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Editorial

As predicted (*ATN* 33, 1) 2002 proved to be a bumper year for conferences and meetings devoted to the archaeology of textiles, their production and cultural context. We are pleased to be able to carry in this number of *ATN* accounts of five which took place in late 2002 and early 2003, and are extremely grateful to those correspondents who supplied us so promptly with their reports.

Some, like the 21st meeting on *Dyes in History and Archaeology* (at Avignon in October 2002) are part of a regular and lively series; others like the colloquium on *Tissus et Vêtements dans l'Antiquité Tardive* (at Lyon in January 2003) have a textile theme *pro hac vice*, in a series dedicated to a wider subject-area - in this case Late Antiquity. Others still, like the gatherings on Ibiza (November 2003), in Hangzhou (November 2003) and in Falsterbo (March 03)(report in *ATN* 37) are one-off events created by the energy of one individual or team. Ironically, these are often the least difficult to finance from national and international grant-aid.

Publication of the papers delivered is now expected: again, the largely unseen but onerous tasks of securing funding and a suitable publication outlet, not to mention the editing and sub-editing, fall to the long-suffering organisers. It is up to the textile fraternity to thank them, not just by buying the volumes themselves - they are seldom expensive - but seeing that academic and national libraries buy them, too.

The fate of the Roman-period textiles excavated by Professor Hideo Fujii and his colleagues in the cliff-face tombs near Kerbala and published so usefully since 1976 is not known. The majority were in Baghdad. One must hope for the best.

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Features

Children's Clothes from the 16th Century

In the summer of 2000, excavations were carried out at a site in the Prinsenstraat in Groningen, the Netherlands, where an apartment block with an underground car park was to be built. The excavations revealed part of the moat that had been dug between 1569 and 1576, during the Spanish occupation of the Netherlands. It was the moat of a fort constructed by order of the Duke of Alva. Never completed, the fort was demolished in 1577 and the moat was filled in, apart from a small stretch that came to lie within the rebuilt town ramparts. For some decades, this was used as a dump for the town's rubbish, and ultimately the site, now the Prinsenstraat, was again built over.

Over 2000 textile items were recovered, including many recognizable parts of garments. A remarkable amount of these were children's clothing. An explanation may be that adults' worn-out clothes would be cut up so that the good parts might be reused, for instance as patches. In the case of children's clothes this would be hardly worthwhile; they simply were too small.

All of the children's clothes are of wool. One stocking and a jacket are knitted; the other items are of woven fabric. Two bodices of frocks are of satin. Five hose were found in children's sizes; one of these is of twill, the others are in plain weave, as are all the other children's clothes. Two somewhat larger pieces were found to be the two halves of a boy's knee-length breeches. Most of the fragments appear to have belonged to doublets: fronts, with or without a lining, skirts, backs, sleeves or parts of sleeves and lots of pickadills, often still attached[1].

The knitted jacket (15T38) is 25cm long, knitted in plain knit from two-ply wool, S-twisted and Z-plied (Fig.1). It has 24 stitches and 33 rows per 10cm. The replica jacket was found to fit a modern baby fairly well, although it was somewhat tight at the top and the sleeves were rather wide. The jacket had been knitted on two needles, starting from the top, with a neckline border in plain knit, followed by two rows in purl on the face and from then on in plain knit, during which stitches were regularly added. At the top of the armhole, stitches were cast off. The two back panels and the front were knitted separately for the next 7cm. Finally all stitches were again put onto a single needle, knitting continued and eventually all stitches were cast off along the bottom edge. Along the sides of the opening and the neck, there is one row of double crochets. For knitting the sleeves, stitches were picked up around the armholes and circular knitting continued with four needles without increasing or casting-off. The length of the sleeves cannot be established, since the cuffs are lacking. The jacket has no fastening, but this would not be necessary for a swaddled baby. Probably the child that wore this jacket was still in swaddling bands, but in its final form of a roller around the body. Anne Buck describes the practice on the basis of a 16th-century report about the care and swaddling of a somewhat older baby, which has its arms free and also wears a frock (Buck 1996, 60). This is how the Groningen baby, too, will have been dressed. At the armpits, the jacket has big wear holes which were mended with large patches (2/2 twill K32S, 124S); these are explained by the fact that in the 16th century many young children were put in go-carts, which supported them under the arms.

When they moved around in this way, their stockings would wear as well, particularly under the toe and the ball of the foot. Evidence of this is an otherwise complete, small red hose, 54T128 (K10Z, 18S), with a leg length of 20cm and a sole 10cm long. The hose in larger children's sizes (1T1, 15T11, 15T7), like those of adults, show wear on the entire sole. There is no wear on the sole of the other baby-sized hose (17T70), also with a sole length of 10cm (K10Z, 18S); its leg part has been cut off.

Nor does the small knitted stocking (17T27.1) show any wear under the foot (Fig.2). In contrast to the way in which stockings were knitted later on, this one was knitted from the toe upwards. Its full length is 25cm; the sole is 10cm long. It was knitted from two-ply wool, S-twisted, Z-plied, with 24 stitches and 36 rows per 10cm. It was knitted circularly in plain knit. The heel part was knitted to and fro with horizontal rows, after which stitches were

Fig.1 Knitted jacket (15T38) (25cm neck to lower edge) in plain knit from the Prinsenstraat, Groningen. (Photo: H.Zimmerman)

Fig.2 Knitted stocking (17T27.1) (25cm long) from the Prinsenstraat, Groningen. (Photo: H.Zimmerman)

Fig.3 Satin bodice (48T3) (22cm long) from the Prinsenstraat, Groningem. (Photo: H.Zimmerman)

Fig.4 Bodice (15T37) (24cm long) in coarsely woven plain weave from the Prinsenstraat, Groningen. (Photo: H.Zimmerman)

Fig.5 Satin bodice (343T33) from the Prinsenstraat, Groningen (Photo: J.Buist)

taken up from the sides and the leg part was again knitted circularly in plain knit up to the top, with just the occasional stitch increase. After two rows in purl on the face, all stitches were cast off.

Both girls and boys in their early years wore ankle-length frocks. In these excavations, two satin bodices were found that might belong to such 'children's frocks'. In 1996, a similar bodice had been found in another part of the same moat (Pr.str. '96 343T33) (Fig.5). All three are of 4/1 weft satin weave.

Find number 13T21 consists of a front, 26cm x 25cm, with a 4.5cm wide facing around the neckline, a small piece with a round, seamed edge, which could be the top of a sleeve, and two small pieces (11cm x 18cm and 10cm x 12cm) that together could have been one of the back panels. These bodices were fastened on the back.

The smallest bodice (48T3) is 22cm long, has inserted side panels and is composed of four different fabrics, all of them 4/1 satin (Fig.3). In the central piece, the warp runs vertically, but in the side pieces - both of them of a different fabric - and the shoulder pieces, which are of yet another fabric, the warp runs horizontally. The thread with which the pieces were stitched together has decayed. Decorative strands of silk in running stitch follow the seams of the insets on both sides.

The third bodice (15T37) is 24cm long and made of coarsely woven material in plain weave (K8Z, 16S) (Fig.4). Along the bottom edge of the front and on one of the back panels there were a number of small, separate pieces, cut on the bias from a different fabric (K10Z, 19S). The front is wider than the two back panels. When the armholes and the shoulders are placed on top of each other, a central piece is seen to be lacking: it appears that the fastening on

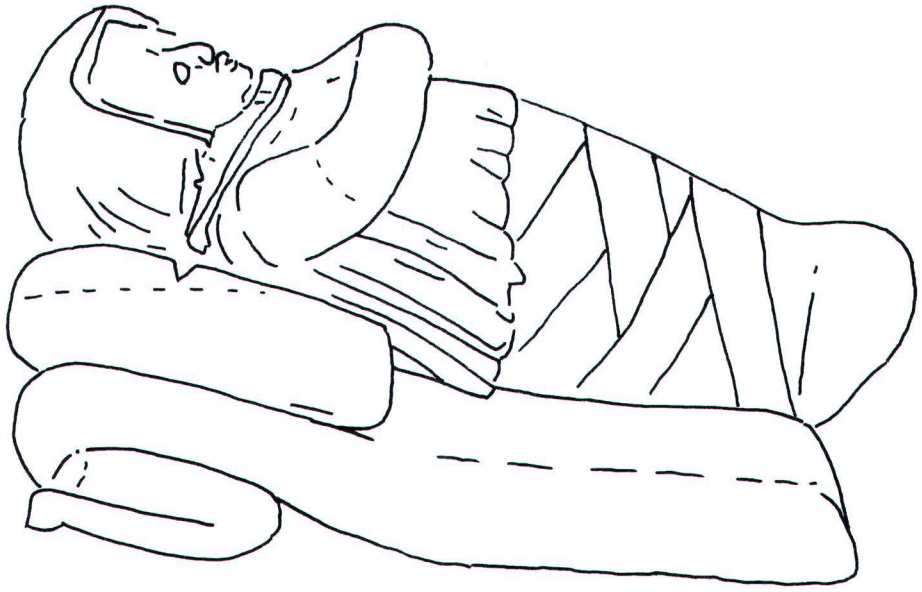

Fig.6 The infant, Mogens Gøje, on the sepulchral monument of his parents in Gunderslev Church, Denmark

the back was cut away. Also the lower edges of the bias-cut fragments had been haphazardly cut off. These may be the remains of a skirt. This raises the question whether we are actually dealing with frocks or with loose bodices, closed at the back, which were worn with a separate skirt. In contemporary pictures it is barely possible to see how these garments were put together, because almost always they are covered by an apron and a bib. Separate bodices, worn swaddled in or otherwise, were at any rate worn by swaddled children once they were old enough to have their arms free. On the tomb of his parents[2] (1590) baby Mogens Gøje is wearing a flaring jacket over the swaddling bands (Warburg 1988, 131) (Fig.6), while Cornelia Burch[3] in 1581 was depicted with swaddling bands covering the bodice (Bedaux, Ekkart 2000, 76).

