Ulla Mannering, Charlotte Rimstad and Irene Skals

The textile bog find from Vong in Denmark

Abstract
In 1950, Margrethe Hald published an unremarkable textile find from a peat bog called Vong in Denmark. The find has now been 14C dated to the 15th century CE, placing it in a time period for which few textiles are preserved. Although the precise clothing type cannot yet be recognised, the Vong bog find sheds new light on textile types and their uses and reuse in the Late Medieval period.

Keywords: bog find, wool textiles, clothing, medieval period, Denmark

Introduction

In 1950, the Danish textile researcher Margrethe Hald published her doctoral thesis, in which a find from a bog called Vong was included (Hald 1950). This bog is located in southern Jutland approximately 10 km from the modern town of Esbjerg on the west coast of Denmark. In the later English edition of her work, Hald wrote: "In 1942 a collection of cloth fragments from three different textiles were found in Vong Mose" (Hald 1980, 67). In Denmark, a large collection of prehistoric textiles and some textiles from more recent periods were recovered during peat cutting in the 18th to the mid-20th century CE. Unfortunately, not much more is known about the recovery of the Vong textiles, as the museum journal file is missing (Journal 611/42). This is probably also the reason why the find was never properly recorded or researched.

Hald continued: "[Fig. 51] shows the shape of the two largest and two smaller pieces, all of the same quality, thick golden brown cloth in three-shaft twill. The yarn of the warp and the weft is S-spun. The thread count of piece I is 88 warps and 74 wefts to 10 x 10 cm, and of piece II 92 warps and 74 wefts to 10 x 10 cm. The textile is cut to a pattern, and there are traces of hems and sewing, but it is difficult to decide to what kind of garment they belong. The find includes some scraps of coarse, black woollen cloth, and some patches fastened with strips of leather to the paler fabric of pieces I and II. Clear traces of fulling are visible and the scraps have different shapes. Here and there an edge is turned over, possibly for a larger piece to be added. In the diagram [...] the pieces are arranged as if they make up part of a garment. There are 80 and 100 threads to 10 x 10 cm. The yarn of the warp is S-spun and the weft is Z-spun. Finally, there is an oval piece of cloth about 35 x 21 cm. It is of dark brown, coarse S-spun yarn woven in three-shaft twill. The thread count is 60 warps and 72 wefts to 10 x 10 cm. The yarn is sheep's wool, the dark pieces have been dyed with woad" (Hald 1980, 67).

Despite the fact that the description is very precise, its brevity and lack of photographs has kept this find out of reach for researchers. This paper presents an update including new photographs, patterns, revised textile analyses, 14C dating and fibre analyses, which now bring this interesting find to the notice of present-day clothing researchers.

Dating

Although Hald's report on the Vong find only mentioned the textile pieces and no additional objects that could date it, she located it in the Early Medieval

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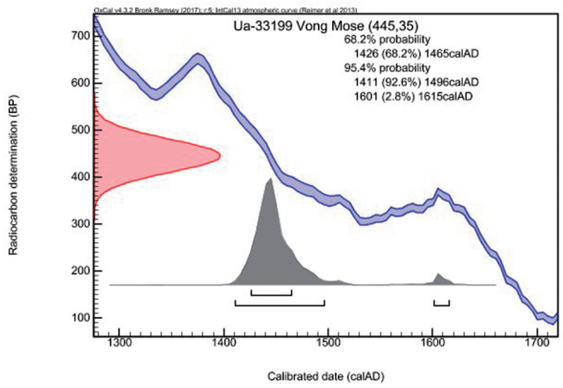


Fig. 1: The calibrated 14C dating of the textiles from Vong (Image: Bente Phillipsen)

era owing to the use of the three-shaft twill (2/1-twill) and in the Kragelund Group (Hald 1980, 196). A radiocarbon 14 dating analysis undertaken by the Danish National Research Foundation's Centre for Textile Research at the University of Copenhagen in 2007 confirmed Hald's dating to the Medieval period, although this placed it slightly later to between 1411 CE and 1496 CE with 95.4% probability (fig. 1).

This result puts the Vong pieces among a rare group of textiles from the Medieval period, which in Denmark is defined as 1050 CE to 1536 CE. These include the find of a bog body clad in a wool kirtle from Kragelund (1045 CE to 1155 CE) and the single bog find of a kirtle from Moselund (1050 CE to 1155 CE), both in Jutland (Østergård 2004, 124–126, 135–139), as well as the Old Norse garments from Greenland, dated from 990 CE to 1450 CE (Østergård 2004, 253). However, only a few of the Old Norse textile garments belong to the 15th century CE. There are hardly any other textiles preserved from this century in Denmark, making the Vong textiles welcome additions. Other relevant finds are the textile from Boringholm dated to the 14th century CE (Østergård and Walton Rogers 2006). From Norway, a few more or less complete Medieval textiles and clothing items are known (Vedeler 2007), while the textiles found in the old town of Oslo, dated to the 15th century CE, are too fragmented to determine their function as clothing (Kjellberg 1977–79, 83–104). From Sweden, the Bocksten Man has the best known complete clothing ensemble, dated to the 14th century CE (Nockert 1997, 137).

