached the theme from a number of different perspectives, including textile tool studies, experimental testing, iconographic studies and context studies.

In the morning session, Tineke Rooijackers (Leiden University Institute for Religious Studies, The Netherlands) discussed the appearance of spindle whorls in the Late Neolithic period at Tell Sabi Abyad and throughout the Near East, suggesting that their introduction was linked to the first spinning of animal fibres. Peter Fischer (Gothenburg University, Sweden and Austrian Academy of Sciences, Austria) presented the evidence for textile production at Abu al-Kharaz in Jordan and considered the differences in the textile tools from different periods at the site, from the Early Bronze Age through to the Iron Age. Janet Levy and Isaac Gilead (Ben Gurion University of the Negev, Israel) then examined the adoption of textile economy in the southern Levant during the Chalcolithic period. Eva Andersson Strand (The Danish National Research Foundation's Centre for Textile Research, University of Copenhagen, Denmark) followed this with a discussion of an Old Mesopotamian text containing a description of how a 'guza' textile was made, considering how this could be interpreted with regard to both the techniques used and the type of fabric produced. Riccardo Besana (Dipartimento di Storia e Tutela

dei Beni Culturali, Università degli Studi di Udine, Italy) discussed the corpus of loom weights from Tell Mishrifeh (Qatna), while Agnete Wisti Lassen (Department of Cross-Cultural and Regional Studies, University of Copenhagen, Denmark) considered the function of crescent shaped loom weights found at Anatolian sites in Bronze Age contexts. Laura Mazow (Department of Anthropology, East Carolina University, USA) ended the morning with an examination of the evidence for fulling in the Late Bronze Age Eastern Mediterranean.

Guilia Baccelli (University of Tübingen, Germany) started the afternoon session with a paper exploring the symbolic meaning of textiles in Syria in the second millennium BC, focusing on the evidence from the Royal Tomb of Qatna. Luca Peyronel and Frances Pinnock (Università di Roma, Italy) then discussed court attire in Early Syrian Ebla, drawing on the technological, textual and iconographic evidence. Assaf Yassar-Landau (Leon Recanati Institute for Maritime Studies, Haifa University, Israel), Eric Cline (Department of Classics and Semitic, George Washington University, USA) and Nurith Goshen (University of Pennsylvania, USA) followed this with a discussion of the evidence for textile production in palatial and non-palatial contexts at Tel Kabri in Israel. Marie-Louise Nosch's paper presented the results of the analyses carried out on a fragment of textile recovered from a Late-Final PPNB layer (8200 BP) from Basta in Jordan. Irene Good (Peabody Museum of Archaeology and Ethnology, Harvard University, USA) then considered changes in fibre use and spinning technologies on the Iranian Plateau c. 4500-2500 BCE, and Caroline Sauvage (ISAW, New York University, USA) examined the evidence for spinning at Ugarit. Jeanette Boertien (University of Groningen, The Netherlands) discussed the loom weights from Tell Deir 'Alla in the Jordan Valley and their links to material from Syria. Finally, Joanna Smith (Princeton University, USA) explored the evidence for tapestries



in the Late Bronze Age and early Iron Age, focusing on Cyprus. The wide range of topics and perspectives presented

at the workshop initiated a great deal of stimulating and lively discussion, and a volume of the papers will be published in 2011.

Lena Larsson Lovén

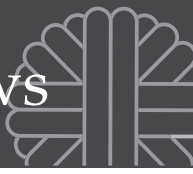
TRAC 2010

25-28 March 2010, University of Oxford,
UK

In March this year the 20th Theoretical Roman Archaeology Conference (TRAC) took place in Oxford, hosted by the University of Oxford and arranged in collaboration with the 9th Roman Archaeology Conference (RAC). The conference started with an opening lecture on the first evening, 25th of March, and was followed by more than 20 sessions during the next two and half days (26-28 March). The sessions covered many different aspects of Roman archaeology from all over the Roman Empire for instance Rome and the Sea, various aspects of Roman religion, Roman imperialism, and recent archaeological work on villas at the bay of Naples. Many interesting papers were presented – for the TRAC conference with a special emphasis on theoretical approaches.

Of particular interest to the readers of Archaeological Textile Newsletter was the session on “Cloth, clothes and gender in Roman art”. The session was organised by Kelly Olson from the University of Western Ontario in Canada. Kelly Olson has published several works on the clothing of Roman women and most recently a book on *Dress and the Roman woman. Self-representation and society* (London/New York 2008) and as contributor to *Roman dress and the fabric of Roman culture* (eds. J. Edmondson and A. Keith, Toronto 2008). At the TRAC conference

she gave a paper on tunics as a sign of status and masculinity in Roman antiquity. Two of the papers in this session were concerned with representations on funerary monuments from the western and eastern parts of the Roman Empire. Lena Larsson Lovén (University of Gothenburg, Sweden) discussed how men and women are represented in relation to textile production on funerary monuments from Roman Italy and Gaul. Erika Cappelletto (University of Heidelberg, Germany) discussed spinning implements as represented on funerary stelae from Asia Minor. In the eastern and western Roman provinces spinning was clearly related to women and it was used as an iconographic symbol of female work as well as femininity. Two other papers were concerned with clothing in the Roman provinces of the Danube provinces. Ursula Rothe (University of Edinburgh, UK) talked about native woman's dress in the Danube provinces as a possible key to the understanding of the cultural identity of region. Karina Grömer and Eva Hölbling-Steigberger (University of Vienna, Austria) presented textile finds from cemeteries in the Roman province of Noricum dated to the 4th and 5th centuries AD. The textiles were the basis of a discussion on clothing and adornment as expression of identity, community and social structures in Noricum. The TRAC 2011 conference will be held in Newcastle, UK.