It was an important transition for a boy to start wearing breeches and a doublet. In her contribution about children's clothes in the catalogue *Kinderen op hun mooist* (Children looking their best) (Bedaux, Ekkart 2000), Saskia Kuus says that it is not exactly known at what age this happened, because there are very few texts that mention such matters. She refers to two cases where this took place around a boy's seventh birthday, and an instance of two brothers, aged six and four-and-a-half (Bedaux, Ekkart 2000, 81). Ariès quotes Heroard, who in his diary says that his charge Louis XIII was aged seven years and six months when he, 'dressed in a doublet and breeches, abandoned the clothing of childhood' (Ariès 1965, 53).

Before boys were breeched, they would already have worn a doublet and a separate skirt from the age of about three. In the excavations, parts of doublets were recovered that could only have fitted very small boys. Seven front panels of doublets came to light. Measured from the waist to the top of the shoulder, the smallest measures 23cm, while two are 26cm, and one is 27cm long. The biggest is 36cm long.

So much of the smallest doublet (13T6) had been preserved that a replica could be made. Number 15T54 (26cm long) also consists of a back, a front, part of a skirt and the lining of a sleeve with a snippet of the outer fabric attached to it. The cuff is fastened with a hook and eye. The front, skirt and snippet are of the same weave (K9Z, I11S). The skirt is lined and finished with a plain edging. A hole was mended with a piece of coarse material. The back is of a different weave (K12Z I12S). The back has no collar cut in one piece with it, as another find does and which is found in patterns of 16th-century garments as described by Janet Arnold (Arnold 1985), but there are clear traces of something having been cut away here.

Numbers 54T131 and 54T15, 26cm and 27cm long respectively, are doublet front panels of a fairly coarse weave (K9S, 18Z and K9Z, I10S). The former has a somewhat

Fig.7 Jacket panel (17T28) (36cm long) from the Prinsenstraat, Groningen. (Photo: H.Zimmerman

lower neckline than the latter. Find number 17T28 also has a low neckline, in this case with a seam along it. This front is 36cm long (Fig.7). Curiously, the facing has been cut in one piece with it, and was folded inwards at an angle, so that the waist is narrower than the chest. Maybe this was a girl's jacket. The fabric (K11S, I10-12S) has flaws in both the warp and the weft.

Apart from the sleeves of the two more or less complete doublets, there are two loose sleeves. All four are of roughly the same cut, closed with a hook and eye at the wrist or traces of them. Number 17T26.1 is 31cm long, 22cm wide at the top and 14cm at the wrist (Fig.8). Probably because there was not quite enough material, a very narrow piece was added on, cut on the bias. The cuff was finished with a 4cm wide facing which bears remains of a metal fastening. The seam is only a few mm wide; though 8cm along the slit somewhat wider. The facing was sewn on with overcast stitching. At the cuff, 10cm of a small pickadill remain. The weaves are as follows. Sleeve: K12Z, 18S; patch: K14Z, I12S; facing: K10Z, 19S; and the little pickadill: K14Z, I14S.

The exhibition in Haarlem, in autum 2000 about children's portraits in the Netherlands between 1500 and 1700 was not for nothing called 'Children looking their best'. Most of the portraits show children of very wealthy citizens. These portraits tell us little about what the common people's children wore, but what we find among the rubbish are the remains of ordinary clothes.

Textiles were valuable: even the home-made, coarser fabrics which form the bulk of these finds, required many hours of spinning and weaving. Discarded children's clothes might have been cut up less frequently, because there was little of use to be retrieved from them, but for the very reason that these were small garments, they often will have been made from old ones. If the material was insufficient, a different fabric might be added, as in one of the bodices mentioned above. The sleeve of the small doublet 13T6 is made up of as many as four different fabrics, and other excavated clothes, too, were found to be composed of different materials. All recovered sleeves have holes in the elbows with patches on them or stitch-holes resulting from patches.

It is notable that all garments were made and mended with great skill and care. The large numbers of recovered pickadills, some

Fig.8 Sleeve of a doublet (17T26.1) (14cm wide at wrist) from the Prinsenstraat, Groningen. (Photo: H.Zimmerman)

detached and some still adhering to parts of garments, suggest that even the clothes of simple folk's children were decorated in this way.

These children's clothes were not particularly comfortable to wear. The sleeves of the knitted jacket are too wide in proportion to the shoulders. The small stocking has a disproportionately wide leg part compared to the foot. But this was nothing compared to the doublets. The recovered standing collars, some 5cm high, were trimmed with pickadills, sometimes with yet another strip of material sewn in, and lined with an even coarser woollen fabric, while often also traces of a linen inner lining were to be seen. The same goes for the stiff skirts.

Footnotes

1 Replicas are currently being made of the boy's knee breeches and of a doublet; these will be discussed in a later issue. Therefore these finds are not described in great detail here.

2 Gunderslev Church, Denmark.

3 Anonymous, in the collection of Viscountess Kemsley.

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Some additional Remarks concerning the Magdalensberg Spindle-hooks with Twisted Shanks

The excavations on the Magdalensberg in Carinthia, southern Austria, have yielded so far 125 small hooks of a specific type, made from a copper alloy (except for one in iron), 98 of them with a twisted shank, but 27 left plain (*ATN* 31, 9-12; Gostenčnik 2001). The dating of the Roman town on the Magdalensberg to between 50 BC and AD 50, its Roman origin decades before the Roman occupation of Noricum in 15 BC, and in additional the use of similar hooks especially in Roman and Coptic Egypt made me think of an origin in the eastern Mediterranean rather than somewhere in Celtic or Germanic Europe. Their production on the Magdalensberg itself, however, is not in doubt, as several hooks, including a few half-finished, were found in our local workshops among the refuse of bronze-smiths and brass-forgers. Further evidence as to the utilization of these hooks in earlier Celtic or other Roman sites in Noricum is still lacking, however. Nevertheless, the excavations on the Hemmaberg in south-eastern Carinthia, which focused on the remains of a late antique pilgrimage centre with five churches dating from the 5th - 6th centuries AD, might have revealed one such hook in 'bronze' (Ladstätter 2000, pl. 34,35). This piece was associated with scrap metal and workshop waste in copper-alloys, including a number of 'bronze'-wire fragments. Unfortunately, from the publication one can not decide whether it is a spindle-hook or part of the suspension for a chandelier from one of the churches. As the Hemmaberg proved to be inhabited during earlier periods as well and is supposed to be the place of worship for a local god of pre-Roman origin called Iovenat or Iouenat, another possibility is that the spindle-hook is of the first century BC or AD, but might also be a re-introduction in Late Antiquity under the influence of material goods from peoples of the migration period (see below). The Hemmaberg find will have to be examined again before one can definitely decide about its function and dating.

H. Kenner in one of her first reports on the small finds from the Magdalensberg in the early 1950s already drew attention to the Celtic material. She pointed out that a few of the hooks were reported among the remains of the oppidum at Velemszentvid in western Hungary (Kenner 1954, 63, n. 121; Miske 1908, 65, pl. 54,6-9 and pl. 55,10-12 from Velemszentvid), dating no later than the mid first century BC. At any rate, for the time being this seems to be one of a very few hints as to the origin of the type in the late La Tène period (cf. also Articus 1997, 173-179; finds from late La Tène contexts will be discussed by M. Schönfelder, Mainz, in a future publication), and we still lack more widespread finds from other Celtic sites. Dating to the Roman period are a number of graves beyond the boundaries of the limes in Slovakia which also revealed a few of these hooks (Kolník 1980, pl. 39, grave 185, cremation; pl. 45, grave 144, inhumation, hook lying on the chest; pl. 95, grave 30, cremation).

Outside the Roman world there is one region in eastern Europe, where spindle hooks with twisted or plain shanks were in use in extensive numbers from the first century BC at least. In the Przeworsk, Oksywie and Wielbark cultures in the Vistula-Oder region of Poland, which flourished between the first century BC and the early fifth century AD, many inhumation and cremation graves revealed spindle hooks in iron and copper alloys, a small number even in silver (for background, see Todd 1998, 452; Cunliffe 1998b, 443; Krüger 1988, 385-424; see references below for the *Monumenta Archaeologica Barbarica*). Relative dating is preferred to an absolute chronology, so it is a little difficult to establish the decades; however, the main finds derive from the period of the Roman Empire.

Though known almost exclusively from their graves, the material remains of those peoples revealed a mixture of elements characteristic of Celtic and Germanic origin together with those of the steppe dwellers. Roman finds in the graves clearly indicate a demand for prestige-goods, which were available by long-distance trade (Biborski, Kaczanowski 2001). The biggest number of finds are today known from Poland, but hooks are also reported quite frequently from northern Germany. By and large, it seems to be quite certain that spindle hooks with twisted or plain shanks were in use among barbarian societies in northern and north-eastern Europe during the period of

the Roman Empire, though apparently a certain number of implements with a somewhat similar shape were used as pins (cf Beckmann 1966, 7-8; Articus 1997, 173-179, with an extensive survey of the relevant literature), which results in the difficulties as to the exact usage.

