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Editorial

The most important function of a *Newsletter* is obviously to print **news**. Once more the Editors are extremely grateful to those who have written to us with announcements of forthcoming events likely to be of interest to readers. Since the *ATN* is only published every six months, the schedule is tight, and it may be that details of an exhibition (for instance) come in at the last minute, or after. Let that not be a deterrent ! Likewise we welcome reviews of meetings and exhibitions - please do not wait to be asked!

Subscription renewal forms are sent out to those whose subscription is ending with the number which the form accompanies. If you have **not** received a renewal form, you are **still in credit** !

What improvements the introduction of the Euro in January 2002 will bring to the ease and cost of sending money, such as *ATN* subscriptions, across international boundaries remains to be seen. *ATN* can accept cheques written in Euros now. We can also accept £ sterling banknotes sent through the post: obviously there is a risk of loss in transit. The standard method of payment remains an international bank draft written in £ sterling - but it is expensive.

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Cover: A thirteenth-century bowl from Acre (diameter 25cm) showing a woman spinning. Photo: Israel Antiquities Authority.

Features

Salt Movement in Ancient Egyptian Linen. A Preliminary Report

The study of archaeological textiles relies on the actual preservation of textiles from archaeological sites. Therefore a study of the reasons why certain textiles have survived in the archaeological context can help not only the textile conservator but also the textile analyst to a greater understanding of these archaeological textiles and the treatment they need for future preservation.

Recent analytical work on Ancient Egyptian textiles has focused on the role of natron and other inorganic salts in the preservation of archaeological textiles. This study has been able to distinguish textiles which were unwashed in antiquity from those washed with natron and can correlate certain linens with specific archaeological deposits. This offers the possibility of scientific analysis of ancient textiles in order to aid the curator and the conservator in the recording, analysis, conservation, storage and display of the textiles, through a greater understanding of their history of usage as well as their chemical and physical nature.

Inorganic salts may often be found in Ancient Egyptian textiles. These salts may have come from a variety of sources: from washing in natron in ancient times, from contact with natron used in mummification processes, from materials containing soluble salts within a tomb environment, or from a burial deposit, particularly from one near a source of highly saline water (Marsh-Letts 2000). It has long been known that salt migration takes place on Egyptian archaeological sites if they are flooded, or even become damp. This is due to the presence in the limestone formations of the Nile Valley of large quantities of sodium chloride and other salts, deposited there when the present land of Egypt was under the sea.

Egyptologists of the late 19th and early 20th centuries, often living close to their subject in Egypt, or handling newly excavated and exported materials, were aware of the presence of salts in both organic and inorganic objects (Hann and Janaway, 1990, 31 and 34). Recent reports of the presence of salts in Egyptian archaeological textiles have come from Wild (1999), who observed that some of the textiles from the Red Sea site of Berenike appeared to contain salts and could not be safely washed in the field, and from Sutcliff (2000), who observed the formation of salt crystals on a Coptic textile after a water washing followed by solvent drying. The movement of salts in archaeological textiles may have been postulated in the past by archaeologists and conservators working with archaeological textiles, but the exact mechanisms of salt crystal formation and dissolution (hydration and deliquescence) in linen textiles have not hitherto been demonstrated.

As part of research work on the nature of salt movement in Ancient Egyptian textiles, samples of Ancient Egyptian linen were examined using the highly sensitive techniques of Ion Chromatography (IC) and Environmental Scanning Electron Microscopy (ESEM), combined with X-ray analysis. The technique of IC has previously been used to monitor the removal of salts from building materials and ceramics, but its use for the monitoring of salts in organic artefacts has not previously been reported. ESEM has also been successfully used for the study of salts in stone (Doehne 1994, 143-150). However, ESEM had not been used for an observation of the movement of salts in textiles. The X-ray analysis techniques of X-ray Diffraction and Energy Dispersive X-ray Analysis (EDXA) were used for the identification of crystalline inorganics present in samples of archaeological deposit and in linen samples.

Some important studies have been done on the dynamics of salt crystallisation within the Dead Sea Scrolls (both parchment and papyrus scroll fragments) using ESEM at the Getty Conservation Institute in Los Angeles (Wallert 1996, 198-202). As this new microscopic technique could show the surface of textile fibres not only 'before' and 'after' treatment, but also record changes in real time, it was chosen to enable the investigation of the growth of crystals either on or within the textile fibres. This would demonstrate whether or not salts moved into the fibres themselves (i.e. if they penetrate in solution to within the fibre, effectively mineralising the fibre) and it would also demonstrate what happened to

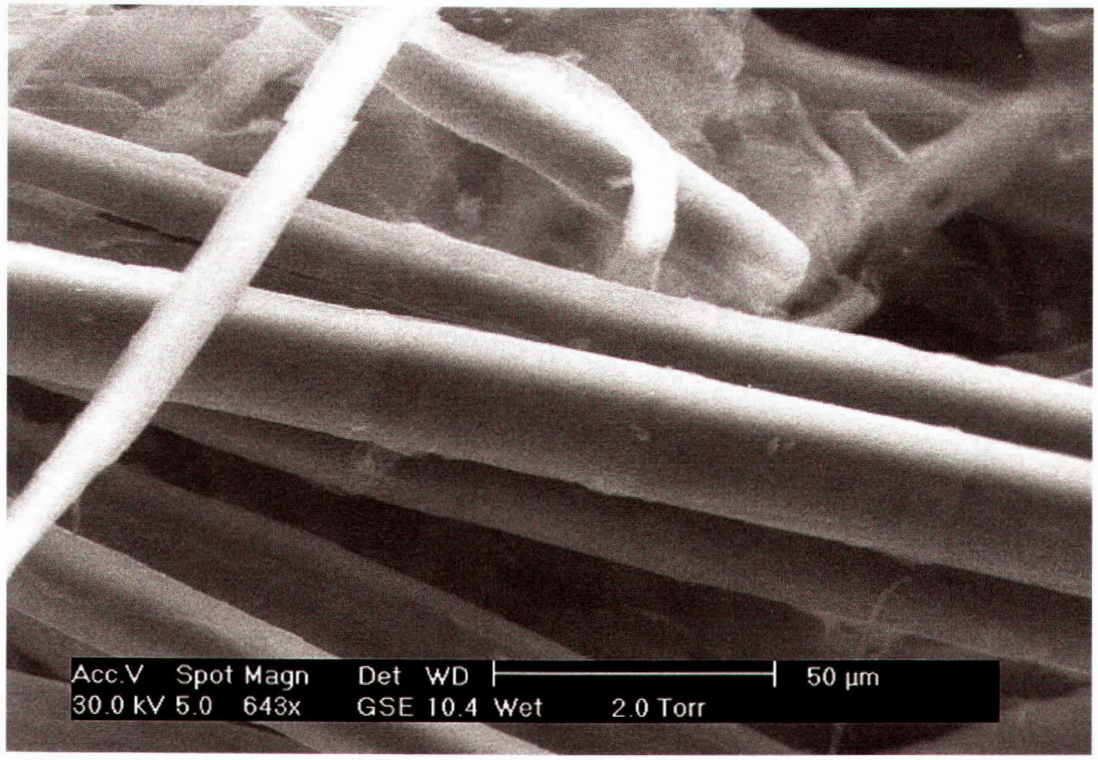

Fig.1 New linen. Magnification using ESEM X-L30 at UTS, Sydney, August 4, 2000.

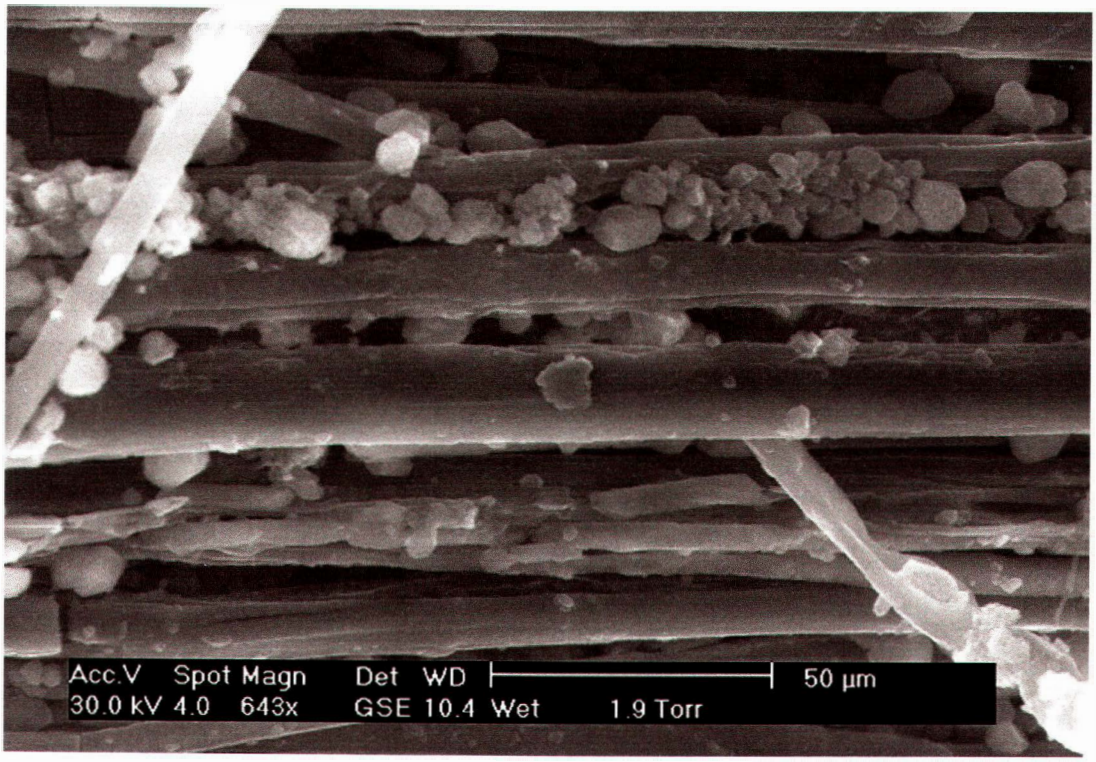

Fig.2 New linen, washed in natural Natron. Magnification using ESEM X-L30 at UTS, Sydney, August 4, 2000, showing crystals of carbonates and salts.

the fibre upon rapid drying. Furthermore, using ESEM coupled with EDXA it would also be possible to demonstrate exactly what salts were removed by conventional textile conservation treatments, and what salts remained within the fibre, as EDXA could identify metal salts and any other inorganic crystalline material present in the fibres before, during and after conservation treatment.

The use of ESEM in the present study has enabled the acquisition of a detailed and interesting record of the dynamics of salts within ancient textiles during hydration and dehydration. A preliminary report on the use of ESEM for the examination of ancient textiles is presented in this paper.

Methodology

The instrument used for analysis was a Phillips ESEM XL 30 equipped with an EDAX light element energy dispersive X-ray detector and DX4 X-ray analyser. A Peltier cold stage was used for the dynamic hydration and dehydration experiments.