The textiles

As Hald observed, the Vong textiles are of three different kinds. There are four light brown fragments of 2/1 twill (inventory number C37593), two large and two smaller fragments which are clearly cut to shape (fig. 2 to fig. 4). The thread count is 8 to 9/10 threads per cm and the thread is from 0.7 mm to 0.9 mm thick in

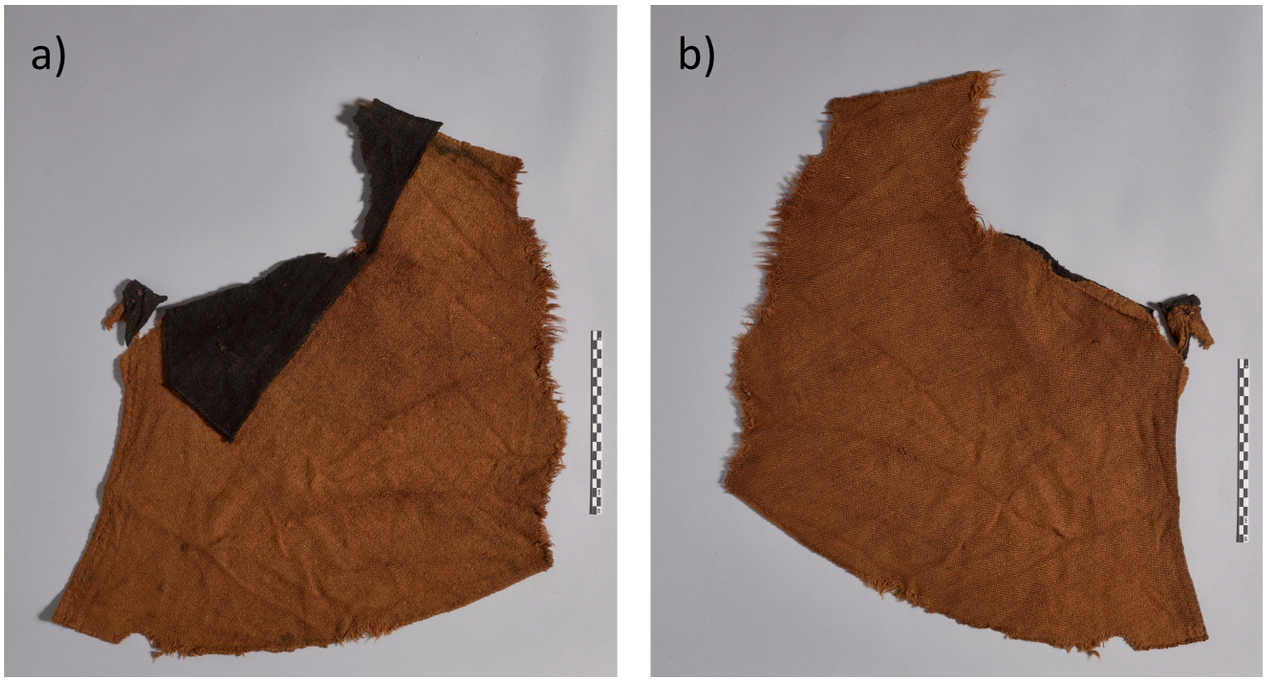


Fig. 2: Vong C37593, fragment 1: a – front with C37594, F1 and F2; and b – back (Images: Roberto Fortuna)