Susanna Harris

TAG 2009, “Wrapping Objects”

19 December 2009, Durham University,
UK

The Theoretical Archaeology Group, abbreviated to TAG, was set up in 1979 to encourage debate and discussion on theoretical issues in archaeology. It is now one of the major annual archaeology conferences in the UK. During the conference the session “Wrapping Objects” explored textiles as one of many materials used to cover and contain objects and to develop the concept wrapping in archaeology.

Seven research presented paper. Susanna Harris explored wrapping materials and introduced concepts of wrapping from social anthropology. This ranged from gift wrapping as formal presentation and concealment to layers of packaging materials as a means to enhance sensory experience, add information and value. Three papers were based in the Americas. Peter Whitridge (Memorial University of Newfoundland) presented his research on dressing wooden dolls as a feature of Inuit play and learning. Wendy Whitby (University of Central Lancashire) looked at how the Chumash used basketry, pottery and grasses to conceal ceremonial objects at cave sites. Kirsten Halliday (The British Museum/University College London) took a technological approach, showing wrapping as a style of production on the Peruvian North Coast. Here the covering and layering principals of textile technology were translated into ceramics and metals. Researching Bronze Age Mesopotamia, Agnès Garcia-Ventura (Universitat Pompeu Fabra, Barcelona) described the special role of wrapping in foundation deposits, with textile and clay used to envelope cuneiform tablets.

Christina Riggs (University of East Anglia) looked at the ancient Egypt practice of wrapping mummies and shrine statues in linen textiles, and the associated ideas of the ritual cleanliness of linen and the role of women in production. From Copper Age Europe, Lesley MacFayden (FLUP) presented buildings and

clay construction materials as a means of containment. Margarita Gleba looked at the way textile wrapping was simultaneously used to increase and decrease the visibility of objects in Iron Age burials in Italy – from dressing cremation urns to ritually killing mirrors and other metal items.

A number of themes came up in the discussion. Wrapping often seems to be used to add value, change the nature of objects or separate them from unwrapped versions. There is also the question of who wraps the objects and how this relates to production. In terms of materials, wrapping may consist of multiple layers using combinations of soft, flexible materials such as basketry and textiles in combination with hard, inflexible materials such as wooden boxes followed by further containment inside caves or buildings. A recurrent theme was the importance of unwrapping. In this archaeologists of earlier times may have been a little too keen to unwrap their treasures, often cleaning off or discarding the ancient wrapping materials.

The wrapping theme has barely been explored by archaeologists and the TAG session was an excellent arena to encourage initial discussion on the applicability of this concept in archaeology. Judging by the level of discussion and the range of speakers, the concept and practice of wrapping offers potential for textile specialists to explore their material in new ways. In May 2010 this session was followed up by “Wrapping and Unwrapping the Body – Archaeological and Anthropological Perspectives” at the Institute of Archaeology, UCL, UK. (see next ATN issue). Selected papers from these two sessions will be published.



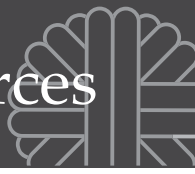
Mary Harlow

Dressing the Dead. Clothing, textiles and bodily adornment from funerary contexts in the Graeco-Roman World

27 May 2010, University of Sheffield, UK

This stimulating day conference was organised by Maureen Carroll and Jane Rempel (University of Sheffield, UK) and attended by speakers and delegates from Europe, Israel, the US and Canada. Thirteen papers were given, covering a range of subjects from protocols for conserving textiles on site, conservation and preservation techniques, interpreting finds from Egypt, Palmyra, Rome, Tripolitania and reading a range of visual and literary references. The conference began with a keynote lecture from Barbara Borg (University of Exeter) discussing the ostentatious and luxurious depiction of clothes and jewellery on mummy portraits from Antinoopolis. Borg argued against the current orthodoxy, based on the ornate nature of the clothing and accessories, that these portraits come from the fourth and fifth centuries A.D. Rather, she backdates this tendency towards ostentatious display to the third century, arguing that the contact with Palmyra might have triggered its development at Antinoopolis. John Peter Wild (University of Manchester) raised the issue of how to approach the precise role of textiles in funerary practices across the Roman empire. Presenting a range of examples from both eastern and western provinces, from contexts which provide relatively extensive textile remains (Egypt, Syria) to those which leave only scraps or impressions of cloth or tantalisingly tiny fragments of gold thread – Wild stressed the need for multidisciplinary approaches among archaeologists and conservators. Such approaches, engaged across the varied cultural contexts of the Roman empire, will also raise awareness of the presence (even if it is literally an impression) of textiles in funerary contexts.