The ESEM operates at a pressure of 1-20 torr, or near normal atmosphere, in the sample chamber, as compared with a conventional SEM which must operate at considerably higher vacuum (< 0.00001 torr). For this study distilled water vapour was used in the chamber, but other low atmosphere gases may be used. These low atmosphere gases prevent charge build-up - the bane of a fibre analysists' life when using a conventional SEM with textiles.

This new technique has considerable potential for textile forensic work, including forensic archaeology, as the samples are examined uncoated, (no sample preparation is necessary). It also has considerable potential for investigation into the processes of bio-deterioration, as processes can both be observed under the microscope, in real time, and also recorded using computer and video equipment.

Examination of Samples

An initial evaluation of the usefulness of the ESEM for this project was done on August 4, 2000 at the Microanalysis Unit, University of Technology, Sydney. Three samples were examined: a 1cm sample of new, untreated, linen yarn (pH 5.0) (Fig.1), a 1cm sample of the same linen which had been soaked in natron from Wadi Natrun, Egypt, unrinsed (pH 10.0) (Fig.2), and a 1 cm sample of yarn from an Egyptian mummy bandage (Figs. 3 and 4). The mummy bandage had been donated for research work, as it was one of several which had been detached from the mummy and could not be reattached. The exact provenance of the mummy was known, as were the nature of the archaeological deposit and the excavation conditions. All samples were examined under low pressure, using water vapour, and then under varying pressures, which caused cycles of wetting and drying to occur in the chamber. The visual results were recorded on a computer file.

Using water vapour in the chamber, and varying the atmosphere, we were able to create high and low humidity conditions at will, thus simulating the 'washing' and 'drying' of samples within the chamber. The sample was saturated with liquid water by lowering the specimen temperature to 4°C and increasing the water vapour pressure to 8 torr, then desiccated by reducing the chamber pressure to 2 torr. In some cases during dehydration we have observed crystals form and grow, breaking through the surface of the fibre (Fig.3). In other cases they form in fissures which were already present in the surface of the fibres, expanding the fissures and causing damage to the fibre surface (Fig.4).

Continuing Investigation of Effectiveness of Conservation Treatments of Salt Affected Textiles

Work is continuing at the University of Technology, Sydney and the University of Western Sydney, Nepean, using the ESEM combined with EDXA and confirmed with Ion Chromatography and X-ray Diffraction Analysis, in order to document clearly (a) the correlation of salts identified from within the textiles and the salts present in the environments from which they were recovered, (b) the effectiveness of conservation treatments for the removal of salts within textiles, and (c) the effects of salt movement on the surface structure of linen textiles, and in particular on the potential for disruption of painted surfaces. This last study (c) is of some relevance to

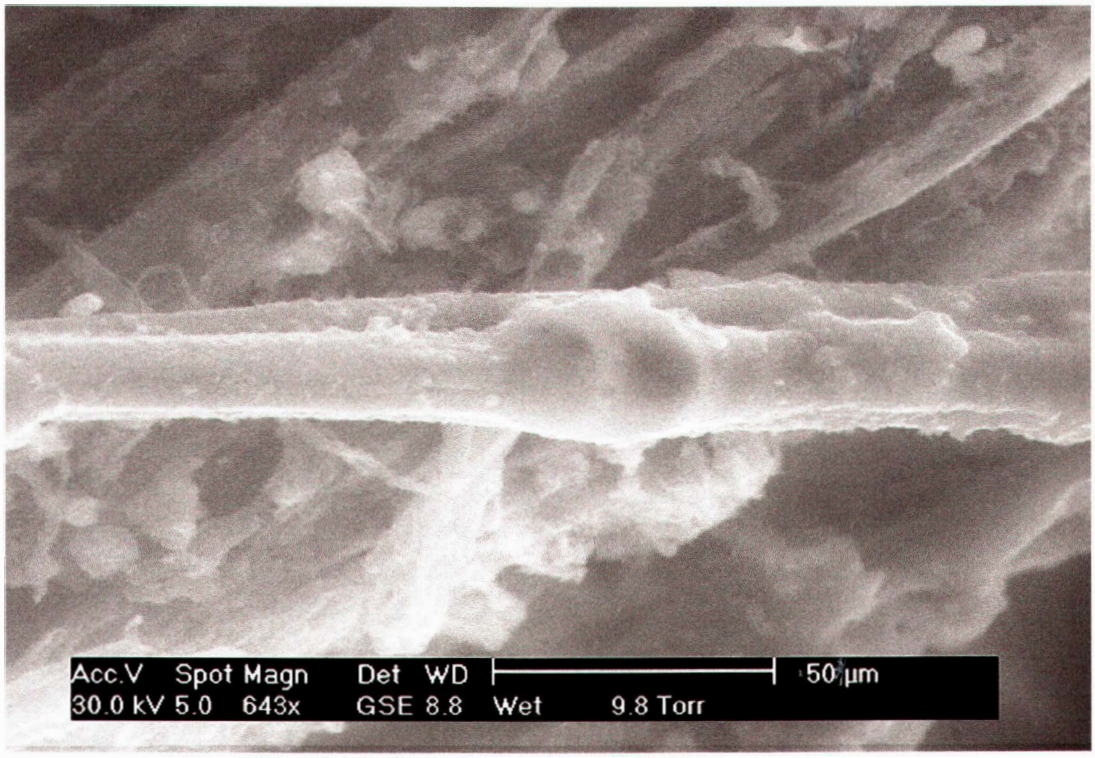

Fig.3 Egyptian mummy bandage, Dynasty 19. Magnification using ESEM X-L30 at UTS Sydney, showing the swelling of a fibre during one hydration and dehydration cycle.

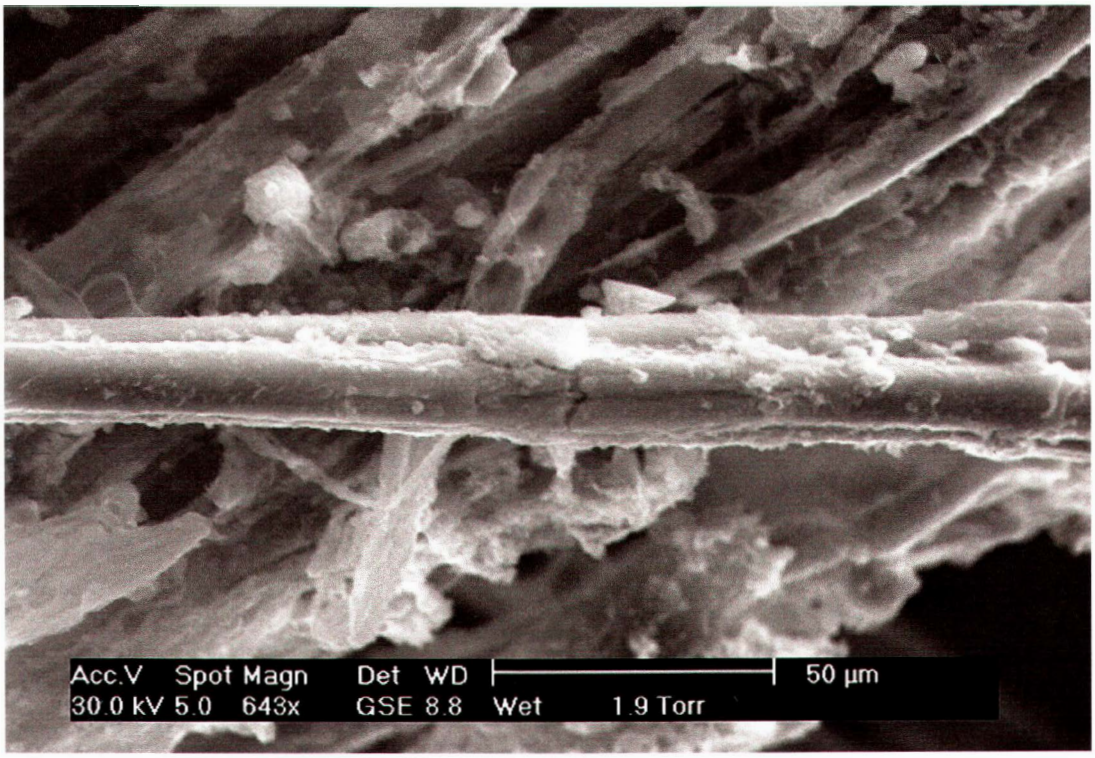

Fig.4 Egyptian mummy bandage, Dynasty 19. Magnification using ESEM X-L30 at UTS, Sydney, showing the same fibre as Fig.3 during dehydration, with the resulting formation of crystals of carbonates and salts, along with cracking of the fibre surface.

art historians, as salt movement might cause the loss of information on painted linen surfaces.

ESEM coupled with EDXA can be used for the determination of salt content of textiles using a very small sample. A section of a single thread, or a small section of a woven fabric, from 0.5cm to 1cm in length will give a good result. As this sample remains uncoated with any conducting material, it can itself be retained and examined again. In the future conservation examination of archaeological textiles can include the chemical testing and/or microscopic examination of fibre structure using a small, representative, sample in order to determine both the presence or absence of metal salts or other inorganic material prior to any conservation treatment. After such an examination the textile conservator, in collaboration with the owner of the textile, the curator of the collection or the archaeological director, will then be able to make an informed decision regarding the advisability of treatment and/or the provision of suitable storage conditions.

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Nineteenth-century Cashmere History repeated with Pashmina at the End of the Twentieth Century

Even the most casual observer of fashion cannot have failed to notice the amazing pashmina phenomenon during the last few years. Many young women have been lured into paying several hundred pounds for fine shawls called pashminas. Pashmina is the Indian name for cashmere (Ryder 1993a; 1995), so there has been a clever marketing ploy in which the name was changed and the price quadrupled. And the higher the price of an object the more desirable it becomes. Fashion writers readily fell for the ploy and fuelled the desire to possess a pashmina with the nonsense language with which they fill their columns. Pashminas soon became a 'must have' garment for trendy young women. But apart from being the zenith of luxury, the soft, warm natural pashmina fibre gave one a feeling of well-being.

By autumn 1998 when a large pashmina shawl could cost £500 there was talk of fashion buyers sourcing direct, and a mysterious man who made regular trips to Kashmir. He was selling more cheaply than this direct to girls in the offices of fashion magazines and could supply over 50 colour shades. A pashmina became fashion's 'hottest' accessory which can be worn as a shawl in summer and a scarf in winter. By spring 1999 the mysterious man had been identified as a person who had started importing the shawls as a hobby. The explosion took place during 1997-98 following a chance meeting in New York where the best quality pashminas are still sold at as much as $1000.

By mid-1999 pashminas had become so widespread and available at lower prices that the most fashion-conscious were seeking another novelty. Others saw no decline in demand - a pashmina is an accessory that combines status with a touch of eastern ethnicity. Pashmina was then defined as 70 per cent cashmere and 30 per cent silk, the silk being a new departure that goes well with the well-known softness of cashmere. As with traditional cashmere shawls the finest pashminas are like gauze and will easily pass through a wedding ring.