The finds from Poland are published with an agreeable frequency, so that the increasing number of graves with spindle-hooks reveal more and more details. All the same, although most authors accept them as implements for spinning (cf especially Dabrowska 1997, 99), their view does not remain uncontradicted. Many a time they are referred to as 'hook-pins', even if parts of the wooden spindles are preserved, the latter being identified, for example, as pin-handles or even pin-cases (Wołągiewicz 1995, pl. 26,249-2; pl. 28,268-10, for pin found near the head with a whorl nearby), but sometimes also as shroud-fasteners (Skorupka 2001, 491). One interpretation suggests them as pins (*Stecknadeln*) for fastening cloth during the process of dressmaking, because a hook was pinned into a piece of cloth along with a needle (Biborski, Kaczanowski 2001). A male (!) inhumation is reported from Pruszcz near Gdansk on the lower Vistula, with a hook in the centre of the thorax, and due to the decaying process, the whorl has slipped into the belly-region (Pietrzak 1997, pl. 55,151-8, cf also the needle close to the left temple!). One more interesting detail is the fact that these hooks can also be found in the hole of the whorl, thus indicating the mounting of hook and whorl at the top of the spindle after the eastern usage (Beckmann 1966, 7-8; Pietrzak 1997, 82). The average length seems to be approximately 4cm, with a maximum up to 7cm (Dąbrowska 1997, 99).

A summary may therefore be given as follows: though spindle-hooks with a shank are reported in small numbers in the late La Tène period, their major use can be seen among barbarian societies of northern and north-eastern Europe during the Roman Empire and the migration period respectively. The Magdalensberg finds therefore do not necessarily have an Egyptian origin (Rutschowscaya 1986), though the lack of finds in our immediate vicinity is highly enigmatic. Moreover, at least for the early 20th century, spindle-hooks for twining threads (*zwirnen*) are reported from Siebenbürgen in Rumania (Kimakowicz-Winnicki 1910, 58-64, fig. 97-98). It is therefore plausible that hooks for spinning were introduced independently in two different regions, that is barbarian Europe and northern Africa. Nevertheless, a simple variation of the Greek type with socket might in both cases be plausible, if one considers the possibility of contacts between barbarians and the Mediterranean during the pre-Roman Iron Age and the beginning of a Greek presence in Egypt in the seventh century BC. The idea of the screw might perhaps more plausibly belong to the Mediterranean (Deppert-Lippitz 1995), but one has to bear in mind that the economy of the barbarian societies mentioned above was also based on metallurgy; their own skills in the production of e.g. pins with twisted shanks could be the source as well. We will have to pay close attention to the theme in future to solve all the problems arising with these small implements. Even so, many grave finds from barbarian Europe revealed an association of hook and whorl; this underlines clearly that the Magdalensberg-hooks with twisted and plain shanks are spinning-implements.

Cultural contacts between southern Carinthia and eastern Poland in the Magdalensberg period might be due to commercial exchanges via the amber route (Buora 1996; Guštin, Božič 1996), in our case by middlemen rather than direct links (?). Further suggestions as to the introduction of the type - eg where first, by whom? - will by all means have to focus on the possibilities of long distance trade in pre- and early Roman Europe.

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Medieval Archaeological Textiles found in Turku, Finland

Introduction

Archaeological excavations by Turku Provincial Museum took place in the Medieval city of Turku, SW Finland, in 1998. The site at Åbo Akademi (Turku I/7/4) is situated near the Cathedral and market place called Suurtori in the central area of Medieval Turku. It was a dwelling site and had many implications for the activities of artisans (Saloranta 1999, 25).

There was a find of nearly 1400 pieces of woven and felted fabric, yarn, string or rope, pieces of plaiting and bundles of fibre. Textile implements were found, for example spindle whorls, half of a rigid heddle, a tablet for tablet-woven band, and different kinds of clubs to break stems of fibre plants. The fragments were dated to between 1350 and 1450. Fragments of textiles were found all over the excavation in the lowest layers, but there were two concentrations at opposite ends of the site. They were 3.5 - 4m thick heterogeneous occupation layers containing manure and other remains of human activities, for example animal bones, altogether 236kg (Seppänen 2002, 357, 359). Osteology of sheep bones has indicated that the age of the female sheep was quite high (over 1½ years) and it is supposed that they were kept for wool, milk and breeding (Tourunen 2002, 102). In addition, many kilos of raw wool have been found on the site (Fig.9).

One hundred and fifty-four textile finds are discussed in this article that is based on my MA thesis. Main questions to be asked were: what kind of textiles are they? Did specialized weavers produce the textiles? Were the cloths imported or local? The number of textiles to be studied here is about one quarter of the total, but the number includes almost all the textiles that had been under conservation. Very limited numbers of Medieval archaeological textiles have been published in Finland and only two articles come to mind, which deal with the textiles of Mätäjärvi, Turku. One was an article dealing with excavations in 1975 and 1982 (Ikäheimo 1989, 156-157), the other is the writer's article considering Åbo Akademi textile finds in the very same quarter but from a different excavation (Kirjavainen 2002, 346-351).

Archaeological textiles are preserved under very special conditions. They may have been in contact with metals such as iron or bronze. Metal salts replace the textile fibres totally or partially (Bender Jørgensen 1986, 85). This can be considered in the case of prehistoric burials, i.e. burials before 1200, in Finland. Alternatively, they can be sealed under waterlogged conditions in dung and garbage layers protected by thick layers of stratification. In this case, preservation is the best in the lowest layers of excavations. Vegetable fibres rarely survive burial unlike wool and other animal fibres (Bender Jørgensen 1986, 85). Only few fragmentary pieces of vegetable fibre survived at the Åbo Akademi site: some yarn, a few bundles of flax fibre and one piece of linen cloth attached to a coarse woollen cloth fragment, which has a row of buttonholes (Fig.10) and underneath them linen cloth in plain weave that supports the buttonholes. Most of the surviving textile fragments are made of wool; a few of them are goat hair. The fibre distribution is: 98% wool, >1% goat hair and <1% plant fibres. As can be seen, preservation conditions have not been favourable to plant fibres. However, there were more indications of plant fibre processing at the site and amongst the fragmentary linen finds; nettle and hemp fibres were found, too. Some of the raw fibre lumps have wave-like imprints, which I have interpreted as scutching marks.

Basic Textile Research at the Åbo Akademi Site

Basic research has been carried out on textiles: weave, thread count, direction of spin, colour of the cloth were analysed and knowledge obtained was converted into a study of weaving standards, techniques and cloth import. Furthermore, the basic weaves tabby, 2/2 twill and 2/1 twill are divided into subgroups according to the qualities of a cloth i.e. woollen cloth, coarse woollen cloth, woollen tabby, woollen 2/2 twill cloth and woollen 2/1 twill cloth. Textile fragments are not very large; average length is 13.2cm and width 8.8cm. Only ten pieces could be identified as a part of garment, 24 pieces were off-cuts and the remaining 120 pieces were used for an unidentified function, although most of them were probably fabrics for clothing (Fig.11).

Fig. 9 Raw wool found on the excavation at Åbo Akademi. (Photo: Turku Provincial Museum/Heini Kirjavainen)

There are three basic weave types found in the textile material; plain weave, 2/2 twill and 2/1 twill. 2/2 twill is the most frequent with 84 pieces (54.5%) of the textile material studied. Tabby weave is in second place with 60 pieces (39%) and the last one is 2/1 twill with only 10 pieces (6.5%). This spectrum of weaves does not correspond with any North European weave combination during the 14th and 15th centuries, where in the most common combination tabby or 2/1 twill comes in first and then 2/2 twill comes in second or third (Maik 1998, 217). The overwhelming number of 2/2 twills can be seen as specialisation in just one type of weave or reflecting a need for this kind of weave for special purposes, for example fulling and dyeing coarse woollen cloth (*vadmal*).

Thread-count means the number of warp and weft threads counted per one centimetre. Mean value of threads in all textile fragments is 10.7 threads per cm in warp and 8.8 threads in weft; they are relatively coarse fabrics. The reason for this could be that in coarse fabrics two kinds of wool fibres could be found, coarse hairy and finer underwool that had been mixed together before spinning. Textiles were woven from mostly Finnish sheep's wool: primitive breeds of Åland sheep and Finnish landrace. Around the 1550's the king of Sweden, Gustav Vasa, started a breeding project to develop better quality wool. Foreign sheep breeds were introduced to Finland and Sweden but the results of his act had little effect on the wool quality of local sheep breeds (Tapio, Kantanen 2000, 22).

There are several spin combinations in the Åbo Akademi textile material. The dominant combination in the textile material studied is Z-S (44.8%), followed by Z-Z (26.6%). These two combinations are most prominent

Fig.10 Coarse woollen cloth with buttonholes from Åbo Akademi (Photo: Turku Provincial Museum/Heini Kirjavainen)

Fig.11 Simple starting border from Åbo Akademi (Photo: Turku Provincial Museum/ Heini Kirjavainen)

in 2/2 twill and 2/1 twill weaves. Of the coarse woollen cloth at Åbo Akademi, 60.9% has Z-S combination and 34.8% Z-Z combination. In order to make a good quality coarse woollen cloth the weaver has to have been considering these factors. Different spin combinations have been used to get the best out of yarn qualities for specialised weaving (Gustafsson, Waller 1987, 156).

All four combinations are found in tabby weaves: S-Z (51.7%), Z-S (20%), Z-Z (11.7%) and S-S (10%). The spectrum of spin combinations is quite unusual for Europe. It seems that nowhere else was the spin combination S-Z used so often as in the Åbo Akademi tabby material. Very often it is hard to distinguish a tabby warp from weft without the evidence of a selvedge. Furthermore, is it possibly a wrong interpretation? Perhaps also the weaver had some kind of special effect in mind, for example, crêpe de chine, a tabby cloth that has S-Z combination and characteristic shrinking (Gustafsson, Waller 1987, 160) which gives a nice uneven texture to a cloth. The view has been expressed in the Mons Claudianus Project in Egypt that it makes no difference if S-spun yarn is used in warp or weft in tabby weaves, especially when the crêpe effect is desired (Hammarlund 1997, 29). The other combinations are much more common in Medieval textile material, for example S-S combination is found in smaller amounts in foreign woollen cloth, too.