Mark Van Strydonck (Royal Institute for Cultural Heritage, Brussels) presented the recent re-dating of the mummy Euphemia and textiles associated with her burial ensemble. Radiocarbon and stable isotope analyses date Euphemia herself to 6th century A.D. but some of the textiles in the panoply turned out to be older than that, while others up to one hundred and fifty years younger. Sewing thread from the nineteenth century was also discovered in the borrolet. Study of acquisitions reports suggest that these varied dates might be the consequences of two sets of finds being misleadingly put together when the museum exhibit was first arranged in the 1930s. Annemarie Stauffer (University of Applied Sciences, Cologne) looked at dress as a social marker in Palmyrene tombs from 1st – 3rd centuries A.D. Funerary representations in the tombs come in a variety of modes: portraits, loculi reliefs, sarcophagi and paintings. Since most figures are individually identified by inscriptions it is possible to track family descent. Various elements of Greco-Roman and local dress styles have been identified and from this it is clear that dress in funerary contexts is not dependent on the official dress found in public sculpture in Palmyra. The different conventions found in the tombs allow for identification of different ranks within the clan group. The Fag el-Gamous necropolis, on the eastern edge of the Fayum, was the focus of two papers. This site has been excavated by the Brigham Young University, Utah, for nearly three decades and includes two Greco-Roman cemeteries, Middle Kingdom tombs and a small Old Kingdom pyramid of the 4th



Dynasty; so far some 1700 burials have been uncovered. David Whitchurch discussed the cultural symbolism of some of the artefacts found, focussing on an intricately woven pomegranate textile found in 1987, dating to the 4-5th centuries A.D. Kristin South has studied the minor textiles from Fag el-Gamous, particularly the ribbons and face bundles (see *ATN* 48). Given the eastward facing placement of the bodies bearing such textiles, and comparison with similar finds at other sites, South has identified these as Christian burials. The preservation and conservation of textiles on site and in museum collections was the subject of Emilia Cortes' paper. She presented the protocols developed for the conservation of textiles by the Metropolitan Museum of Art at their excavation at Dahshur, Egypt. Emphasis was given to the importance of preliminary work to define context and to minimal intervention on site to allow for long term research. Such an approach will not only allow for more holistic understanding of the mummy, associated textiles and iconography, but also help recover contexts for those less well recorded in the past. Annette Paetz gen. Schieck and Sylvia Mitschke (Riess-Englehorn-Museen) presented the results of very recent research (October 2009) undertaken in catacombs in Rome. They were granted access to two late Roman *in situ* burials in Sant' Agnese and a rich assemblage of textiles from a sarcophagus burial of late antique/early medieval date from San Sebastiano. From a cinerary urn from Via Ostiense a fringed linen textile was examined. This was perhaps used as a shroud as examination showed signs of preparation of the body for the funeral. It appears the body was embalmed, wrapped in the linen, than unwrapped for cremation. The linen was then used to hold the ashes. The fully published results will demonstrate the positive use of variety of techniques to extrapolate information from both large textiles like the linen shroud, but also very small and degraded scraps, and mere impressions on plaster.

Jane Rempel (Sheffield) presented an examination of the relationship to and importance of the cult of Demeter in female graves in the Bosporan kingdom from the 4th century B.C. to the Hellenistic period. Using both tomb paintings and associated finds, particularly jewellery, Rempel argued that this imagery was key to female identity in the area. Lucy Audley-Miller (Oxford) re-assessed the iconography of dress on the tomb sculpture of Ghirza, in the Tripolitanian pre-desert. The paper offered a nuanced view of the way Roman and local dress styles were manipulated and negotiated to express local constructions of status, gender and social role.

The evidence of the child clothed and sometimes

adorned for death was the subject of two papers. Maureen Carroll (Sheffield) argued that the archaeological, visual and textile evidence, from Italy and the European provinces, for the burial of very young children, shows concern for the age and status of the child. Such material throws light on attitudes towards children, especially in the case of the burial of the very young infant. Taking slightly older children, Mary Harlow (Birmingham) argued that the jewellery and other accessories deposited with girls and young women might have a direct relationship to the stage these individuals had reached in the life course – ready to leave childhood behind, but not yet fully transposed into full womanhood.

Nahum Ben Yehuda (Bar Ilan University) presented the Jewish attitudes to the clothing of the dead and mourners in Talmudic law. Shrouds were subject to regulation in terms of fabric, colour and relative lavishness. Regulations also extended to mourners where certain behaviour was controlled (no injuring of the face or tonsuring, for example) and dress was subject to prescription both at the funeral, during mourning and visits to the cemetery.

The conference was a prelude to the 5th General Meeting of the European Dress ID project: Clothing and Identities. New Perspectives on Textiles in the Roman Empire.