Manufacturers of Scottish knitwear were not slow to cash-in on the craze. The pashmina story was quoted as being unbelievable - the biggest event in the industry for a long time and with no indication of a decline in demand. What was normally a seasonal accessory was being sold all the year round, giving a welcome boost to business. Pastel shades - pale blue and pink - were popular during the summer. One size was even being bought by men, but my traditional, fawn scarf made of 70 per cent cashmere and 30 per cent fine wool will have to last a lifetime. This Scottish Border product is amazingly warm for its small size. In fact finer fibres trap more air which adds to the natural warmth and comfort of cashmere and wool.

By the end of 1999 an American scientist was brought in to pronounce on the nature of pashmina. He stated (what I already knew) that there is no difference in appearance between cashmere and pashmina under the microscope and showed that they also have the same range of fibre diameter from 14 to 16 microns. Undeterred, one seller of pashminas at £800 claimed that only the finest fibre is used in pashmina shawls. In many instances this may well be true, but whether such a high price is justified is another matter, although these particular shawls were embroidered, which must add value. Others claim that the addition of silk actually cheapens the product so increasing the mark-up price. But fashion writers had the last word pointing out that arguments about the fibre are irrelevant to the fashion-conscious girl who needs a shawl.

Also by the end of 1999 pashmina had lost its snob appeal - the word pashmina had come to mean the shawl and girls were referring to their 'pashminas'. The symbol of beauty, money and power was already losing its status. Pashminas ('the ultimate accessory, timelessly elegant') were now being advertised at realistic prices comparable with cashmere - £99.50 for a large shawl, £89.50 for an ordinary shawl and £39 for a scarf - much to the annoyance of those who had not long before forked out £200 for something that was now found to be no longer exclusive. There were even special offers at £75. In my local paper I saw 'pashminas in various colours' being advertised for £13.50 and so I went to the shop to investigate a possible contravention of the Trade Description Act.

The word pashmina was not used in the shop and I was directed to a rack of scarves only to find that they were made in Italy and labelled 'Cashmania, 100% acrylic'.

This use of a name suggesting something superior is also seen with the hijacking of the word 'fleece', which one instinctively associates with wool, described as '100% polyester'. Matters are made worse when polar fleece microfibre is claimed to have 'green' credentials to make 'eco-clothes' because it is made of recycled plastic - nothing is 'greener' than wool, which is made from recycled grass.

History repeats itself

Much of the above is actually a repeat of what happened with cashmere during the nineteenth century. The name 'cashmere' comes from the old spelling of 'Kashmir', where in the eighteenth century Europeans first encountered the delicate woven shawls although at first it was not known where the fibre came from. The fibre was called *pashm shul* ('shawl wool') and the animals 'shawl goats' so even our word 'shawl' is of Asiatic origin. *Pashm* is the Persian word for wool and, as we have seen, pashmina is the name given to cashmere fibre in the Indian sub-continent.

At first European royalty wore imported cashmere shawls and then the ladies of the English aristocracy did so. As the shawls filtered down the social strata demand exceeded supply and they began to be made in Britain with imported cashmere fibre. The main centre of production was Paisley in Scotland and the shawls came to be known as Paisley shawls. One of the largest collections of these shawls in the world is to be found in Paisley Museum and I measured the fibre diameter in 55 yarns from all the shawls in that museum plus others from the Victoria and Albert Museum, London. The shawls ranged in date from 1650 to 1850 and the mean fibre diameters from 12.0 to 19.2 microns. The overall mean fibre diameter was 14.8 microns, which is not very different from the mean of 15.5 microns sought in individual batches by present-day manufacturers of cashmere knitwear. Eventually shawls were made for the masses in cotton with the pattern printed on. In the late nineteenth century it was common for a girl to be married in one of these. If you ask anybody to name the 'bent tear-drop' found on the shawls they will invariably reply 'Paisley', so well known has the Paisley pattern become. But in fact this is an ancient Asiatic pattern, the Indian name for which is *bhoti (boteh)*, and this is found in carpets and textiles from the Indian sub-continent and through the Middle East.

Shah-tus mystery

In a parallel story it is alleged that the finest shawls threaten the existence of a rare antelope. Turner (1998) claimed that the fine textile fibre Shahtoosh (usually spelled *shah-tus*) used to make the finest cashmere shawls originates solely as the underwool of an endangered Tibetan antelope the chiru (*Pantholops hodgsoni*). The author stated that in Kashmir, where the fibre is spun and woven into shawls, the source of the fibre (supposedly the finest animal fibre in the world) has been kept a secret for centuries. The point is that the wild antelope has to be killed in order to obtain the fibre. It was thought that *shah-tus* (which in Persian is said to mean 'king of wools') was the shed underwool of the wild ibex collected during the spring moult and such fibre is used. *Shah-tus* is the modern textile trade name for the wild fibre, which usually has undesirable natural pigment and is coarser than domestic cashmere. The latter is harvested by combing the animals during the moult. Turner illustrates *Shah-tus* shawls seized by the customs in Delhi of a whiteness only expected in highly-bred domestic cashmere.

The underwool of several species is claimed to be the finest in the world e.g. musk ox and vicuna as well as cashmere, but when one measures the fibres they are found to have similar mean diameters. It is extremely difficult to distinguish the different fibres of the Goat-antelope Subfamily under the microscope, so it is not clear how one would distinguish the raw fibre or the finished product by eye. Not only are fibres from different species likely to be mixed together for processing (even unwittingly), but genuine cashmere products might be seized by inexperienced customs officers. Litigation over this question in the West usually involves the adulteration of cashmere fibre with fine (sheeps') wool. In an attempt to protect the chiru, and the livelihoods of 80,000 artisans in the

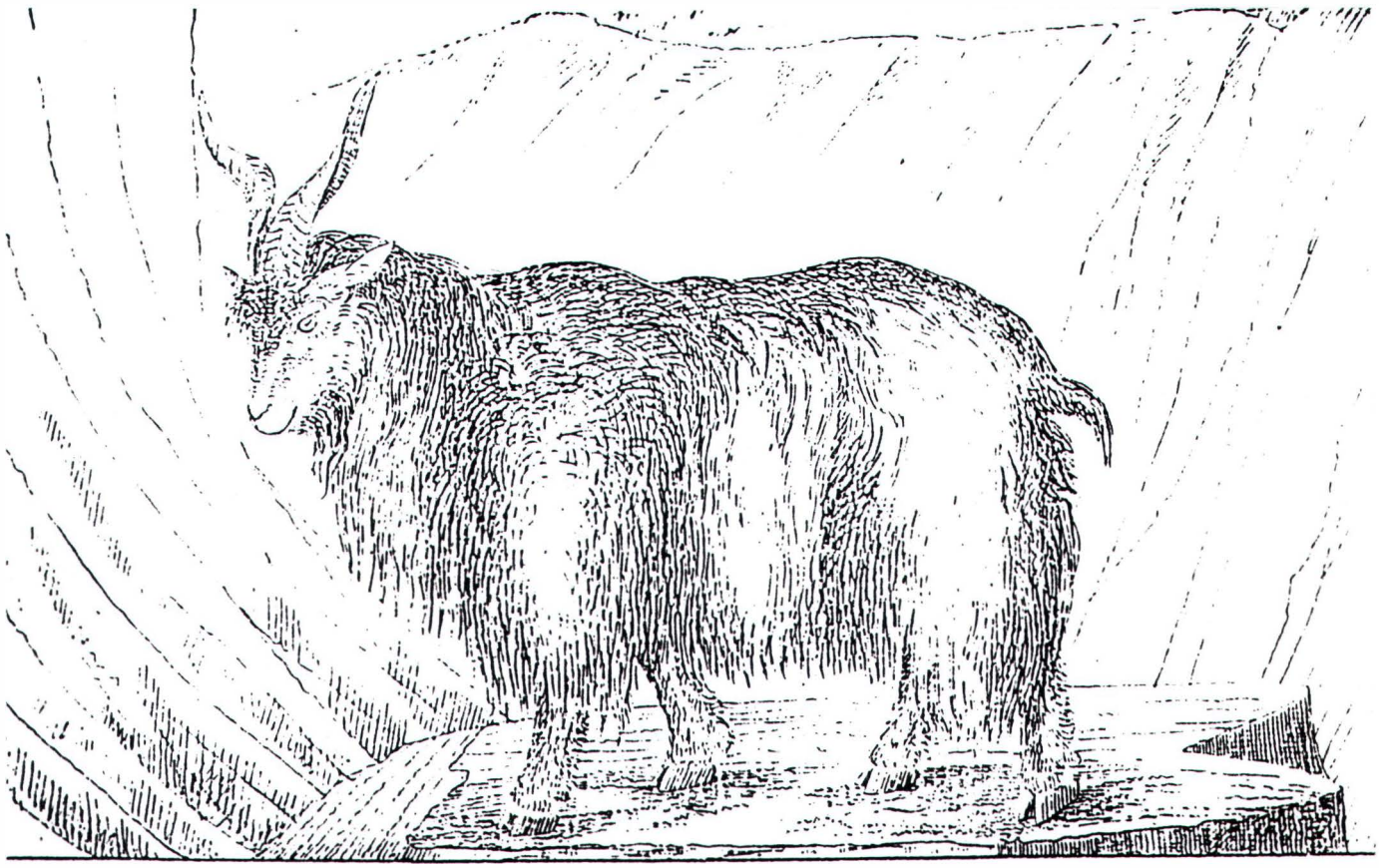

Fig.5 Old print of cashmere goat in the Himalayas (Hodgson 1847)

Kashmir shawl industry, the Wildlife Protection Society of India is offering for sale shahmina shawls made from the fibre of domestic cashmere goats. These are of the same weight and texture, but are only half the price of the illegal ones.

Since Turner's report appeared to be based on anecdote, with no scientific references, I challenged the author in print to produce some (Ryder, 1998). It would have been useful to have had some fibre measurements. Having for many years researched animal fibres and in particular the origin of cashmere goats (e.g. Ryder, 1993b) I doubted whether the situation is as clear cut as he implies. Also, I have never seen a *shah-tus* shawl on sale and never met anybody who has even heard of one. It seems that the main market is the USA. Turner did send me photomicrographs of fibres from a shawl prepared by the US Wildlife Forensic Laboratory. These did indeed show antelope hairs and not goat hairs among the fine fibres, but this only added to the mystery: there should not be single hair in best quality cashmere yet *shah-tus* is supposed to be best quality. It was as if the hairs had been added to prove that it was *shah-tus* and not ordinary cashmere.

The situation has since been widely reported in the press and has been twisted from a conservation issue to one of cruelty since several antelopes have to be killed to provide the fibre for one shawl. Undyed shawls have the expected natural grey-brown colour. Apparently the biggest offenders are New York socialites who have paid up to $7000 for a *shah-tus* shawl. The American authorities have become so tough on the sale of these illegal shawls that women who possess one have been ordered to hand them in. Their sale is punishable by five years in prison or a fine of up to $250,000.

In Britain, the shawls are sold 'under the counter' and although it is illegal to sell

them (penalty two years in prison or a fine of up to £5000) it is not illegal to possess one. The last word appeared in a leading article in *The Times* for October 5th 1999 in which *inter alia* it was stated that whereas prohibition usually stimulates the rich to disobey, the climate of opinion regarding animals today means that aspiring fashion leaders would soon become pariahs.