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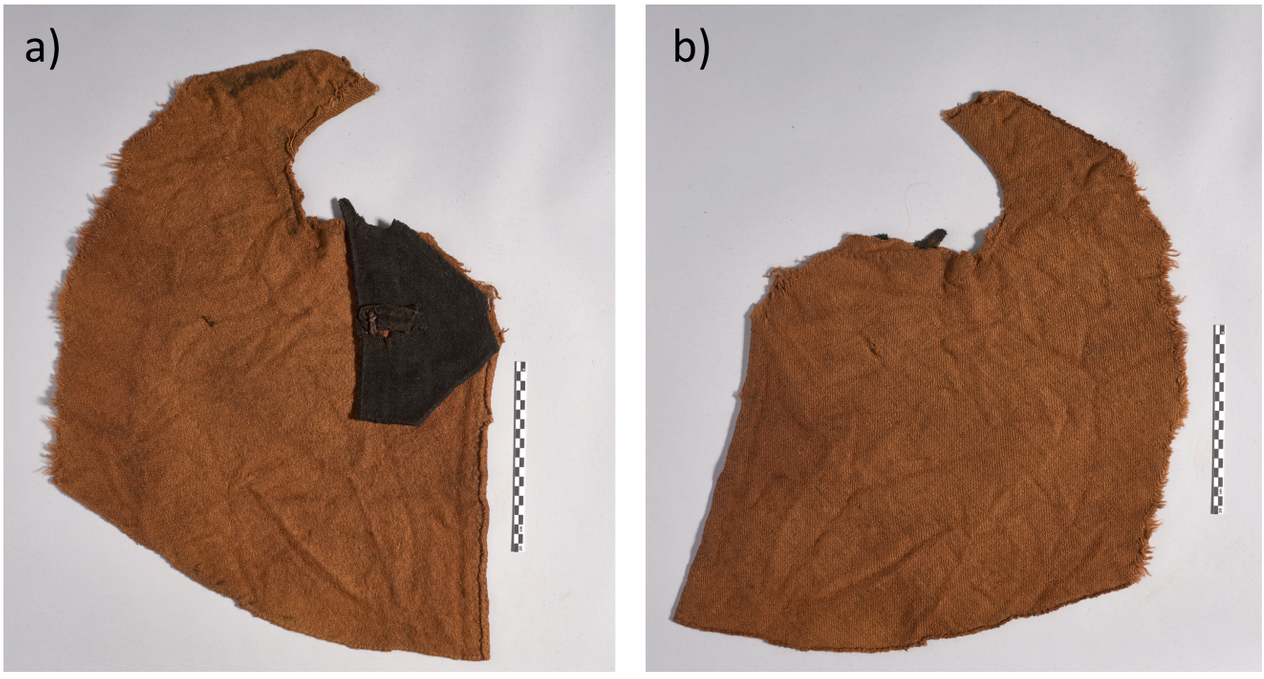


Fig. 3: Vong C37593, fragment 2: a – front with C37594, F3, F4 and F5; and b – back (Images: Roberto Fortuna)

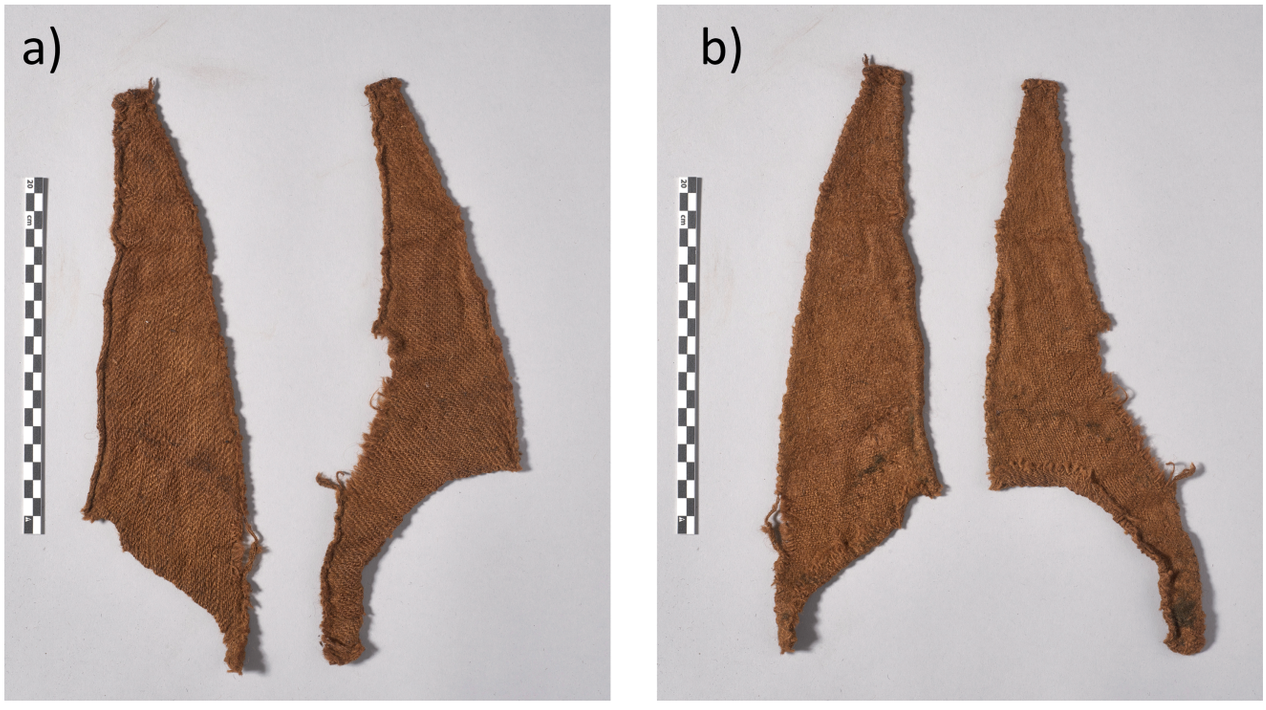


Fig. 4: Vong C37593, fragments 3 and 4: a – front; and b – back (Images: Roberto Fortuna)