The Z-S combination is the dominant feature of 2/1 twill weaves (70%); next comes Z-Z combination with only two pieces (20%). The Z-S combination is most practical for 2/1 twill. The warp effect can be seen on the right side of a cloth (ie the diagonal lines of twill weave are visible) and the fluffier weft thread is more visible on the other side. This side was usually fulled for warmth and softness, while the right side was more water resistant because of the longer fibred Z-spun thread (Gustafsson, Waller 1987, 157). There are seven other combinations with plied yarns in this sample, but they are not considered here.

Colour in archaeological textiles is nearly always in different hues of brown that has been caused by burial. It cannot be said with great certainty what the original colour of a textile was without dyestuff analyses (UV visible spectrophotometer and TLC). Only nine dye samples were sent for analysis to Textile Research in Archaeology at York because eight of them seemed to be dyed red when microscopic research was executed. The York test results were very positive: all of the samples had been dyed red, four of them with imported dyer's madder (*Rubia tinctorum* L.) and rest of the samples in local bedstraw (*Galium verum* L. or *Galium odoratum* L.). Dyer's madder does not grow in Finland and it was cultivated in Europe in the Middle Ages, but bedstraw is native in Finland but grows in Europe, too (Walton 2001). In addition, one black/brown sample was tested and the result was alder bark (*Alnus glutinosa* L.) which is common in Europe and in Scandinavia (Walton 2001). Alder bark and bedstraw is known in Finnish ethnographic sources, too (Vuorela 1983, 495-496). A hint of blue was detected in one purplish and one bright brick red sample. This was analysed as woad (*Isatis tinctoria* L.) which is more probable than indigo from India which did not reach Europe in large amounts until later. Mysterious 'yellow X' was detected but could not be identified, although it is quite common in Scandinavian dye samples (Walton 2001).

There are 78.3% of tabby weaves dyed, 63.1% of 2/2 twill weaves and 40% of 2/1 twill weaves. The figures are quite high and they are based on microscopic examination only; but compared with the dyestuff-analysed samples they could give some kind of indication of the character of the textiles on the Åbo Akademi site. Overall, it can be said that there are textiles dyed with imported dyes, dyer's madder and woad, which were used by professional dyers in urban centres.

Cloth Types and Quality

What were the quality requirements for the cloth produced by professional weavers? Here quality is not understood in terms of the fineness and thinness of a cloth, but in terms of specific properties which cloth has to have to be professionally acceptable. So when these qualities appear in many pieces of cloth in standardised measures it can be assumed to be an 'industrial product' (Hoffmann 1974, 284; Gjøl Hagen 1988, 115). What are the specific elements needed? Variation is then the focus.

Professionally made cloths have less variation in warp and weft; they have higher mean quality than homemade cloths (Gjøl Hagen 1988, 126). Using the weft to hand, it can be considered as a matter of the weaver's skill to weave a proper fabric and so weft can contain more variation than warp (Gjøl Hagen 1988, 364-365). Thread counts were standardised in warp and weft, and the width of a cloth and weaves were simplified so that they were easy and fast to construct and to weave.

Horizontal looms were introduced in Europe around AD 1000 (Hoffmann 1974, 258) and it is highly probable that they were used in Åbo Akademi at the turn of the 15th century. There are a few shuttles and about ten wooden pulleys to support this assumption. Horizontal looms are usually connected with professional weavers in urban centres (Hoffmann 1974, 261). The treatments after weaving such as fulling and dyeing with imported dyes support the idea of developed urban crafts. When archaeological textiles are in question, the answer could be achieved by studying the degree of standardisation (Gjøl Hagen 1988, 126). This is expressed with a standardisation co-efficient that is low in more professionally woven fabrics and higher in domestic woven cloths (Gjøl Hagen 1988, 128).

Weave types were divided into groups of cloth types: woollen cloth, coarse woollen cloth, woollen tabby, 2/2 twill and 2/1 twill weave. Woollen cloth is fine and high quality cloth made in short-stapled wool. It is fulled, teaselled (ie the nap is raised) and then sheared (Strömberg, Geijer, Hald, Hoffmann 1974, 44). Woollen cloth numbered 14 pieces of which 85.7% had been dyed, mostly in red. Ten pieces are medium fine fabrics whose thread count varies from 11 to 18 threads per cm. Six of a total of 24 off-cuts were found in this textile group.

Woollen cloth was imported into Finland in the Middle Ages. The first mention of locally produced woollen cloth in Turku is in the account book of Turku castle (Melander 1914, 2). This is important because only imported woollen cloth is mentioned in Medieval written sources (Hausen 1921, 193, 197). According to the written sources, woollen cloth was imported mainly from Flanders at the end of the 14th century. Then the cloth was imported principally from Holland and England during the 15th century (Taavitsainen 1982, 24). However, import was not a straightforward line from the city of origin to Turku; cloth was imported via Hanseatic towns such as Reval, Lübeck or Danzig (Kerkkonen 1981, 468).

In the study of standardisation, woollen cloth can be considered as a basic material for comparison because it was a highly developed and finished cloth product. Standardisation and control regulated weaving as was the case in Elbing where statutes (1420) ordered 'sollten Gewebe etwa 8 Fäden in der Kette haben' (Maik 1998, 225).

Coarse woollen cloth is called *vadmal* in Scandinavia, *sarka* in Finnish. Coarse woollen cloth is domestic-woven coarse and often fulled fabric (Strömberg, Geijer, Hald, Hoffmann 1974, 91). The Finnish word *sarka* is supposed to derive its name from weaving a narrow cloth with a horizontal loom (Kaukonen 1962, 330). These cloths are very suitable for the northern climate; they are very warm, water and wear resistant. It is supposed that, although there is no surviving written source, coarse woollen cloth weaving was regulated by statutes (Kuujo 1981, 165). In the 16th century, such cloth was a value unit for payment (Kaukonen 1982, 415). As to coarse woollen cloths in Åbo Akademi, they are very thick and coarse; thread count varies from 7 to 10 threads in warp and from 6 to 12 threads in weft. There are 23 pieces of cloth and 78.3% has been dyed, mainly in red. The high number of dyed fabrics and the results of dye tests may indicate a dyer's presence at the site.

There are 41 pieces of plain woollen tabby cloth, of which 80.5% has been dyed. This group is between coarse (41.5%) and medium fine (58.5%) cloth. The coarse pieces have 5 to 10 threads in warp and 6 to 10 threads in weft. Medium fine cloths have 11 to 16 threads in warp and 9 to 14 threads in weft. In this case coarse does not mean thick cloth: ie warp and weft threads are not so close together, so in other words warp and weft threads have space to move around (Hammarlund 1997, 27).

Woollen 2/2 twill cloth is quite common with 63 pieces. Thread count varies from 6 to 22 in warp and from 5 to 30 in weft. Coarse fabrics form 61.9% and medium fine 34.9%; two fragments are fine (3.2%). Although this is the largest weave group, 60.3% of the dyed fragments are in this group. This figure is lower than in the tabby cloth. The quality of cloth is more heterogeneous; but in spin combinations this group has only Z-S and Z-Z combinations. Woollen 2/1 twill cloth is represented with 10 pieces. Thread count varies from 9 to 20 in warp and from 7 to 14 in weft. Forty percent of this type has been dyed and fulled, but only on one side.

Three examples of goat hair textiles have been taken as a separate group. These are very thick and coarse fabrics woven from plied yarn Zs/s in warp and weft. Thread count varies from 2.5 to 3 in warp and from 2 to 2.5 in weft. These fabrics were used as wrapping material for trade goods. The same kinds of fabrics have been found all around Europe in Medieval trading towns and they all have a standard appearance (Bender Jørgensen 1986, 95-96). They can be regarded as 'imported' cloths. Undoubtedly a specialised weaver like, for example, in Lübeck a 'Harmaker/Haardeckenmacher' wove goat hair textiles (Tidow 1982, 169).

Conclusion

In the woollen cloth group the standardisation is high at 18.2% in warp and 15.6% in weft. There must have been very skilful weavers at work and the standardisation and regulation must have controlled the cloth production intensively. In considering the imported woollen cloth arriving from different towns in Europe, one cannot help but be amazed how evenly they were woven. When their degree of standardisation (18.4% in warp. 14.9% in weft) is compared to the figures for coarse woollen cloth, the statistics seem quite similar. It can be assumed that at least this type of fabric was produced by professional weavers. Woollen tabby cloth (26.6% in warp and 27.9% in weft) and woollen 2/1 twill cloth (27.4% in warp and 22.8% in weft) have rather similar standardisation figures to each other and higher figures than woollen cloth and coarse woollen cloth.

2/1 twill weaves have been considered to be professionally or domestically woven fabrics because they are very often linked to the appearance of professional weaving either on vertical or horizontal looms (Lindström 1976, 291); but since the number of 2/1 twills is so low and scattered no conclusions can be made at this point. The high proportions of dyed tabby and variation in spin combinations are worth noticing. Could it be assumed that not every piece of tabby was woven by a professional weaver? Most intriguing, woollen 2/2 twill cloth shows 21.4% standardisation in warp, but 39.3% in weft. Certainly not all of the 2/2 twill cloth can be professionally woven. When count is combined with dyeing figures, numbers fall to 17.3% in warp and 16% in weft and it has the same effect on woollen tabby cloth, 17.6% in warp and 17.9% in weft. Can this mean that more professionally produced cloth went through dyeing processes and homemade cloth was in use without any colour at all? As to coarse goat hair textiles, they have very standardised figures, only 8.9% in warp and 10.9% in weft. They can be regarded as 'professionally' woven cloths although not in the same sense as the other cloth types mentioned above.