Dissertations

Maj Ringgård, The National Museum of Denmark and the University of Copenhagen, Denmark has been awarded a PhD for her thesis: *"To par strixstrømper oc en nattrøie naccarat" Filtede og strikkede tekstiler fra omkring år 1700, fundet i Københavnske byudgravninger - og sammenhænge mellem tekstilers farve og bevaring.*

New publications

Contrôle Économique et Administration à l'Époque des Palais Mycéniens (fin du IIe millénaire av. J.-C.),
by **Françoise Rougemont (BEFAR Bibliothèque des Écoles Françaises d'Athènes et de Rome, 2009) in French**

Ce livre étudie le contrôle économique et l'administration en Grèce à l'époque des palais mycéniens (textes datés entre ca 1450 et 1200 av. J.-C.). Il s'appuie principalement sur les tablettes inscrites découvertes dans ces palais et propose une synthèse sur les principaux aspects de la question : les scribes (qui tenaient la comptabilité) et l'organisation des archives, la géographie administrative, la fiscalité, la gestion du personnel, le contrôle des terres, les relations entre l'administration des palais et les sanctuaires, le degré d'implication des palais dans les échanges, ainsi que le recours aux fonctionnaires palatiaux ou à des notables locaux dans les procédures de contrôle économique. Chaque fois que cela a été possible, les données des tablettes ont été comparées soit avec les données de l'archéologie, soit avec certaines archives proche-orientales (principalement des textes de l'époque d'Ur III, ainsi que des textes de Mari, de Nuzi et d'Ougarit). La deuxième partie est consacrée aux problèmes de l'administration de l'élevage des ovins et à la question des « collecteurs ».

ISBN 978-2-86958-215-6
Price EUR 90.00

***Roman Military Dress* by Graham Sumner (History Press, 2009)**

The Roman military was one of the most powerful forces of the ancient world. But what did its soldiers wear? This book presents an accurate and illuminating study of a popular yet understudied subject. Spanning 1000 years from the Late Republic to the Byzantine Empire, including every item from helmet linings to leg wrappings, Graham Sumner presents an original and detailed interpretation of wide-ranging evidence, drawing on recent textile finds, ancient artwork and original literary sources from across the Roman Empire.

With the help of informative illustrations, we understand how the garments were worn and by which soldiers, both on and off the battlefield. Materials used, methods of manufacture and dying, and the second-hand trade are also discussed. Including stunning colour images and reconstructions, this book

will be of great value to students and re-enactors of the Romans, as well as costume and fashion students.
ISBN: 9780752445762

Price: GB £17.99

<http://www.thehistorypress.co.uk/products/Roman-Military-Dress.aspx>

The Medieval Broadcloth: Changing Trends in Fashions, Manufacturing and Consumption, edited by **Kathrine Vestergård Pedersen and Marie-Louise B. Nosch, Ancient Textiles Series 6 (Oxbow Books, 2009)**

The eight papers presented here provide a useful introduction to medieval broadcloth, and an up-to-date synthesis of current research. The word *broadcloth* is nowadays used as an overall term for the woven textiles mass-produced and exported all over Europe. It was first produced in Flanders as a luxurious cloth from the 11th century and throughout the medieval period. Broadcloth is the English term, *Laken* in Flemish, *Tuch* in German, *Drap* in French, *Klæde* in the Scandinavian languages and *Verka* in Finnish. As the concept of broadcloth is derived from the written sources it cannot directly be identified in the archaeological textiles and therefore the topic of medieval broadcloth is very suitable as an interdisciplinary theme.

The first chapter (John Munro) presents an introduction to the subject and takes the reader through the manufacturing and economic importance of the medieval broadcloth as a luxury item. Chapter two (Carsten Jahnke) describes trade in the Baltic Sea area, detailing production standards, shipping and prices. Chapters three, four and five (Heini Kirjavainen, Riina Rammo and Jerzy Maik) deal with archaeological textiles excavated in Estonia, Finland and Poland. Chapters six and seven (Camilla Luise Dahl and Kathrine Vestergård Pedersen) concern the problems of combining the terminology from the written sources with archaeological textiles. The last chapter reports on an ongoing reconstruction project; at the open air museum in Eindhoven, Holland, Anton Reurink has tried to recreate a medieval broadcloth based on written and historical sources. During the last few years he has reconstructed the tool for preparing and spinning wool, and a group of spinners has produced a yarn of the right quality. He subsequently wove approximately 20 metres of cloth and conducted the first experiment with foot-fulling.



ISBN-13: 978-1-84217-381-7

Price GB £25.00

<http://www.oxbowbooks.com/bookinfo.cfm/ID/86932>

From Minos to Midas: Ancient Cloth Production in the Aegean and in Anatolia

by **Brendan Burke**, **Ancient Textiles Series 7 (Oxbow Books, 2010)**

Textile production was of greater value and importance to people in the past than any other social craft activity: everyone depended on cloth. As with other craft goods, such as pottery, metal objects, or ivory carving, the large-scale production and exchange of textiles required specialization and some degree of centralization. This book takes an explicitly economic approach to textile production, focusing on regional centers, most often referred to as palaces, to understand the means by which states in the Aegean and Anatolia financed themselves through cloth industries. From this we can look for evidence of social stratification, inter-regional exchange, and organized bureaucracies. Spanning multiple millennia and various sources of evidence, Burke illustrates the complex nature of cloth production, exchange, and consumption and what this tells us about individual societies and prehistoric economies, as well as how developments in cloth industries reflect larger aspects of social organization.