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Fig. 5: Close-up of the Vong textile surfaces: a – C37593 front; b – C37593 back; c – C37594 front; and d – C37594 back (Images: Charlotte Rimstad)

both the warp and weft. The yarn is single s/s twisted and the twist angle for the warp is 32^0 to 36^0 and for the weft 38^0 to 40^0 (table 1). The largest fragments mirror each other in shape and each has what seems to be half an armhole. Along the edges, there is a 0.7 cm to 1.5 cm wide fold, except for a torn edge, probably where the two pieces were once united. There are no inserted gores and no traces of fastening in the fabric.

No dye analyses have been carried out on these fragments, but given their present appearance, they may have been of white, undyed wool. They are likely to have been the lining of the garment, and traces of black wool fibres on the light brown fabric, coming from C37594, show that the two fabric types were once closely connected (fig. 5a and fig. 5b). Small traces of a plant fibre textile, probably flax, are visible on both sides of the fabric, indicating the presence of both a middle lining and an inner linen lining. The sewing thread was also of plant fibres and small remnants are still visible in the otherwise empty stitch holes along the edges of the fabric. The still visible parts of the sewing threads have a thread diameter of 0.14 mm and twist of approximately 44. The threads are either z-twisted or z-plied. A similar use of plant fibre sewing threads has also been recorded in British textiles (Crowfoot et al. 1992, 151).

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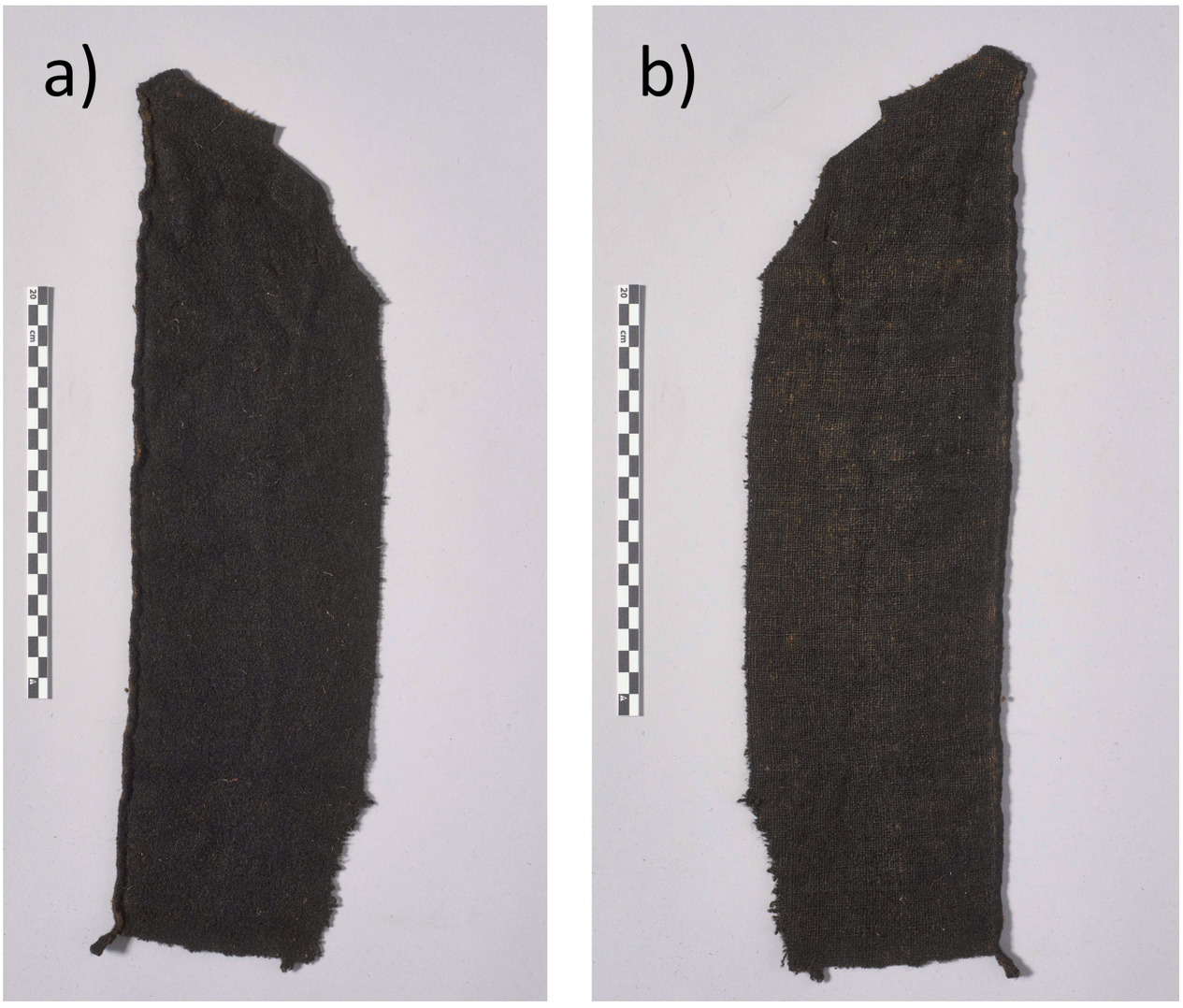