Finally, it can be said that there are textiles woven by professional weavers at the end of 14th century and the beginning of 15th century. There are imported textiles ie woollen cloths and goat hair textiles, too. The total proportion of foreign textiles is over 10% and that must say something about trade connections between Turku and other European trading towns. There are local textiles, namely coarse woollen cloth, woollen tabby, 2/2 twill and 2/1 twill cloth woven by skilful craftsmen, but there are certainly domestic woven textiles among them. Some of them may have been woven at the Åbo Akademi site but there have to be textiles of other local origins, too. The number of dyed fabrics is so high that surely there was a dyer with a great skill in Turku.

Note

Dyeing or its absence is not a straightforward indicator of professionally produced fabrics, nor can anything be said about thread counts and variation on a small scale. Nevertheless, if one can say anything

about the Åbo Akademi textile fragments, which have been gathered in one or two places on the excavation site, it is that no single person could have done the work and it probably took four to five generations to achieve the output. Definitely, the appearance of the textiles and the finishing processes (fulling, napping, shearing, dyeing) on the same range of different cloth types is a proof of work with consistent standards.

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Reports

The Karanis Textile Project: An internet-ready documentation project under way at the Kelsey Museum of Archaeology, University of Michigan.

In September of 2002, the Kelsey Museum initiated a two-year documentation project of its collection of approximately 3500 Roman textiles from the Egyptian site of Karanis. These textiles were unearthed during the University of Michigan's excavations at Karanis in the 1920s and 1930s (Boak, Peterson, 1931). As the documentation project proceeds, the detailed information and photographs of the textiles will become available online, through the Kelsey Museum's Artifacts Database (www.lsa.umich.edu/Kelsey/research.html). The final result of the Karanis Textile Project will be a complete catalogue of the textiles, accessible over the internet.

Funding for the project is provided by the Kelsey Museum and by the International Partnerships Program, Horace H. Rackham School of Graduate Studies, University of Michigan. The project is directed by Thelma K. Thomas, who curates the textile collections at the Kelsey Museum. After several years researching the Karanis collection, in the autumn of 2001, Thomas opened the exhibition 'The Fabric of Everyday Life: Historic Textiles from Karanis, Egypt' and published a brief overview of the collection (Thomas, 2001). In the winter of 2002, the exhibition was transformed into a 'virtual' display available online at (http://www.lsa.umich.edu/kelsey/galleries/Exhibits/textiles/index.html). Motivated by various inconsistencies and omissions in the museum's existing textile records and an outdated set of recording criteria, in the spring of 2002, Thomas began work on the current project to accomplish a single, consistent recording of the Karanis collection.

My contribution to the Karanis Textile Project is as a periodic consultant. In particular, I helped in the initial stages of the project to redesign the museum's existing database, adding new fields and defining the recording criteria for each of the new fields. Having recently completed a PhD (Batcheller, 2002) which focused on the portion of the Karanis textiles belonging to the Bolton Museum and which included a detailed catalogue of the textiles, I was ideally qualified to help with the documentation of the larger collection in the Kelsey Museum. Both collections originate from the same University of Michigan expedition to Egypt. The Bolton collection is a representative sample of the textiles from the larger Kelsey collection. A number of duplicate fragments (portions of one original textile) exist in each collection (Fig.12). The Karanis textiles were acquired by the Bolton Museum (formerly the Chadwick Museum, Bolton, England) in 1930, in exchange for the post-excavation cleaning and recording of all of the Karanis textiles, carried out by Thomas Midgley, the museum's curator at the time.

Each field in the Karanis textile database will be fully searchable so that subsets of textiles with features of interest may be generated by the 'find' function of the database program. The relevant fields from the existing Kelsey Museum's Artifacts Database include: accession number; site (Karanis); location (in museum); provenance (Egypt); period (Roman); date; bibliography (for published fragments); catalogue number (publication nos. and

Midgley inventory nos.); function (textile); materials (predominant fibres present); dimensions (length and width); and conservation report.

The new fields specific to the Karanis textiles and for which data is currently being recorded, include: photo (front, back, detail); description (general appearance, including patterns/decoration); condition; fabric structure (generic designation, details and illustrations); border type (width, details and illustrations); selvedge type (width, details and illustrations); sewing; miscellaneous comments; and comparanda. Additionally, there is a set of repeating fields for recording the yarns in each fragment. Since each yarn has its own set of fields, fragments with more than one warp or weft yarn can be accommodated. These fields include: yarn identification number; yarn function (i.e. warp, weft, supplementary weft, pile weft, sewing thread, other); yarn colour; yarns/cm; yarn structure (single, plied, other); spin direction (S or Z); twist level; and fibre content.

The documentation work is being carried out by Kate Carras, who has an MA in textile arts and is an experienced hand spinner, weaver and knitter. Carras is responsible for the painstaking work of recording of the textile fragments, checking previously recorded values and entering the results to the computer database, thereby updating each textile record as she proceeds.

It should be noted that a great deal of work has already gone into the documentation of

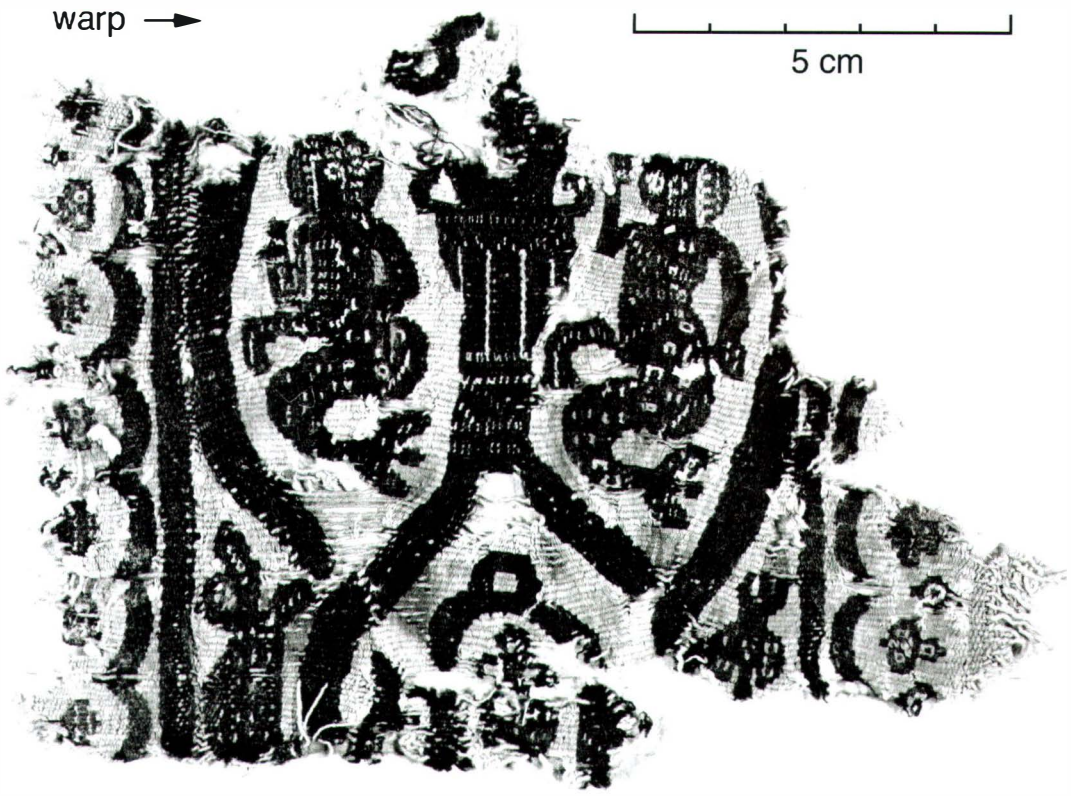

Fig. 12 Example of a tapestry band (wide clavus *band) from Karanis, Egypt (Bolton No. 19.30.63; Batcheller 2002, Cat. No. 195). Another portion of the same textile is also found in the Kelsey Museum (No. 13347; Wilson 1933, Cat. No. 66). Dark wool and undyed linen weft are woven on a wool warp. (Photo: J.Batcheller)*

the Karanis collection, including the original inventory prepared by Thomas Midgley and the early publication of a selection of the textiles by Lillian Wilson (1933). Various museum staff, researchers, and conservators have also worked on the textiles over the years; however, the level of recording is variable from fragment to fragment. Some of the work is now outdated and although accurate, the information is not easily interpreted or even accessible, except to those who are able to view the textiles first-hand within the Kelsey Museum. As well, the existing documentation is not entirely compatible with the recording of textiles from other Roman-period sites and this prevents the full inclusion of the Karanis textiles in the wider discussions of ancient textiles. The current documentation project will bring the Karanis textiles in line with accepted practices for the recording of archaeological textiles. It is hoped that it will also open up the collection to a wider audience over the internet, and will stimulate a renewed interest in this important museum collection.

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New German-Chinese Textile Conservation Lab in China

Run as a bilateral German-Chinese project, the Römisch-Germanisches Zentralmuseum Mainz has established a textile conservation lab in Shaanxi's provincial capital Xian. Housed in the rooms of the Shaanxi Archaeological Institute, the facility was designed for the conservation treatment of the famous silk textiles from Famen temple. The silks had turned up in 1987 during the excavation of a collapsed pagoda, when a hitherto unknown vault in the temple base was detected. The vault contained one of the most significant treasures of the Tang dynasty (AD 618-907), including a vast quantity of precious metal, porcelain and silk, all personal gifts made by Tang emperors to the Buddhist shrine. The value of this collection lies in the fact that it had remained undisturbed and is provided with an exact historical background: a stele covering the entrance of the vault lists all items and dates in detail. According to the ancient list the textile remains include, among other things, fabrics covering the boxes containing Buddhist relics, small textiles such as handkerchiefs and whole monk's ensembles. Woven with precious metal threads, covered by splendid embroideries and painted in many colours, the famous Famen silk fabrics are of immense scientific value to specialists in the field of art history and textile technology. However, the bad state of preservation of the silks inhibited any handling for research purposes or even exhibition.