ISBN-13: 978-1-84217-406-7

Price GB £30.00

<http://www.oxbowbooks.com/bookinfo.cfm/ID/88281>

Textile Terminologies in the Ancient Near East and the Mediterranean Area from the 3rd to the 1st Millennium BC, edited by **C. Michel and M.L. Nosch**, **Ancient Textile Series (Oxbow Books, 2010)**

ISBN-13: 978-1-84217-975-8

Price GB £35.00

<http://www.oxbowbooks.com/bookinfo.cfm/ID/89224>

Sea of Silk: A Textile Geography of Women's Work in Medieval French Literature

by **E. Jane Burns** (UPenn Press, 2009)

The story of silk is an old and familiar one, a tale involving mercantile travel and commercial exchange along the broad land mass that connects ancient China to the west and extending eventually to sites on the eastern Mediterranean and along sea routes to India. But if we shift our focus from economic histories that chart the exchange of silk along Asian and Mediterranean trade routes to medieval literary depictions of silk, a strikingly different picture comes into view. In Old French literary texts from the twelfth and thirteenth centuries, emphasis falls on

production rather than trade and on female protagonists who make, decorate, and handle silk.

Sea of Silk maps a textile geography of silk work done by these fictional women. Situated in northern France and across the medieval Mediterranean, from Saint-Denis to Constantinople, from North Africa to Muslim Spain, and even from the fantasy realm of Arthurian romance to the historical silkworks of the Norman kings in Palermo, these medieval heroines provide important glimpses of distant economic and cultural geographies. E. Jane Burns argues, in brief, that literary portraits of medieval heroines who produce and decorate silk cloth or otherwise manipulate items of silk outline a metaphorical geography that includes France as an important cultural player in the silk economics of the Mediterranean.

Within this literary sea of silk, female protagonists who "work" silk in a variety of ways often deploy it successfully as a social and cultural currency that enables them to traverse religious and political barriers while also crossing lines of gender and class.

ISBN-13: 978-0-8122-4154-9

Price US \$59.95 / GB £39.00

<http://www.upenn.edu/pennpress/book/14597.html>

I reperti tessili, le fusaiole e i pesi da telaio dalla palafitta di Molino di Ledro by **Marta Bazzanella and Anna Mayr** (Trento, 2009) in Italian

The pile-dwelling (*palafitta*) site of Molina di Ledro with its 297 finds relevant to textile archaeology (83 textile fragments, 2 balls of yarn, 195 yarn fragments, 12 cord remains and 2 worked raw fibre finds) is one of few Italian sites with such a consistent corpus of material. The volume is a detailed study of these finds in relation to the textile production at Ledro and in comparison to other contemporary sites. Besides the numerous textile and yarn fragments, the site yielded two almost complete items in linen: a decorated band and a belt with a loop. Regrettably, the majority of the objects lack precise stratigraphic and special distribution information. The volume also includes a detailed catalogue of textile tools found on the site. Together, the textiles and the tools provide a glimpse of the textile production in Bronze Age Italy.

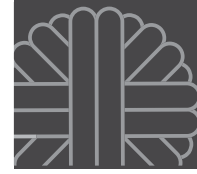
Price EUR 25.00

ISBN: 9788877022257

<http://www.edigiglio.it/scheda.asp?ctg=4&keyw=816>

Textile History and the Military, Textile History Volume 41, Number 1, Supplement, May 2010.

Textiles are key components of much military equipment, and the organization of the armed forces as well as their operations are unthinkable without them. Textiles are used for uniforms, tents, sails,



saddle pouches, caparisons, parachutes, early model aeroplanes, camouflage nets, dinghies, body armour and more besides. This volume presents and discusses the role of the textile culture within the military organization: the use, the distribution, the production, provision and consumption of raw materials, and the organization of the production processes. Moreover, aspects such as symbols and badges, the development of technologies, political and national agendas, and the interaction between military and the civil society will be addressed. Thus, in this volume specialists from various fields of study have joined forces to provide a truly interdisciplinary collection. These 'happy few' comprise historians, archaeologists, museum curators and conservators, social

scientists and textile researchers as well as military experts. The volume is the result of an international and interdisciplinary conference held 21–22 May 2009 at the University of Copenhagen, Denmark (see ATN 46). The conference were organized by Dr Kjeld Hald Galster, the Royal Danish Defence College, and Professor Marie-Louise Nosch, Director of the Danish National Research Foundation's Centre for Textile Research.

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<http://www.ingentaconnect.com/content/maney>

Ulla Mannering

CTR 2010-2015

The Danish National Research Foundation's Centre for Textile Research (CTR), University of Copenhagen, has received a five year prolongation (2010-2015) and is happy to continue textile research with new and exciting projects. CTR looks forward to five more intensive and challenging years in collaboration with Danish and international research colleagues. The overarching theme to be explored in the period between 2010 and 2015 is the connection between textile, environment and society. This question will be explored via two research programs with subprojects and affiliated PhD projects.