Fig. 6: Vong C37594, fragment 6: a – front; and b – back (Images: Roberto Fortuna)

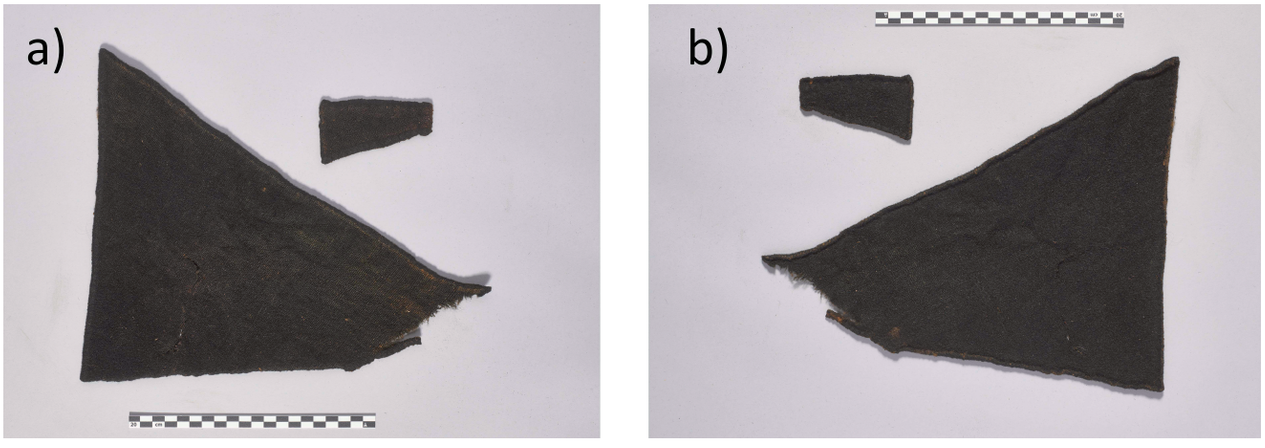


Fig. 7: Vong C37594, fragments 7 and 10: a – front; and b – back (Images: Roberto Fortuna)

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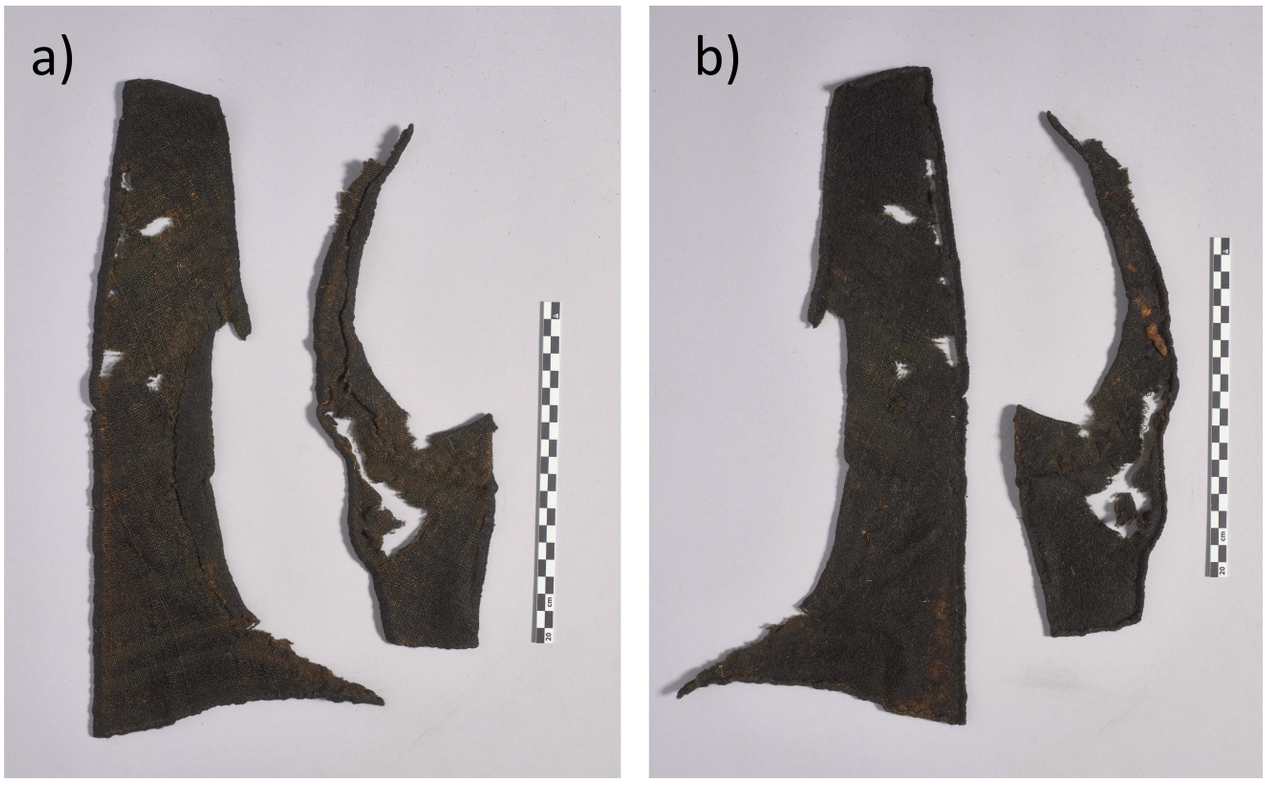