Post-Script

After 50 years of researching animal fibres I recently made my first visit to India and learnt some new angles on pashmina and *shah-tus*. First, instead of a single quality of cashmere or pashmina shawls we see in the West a specialist shop in Delhi had a range of qualities. The fibre is selectively sorted for various uses and the weaves also ranged from fine to moderately coarse. In addition to the expected fibre from the Himalayan pashmina goat, there was underwool from ordinary goats and from mountain goats and other examples containing many (white) outer hairs, which are thought to be undesirable in the West - all described as pashmina. The finest fibre was named as *shah-tus* and I was told (as I thought) that this was collected as shed fibre from wild animals (which could include wild goats such as the ibex) and that it is now illegal to sell shawls made of this fibre because antelopes (including the young for even finer fibre) are now shot to obtain it. My interpretation of the shooting story is that, far from the source of the fibre being a secret kept for centuries, it is a recent phenomenon in which Tibetan poachers discovered that the supply of fibre obtained from dead animals could be lucrative. I actually met a woman who possessed a *shah-tus* shawl - characteristically dyed black, with no tassels and not completely devoid of hair. *Shah-tus* shawls are said to be so fine that they will pass through a wedding ring, although this claim is made for all pashmina/cashmere shawls and even similar items made from fine, Shetland wool. I did not see any of the shahmina shawls mentioned above.

I also gained new insight into the processing. Before weaving, the yarns are soaked in a rice-based solution (equivalent to sizing) to give strength, but it is not clear whether this applies only to the warp. An extra shuttle is used for the pile yarns, which are put in after every five wefts and lifted out with a bamboo needle. This must refer to a particular weave, because a pile is not a standard feature of the shawls. After weaving, the cloth is washed in *reetha* (soap nut) solution and the surface brushed with a needle before being finished by rubbing with a black mountain stone.

Surprisingly, when I asked the name of what I call the 'bent tear-drop' design the reply was what one gets in the West: 'Paisley' and not the Indian name *boteh*, although the pattern actually originated in Persia. How odd that a pattern that went to Britain from India during the nineteenth century has gone back with a British (or rather Scottish) name.

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A Piled Cotton Blanket in the Museum für Byzantinische Kunst, Berlin

Among the entries of the recently published catalogue of textiles from Egypt in the Skulpturensammlung und Museum für Byzantinische Kunst, Berlin there is a small blanket (Fig.6) of nearly 90 cm height and 65.5cm width (Fluck, Linscheid & Merz 2000, 222-223, no.154, acc. no. 9914). It was bought in Egypt by C. M. von Kaufmann for the Egyptian Museum, Berlin in 1893 and has belonged to the Museum für Byzantinische Kunst since 1934. The blanket is well worth a closer view, because it combines a number of interesting features.

First of all, the very good preservation is astonishing. Apart from a brownish discolouration of the surface due to its age and burial in the soil, a few browny spots and missing fringes, there are no traces of damage.

The ground weave is woven in weft-faced tabby. Undyed cotton is used in warp and weft. Warp fringes emerge from the top and bottom rows of the fabric. Weft-looping of also undyed cotton occurs in every fourth row. The pattern which covers nearly the whole surface of the cloth is created by the structure of the narrow loops. An upright rectangular zone of three squares on top of each other makes up the centre of the pattern (Fig.7). The square at the top shows an eagle with his head facing left and spread out wings between two columns crowned by half impost capitals. The middle square is divided into four smaller rectangles which are filled with alternating rosettes and baskets of fruits. In the square at the bottom a large stylized motif can be recognized, possibly a large basket of fruits or an amphora. Or is it a stunted version of a gabled aedicula with acroteria?

The whole central area is surrounded by a multizoned frame with ornamental decoration: at the inner band a meander, then a band of champignon- and arrow-shaped motifs, followed by baskets of fruits in rectangles as well as alternating lozenges and squares with dots in the middle on the outer band.

Blankets of this kind do not seem to be very common. The technique of weft-looping in linen fabrics has been known in Egypt since pharaonic times. It apparently occurred for the first time in the 11th Dynasty under Metuhotep II (Barber 1991, 149-151). In one of the pharaonic specimens the loops create a pattern like in the later textile described above (Barber 1991, 150, fig.5:3). Up to now I only know of two more comparable pieces with similar technical and iconographical features; one also consists of undyed cotton and partly of coloured wool, the other is said to be made of linen and coloured wool. They both appear in a good condition, too. One of them belongs to the Museum für Byzantinische Kunst as well (*Ägypten - Schätze aus dem Wüstensand* 1996, 306, no. 347, acc. no. 6814), the other to the Louvre, Paris (Calament-Demerger 1998, 137, no. 175, acc. no. E29321). All three of them seem not to be earlier than Roman, nevertheless I have no concrete idea about their date. The symbolic character of the representations can not be denied. Therefore, I suppose that they belong to an extraordinary group of cloths, which might have been woven for a special purpose. Their ornamentation and the emphasis of the centre by symbols of eternity and everlasting fortune remind me of several late-antique and early Christian tombstones from Egypt (eg *Ägypten - Schätze aus dem Wüstensand* 1996, 128, no. 83). Did these blankets only occur in a sepulchral context, as the one decorated with peacocks in the Louvre quoted above which was found by A Gayet in the grave of the 'Dame byzantine'? Could they have at least served as a substitute for tombstones? Are they restricted to a special locality and period? Is there a connection between them and the type of similar sized sheets with brocaded ornaments of the Abbasid and early Fatimid period, whose function also is unclear up to now (eg De Moor 1993, 266-267, cat. 150-151)? Or have they simply been used as decorative cushions or cushion covers like some piled textiles of pharaonic times and a row of small late-antique linen sheets with purple-coloured and symmetrically arranged motifs in tapestry, which were folded in the middle to wrap the cushion (eg De Moor 1993, 115-117, cat. 24-26)?

However, to be able to draw final conclusions on the questions of function, iconography and dating, we need more comparisons, and further researches will be

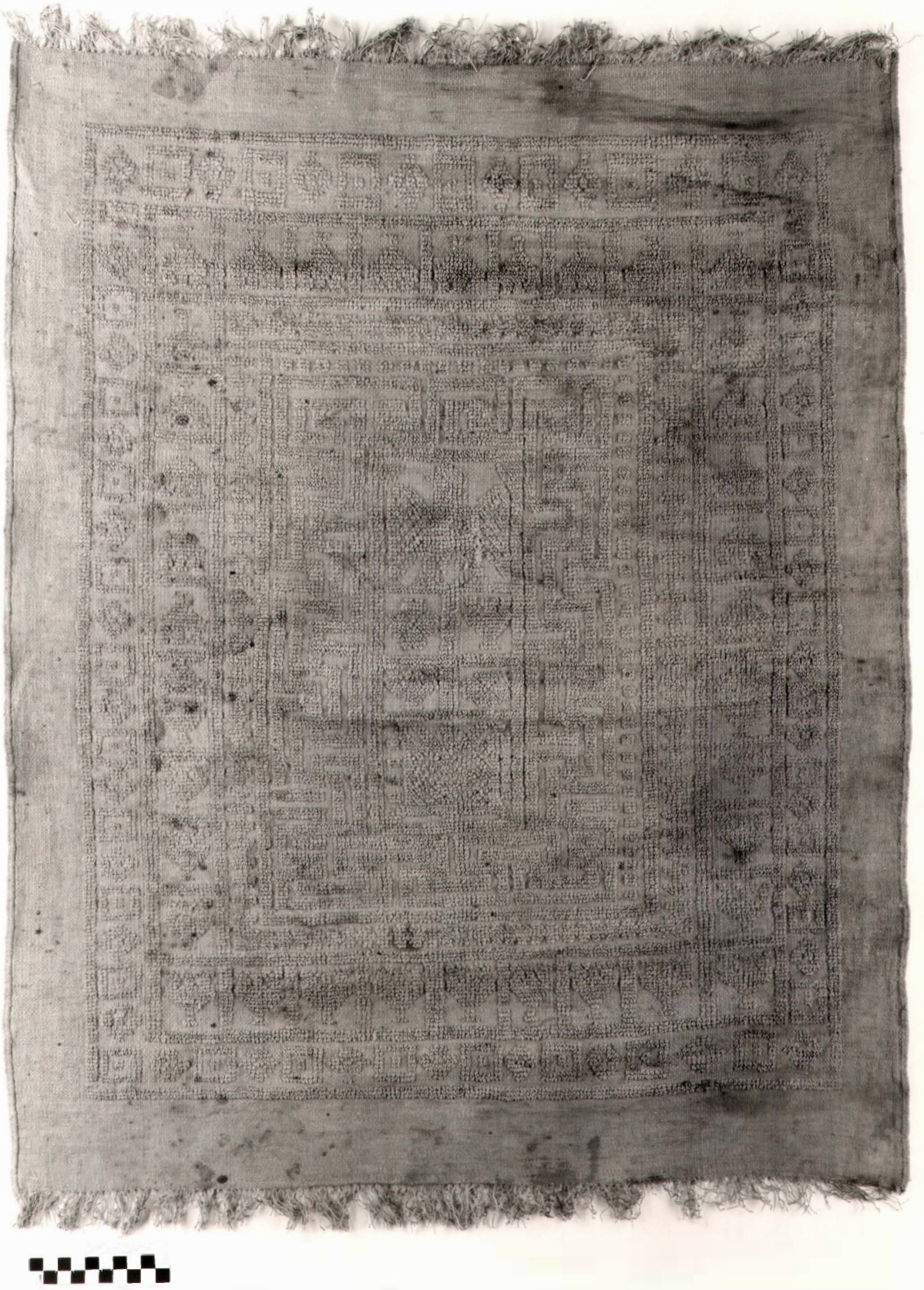

Fig.6 Piled blanket, Museum für Byzantinische Kunst, acc-no.9914 (copyright: Skulpturensammlung und Museum für Byzantinische Kunst, Berlin)