TEXTILE ECONOMIES IN THE MEDITERRANEAN AREA (TEMA) is based on a collaboration between CTR, international research centres, universities and museums. The program is headed by CTR director Marie-Louise Nosch and is hosted by the SAXO Institute, University of Copenhagen. The program investigates Mediterranean textile cultures in the Bronze Age and Iron Age with particular focus on the production and management of textile resources in agriculture and trade, and the interaction between environment and textile production. Further topics are the development of flax fibres into a resource for both food and textile production and its impact on agriculture and agrarian praxis; the terminology of textile in Greek; the economic and cultural history of textile production in non-domestic

contexts is investigated, and an international team surveys the economy of wool, both the Bronze Age palace cultures and in the classical Greek and Roman world; finally the textile production in sanctuaries will receive particular attention. The program is solidly placed on the research results obtained at CTR 2005-2010 on textile tools, textile technology and textile terminology, but takes textile research into a new domain: the placement of textile production within economy and within society.

An important subproject within this program will combine traditional craft knowledge of textile techniques and tools with experimental textile archaeology, in a dialogue with ethnographic investigations. The aim is to render textile craft visible in areas and periods where the archaeological evidence is scarce or missing, thereby illuminating the lost or invisible aspects and processes of textile production. Jordan, Turkey, and Syria will be the areas of investigation because of their varied craft traditions. This subproject is directed by Eva Andersson Strand.

TEXTILE CRAFTS AND CULTURES (TECC) is a joint national endeavour of CTR, the Heritage Agency of Denmark and the National Museum of Denmark. Textile research is a national focus area in Danish archaeology between 2010 and 2015.

The program is headed by Ulla Mannering in collaboration with Eva Andersson Strand and is hosted by



the National Museum of Denmark. The programme investigates the textile and skin production focusing on the environment and long-term strategies, from breeding sheep and cultivating textile crops to trade and exchange in textiles and their final deposition in for instance graves. This is accomplished through the systematic registration and analyses of raw materials of vegetal and animal origin, textile and skin objects and costumes, tools and

production installations. The focus will primarily be placed on Bronze and Early Iron Ages contexts. The results of the analyses of the textiles and costumes from the Early Iron Age investigated in CTR's research 2005-2010 and the continued focus on pre-historic costume will provide an important comparison to this part of the research program. More information can be found on CTR's homepage: <http://ctr.hum.ku.dk/>

Martin Shannon

Textile Conservation Centre at the University of Glasgow

Preserving the fabric of the nation's treasures for future generations, a new textile conservation centre is to be established at the University of Glasgow. The Textile Conservation Centre Foundation (TCCF) and the University of Glasgow have agreed to found the new teaching and research facility in the University's Robertson Building.

The new centre for Textile Conservation, History and Technical Art History will focus on multidisciplinary object-based teaching and research that encompasses conservation and the physical sciences as well as art history, dress and textile history. It will be the first time that conservation training has been undertaken in Scotland and, combined with the University's recent developments in technical art history, the new centre will have national and international impact. The new Centre will inherit existing library intellectual property and analytical equipment from the TCCF, so that staff and future students will be able to draw on the key physical and intellectual assets built

up over more than 30 years. Students will also have the opportunity to work with some of the best textile collections in the world held by Glasgow Museums, the National Museums of Scotland and the University's own Hunterian Museum and Art Gallery. New academic posts will be created and the Centre will work closely with the Foundation to establish a global research network in textile conservation, textile and dress history and technical art history. The first student intake is planned for September 2010 offering a 2-year Masters in *Textile Conservation* and a 1-year Masters in *Dress and Textile History* as well as opportunities for doctoral research. Course details can be obtained by contacting Ailsa Boyd at the University of Glasgow at: A.Boyd@arthist.arts.gla.ac.uk or t.mccabe@arthist.arts.gla.ac.uk



Lice hang ancient date on first clothes

A genetic analysis of head and body lice suggests that people may have begun making and wearing clothing as early as 190,000 years ago.

For once lice are nice, at least for scientists investigating the origins of garments. Using DNA to trace the evolutionary split between head and body lice, researchers conclude that body lice first came on the scene approximately 190,000 years ago. And that shift, the scientists propose, followed soon after people first began wearing clothing.

The new estimate, presented April 16 at the American Association of Physical Anthropologists annual meeting, sheds light on a poorly understood cultural development that allowed people to settle in northern, cold regions, said Andrew Kitchen of Pennsylvania State University in University Park. Armed with little direct evidence, scientists had previously estimated that clothing originated anywhere from around 1 million to 40,000 years ago.

An earlier analysis of mitochondrial DNA from the two modern types of lice indicated that body lice evolved from head lice only about 70,000 years ago. Because body lice thrive in the folds of clothing, they likely appeared not long after clothes were invented, many scientists believe.

Though well suited to gauging the timing of evolutionary events, mitochondrial DNA is a relatively small part of the genome. Kitchen's team examined both mitochondrial and nuclear DNA samples from head and body lice, yielding the much older, and presumably more accurate, estimate of when body lice first evolved.