Fig. 8: Vong C37594, fragment 8 and 9: a – front; and b – back (Images: Roberto Fortuna)

The black fragments (C37594) are smaller in size but greater in number (fig. 2a, fig. 3a, and figs 6 to 8). There are ten in all and they consist of a tabby woven, fulled wool textile with a thread count of 10/10 per cm, and 0.6 mm to 0.8 mm thick threads in warp and weft. The yarn is single z/s twisted, and the twist angle for both the warp and weft is 30^0 to 40^0 (table 2). This type of fabric was termed *klæde* (woollen cloth) from the Medieval period onwards in Denmark (Lorenzen 1975, 9). The pieces are clearly fulled but the nap has worn off on the outer side. It is better preserved on the inner side, where it touches the light brown 2/1 wool twill (fig. 5c and fig. 5d). The black textile layer in the garment was clearly pieced together. Except for the five fragments (C37594 F1-F5) that are still attached to the 2/1 wool twill (C37593 F1 and F2), their exact position is unclear, and the various rectangular, triangular and trapezoid shapes may fit in several places. Three of the fragments still attached to C37593 F2 are tied together with leather thongs that go through all the layers of fabric (fig. 9). The two fragments placed on C37593, F1 are also tied with a leather thong in two different places. The leather thongs are barely visible on the other side of the textiles. The leather thong is about 0.5 cm wide but, as the edges in many places are folded in towards the middle, it looks much narrower.

The two narrow textile straps (C37594 F4 and F5) are finger-shaped with one rounded end and the other end cut straight off. They are possibly the remains of some sort of back-strap as is seen on modern vests. The straps measure about 0.5 mm in width and are tied together with several stitches and knots made in the leather thongs.

In 1945, Hald had a sample from one of the black pieces tested for dye. Mogens Skytte Christiansen identified woad in it (Hald 1980, 137). *Klæde* was often used as the outer fabric for coats and other outerwear in the Medieval period, and the fabric could be turned inside out for alteration purposes. It is thus most likely that the black fabric functioned as the outer part of the garment.

The oval fragment, C37595, is a coarse 2/2 twill, made of a naturally pigmented brown wool (fig. 10). There is only one piece of this fabric type preserved and its function is not clear. The 2/2 twill has a thread count of 7/6 threads per cm. The warp direction is identified as the thread system with the thinner threads: from 0.8 mm to 0.9 mm threads in the warp and 1.0 mm to

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Fig. 9: Vong C37594, detail of fragments 3 to 5 (Image: Roberto Fortuna)

pattern. Stitch holes are recorded along the edge, about 5 mm to 10 mm apart, and a 2-ply black wool cord is placed near the straight edge, which may be the remains of a sewing thread.

The wool fibres

Fibre analysis has been conducted on samples from all three fabrics using a Primo Star iLED microscope from Zeiss with x10 magnification and equipped with an AxioCam ERc5s camera according to the methodology described in 2018 (Skals et al. 2018). Diameter measurements were taken using the camera software and the statistical data was analysed in Excel. From textile C37593, samples of the warp and weft (S.1 and S.2) were analysed. Sample 1 has a majority of fine and medium fibres and few coarse fibres. The coarsest fibre recorded measures 64 microns. In Sample 2, almost half of the fibre content is coarse (table 4).