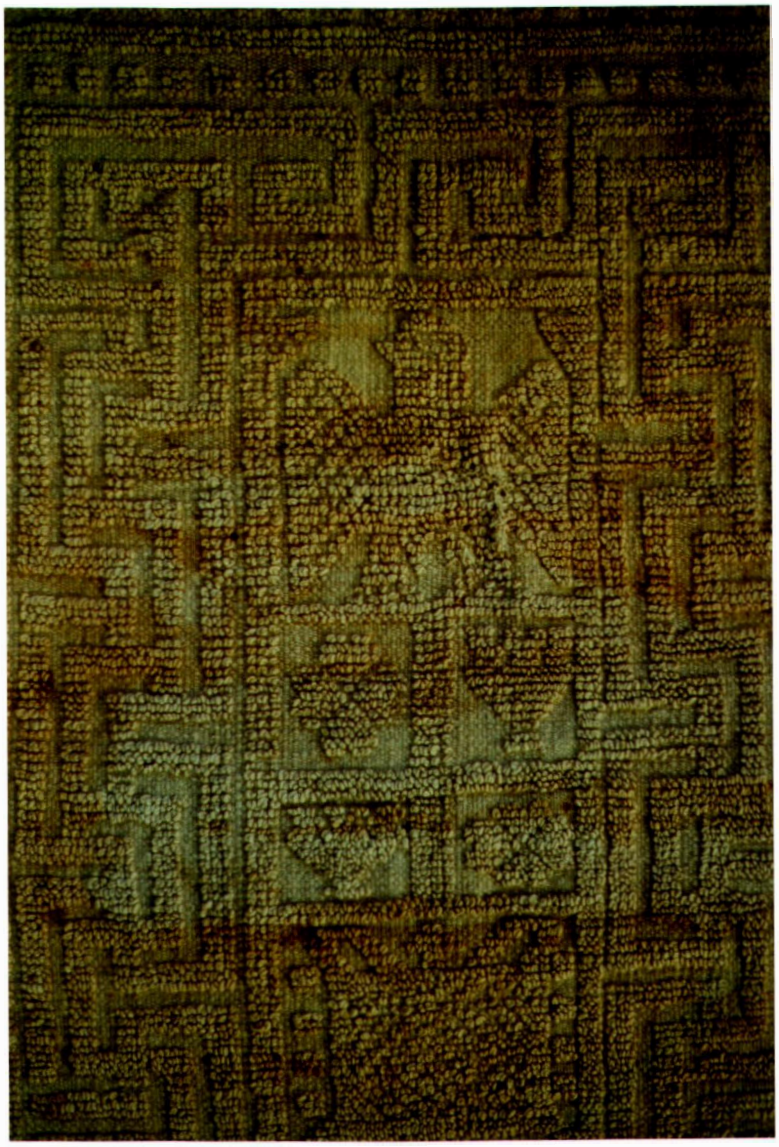

Fig. 7 Detail of piled blanket (copyright: Cäcilia Fluck)

necessary. A dye and mordant and a radiocarbon analysis of the Berlin pieces are scheduled for the near future. This will of course not be efficient enough for a final dating, but it is a first step in the right direction. There is good reason to do so with a restricted number of textiles of the same kind, as a recent study demonstrates. It was initiated by A. De Moor and the results were reported by him during the 7th International Congress of Coptic Studies in Leiden, 27.08 - 02.09.2000. The radiocarbon analysis of samples taken from not more than a dozen tunics with corresponding decoration showed on the one hand that they belong to the same period, and on the other hand that they are of much earlier date than has been expected till now.

I wonder if anybody knows of further published or unpublished references to this sort of piled blanket that I am not acquainted with. I would be very grateful for any information on this subject.

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Textile Casts in Corroded 16th Century Lead Cloth Seals from Fountains Abbey, North Yorkshire

Lead cloth seals 'were as familiar to anyone purchasing cloth in the markets of the Tudor and Stuart era as today's date stamps on food stuffs are to latter-day shoppers' (Egan 1994, 4), and many examples survive from archaeological sites across Britain and abroad (Fig.8). In Britain cloth seals were used from the late 14th century until they went out of use in the 19th century. They had several functions, firstly as a means to identify the makers and weavers of the cloth, to limit theft, for taxation purposes and the regulations of quality control (Egan 1994, 1). One piece of cloth could have half a dozen seals attached to it by the time it arrived at the market. The seals usually consist of twin discs linked by connecting strips, which were attached to the cloth by folding around the textile edge and then held in place by an integral rivet (Fig.9).

Excavations in the nineteenth century at Fountains Abbey (Walbran 1862; 1876) produced ten cloth seals. Recent research into the lead artefacts from the site has examined these seals (Frith 1999), which have stamped designs of varying quality and completeness. Most of the designs were identified as coming from Valenciennes or possibly Brugge (see Table 1), and date to the 16th century (pers. comm. Geoff Egan, 1.9.99).

Careful examination of the internal surfaces of six seals revealed visible casts of woven cloth in the corrosion products. These can be seen with the naked eye. However, to identify the weave structure examination by low-power reflected light microscopy is required. The mechanism for the formation of these casts is fairly well understood. The seal in use would have been covered by a thin coating of lead oxide, but on burial more extensive corrosion products would have formed and been deposited around the object. These would partially encapsulate the cloth. The concentration of lead ions would not be sufficient to prevent biodeterioration of the textile fibres, so, provided that the lead corrosion had formed prior to the rotting of the textile, a negative cast or impression would be preserved on the artefact.

The two best preserved examples showed clear woven structures, probably a twill weave. The fabric impression on the first seal (EH - 671472.1) (Fig.10) was probably a 2-over-2 twill weave with a count of 20 threads per cm in one direction and 22 in the other. The yarns were single, unplied, loose S-spun with a diameter between 0.5 and 1 mm. It was not possible to identify the warp and weft. Analysis of the other seal (EH - 671477) (Fig.11) showed it was also probably a 2-over-2 twill weave. One direction, probably the warp, was Z-spun single yarn, with approximately 14 threads per cm. The other direction, probably the weft, was loose S-spun, approximately 18 threads. The yarn measured approximately 0.5 to 1mm in diameter.

The yarns and weave characteristics are consistent with woollen cloth. The clearly visible yarn structure indicates that the fabric had not been heavily fulled, and the nap not raised.

Fabric analysis of cloth seals has the potential to help in understanding the economic activities of the Cistercians at sites such as Fountains Abbey, particularly their wool import and export trade. While in general cloth seals themselves have received attention, there has, outside London, been little systematic study of fabric casts in the corrosion products. There is clearly the

Fig.8 Folded cloth seal from Fountains Abbey showing lion rampant, EH-671475 (Photograph: R. Smith)

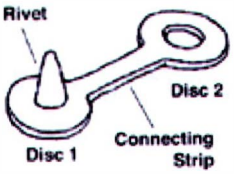

Fig.9 Cloth seal diagram (Egan 1994)

Fig.10 Video-micrograph of the woven structure, EH - 671472.1 (R.C.Janaway, University of Bradford)

need for a wider survey of lead seals for this type of evidence.

Acknowledgements

Fountains Abbey is owned and managed by The National Trust. The Abbey is maintained and the artefacts curated by English Heritage.

We are indebted to Geoff Egan of the Museum of London Specialist Services and Andrew Morrison, English Heritage Regional Curator.

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Fig.11 Video-micrograph of the woven structure, EH - 671477 (R.C.Janaway, University of Bradford)

English Heritage accession number	Stamped design evidence for origin of cloth seal	Textile casts	Textile cast evidence on internal surfaces
671472.1	Faint stamp, probably from Valenciennes*	Yes	Clear woven structure, probably a 2 over 2 twill weave, yarn 1/2 -1 mm in diameter, single ply S-spun in both directions
671473	Probably Low Countries*	Yes	Detail of weave unclear
671474	Lion rampant stamp, half of 671481*	Yes	Remnants of a woven structure although not clear enough for identification
671475	Lion rampant stamp*	No	Folded so limited access, although what is visible appears not to have textile casts
671476	Stamped 'VALENC...' –Valenciennes*	Yes	Evidence of woven structure although not clear enough for identification
671477	Stamped with swan or eagle design, probably from Valenciennes*	Yes	2 over 2 twill weave, Z-S spun, single ply, approximately 14 threads per cm
671478	Stamped lettering, probably from Lille or Brugge*	Yes	Larger cloth seal, evidence of woven structure although not clear enough for identification
671479	Stamp unclear, half of 671482*	No	No textile cast evidence
671480	Faint stamp, not identifiable*	Yes	Evidence of woven structure although not clear enough for identification
671481	Faint stamp, not identifiable, half of 671474*	Yes	Woven structure, S-spun in one direction, 1/2 -1 mm approximate diameter, too degraded for yarn count
671482	Lion rampant stamp, half of 671479, probably from the Low Countries *	No	No textile cast evidence
671484	Probably Valenciennes*	Yes	Evidence of woven structure, probably wool, spun direction of yarn in at least one direction is S-spun

Table 1 Table of cloth seals (G. Egan, pers. comm. 1.9.99)*

Reports

Early Byzantine Textiles from Amorium, Anatolia

Amorium in Central Anatolia, 180 km southwest of Ankara, was a major Byzantine site and the capital of the Byzantine province Anatolikon. Excavations have been carried out since 1988 with the principal aim of investigating the nature of occupation in the city from the Late Roman to the Seljuk period (Harrison, Lightfoot et al. 1988–1999). During the 1993 and 1996 seasons a total of 12 textile samples were recovered from massive destruction layers in the area of the Byzantine Lower City walls. All the evidence suggests that the destruction occurred in AD 838 when the town was besieged by the Arabs.

The textile finds consist of numerous small or minute fragments, measuring max. 2cm x 8cm. Owing to a fire during the destruction, the fibres are highly carbonized and thus not suitable for optical analysis. In testing the pH-concentration of the fibres of some items, it appeared that most were of animal origin and only a few of vegetable origin. A more precise fibre analysis will be carried out soon, based on a cleaning of the fibre samples.

Among the finds 21 different fabrics could be distinguished. With just one exception, all the fibres were spun in the Z-direction. S-spun fibres were used only in a Z-plied, thin cord. Three different weaves were recorded: 11 examples of tabby weave, 4 of half-basket weave and 1 twill weave. Most of the tabby weaves are faced due to a higher thread count in one thread system. In just one of these examples the warp and weft directions are determinable, revealing that the weave is weft-faced. Three of the faced tabbies are of very fine texture. Two

tabbies in a balanced weave are more coarse.

All the examples of half-basket weave consist of paired threads in the warp and single threads in the weft. The structure is always weft-faced owing to the higher proportion of weft threads. Thread diameters and thread counts indicate a fine texture.

The twill is woven 2:1 in Z-direction. It is weft-faced with very fine threads and high thread densities. Eventually another twill fabric might be identified in the course of the research.

The selvedges preserved on all the textiles in half-basket weave and on one of the tabby weaves are plain. Moreover, one fragment in half-basket weave preserves its starting or finishing border, where the warp-ends were braided into fringes. Two textiles are hemmed: one of the faced tabby weaves has a hemmed edge, while on the twill fragment two opposite edges are hemmed to form a band 1cm wide.

If and how the textiles were decorated, is still an open question. On one of the coarser, balanced tabbies, a curved line of twining or embroidery was observed. Further study is required before one can tell whether this is a decorative or a constructional feature. In addition, traces on the same fragment of what might be brocading will be analyzed more thoroughly.

Five examples of non-woven techniques were recorded: two loose three strand braids, similar to the example of braided fringe, and three twisted cords.

The uses of most of the textiles cannot be determined. The only fragment that has preserved traces of shaping is the band in twill weave, which is 1cm wide and at least 10cm long. Regarding the double folded hems, the band was presumably cut to shape, maybe from a worn-out cloth. The twill weave and the fineness of the texture suggest that this cloth had once been a garment. Maybe the band was still used for some kind of clothing, since the hems are most carefully stitched.

Very few textiles are as yet known from Early Byzantine Anatolia, and so the Amorium textiles help to fill a major gap in our knowledge of ancient textiles. The secure dating of the material to the first half of the 9th century makes it even more valuable.