It makes sense that people, or perhaps Neanderthals inhabiting cold parts of Europe, started making clothes around 190,000 years ago, Kitchen explained, since both species had already lost most body hair and knew how to make stone tools for scraping animal hides. *Homo sapiens* originated approximately 200,000 years ago.

The researchers calculated relatively fast mutation rates for both forms of lice, so the new age estimate for the divergence of body lice from head lice is a conservative one. It's possible for body lice to have evolved from head lice in only a few generations, according to laboratory studies. No evidence indicates that head lice can evolve from body lice.

More information in Science News May 8th, 2010; Vol.177 #10 (p. 15), <http://www.sciencenews.org>

Sabine Schrenk, Frank Albert, Anne-Sophie Lüttge

On-line database for 14C-dated textiles

A few months ago we announced the upcoming on-line database "textile-dates" for 14C-dated textiles from early times until the end of 1st millennium AD.

We are pleased to inform you that the database is on-line and ready to use since several months.

The internet address is:

<http://www.textile-dates.info>

The database is pursued by the Dept. of Christian Archaeology of Bonn University (Sabine Schrenk

[responsible], Anne-Sophie Lüttge, Frank Albert) in collaboration with the KIK IRPA Brussels (Mark van Strydonk).

Because the value – *i.e.* possible application – of this database grows with the number of entries please add to it if you have any radiocarbon dates from textiles!

Please email to: 14ctextiles@uni-bonn.de



Oldest leather shoe discovered



In 2008, a well preserved and complete shoe was recovered at the base of a Chalcolithic pit in the cave of Areni-1 in the Vayots Dzor province of Armenia, which borders on Turkey and Iran. It is made of a single piece of leather and was shaped to fit the wearer's foot. The shoe contained grass, although the archaeologists are uncertain as to whether this was to keep the foot warm or to maintain the shape of the footwear. Likewise it is uncertain whether it was worn by a man or a woman. The shoe is relatively small, corresponding to a European size 37. Three leather samples provides a date range of 3627–3377 Cal BC (95.4% confidence interval) and the calibrated range for the straw is contemporaneous (3627–3377 Cal BC). The archaeologists put the shoe's remarkable preservation down to the stable, cool and

dry conditions in the cave and the fact that the floor of the cave was covered by a thick layer of sheep dung. This layer of excrement acted as a solid seal, preserving it over the millennia.

"We thought initially that the shoe and other objects were about 600-700 years old because they were in such good condition," said Ron Pinhasi from University College Cork in Ireland. "It was only when the material was dated by the two radiocarbon laboratories in Oxford and in California that we realised that the shoe was older by a few hundred years than the shoes worn by Oetzi the Iceman."

Other well preserved objects were also found in the cave, including large containers, many of which held wheat and barley, apricots and other edible plants. Other 4th millennium discoveries of shoes (Italian and Swiss Alps), and sandals (Southern Israel) indicate that more than one type of footwear existed during the 4th millennium BC, and that we should expect to discover more regional variations in the manufacturing and style of shoes where preservation conditions permit.

Read the full article on "First Direct Evidence of Chalcolithic Footwear from the Near Eastern Highlands" (2010) by R. Pinhasi, B. Gasparian, G. Areshian, D. Zardaryan, A. Smith, G. Bar-Oz and T. Higham in PLOS ONE, 3 June 2010, Volume 5, Issue 6, e10984 (www.plosone.org)

Conference announcements

Textile production workshop 2010

23-25 August 2010

Lejre, Denmark

The workshop will give practical introductions into different aspects of both textile production based on knowledge from the Roman world and also from Roman Iron Age Scandinavia. This will be hands-on experience archaeology, which will give important insights into ancient textile production and its complexity. Furthermore, the obtained knowledge can serve as inspiration for questions to be explored via experimental archaeology. The workshop addresses researchers interested in textile craft but with no or little practical experience. Registration is necessary, deadline 1 July.

Each participant can choose two subjects of interest to study out of four possibilities; one for each of the first two days. The subjects are 1. Fibre preparation and spinning, 2. Dyeing with plant material, 3. Weaving on upright loom and 4. Tool making. The third day is for those who want to continue with one of these projects, but without instruction. There will be room for 4 persons in each study group.

This workshop is arranged by the Danish National Research Foundation's Centre for Textile Research and the EU culture programme Clothing and Identities – New perspectives on textiles in the Roman Empire (DressID) and the Land of Legends Lejre (former Lejre Experimental Centre).



For more information please contact Ida Demant,
ida@sagnlandet.dk
http://ctr.hum.ku.dk/conferences/2010/uploads/textile_production_workshop.pdf/

Textile Forum 2010 6-12 September 2010

ArcheoParc Schnals, Italy

The European Textile Forum is organized for people working in historical textile crafts. The programme consists of three parts: Free time to work, try out things and talk about textile techniques in the mornings; the possibility to attend workshops about historical techniques in the afternoon; and a series of short paper sessions in the evening hours. The aim is to present current projects, reconstructions, technical problems or research work during those talks. Poster presentations, including a "show-and-tell" of your current project in progress, are also very welcome. The European Textile Forum will take place at ArcheoParc Schnals, South Tyrol in Italy. Up to thirty textile experts and enthusiasts will be given the opportunity to meet at the museum for one whole week. The museum is open to the public and we welcome weavers, spinners, dyers, to come so they can also sit, work and talk with both guests and participants. Information about accommodation and registration on www.textileforum.org. Questions can be addressed to info@textileforum.org.