A cumulative frequency diagram presents the sum of the percentages of fibres at each diameter (fig. 11). The two curves coincide in the first 15% of measurements,

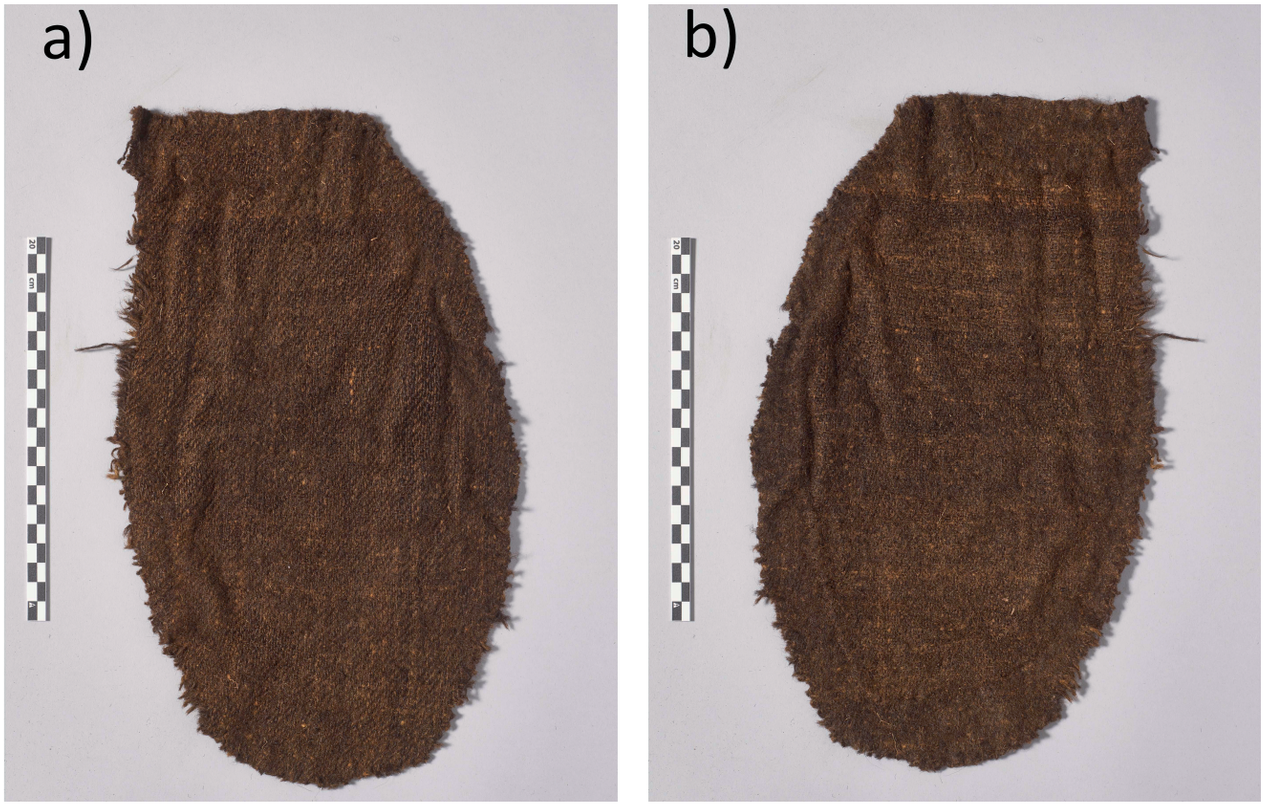


Fig. 10: Vong C37595: a – front; and b – back (Images: Roberto Fortuna)

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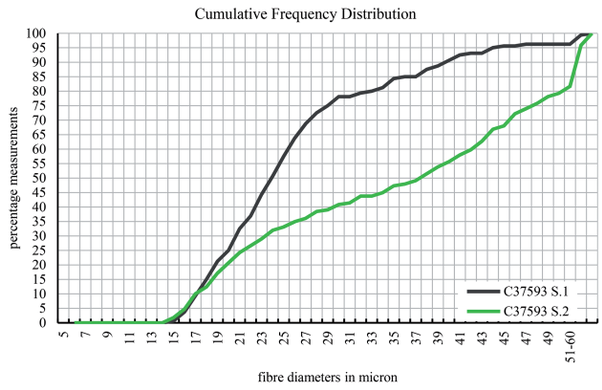


Fig. 11: The two samples from textile C37593 have similar curves for about 15% of the measurements after which they separate and become distinctly different (Image: Irene Skals)