Of great interest is the spin direction: while in the Early Islamic Near East the S-spin is predominant (Mackie 1989, 81), the textiles in Amorium are Z-spun. The same difference was noted by E.J.B. Barber refering to Anatolian textiles from prehistoric periods. Barber presumed the reason to be a different textile tradition between the Near East and Egypt on the one hand and central and western parts of Anatolia and Europe on the other hand (Barber 1991, 65). The textiles found at Amorium may support this theory. Last but not least, the Amorium textiles may cast some new light on the question of textile imports: if Early Byzantine Anatolia has a Z-spinning tradition like Europe or Persia, the origin of some textiles from Z-spun fibres found in the Near East and in Egypt must be reconsidered.

The study on the Amorium textiles is still 'research in progress', and further work is required, especially on the fibre identification. A full account of this important group of material will be published by the author in the forthcoming interim excavation report. The author is grateful to the Amorium Excavations Project and its Director, Chris Lightfoot, for providing the opportunity to study the finds at Amorium.

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The Textiles, Basketry and Cordage from Qarantal – Cave 38: the First Medieval Assemblage Discovered in Palestine

In the course of excavations conducted in 1993 at Cave 38 in the Qarantal cliff, east of Jericho, on behalf of the Israel Antiquities Authority and the Civil Administration in Judea and Samaria Staff Office of Archaeology under the direction of E. Ahronstein, 768 textile, 34 basketry and 93 cordage fragments were discovered.

Preserved by the arid climate of the Judean Desert, the perishables of Cave 38 display a remarkable variety of materials and techniques suggesting their diverse geographical origins. Most significant are the silk fragments made in various techniques, some of them requiring sophisticated looms, and a large group of textiles with S-spun linen warps and Z-spun cotton wefts which is unique to the site; only a few such textiles have been reported from any other source. This assemblage is the first, and for the moment the only large group of medieval textiles discovered in Palestine, except those from burials of the ninth century CE at Kasr al-Yahud (Janaway and Shamir, in preparation). The date of the material, 9th – 13th century CE, provided by its archaeological context (ceramics and coins) has been confirmed by carbon 14 analysis (carried out by I. Carmi and D. Segal, the Weizman Institure of Science and Israel Antiquities Authority, Rehovot).

In the light of the artifacts found in the cave it can be assumed that it was used as a refuge for people who escaped from Jerusalem or nearby areas during the unrest due to the frequent fighting between the local population and the various conquerors who invaded the area in this period.

The cave consists of several connected spaces on three planes. Most areas of the cave were used for living. Area F, where most of the textiles were found, served for the storage of used textile fragments. In the living areas of the cave, one Roman and some Ottoman textile fragments (the same as in the storage area) were found, although most fragments were of the medieval period.

The textiles are fragmentary, torn, cut, patched and reused, sometimes more than once. Many are composed of several different textiles or of several pieces of the same materials stitched together. Some of the reused textiles are of high quality materials and design used only by the wealthy classes of the population. It can be assumed that most of these fragments were parts of clothing (e.g. trousers, tunics, coifs), although no complete garments were found. Many textiles were cut into strips, rectangles and triangles and their use could not be determined; others could be recognized as bags, wrappers and strips for tying; one was tied around a lump of asphalt, which was probably used for medical purposes.

Some fragments are stained (with substances that could not be removed by the usual method of cleaning), some were partly burnt. The colours were often faded.

The two largest groups of textiles are made of cotton and linen, and are almost equal in number. 289 out of 768 are made of cotton. Most of them are Z-spun in the warp and weft. All cotton fragments are woven in various forms of tabby. 199 are undyed; three are undyed with blue checks; one blue fragment has a one cm wide cream band, and one undyed fragment has selfbands.

The second large group, 265 out of 768, is made of linen. Most of them are tabbies. Three have supplementary wefts, others are decorated with cotton stripes, bands, brocading and silk tapestry bands with patterns of birds, scrolls and unrecognizable devices in cartouches. Many such textiles, originating from Egypt, with or without tiraz inscriptions, have been published. Most of them are in museums and were acquired from dealers and collectors (Salim 1995, 21–27). 11 such textiles were reported from the Fustat excavation (Mackie 1989, 84), attributed to the tenth–eleventh centuries.

A third group of 133 fragments, which is about half the size of the first two, has linen yarns in the warp and cotton yarns in the weft. This phenomenon is not known in such a quantity from any other site in the region nor in other medieval textile finds. In most fragments the linen is S-spun and the cotton Z-spun. The linen fibres are longer, stronger and smoother than the cotton ones, so they were used for the warp, while the softer and more elastic cotton fibres were

used for the weft. As both materials were available to the local weavers, they tended to use both of them in the same fabric in order to produce a soft but strong weave.

In contrast to other sites in the region, where only a small number of pure silk fragments was found, there are 38 fragments of 100% silk, but only one mulham, while on Jesiret Fara'un a large group of mulham was discovered (Baginski, Shamir 1998). Most silk fragments have Z-spun yarns in the warp and unspun and unreeled yarns in the weft. The silk fragments are woven in various techniques. Three fragments are weft-patterned tabby weaves (Granger-Taylor 1989); three are double faced compound tabbies, five are weft-faced compound twills, and ten are lampas weaves. Sometimes several silk fragments were sewn to each other or to other fabrics. They are cream, gold and various shades of blue. Most tabbies are monochrome ivory or gold; one is brown. Two have blue geometric printed decoration on undyed ground; three are brocaded cream or gold, one has weft floats. One 3:1 twill was used as a lining for a compound silk; a red extended tabby has golden 3:2 twill bands. One small silk fragment is a red and gold soumak. Eighteen silk fragments are woven in compound weaves. One of them is monochrome, the others have coloured patterns, blue, green, red and brown on undyed ground or vice versa. Some of these fragments have two warps, a coloured and an undyed one. Some of them have (hidden) brown binding warps. These are luxury fabrics woven on sophisticated looms with a technical apparatus for mechnical patterning. The silk fragments from Cave 38 were all reused, sometimes more than once, as patches or decoration sewn onto other textiles.

A relation between design and technique in the compound silk fragments can be observed. The weft-faced compound twills are mostly monochrome without patterns or motifs, or their motifs are unrecognizable. The compound tabbies and lampases are mostly bicolored and their motifs recognizable. They feature remains of Arabic inscriptions or pseudoinscriptions, bands with stylized vegetation, birds, animals, heart-shaped and geometric devices. They resemble the textiles found in Ray, Persia (King 1987).

There are relatively few wool fragments: only 25 out of 768 pieces. One is made of unspun long wool (?) fibres dyed red and blue; one is a fragment of a carpet with a coloured pile. Only three fragments which are made of goat-hair were found in the cave; all of them are undyed.

The textiles are of various origins. It can be assumed that some of the cotton fragments were woven in Palestine or Lebanon since cotton was cultivated there at least since the 9th century CE. It can be also assumed that some cotton fragments were imported from the eastern parts of the Middle East, from where cotton was exported through routes crossing Palestine. The few cotton fragments with S-spun warps and Z-spun wefts could have been also locally woven from local, S-spun and imported, Z-spun yarns. No linen was grown in Palestine after the Islamic conquest in the seventh century CE because it was cheaper to import it from Egypt which was now part of the same political unit. The large group of textiles with linen S-spun warps and cotton Z-spun wefts, was probably locally woven from cotton grown in the nearby area and imported linen from Egypt.

The silk fragments were also not local products. Silk was not cultivated in Palestine or in nearby areas. It can be assumed that some fragments were woven in Byzantium or in Syria from Byzantine silk (King 1987, 44-45; Otavski 1995, 137). Others could be of an origin further east such as Mesopotamia or Persia.

The wool and few goat-hair fragments were locally made. Only one, a fragment of a pile carpet, was probably imported from Egypt or Anatolia. This had a geometric pattern, with 15 symmetrical knots per cm^2.

The frequent occurrence of blue dyed coloured fragments indicates local production because indigo was grown in the area for local use as well as for export.

Unique to the site are also the two printed silk fragments and the one made in the soumak technique. Such textiles have not been reported from any other site in the region. Their provenance could not be determined.

In contrast to the large number of textiles,

only a few fragments of basketry and cordage were found. It can be assumed that the people who used the cave were interested in collecting textiles, and that the basketry and cordage were only for their daily use.

Why was such a large quantity of used textiles stored in the cave? Apparently because the people who stored them there were rag collectors or merchants who collected them for the paper industry which became popular in the region from the 9th century, which used linen and cotton as its raw material (Hunter 1978). They carried their goods with them when they escaped to their refuge in the cave.

The full report will be published in *'Atiqot*.

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Reviews

Textile Society of America Biennial Symposium, Santa Fe, New Mexico

The seventh Biennial Symposium of TSA took place in Santa Fe, New Mexico from September 21-23, 2000. The venue was the La Fonda Hotel, where there has been an inn since the sixteenth century. About 270 participants joined in the three day programme of varied papers, site study visits, video sessions and visits to important local museums. Since Santa Fe is a natural centre for the study of Native American textiles and the textile arts of the South West of America, there was an immediate opportunity to learn and participate in the rich resources available locally.

The first session was uniquely blessed by an elder from the nearby San Juan Pueblo, Peter Garcia, Jr, and his five grandchildren who gave an invocation and buffalo dance appropriate to the occasion. After this auspicious start and the opening presentations parallel sessions, panels and museum visits took place. The first session was devoted to a most instructive discussion by Nilda Callanaupa and Pearl Sunrise of their experiences of teaching their indigenous weaving traditions in Quechua (Cusco, Peru) and Navajo communities, and how self-esteem and pride grow with the knowledge of weaving. The keynote address on 'Approaching Life through Textiles' was given by Mary Hunt Kahlenburg on Thursday evening at the Santa Fe Museum of Fine Arts.

In the session on Prehistoric Textiles Mary Elizabeth King, who chaired the session, proposed a challenging agenda of cultural information under which the study of prehistoric fabrics can be undertaken. These are 'Conceptualization, Preparation

and Production, Distribution, Function, Meaning' and 'Aesthetics'. Nettie K. Adams presented the results of three studies on the thousands of textiles she and Elisabeth Crowfoot have analyzed from Qasr-Ibrim, Egypt. Virginia Davis discussed the long tradition of compression resist dyeing of textiles in North and Meso America, and Penelope B. Drooker developed the theme of 'Approaching Textiles through Impressions on Pottery' using evidence from the Mississippian period (ca. 900-1400AD).

As is always the case at good conferences, there were lots of opportunities for stimulating conversations outside the formal events. Many delegates were staying at the La Fonda and breakfasting together so that the discussions started early and continued late. The Conference Dinner was a New Mexican feast with regional specialities, and a symposium lunch featured tables devoted to different textile interests so like-minded souls could seek each other out and exchange views.

Outside the Symposium for many participants there were other highpoints. One of these was a visit to the Neutrogena Textile Collection formed by Lloyd Cotsen at the Museum of International Folk Art. This stunning collection is brilliantly displayed, and in the basement is an ideal 'touchy-feely' section where visitors can explore textiles, and the techniques of textile production. Another treat was to visit the many outstanding textile galleries in Santa Fe that flourish in the picturesque town streets and leafy suburbs.

The co-ordinator of the Symposium, Ann Lane Hedlund, University of Arizona is to be warmly congratulated on the smooth running of this very large gathering, and the imaginative events and outings that complemented the academic programme.