Shortly after excavation of the fragile remains, some were treated by the Chinese textile specialist Wang Xu and his team. However, due to the bad health of Mr. Wang, the work ceased and during the following ten years the objects dried out or were infested by mould, depending on whether they were kept on shelves or in refrigerators.

With substantial investment by Germany's Federal Ministry of Education and Research,

Fig. 13 The German-Chinese Textile Conservation Lab in Xian, China (Photo: Römisch-Germanisches Zentralmuseum, Mainz, Germany)

in 2001 the specialists from the Römisch-Germanisches Zentralmuseum Mainz established a conservation lab. They had already been running a German-Chinese lab for inorganic artefact conservation for more than ten years in Xian.

Angelika Sliwka, a German textile conservator trained at the Swiss Abegg-Stiftung, took over the difficult task of caring for the heavily degraded silk fabrics. Young Chinese conservators are trained in the workshop, which comprises rooms for dry working as well as wet cleaning. Treatment of the fragile artefacts is accomplished through the use of a purpose-designed climatic chamber and a vacuum table, both important facilities for bringing both dry and wet silks to an adequate humidity level. Currently, a dye-laboratory is on its way from Germany to China. The lab represents a new era for Chinese textile conservation.

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Reviews

Dyes in History and Archaeology, Avignon, 10-11.10.02

The 21st annual meeting on Dyes in History and Archaeology was held in Avignon on 10-11 October 2002, with the now-normal two days of papers. The meeting was organised by CNRS, Avignon, the botanical laboratory of the Université de Montpellier, and the Association Couleurs Garance, Lauris, who arranged a visit on 12 October to the garden of dyeplants at Lauris, where there was also a display of posters and demonstrations of various dyeing techniques. The international nature of the

meeting was emphasised by the fact that the speakers alone, not to mention the audience, came from seventeen countries.

The meeting opened with tributes to the pioneer Max Saltzman, who had recently passed away.

Woad attracted the usual interest, with papers on indigo-reducing bacteria in the Medieval woad vat, on the history of woad production in Medieval Catalonia and Roussillon, and a resumé of the work of Edward Schunck, who elucidated the structure of indigotin. Real or shellfish purple is still a popular topic. Recent work on the nature of the Biblical dye *Tekhelet* was reviewed. Real purple has been identified on an eighth-century Insular gospel book - not as a 'purple page' but as part of the script decoration. A poster showed that it was possible to analyse purple-dyed fibres non-destructively by Raman spectroscopy.

The history of the use of logwood was reviewed. Natural dyes in Poland in the 17th and 18th centuries, on the north coast of the Black Sea from ancient to modern times, and in China and Bhutan. were also covered.

A three-year European Union project of monitoring damage in historic tapestries was described by Anita Quye (Edinburgh) and Jan Wouters (Brussels). Quye also described recent analytical work on native Scottish flavonoid dyes (sources of yellow dyes) which this reviewer found especially rewarding.

The study of natural dyes increasingly attracts high-powered scientific research and a number of papers reflected this. It is not possible to adequately summarise all in this review. Two groups of Coptic textiles from the first three centuries of the present era were examined by Dominique Cardon and Jan Wouters, including 75 dye analyses on 55 textiles. In addition, a Polish group have added fluorescence detection and mass spectrometry in identifying dyes separated by HPLC, also involving Coptic textiles. Work has continued in several laboratories on the study of paint pigments. Jo Kirby (National Gallery, London) concludes that though red pigment from lac was directly sourced from the insect, in the case of kermes and madder, the colorant was extracted from dyed textiles.

The organisers are to be congratulated on arranging such a mass of new and complex information in an enjoyable three days.

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Textile Archaeology in China. Hanghzou, 4-6.11.2002.

An international conference on Chinese Archaeological Textiles was organised by the China National Silk Museum, Hangzhou specifically by Prof. Dr. Zhao Feng and his assistant Zhou Yang. The conference was held from November 4th to 6th, 2002 at the very pleasant location of the Xizi Hotel, in walking distance from the Silk Museum.

An opening reception and a short welcoming speech by Xu Deming was held in the afternoon of November 4th followed by a guided tour of the Museum. 'Chinese Looms' and 'The History of Chinese Silks' are permanent exhibitions. A contemporary exhibition on 'Recent Excavated Chinese Textiles and Costumes' was closely related to the conference programme. A well documented catalogue is still available (see below). We also had the opportunity to visit the Chinese Centre for Textile Identification and Conservation (CCTIC) founded in 2000, of which Prof. Dr. Zhao Feng is the director.

In the morning of November 5th, the topic of the five lectures was 'Recent Excavations of Textiles in China'. Li Wenyin (China) spoke about textiles excavated in burial grounds at Yingpan, a major town on the Loulan Route of the Silk Road. The ruins consist of the ancient city, Buddhist monasteries, beacon towers, and a large public burial ground. Several hundred Han and Jin Dynasty tombs were excavated resulting in a rich array of textiles such as Jin silks in compound warp-faced tabby, silk damask in checked pattern, striped wool textile in twill 2/2 S- and Z- (Roman style), wool taqueté with rosettes (Roman style). The most important garments were exhibited and described in the catalogue.

'Tang textiles excavated from Dulan', was presented by Xu Xinguo (China). The Dulan tombs contain a large quantity of silks in many varieties, produced with a high level of weaving technology over a long period of time. There are a total of 350 pieces and fragments. 'Yuan textiles and costumes from Daqintala (Inner Mongolia)' was the topic of Wang Dafang (China). When found in 1991, only one tomb out of a group of nine was not completely robbed. Six parcels of textiles, containing several Liao costumes, consist of the most intriguing finds in this region. Most of these costumes were on display in the exhibition. The fabric of one of these Liao robes, a samite with goose motif, has been rewoven by CCTIC.

The lecture of Sun Huijun (China) was on 'Yuan textiles found in Dove cave' (Hebei province). In 1999, a package containing 44 textile pieces was found by playing children. Textual records found in the same site indicate a date around 1362. These textiles are a witness of the high quality of the weaving technology in this period.

Xu Changqin (China) spoke of Ming costumes from Nanchang. These costumes were recovered from a Ming dynasty tomb of Lady Wu, the concubine of Marquis Jing, entombed in 1504. In total 42 pieces of garments were found. Eight bolts of fabric, each 6m long, are still in good condition and some of them seem to be woven specially for the funeral.

In the afternoon the topic of the lectures was on Chinese textiles through archaeology. Annemarie Stauffer (Germany) could demonstrate the close relationship of some textiles found in Palmyra and some sites in China although the question of origin still remains. Zhao Feng (China) showed a survey of textiles found on the Silk Road through Wei to Tang. Of the most important sites the different types of cloth were given and Persian and/or Western influences were indicated. Kazuko Sakamoto (Japan) reported on textiles excavated in Xinjiang but collected in Germany and now in the collection of Indian Art (Dahlem). Xu Bingkun (China) gave a detailed survey of the five different periods of the Liao textiles and costumes from 907 till 1279. James Watt (USA) discussed the Mongol textiles that he divided into three parts: Beijing, Loulan and Transoxan. Differences between textiles from China or Central Asian can be seen in the use of colours. The colours in Chinese textiles were according to nature while the colours of Central Asian textiles had no relation with nature. Bao Mingxin (China) spoke about Ming textiles, the different weave structures, different types of costumes and the use of cotton in that period.

The morning of the last day was dedicated to the relationship of textiles between China and other countries. Zhou Qicheng, one of the leading textile scholars of China had some comments on the history of silk. Kojima Yasutaka (Japan) described the excavation method of the Niya site, a Sino-Japanese co-operation. Different mentalities lead to some difficulties. Hero Granger Taylor (UK) talked about the evidence for trade in textiles from West to East during the Han/Roman period. The copying of the most favourite designs, imitations of damask, different material and colours, were adapted to local use. Chris Verhecken-Lammens (Belgium) described a 13th century central Asian costume. This is a silk and gold coat in Khitan-style. The fabric has a samite weave structure. Sim Yoen Ok (Korea) gave a comparison of Korean and Chinese textiles while the last speaker; John Vollmer (Canada) demonstrated the differences between Chinese and European textiles.

The program in the afternoon was more relaxed with a cruise on the West Lake, a visit to the Zhejiang Provincial Museum and the Linyin Temple and shopping in the old district near Hefang street.

The conference was a meeting point for people with their own interest in Chinese textiles coming from different countries. Sometimes informal discussion was difficult due to the language barrier but this was solved by the younger people volunteering to act as interpreter.

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The 1st International Symposium on Textiles and Dyes in the Mediterranean Roman World, Ibiza, 8-10.11.2002

In November last year a three day conference on dyes and textiles was held on Ibiza. It was organized by Carmen Alfaro Giner (Universitat de València, Departament d'Història Antiga) and Benjamí Costa (Museu Arqueològic d'Eivissa i Formentera) with the Consell d'Eivissa i Formentera and other local authorities.

The geographical area covered was the Mediterranean from Spain (including the Balearic Islands), France, Italy and North Africa on to Egypt but also Poland and Costa Rica.

The focus of the first day was on textiles. The materials covered were from wool (F. Medard) and linen (M.Gleba) to gold thread (A. Bedini). The subjects also covered were the usage of the textiles, the production process, weaving techniques, a discussion about sheep's wool (J.Maik) and also a summary about Roman textile research, its development and standpoints until today (J.P. Wild, L. Bender Jørgensen).