PURPUREAE VESTES IV - Textiles y tintes del Mediterráneo

5-6 November 2010

Literary University of Valencia, Avda. Blásco Ibáñez, 28 (46010 Valencia)

Theme: "Production and Trade of Textiles and Dyes in the Roman Empire and Neighbouring Regions"

Contact: manuel.albaladejo@uv.es

International Symposium and Exhibition on Natural Dyes and Colorants (ISEND) 2011 Europe 24-30 April 2011

La Rochelle, France

Information available at <http://www.isend2011.com>

Twelfth International Conference on Oriental carpets (ICOC)

16-19 June 2011

Stockholm, Sweden

In June 2011 the Twelfth International Conference on Oriental carpets will be held in Stockholm, Sweden.

The conference, a Dealers' Fair and several exhibitions will take place at the congress hall

Stockholmsmässan, ten minutes by train from the

centre of the city. In the evenings there will be exhibitions at several museums and at the Royal Palace with well-known rugs and carpets as the world famous Marby rug, Transylvanian rugs, Polonoise, Swedish folk art textiles from the 18th century, a world famous Safavid velvet coat that belonged to Queen Christina *etc.* A pre-tour to Copenhagen June 14-15 to see the David Collection, the royal castle Rosenborg, the Museum of Applied Arts and the royal apartment at Amalienborg Palace will be organized.

After the conference there will be a post-tour to St. Petersburg to see many famous carpets and textiles from the storages of the Hermitage, Kunstkamera and the Russian Museum of Ethnography. There will be a boat tour and visits to a Palace.

The three cities that will be visited: Copenhagen, Stockholm and St. Petersburg are beautiful cities with rivers, lakes and canals, many beautiful buildings and ideal to see in the summer. Information available at <http://www.icoc-orientalrugs.org/index.shtml> or anette.granlund@bukowskis.se

XI Nordic-TAG on Multidisciplinary archaeology with session on Textile and Theory

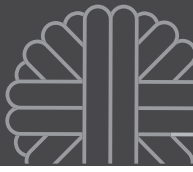
26-29 April 2011

Kalmar, Sweden

Textile research as an specialized archaeological field of research has a reputation of being non-theoretical and the results obtained are often considered difficult to use in archaeological research in general. Textile research is a field that contains researchers with many different training backgrounds and approaches, and a textile researcher can for example, be a textile conservator, textile engineer, craft person, archaeologist, historian or ethnologist. Similarly textile research has traditionally focused on the analyses of the textiles themselves: developing of methodology and new types of analyses especially in collaboration with the natural sciences.

As textile archaeologists, analysis of archaeological textiles and studies of their physical and social context from both a diachronic and a synchronic perspective are of course, together with different theoretical approaches, essential in our interpretation of the past. The challenge is not the lack of material, results or theoretical approaches, but rather how to integrate all this information into archaeological research and make it visible and useable. Further, it is important to discuss what textile research can contribute to the understanding and the interpretation of the past.

This session invites conference participants to show how theoretical approaches can be applied to textile



research results or how textile researchers have contributed to the theoretical discussion. For further information please contact: evaandersson@hum.ku.dk

Textile Calendar 2010

28-31 July: Celtic Conference in Classics, session "Addressing Dress: Clothing in the Ancient World", University of Edinburgh, UK

23-25 August: "Textile Production workshop", Land of Legends Lejre, Historical Archaeological research and communication centre, Lejre Denmark
http://ctr.hum.ku.dk/conferences/2010/uploads/textile_production_workshop.pdf/

1-5 September: EAA sessions "Threads to the past: novel methods for the investigation of archaeological textiles and other organic materials", "Golden glittering garments; Investigation, Systematic Study, Experimental Reconstruction, Handling and "Material networks in the ancient Mediterranean and beyond", the Hague, Netherlands
www.eaa2010.nl

6-12 September: Second Textile Forum, Archeoparc Val Senales, South Tyrol

8-9 September: Conference "Distribution Networks for Textiles and Dress, c. 1700-1945", Wolverhampton, UK
<http://home.wlv.ac.uk/~in6086/2010conf.html>

6-9 October: Textile Society of America Symposium "Textiles and Settlement: From Plains Space to Cyber Space", Lincoln, NE, USA
http://www.textilesociety.org/symposia_2010.htm

5-6 November: Purpureae Vestes IV "Production and Trade of Textiles and Dyes in the Roman Empire and Neighbouring Regions", Valencia, Spain

19-20 November: Early Textiles Study Group Meeting "Colour", London, UK
h.persson@vam.ac.uk

General Information

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:

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Or by electronic mail to the corresponding editor:

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