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Focus on Textile Conservation. The Netherlands Institute for Cultural Heritage, Amsterdam, The Netherlands, 13-17 November 2000

A week of meetings and workshop/museum tours dedicated to the conservation of textiles was organised by The Netherlands Institute for Cultural Heritage (ICN), The Dutch Textile Committee (TC), and the Textile Working Group of the ICOM Committee for Conservation (ICOM-CC). The week consisted of:

13 and 14 November: Archaeological Textiles: Conservation and Research
15 November: The Training of Textile Conservators (by invitation only)
16 November: Textile Conservation, Past - Present - Future
15 and 17 November: Tours of Conservation Workshops and Museums

Archaeological Textiles. Conservation and Research (13 and 14 November)

In 1988 the United Kingdom Institute for Conservation (UKIC) organised a one-day meeting on the theme of archaeological textile conservation. There have been many developments in this field since then, especially in the approach to analysis and treatment, and the conflict between preserving the archaeological textile and the information it contains. It was indeed time for another look at the conservation of archaeological textiles.

The first two days of the week were devoted to an interim meeting of the ICOM-CC Textile Working Group. The emphasis of the international meeting focused on the conservation and research of textiles recovered from archaeological contexts. The first day was devoted to the conservation of textiles from a wet burial environment; the second day focused on textiles from a dry archaeological context. The preservation of the integrity of the textile object and its role as a carrier of information was the central theme. There were also contributions that focused on more general topics in textile conservation but that had a relation to the preservation of archaeological textiles. Questions were raised as to what extent the conservation of archaeological textiles differs from that of 'traditional' museum textiles, and whether there is or should be a

difference in approach between a 'wet' and a 'dry' context.

The symposium's participants were welcomed by Rik Vos, Director of The Netherlands Institute for Cultural Heritage, Judith H. Hofenk de Graaff, Chairperson of the Dutch Textile Committee, and Rosalia Varioli-Piazza, Coordinator of the ICOM-CC Textile Working Group. Rosalia Varioli-Piazza (Istituto Centrale del Restauro, Rome) then opened the first session with her paper about Ethics for Archaeological Textile Findings in which she described the project of the controlled opening of the medieval sarcophagus of Federico II, Emperor of the Holy Roman Empire, in Palermo Cathedral. Elizabeth Peacock (Norwegian University of Science and Technology) outlined research carried out in Trondheim into the drying of water-degraded archaeological textiles, including rope. Gunilla Lagnesjö (Studio of the Western Sweden Conservators' Trust, Gothenburg) continued the theme of maritime textile materials with 18th Century Cordage - Network through the Ages in which she described the problems inherent in large masses of water-degraded nets.

Elena Mikolaychuk (State Hermitage Museum, St Petersburg) discussed highly degraded archaeological textile finds - including cotton preserved in permafrost and silk - and problems encountered in removing earlier conservation materials. Helen Taylor (British Museum) described the dismantling of an ancient Egyptian burial assemblage (mummy).

Elizabeth Goodman highlighted the effect the commercialisation of archaeology, with its competitive tendering, has had in restricting the approaches and solutions the conservation of wet archaeological textiles has taken at the Museum of London. Irena Skals (National Museum of Denmark) took the audience through varying attitudes in the handling and display of burial garments with respect to discipline (e.g. anthropology, classical archaeology) and era. Ursula Rothamel (Textil-Restaurierungen, Darmstadt) questioned whether we base our selection of conservation methods for archaeological textiles on scientific grounds or tradition.

The second day was devoted to the conservation of archaeological textiles from 'dry' burial environments. Discussions of the ethics of conservation are very much on the agenda these days, but Marie Berducou (IFROA, Paris) brought the ethics of archaeological conservation down to the decisions one confronts on a daily basis, well illustrated with everyday examples from her work in teaching and excavation. Traditionally the study of archaeological textiles centres on the technical analysis of thread count, weave or colorants used. Bill Cooke (UMIST) presented work that strives to tease more and non-traditional information from archaeological fragments. The scanning electron microscope (SEM) for example, can assist in identifying fibre damage and therefore fabric usage, and in combination with image analysis and statistical software better enables mapping the morphology and identification of fibres and twist of yarns.

The use of image analysis and design software enabled Foekje Boersma (Textile Conservation Centre, Winchester) not only to interpret a group of archaeological carpet rug fragments, but also to a degree of sophistication not possible without computer technology. The re-treatment of a 'Coptic' tapestry cover with pile provided Howard Sutcliffe (American Textile History Museum, Massachusetts) the opportunity to study the use of Alpha-amylase enzymes in removing aged adhesive materials, and in re-characterising the nature of the cover.

Another look at changing attitudes was presented by Sara J. Wolf (Textile Museum, Washington DC). She described the history of the conservation and display of dry-site archaeological textiles at the Textile Museum. One could see the increasingly less interventive approach evolve over time. Finds of everyday objects of more recent date are often highly valued by the local community as witness of their heritage. Alister Lister (Textile Conservation Centre) described the dilemmas such a group of finds of Genizah artefacts from the 20th century found hidden in lofts can create. Illustrated by the conservation of a group of Peruvian Quipus, Lena Bjerregaard (Ethnologisches Museum, Dahlem-Berlin) took up the theme of aiming for a balance between preserving the integrity of the object and preserving the object itself. Lastly, Karin von Leber (Prevart GmbH, Wintertur, Switzerland) emphasised the

importance of every fragment, as illustrated by the reconstruction of two liturgical garments recovered from the Cathedral in Freiburg.

The Training of Textile Conservators (15 November)

During the conference a by-invitation-only workshop was held for teachers from European centres for textile conservation. The aim of the meeting was to investigate the possible means of co-operation in the field of textile conservation training and to discuss the content of training. The results were presented at the meeting 'Textile Conservation, Past - Present - Future' on 16 November.

Tours of Conservation Workshops and Museums (15 and 17 November)

Two days were devoted to tours to textile conservation workshops and museums with important textile collections. The Netherlands being a small, well-connected country enabled tours to be organised to institutions outside Amsterdam. Gemeentemuseum Den Haag, Werkplaats tot Herstel van Antiek Textiel (Haarlem), the Netherlands Textile Museum, (Tilburg), Amsterdam Historical Museum, Rijksmuseum Amsterdam and Paleis het Loo, National Museum (Apeldoorn) were among the tour offers.

Textile Conservation, Past - Present - Future (16 November)

Incorporated into the week was a traditional Dutch Textile Committee 'Textile Day' taking as its theme this year, the profession of textile conservation - the changes from traditional restoration concepts to present-day ideas of conservation and to the development of science-informed conservation methods in the future.

Textile conservation as an activity has a long tradition, but the profession as such is experiencing rapid development. Textile conservation continues to have in the eyes of many museum professionals as well as the general public, the image of the homemaker carefully sewing and washing ancient textiles. Almost all textile objects are part of daily life and the care for these objects has traditionally rested with women. The textile conservation profession has developed from that tradition. As a discipline it has followed the same development as for instance that of the painting conservator - from artisan to conservator trained at academic level.

The papers presented at this meeting mostly were of interest to conservators of 'traditional' museum textiles and conservators in general. Nothing addressed archaeological textiles specifically. Frequently traditional methods have been adopted for the conservation of non-archaeological textiles, and in this regard some of the work presented was of interest. However, as was made evident in the two-day meeting 'Archaeological Textiles. Conservation and Research', archaeological textiles, especially those from a 'wet' context, require a different approach. The past focused on the history of textile conservation and the changing ethical viewpoints. The present focused on the image of the textile conservator in general and on various conservation workshops. The future concentrated on recent developments in cleaning techniques. The individual contributions are not reviewed here, but the titles and presenters are as follows:

Introduction: Judith Tegelaers, Erfgoedhuis Zuid-Holland, Leiden.

Textile Conservation - Past:
'Changing Views in the Ethics of Conservation', Ebeltje Hartkamp-Jonxis, Rijksmuseum Amsterdam.
'History of Textile Conservation', Tuuk Stam, Museum Catharijnecovent, Utrecht.
'The Zealand Tapestries Project. The History of a Restoration Project 1955-2003', René Lugtigheid, Stichting Werkplaats tot Herstel van Antiek Textiel, Haarlem.

Textile Conservation - Present:
'The Image of Textile Conservation', Annette Kipp, The Netherlands Institute for Cultural Heritage.
'Synthetic Adhesives in the Relining of Textiles. Considerations and Decision-making', Emily de Groot, Stichting Werkplaats tot Herstel van Antiek Textiel.
'A Textile Conservator Goes 'Digital''

Textile Conservation - Future
'Wet Cleaning of Textiles, Present and Future', Agnes Timár-Balázsy, Hungarian

National Museum.
'An Initial Investigation into the Cleaning of Historic Textiles Using Laser Radiation: Possibilities and Limits', Howard Sutcliffe, American Textile History Museum, Massachusetts.
'Dense Phase CO2 as a Solvent for Cleaning Textiles', W.A.J.L. den Otter, TNO Industrial Technology-Cleaning Technology, Delft.
'Training of Textile Conservators in Europe'.

The week of meetings and tours presented a balanced and well-organised programme. The two-day archaeological textile conservation meeting was a much-needed review of this important speciality. Postprints of these two days in the form of extended abstracts will be forthcoming. It is unfortunate that these contributions will not appear in full.

Elizabeth E Peacock
Institute of Archaeology
Vitenskapsmuseum
Norwegian University of Science and Technology
NO-7491 Trondheim Norway

Early Textiles Study Group
Manchester (8-10.9.2000)

The ninth biennial conference of ETSG took place once again at Ashburne Hall, on the theme of *Migrating Textiles*. Prof. Anna Muthesius again arranged a stimulating programme with a wide range of visiting speakers. The first three papers were devoted to aspects of Indian textiles at various periods: in the Roman period at Berenike, Egypt (John Peter and Felicity Wild, Manchester), the early textile trade to the Middle East (Rosemary Crill, London) and Indian silk cloths of the 12th century and later (Steven Cohen, London). Other topics covered included Near Eastern silks at Canterbury Cathedral (Anna Muthesius), Indigo (Jenny Balfour Paul, Exeter), Chinese textiles at Palmyra (Prof. Anne-Marie Stauffer, Cologne) and two papers, with videos, on Chinese gold thread and Chinese drawlooms (Chris Verhecken-Lammens, Brussels). After papers concentrating primarily on Eastern textiles in the West, Hero Granger-Taylor (London) did much to redress the balance by presenting evidence for the trade from West to East. Other contributions included textiles of the Nabataean to Byzantine period from Israel (Orit Shamir, Jerusalem), Nomadic felts from Pazyryk and Noin Ula (Stephanie Bunn, Manchester) and two papers on head-gear: the Orkney Hat (Thea Gabra-Sanders, Edinburgh) and Sprang caps (Petra Linscheid, Berlin). Rosalind Janssen (London) ended the programme on the important topic of teaching textiles.

Frances Pritchard kindly arranged for participants to visit the Whitworth Art Gallery to view examples of migrating textiles from sites in Egypt.