Several papers dealt with weaving: weaving techniques, textile reconstructions and different types of looms with examples from France (M.P.Puybaret, C. Micouin-Cheval) and Egypt (M.Ciszuk). From the harbour site of Berenike, from a rubbish dump, come examples of textiles used for packing and also sails (F.Wild). The latter are patched cloth with reinforcement bands. The cloth is spun in different directions with the s-spun flax cloth interpreted as being Egyptian and the z-spun cotton cloth being Indian.

Textile craftsmanship, dyeing and the organisation of the textile- and dyeing production in Pompeii (P.Borgard) and North African Roman towns (A.Wilson) were the subject in two of the papers.

The theme of the second day was dyes and colour and in particular the colour purple with its various aspects of importance including production, legislation and methods of catching the molluscs. Even if purple was the focus other dyestuffs were also discussed: tannins for instance, the plants used and the dyeing techniques involved to obtain the colour black (A.Roquero). Other dyestuffs were reviewed in another Egyptian contribution (D.Cardon). From the fortresses (*praesidia*) of Maximianon, Krokodilô and Didymoi in Egypt, inhabited by middle- or low class people and soldiers, come textiles from the first three centuries AD. Some of these textiles have been analysed to identify the dyestuffs from the point of view of colour. In this analysis dyestuffs like madder (wild and cultivated), weld and indigotin were found, but also kermes and purple. The context of the purple industry was reviewed in two further papers (E.García Vargas, C. Macheboeuf).

A different mode of purple production was discussed in an example from Costa Rica (I.Quintanilla) where living purple mollusc shells are collected. Instead of being destroyed in the process as was the case during classical antiquity these shells are collected and 'put under stress' to make them secrete the liquid that, exposed to light, gives a purple hue.

Three of the papers were about current excavations on Ibiza (J.Ramon, B.Costa, C.Alfaro and E.Tébar). In these papers the attention was on purple production, commerce and the importance of Ibiza during Antiquity. A couple of the sites mentioned in the papers in connection with purple production, Sa Caleta and Pou de Lleó, were visited on the third day of the conference. These sites were very interesting and gave the impetus for very interesting discussions throughout the day. In conclusion I would say that the juxtaposition of these subjects, textile production and dyeing, gave rise to a lot of new thoughts and made these three days very comprehensive and stimulating.

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Fig. 14 Participants at the Lyon Conference modelling the reconstructed Roman kaftan and chlamys (Photo: Lise Bender Jørgensen)

Tissus et Vêtements dans l'Antiquité Tardive. Colloque de l'Association pour l'Antiquité Tardive, Lyon, 18-19.1.03

The Association pour l'Antiquité Tardive gathered a selection of archaeologists, art historians, conservators, historians and philologists to discuss textiles and clothing in Late Antiquity during a two-day session at the Musée des Tissus in Lyon. General themes were: Textile Production and Trade, economics and technology, Textiles and Clothing, and Clothing as symbols of social status and value.

The conference was formally opened by the president of the Association pour l'Antiquité Tardive, M. François Baratte, and the

Director of the Musée des Tissus, M. Guy Blazy. Mme Marie Schoefer-Masson took the participants on a guided tour of the Musée des Tissus, highlighting the magnificient late antique textiles from Antinoë and the rich collections of Lyon silks. The first academic theme was opened by Jean-Michel Carrié, with a survey of knowledge on Roman textile production. Federico Morelli spoke on 'Tessuti e Indumenti nel Contesto Economico tardoantico: i Prezzi', on the role of textiles in Late Antique economics. Lise Bender Jørgensen and Dominique Cardon presented results of research based on the recent excavations of Roman sites in Egypt's Eastern Desert. Bender Jørgensen focused on changes in the textiles observed over the first half-millennium AD, Dominique Cardon presented the results of dye analyses of textiles from the *praesidia* Maximianon, Krokodilô and Didymoi: the analysis of some 80 samples were done at the IRPA/KIK laboratory in Brussels and at the research laboratory of the cosmetic firm L'Oréal in Paris. D. Cardon discussed the implications of these results for our understanding of the dye industries in the ancient world. The first session was concluded by M. Martiniani-Reber who discussed textile evidence for relations between Egypt and the Near Eastern world.

The theme of textiles and clothing was opened by François Baratte with a survey on knowledge on dress, followed by a report by Marie-Hélène Rutchovscaya and Dominique Benazeth who presented results of recent research on Roman textiles from Egypt in French museums and collections. Jean-Pierre Callu discussed the social role of Roman dress, based on the Historia Augusta, and Roland Delmaire investigated Roman attitudes to dress according to legal sources. Mme G. Ripoll presented preliminary results on an investigation into textiles in architecture by herself and Noël Duval, establishing items such as curtains and cushions depicted in Late Antique art.

The final session dealt with dress in value systems and social display. Mary Harlow discussed women's dress in the 3rd-6th centuries and how it reflected social status and identity, and perceptions of womanhood. Ellen Swift employed dress accessories to chart culture and identity in the Late Roman World. V. Neri spoke of body and dress in Late Roman society, R. Martorelli on religious influences on dress during the first centuries of Christianity, M. Mossakowska-Gaubert on monks' tunics in Late Roman Egypt, and C. Metzger on textiles as relics. Gisella Cantino Wataghin concluded by summing up the various papers and outlining perspectives for further work.

The conference was well organised, the Musée des Tissus provided the perfect setting and meals were memorable. Gisella Cantino Wataghin and Jean-Michel Carrié had done a fine job in selecting speakers who could each contribute to the theme of Roman textiles and clothing from different research fields. This generated a lively discussion that engaged texts with textiles, created widening perspectives, and a happy feeling of entirely new possibilities. Moments of hilarity occurred when participants tried on reconstructed Roman garments such as a chlamys and a long-sleeved turquoise Antinoë kaftan. Many new friends were made. Eye-openers were frequent: historians and philologists were presented with physical examples of concepts hitherto only familiar as words, textile scholars with perceptions of dress - or nudity - based on interpretations of Roman texts, legal sources etc. that lent entirely new meaning to their ancient rags. It became obvious how various fields of research had established independent bodies of knowledge, little known to each other. When, for example, François Baratte referred to 'that well-known standard work on Roman dress', textile archaeologists looked at each other and whispered: 'did you ever hear of that before?'

The papers will be published as a special issue of the scientific journal Antiquité Tardive. It will be co-edited by Gisella Cantino Wataghin, Jean-Michel Carrié and Dominique Cardon.

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Textilien und Inschriften des 1. Jahrtausends n. Chr. aus Ägypten: Workshop der Internationalen Arbeitsgruppe 'Textiles from the Nile Valley', Berlin, 25-26.1.2003

Am letzten Januarwochenende dieses Jahres versammelten sich ca. 45 Textilspezialisten, Archäologen, Epigraphiker, Islamwissenschaftler und Papyrologen zum dritten Treffen der Arbeitsgruppe 'Textiles from the Nile Valley' in Berlin. Die Tagung stand diesmal unter der Obhut von Arne Effenberger (Direktor der Skulpturensammlung und des Museums für Byzantinische Kunst) und Claus-Peter Haase (Direktor des Museums für Islamische Kunst) und wurde organisiert von Gisela Helmecke, Kathrin Mälck und der Unterzeichneten. Den thematischen Schwerpunkt bildeten griechische, koptische und arabische Inschriften auf Textilien ägyptischer Herkunft aus dem ersten nachchristlichen Jahrtausend.

Nach den Grußworten der Direktoren und einer kurzen Einführung in die Thematik durch die Organisatoren am Samstag Vormittag, eröffnete Hermann Harrauer (A-Wien) die Reihe themenbezogener Referate mit einem Überblick über die drei, im ersten Jahrtausend wesentlichen Landessprachen Ägyptens - griechisch, koptisch und arabisch. Auch das Lateinische wurde am Rande berücksichtigt. Dabei wurden einige Kuriosiäten aus dem reichhaltigen Schatz der Wiener Papyrussammlung vorgestellt; unter anderem wurden einige Irrtümer in der Deutung wiederkehrender Kürzel für bestimmte Redewendungen aufgedeckt. Im Anschluss daran führte Claus-Peter Haase (D-Berlin) in die arabischen Inschriften auf Denkmälern des ersten Jahrtausends ein. Daran schloss eine epigraphische Untersuchung der griechischen und koptischen Inschriften auf spätantiken bis frühislamzeitlichen Textilien von Jacques van der Vliet (NL-Leiden) an. Besonderes Gewicht wurde auf die Funktion und die bislang vernachlässigte sozialgeschichtliche Auswertung der Inschriften gelegt. Monika Springberg-Hinsen (D-Münster) ging den islamischen Schriftquellen aus der Abassidenzeit nach Hinweisen auf beschriftete Textilien nach. Den Vormittag beendete Peter Baumann (D-Henfenfeld) mit einem Referat über Inhalt, Funktion und Platzierung von Inschriften auf spätantiken Mosaiken, vornehmlich des östlichen Mittelmeerraums, die eine deutliche Parallelität zu den zeitgleichen bebilderten Textilien mit Beischriften erkennen ließen.

Tiefer ins Detail führten die Beiträge am Nachmittag. Die Beischriften ausgewählter Textilien wurden näher beleuchtet. Maximilien Durand (F-Paris) analysierte die Pseudobeischriften einer Gruppe von Wirkereien mit mythologischen Darstellungen und konnte sie auf Diogenes, Thetis und Panope zurückführen. Elke Niewöhner (D-Wolfenbüttel) setzte sich mit Inschrift und Herkunft eines Tirazes aus dem 'Schatz der Goldenen Tafel' im Lüneburger Staatsarchiv auseinander. Schließlich machte sich Sabine Schrenk (CH-Bern) Gedanken über den 'Wert' von Beischriften anhand eines Seidengewebefragmentes mit Mariendarstellung, heute in der Abegg-Stiftung Riggisberg, auf dem die Inschrift spiegelbildlich wiedergegeben ist.

Das Programm des ersten Tages klang aus mit Referaten über technische Aspekte der beschrifteten Textilien. Antoine de Moor (Scheldewindeke, Belgien) ging der Frage der Datierung nach, indem er die Ergebnisse einiger C14-Analysen vorstellte. Kathrin Mälck (Museum für Byzantinische Kunst, Berlin) untersuchte die textiltechnische Ausführung der Inschriften.

Der Vormittag des 26. Januar war den Sammlungen verschiedener Museen vorbehalten. Dominique Bénazeth (F-Paris) stellte die beschrifteten Textilien aus der ägyptischen Abteilung des Louvre vor, Harald Froschauer (A-Wien) die der Papyrussammlung der Österreichischen Nationalbibliothek. Cäcilia Fluck (D-Süderlügum) und Gisela Helmecke (D-Berlin) präsentierten einen Querschnitt aus den Beständen der Berliner Museen. Erstmals konnten auch einige seit dem Krieg verschollene Textilien gezeigt werden, von denen jüngst Archivaufnahmen wiedergefunden wurden.

Alle Beiträge wurden von einer regen Diskussion begleitet, für die genügend Raum war. Eine Veröffentlichung der Referate ist geplant.

Neben der Erarbeitung eines bestimmten Mottos ist es ein Anliegen der Arbeitsgruppe, Aktuelles aus dem Fach zu

berichten. So referierte Annette Schieck (D-Köln) über ihre Dissertation 'Spätantike Textilien aus Ägypten in Sammlungen Nordrhein-Westfalens'. Nikkibarla Calonder (Ch-Riggisberg) informierte über die Textilfunde und ihre Auswertung aus der Grabung der Universität Tübingen im Kom el-Ahmar bei Sharûna (Mittelägypten) unter der Leitung von Béatrice Huber.

Das Programm endete mit einem Hinweis auf laufende und geplante Ausstellungen (Warschau, Krefeld, Wien, München). Der nächste Tagungsort wird voraussichtlich Antwerpen sein. Als Thema stehen die verschiedenen Datierungsmethoden spätantiker bis früharabischer Textilien zur Diskussion.

Interessierte Teilnehmer konnten nachmittags die Textildepots und Textilrestaurierungswerkstätten des Museums für Byzantinische Kunst und des Museums für Islamische Kunst besichtigen. Darüber hinaus bestand die Möglichkeit, einen intensiveren Blick in die am Vorabend der Tagung eröffnete Sonderausstellung 'Textile Botschaften' im Pergamonmuseum (Miniaturenkabinette des Museums für Islamische Kunst) zu werfen. Die Ausstellung ist dort noch bis zum 06.04.2003 zu sehen ist. Es werden Exponate aus den oben genannten Museen und eine Leihgabe aus dem Ägyptischen Museum, Berlin gezeigt.

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Advance notice

The *Cambridge History of Western Textiles*, a two-volume survey of textile history in the Old World from the Mesolithic to the present day, should appear in print in July after some 15 years' gestation. It was the brainchild of the late Ken Ponting and had the Pasold Research Fund's support. Published by the Cambridge University Press and edited by David Jenkins, it promises to be the authoritative textbook. The first part,

on the textile industries of the ancient world to AD 1000, is largely based on archaeological evidence. Institutional subscribers to *ATN* will receive flyers for it.

News in Brief

Intrecci e Tessuti dalla Preistoria in mostra a Riva del Garda
Textiles: Weaving and Fabrics from Prehistoric Europe, 'La Rocca', Riva del Garda, 23.5-19.10.2003

An exhibition of prehistoric fabrics and weaving will take place at 'La Rocca' in Riva del Garda from 23 May to 19 October 2003, organised by the Archaeological Heritage Office of the Autonomous Province of Trento, with the collaboration of the Civic Museum of Riva del Garda.

The intention of the exhibition is to bring to the attention of the public the types of fibre used by our ancestors, the procedures used to extract and obtain fibres and yarn, loom working techniques and their evolution and the various decorative designs executed.

In the exhibition visitors will find tools used for the working of textiles in prehistoric times: rods, combs, cards and spindles for the production of yarn, the warp-weighted loom, body tension loom, shuttles, weaver's picking sticks and knives, heddles and combs for the production of fabrics.

Evidence of the weavers' ability can be seen in the number of finished products and weave types. The exhibition will present a selection of the most significant finds from the main European sites (Switzerland, Germany, France, Denmark and Italy) in addition to reproductions of the clothing and fashion of the era.

In Trentino, in particular, the presence of a body of textile materials of considerable importance is revealed to the public. The finds from the lake-dwelling in Molina di Ledro are on display, including two complete garments: a decorated sash and a belt, together with numerous woven items found during the excavations of the peat-bog at Fiavé-Carera and the tools for the working of textiles found in these settlements.

The exhibition is supervised by Gianni Ciurletti; Marta Bazzanella, Anna Mayr and Antoinette Rast-Eicher are responsible for the scientific content. The administrators are Silvano Zamboni and Luisa Moser.

<textiles2003@libero.it>

Tales in the Textile: the Conservation of Flags and Other Symbolic Textiles: North American Textile Conservation Conference 2003. 6-8.11.2003, Albany, NY, USA

The fourth biennial North American Textile Conservation Conference, 'Tales in the Textile: The Conservation of Flags and Other Symbolic Textiles', will take place on 6-8 November 2003, co-sponsored by the New York State Museum and the New York State Office of Parks, Recreation and Historic Preservation. The keynote speaker will be Laurel Thatcher Ulrich.

The three-day program (6-8 November) includes 23 papers, 9 posters, 2 receptions, a tour and discussion sessions. Additional tours are offered on the day before and the day after the conference. A separate session of 3 workshops will precede the conference, on Wednesday 5 November.

Full conference cost, Early Bird (Sept.1, 2003) $275.00. For more information or to receive a brochure and registration details in May, please contact:

<Ruth.Potter@oprhp.state.ny.us>

Query: 12th century textiles

Nancy Spies is looking for extant 12th-century textiles from Sicily and Tunisia/the Magreb. If you know of any, please contact her at <snspies@aol.com>. Thank you!

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Der Weber, der zuviel verdient hat

Die folgende Stelle stammt aus einem Brief, der 384 n.Chr. an 'Eustochium, Paulae filiam' von Hieronymus geschrieben wurde. Eustochium gehörte zu dem Kreis der Frauen, die von Hieronymus unterrichtet wurden. Ägyptische Mönche mussten alle einen Beruf erlernen, wenn sie sich der Gemeinschaft anschliessen wollten. Die Quelle gibt einmal Auskunft darüber, was sich mit Leinenweberei an Geld verdienen ließ. Selbst auf die Gefahr hin, dass es sich nur um ein Gerücht handelte, würde Hieronymus dies nicht weitergegeben haben, hätte es sich um ein unwahrscheinliches gehandelt.

verum .. quid ante non plures annos Nitriae gestum sit, referemus. quidam ex fratribus parcior magis quam avarior, et nesciens triginta argenteis Dominum venditum, centum solidos, quos lino texendo acquisierat, moriens dereliquit. initum est inter monachos consilium (nam in eodem loco circiter quinque millia divisis cellulis habitabant) quid facto opus esset. alii pauperibus distribuendos esse dicebant; alii dandos ecclesiae; nonnulli parentibus remittendos. Macarius vero et Pambo et Isidorus et ceteri quos patres vocant, sancto in eis loquente spiritu, decreverunt infodiendos esse cum domino suo, dicentes: pecunia tua tecum sit in perditionem. nec hoc crudeliter quisquam putet factum; tantus cunctos per totam Aegyptum terror invasit ut unum solidum dimississe sit criminis.

'Aber ich möchte etwas erzählen, was sich vor wenigen Jahren in der nitrischen Wüste ereignet hat. Ein Bruder, der mehr sparsam als geizig war und nicht wusste, dass Christus um dreißig Silberlinge verkauft wurde, hinterließ bei seinem Tode hundert Goldstücke, die er durch Leinenweberei verdient hatte. Die Mönche, deren dort ungefähr 5000 in getrennten Zellen wohnten, hielten Rat, was zu geschehen habe. Die einen meinten, man solle das Geld unter die Armen verteilen. Andere wollten es der Kirche schenken, während eine dritte Gruppe riet, es den Eltern zu schicken. Macarius aber und Pambo und Isidor und die übrigen, die den Namen Väter führten, beschlossen, erleuchtet vom Hl.Geiste, es solle mit seinem Herrn begraben werden. Sie sagten: "Dein Geld gehe mit Dir ins verderben". Darin darf man nicht eine Grausamkeit sehen. Aber alle (Mönche) in ganz Ägypten ergriff ein solcher Schreck, dass sie es für ein Verbrechen hielten, auch nur ein Goldstück zu hinterlassen.'

(Hieronymus, *Epistulae* XXII, 33)

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Guidelines for Authors

The *Archaeological Textiles Newsletter* 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. 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.

3. 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.

4. Please send submissions in hard-copy, typed, form (lines not justified). (An accompanying disk in Word would be welcomed.) References should be in the Harvard system (eg Smith 1990), with bibliography at the end.

5. Line drawings and photographs are accepted, but must be originals of high reproduction quality. Artwork should not be mounted or incorporated into text. Captions, please !

6. The Editorial Board reserves the right to suggest alterations in the wording of manuscripts sent for publication.

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