The success of the conference can be gauged from the capacity audience who, despite rebuilding work at the Hall, enjoyed a fascinating and stimulating weekend. Acquaintances were renewed, new friends made, problems aired and we all learnt much. Thanks are due to all involved in the organisation and running. The tenth conference, on *Tapestry*, is scheduled for September 2002.

Felicity Wild

Keriya, Mémoires d'un Fleuve: Archéologie et Civilisation des Oasis du Taklamakan
Espace Electra, Paris (until 27.05.01)

A stunning exhibition, with an equally impressive catalogue (see under Recent Publications below). Since 1991 a Sino-French team has been working annually in the valley of the Keriya (Yutian) on the southern flank of the Taklamakan Desert (Tarim Basin) in NW China. Their research has been an ethnoarchaeological exercise, recording both the architecture of the modern village of Daheyan and excavating two of its predecessors on earlier courses of the river, Karadong (third-fourth century AD) and Djoumboulak Koum (broadly fifth century BC). Karadong was examined by Sven Hedin and Aurel Stein, but Djoumboulak Koum is a new discovery.

Organic remains are well preserved and wood, textiles and wall paintings have been conserved and studied in Paris prior to return to China. The textiles are well integrated into the material culture, strongly influenced by both India and China. The

corpus from Djoumboulak Koum is especially fascinating. Clothing is expertly tailored and much reliance placed on braids, ply-split braids, bands of tapestry and twills, all in wool, goat or camel hair. Key pieces are on display in Paris, supported by the analyses of Sophie Desrosiers, Patricia Dal-Prà and Christoph Moulherat, and full publication of them is promised.

John Peter Wild

Notes and Queries

A Bowl from Acre: A Spinning Woman

In the Crusader Castle of Acre, a shallow proto-maiolica bowl from the thirteenth century CE was found. On the bowl is the painted depiction of a standing woman in the act of spinning (Fig.12).

In the article I wrote about the painting of the spinning woman on the bowl (in Hebrew (Sheffer 2000)) I concentrated on proving that the bowl, although found in Israel, was manufactured in Europe. My approach was based on the attire (dress and head cover) and the use of the distaff (Fig.13).

I suggested that the attire of the spinning woman is a simplified version of the beautiful attire worn by the woman in the painting of Villard de Honnecourt from the thirteenth century (Bowie 1959, 16).

The other point I stressed was that in the West, women spun with the help of a distaff, as shown in works of art from the Hellenistic period, through the Middle Ages and the Renaissance up to the beginning of the present era. In the East (including Palestine), by contrast, the use of the distaff was unknown amongst indigenous women and is not in use, even today. The only exception was during the Hellenistic period, when many of the Greek habits were adopted by women of higher social standing

In the European pictures showing women

Fig.12 A painted bowl from Acre. Photo: Israel Antiquities Authority.

Fig.13 Drawing of the woman spinning on the bowl from Acre.

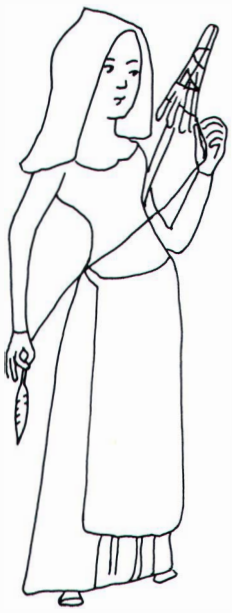

Fig.14 Woman spinning. French, late 15th century

spinning, the distaff is held under the left armpit, which is the correct method of spinning with the aid of a distaff (Fig.14). Sometimes the stick of the distaff is held in the girdle of the woman's dress.

As for the long stick of the distaff, it is sometimes stuck into a piece of furniture, but I do not know of any pictures which show a woman spinning with a long stick.

I would appreciate answers to two questions:
1 Why is the 'Acre' woman holding the distaff under her *right* arm?
2 Why is it so long?

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News in Brief

Tutankhamun's Wardrobe, Edinburgh: 31.3.01 - 1.7.01

British readers will have an opportunity to view this highly acclaimed exhibition (reviewed by Martin Ciszuk (*ATN* 30) at the Royal Museum of Scotland, Chambers Street, Edinburgh EH1 1JF, where it will be on show until 1st July 2001. Mon - Sat: 10am-5pm; Tues: 10am-8pm; Sun: 12-5pm. Tel: 0131 247 4219. Further information is available on the Internet: www.nms.ac.uk; www.tutankhamuns-wardrobe.com.

La Laine au Proche-Orient dans l'Antiquité préclassique, Beirut, November 2001

The Institut Français d'Archéologie du Proche-Orient, in collaboration with CNRS and the Université de Bordeaux 3, is organising a three day round table on the subject of wool in the Near East in preclassical antiquity in Beirut (Lebanon) in November 2001. The project is aimed at archaeologists, archaeozoologists, epigraphers and textile historians and is particularly designed to cover the Neolithic, Chalcolithic and Bronze Age, periods poorly documented on the subject. The proceedings will be published in the IFAPO series *Bibliothèque Archéologique et Historique.* Further information may be obtained from: Catherine Breniquet, UFR Histoire de l'Art et Archéologie, Université Michel-de-Montaigne - Bordeaux 3, Domaine universitaire, 33607 PESSAC CEDEX. (e-mail: Catherine.Breniquet@montaigne.u-bordeaux.fr)

The Clothed Body in the Ancient World, Milton Keynes, UK, 17-19.1.02

An international conference is being organised by the Open University and the University of Birmingham, aiming to bring together experts in a wide variety of disciplines to enhance understanding of the role of dress in ancient societies. Papers will cover the clothed body in ancient Egypt, the Near East, Greece, Rome and Byzantium. For further information contact: Dr Lloyd Llewellyn-Jones, Dept. Classical Studies, The Open University, Walton Hall, Milton Keynes, UK. MK6 7AA (e-mail: l.j.llewellyn-jones@open.ac.uk) or Dr. Mary Harlow, Centre for Byzantine, Ottoman and Modern Greek Studies, University of Birmingham, Edgbaston, Birmingham UK, B15 2TT. (e-mail: m.e.harlow@bham.ac.uk)

Textile Society of America, 8th Biennial Symposium, 26-28.9.02

The Eighth Biennial Symposium of the Textile Society of America will be woven around the theme 'Silk Roads, Other Roads'. Silk will serve as a primary thread of the conference, while other textile-related topics will be featured in concurrent sessions. TSA encourages presentations on textiles from all parts of the globe and from all disciplines including, but not limited to, anthropology, archaeology, art, art history, conservation, cultural geography, design, economics, history, linguistics, theater and the physical and social sciences. Direct involvement in the program by scholars and textile producers/users working with/in their native traditions is especially welcomed. The symposium will be held at Smith College in Northampton, Massachusetts, from September 26-28, 2002. For infomation contact co-chairs: Marjorie Senechal, Smith College, (413) 585-3862, (e-mail: senechal@math.smith.edu) or Pam Parmal, Museum of Fine Arts, Boston, (617) 369-3707. (e-mail: pparmal@mfa.org) or visit the TSA website: http://textilesociety.org.

New Light on Scandinavian Dress based on Iconographic Material from the Late Iron Age

From 1.10.00 - 30.9.04, a PhD project on Scandinavian dress will be undertaken by cand.mag., MPhil. Ulla Mannering at the Department of Archaeology and Ethnology, University of Copenhagen, Denmark.
In Scandinavia, the source material for clothed figures is rich and varied, including gold-foil figures, runic stones, sculpture, tapestries, jewellery and arms. The material has a geographical and chronological spread which makes it suitable for comparative studies. The aim is to investigate all representations of dress on these different source materials and to assess if the garments depicted tally with clothing known from archaeological textile finds. Within the framework of this study, a one-day seminar is planned. Date and theme will be announced in *ATN*. For information, contact: Ulla Mannering, (e-mail: manner@hum.ku.d)

International Collection of Textile Remains Donated to the Textile Conservation Centre, Winchester.

Dr Michael L. Ryder, a specialist in natural fibres, is donating his large collection of archaeological remains of textiles to the Textile Conservation Centre, now in Winchester and part of Southampton University. The collection comprises the thousands of textiles he has investigated and on which he has reported. These were excavated at many archaeological sites throughout the world and were amassed during a period of study lasting over 40 years. Although Dr Ryder's main interest has been the information that can be gained from fibres, which includes details of textile manufacture and information on how the fibres were produced, the remains also throw light on what caused them to survive (*ATN* 31, 2-3).

In northern Europe the most common form of textile preservation on archaeological sites is the exclusion of air through waterlogging. Examples of waterlogged sites from which there are textiles in the collection are the bog burials of Bronze Age Denmark dating around 1500 BC, and medieval Britain. There are hundreds of mostly wool textiles dated from the eleventh to the sixteenth centuries from London, York, Perth and Aberdeen. The oldest sample in the collection, however, had been preserved by carbonisation caused by charring. This is some linen cloth dated 6500 BC from the Neolithic site of Catal Huyuk in Turkey.

One of the oldest group of finds in the collection from Britain is from the Bronze Age and is dated 800 BC. This was found during 1991 with a hoard of bronze weapons in St Andrews, Scotland, and consists of skin, wool and a plant bast fibre, probably the earliest hemp in Britain. This material was almost certainly preserved by copper ions deriving from the bronze objects.

Almost unique has been the preservation of cloth from the first millennium BC by salt in the salt-mines at Hallstatt in Austria. The items recovered from the 2500-year-old mines include fragments of clothing probably used as rags by the miners. The investigation of several hundred wool samples from this site took 12 years. Some less well-known salt mines at nearby Dürrnberg, as well as wool on which dyes were clear, yielded linen and possibly hemp cloth. Most excitingly there was some silk, almost certainly from China, so confirming the find of Iron Age silk at Hallstatt many years ago.

The collection includes examples from the best-known frozen site, Pazyryk in Siberia. As well as yarns from the clothing of the Scythian people buried there in about 500 BC there is some sheepskin with the wool intact. Also from Siberia, but not a textile, is some hair from a mammoth preserved in the frozen earth for over ten thousand years.

Perfect dryness, too, prevents microbial decay. The collection includes fine linen cloth from ancient Egypt where it has survived in pharaohs' tombs. Some more finds preserved by dryness came from further south in Sudan and belonged to the little-known Kerma civilisation of about 2000 BC and so contemporary with that of ancient Egypt. They comprise haired sheepskins (at a stage before a fleece had developed) lined with linen cloth, which were probably shrouds since they were associated with human burials. From the 'Cave of the Letters' in Palestine dated second century AD there are fragments of wool cloth dyed yellow, green and maroon.

Dr Ryder was a researcher on wool with the Agricultural Research Council in Edinburgh and is now an independent consultant and writer on fibres and textile history. He has used the archaeological remains of wool in the collection to follow the human development of different kinds of fleece for varied uses, a theme of his book *Sheep and Man* (1983).

A parallel collection of sheep and wool objects has been accepted as a donation by the British Museum. This international collection consists of sheep husbandry tools and hand spinning and weaving implements as well as much documentary material on shepherding customs in different parts of the world. It is going in phases to the new Clothworkers Centre for World Textiles to be set up in 2002 within the British Museum Study Centre.

Subscription

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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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