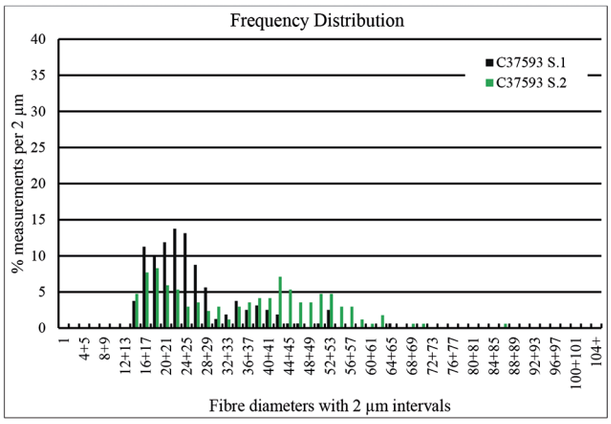


Fig. 12: In the histogram of the fibre analysis of textile C37593, the results are displayed in three peaks and the dominance of different fibre types is demonstrated (Image: Irene Skals)

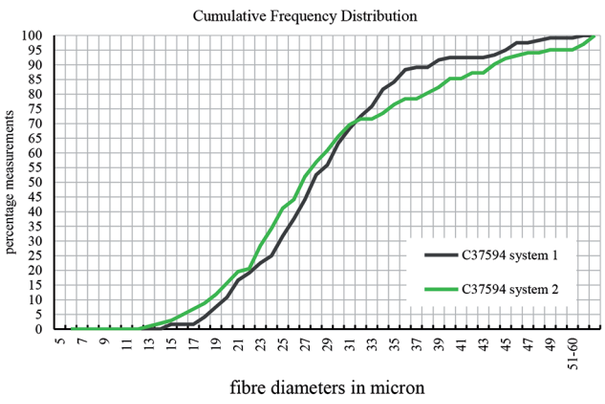


Fig. 13: The variations in the contents of the three fibre groups are illustrated in the separation of the curves showing the results from fibre analysis of textile C37594 (Image: Irene Skals)

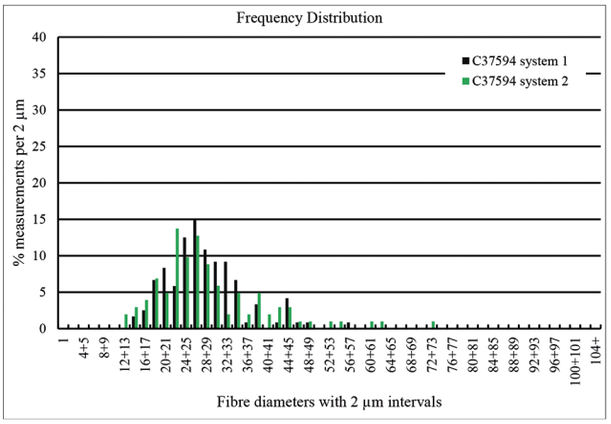


Fig. 14: The histogram of the fibre analysis of the warp and weft from textile C37594 are almost identical with only small differences in the height of the peaks (Image: Irene Skals)

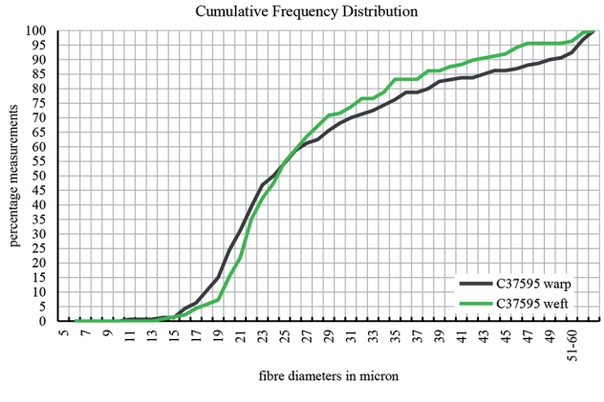


Fig. 15: The small variation in the contents of medium and coarse fibres in the yarns from textile C37595 are expressed in the curves (Image: Irene Skals)

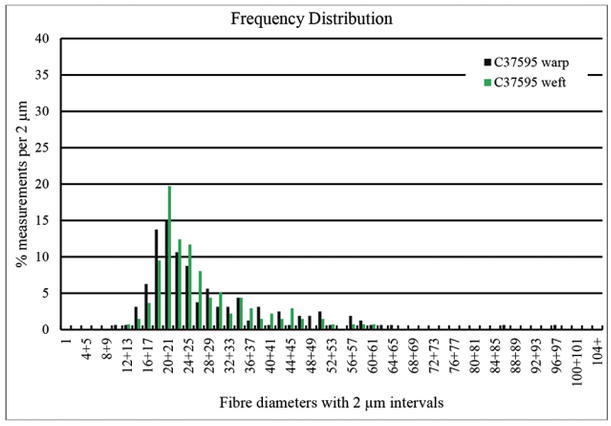


Fig. 16: The histograms showing the fibre analysis of textile C37595 illustrate the similarity in the wool used in the two yarns (Image: Irene Skals)

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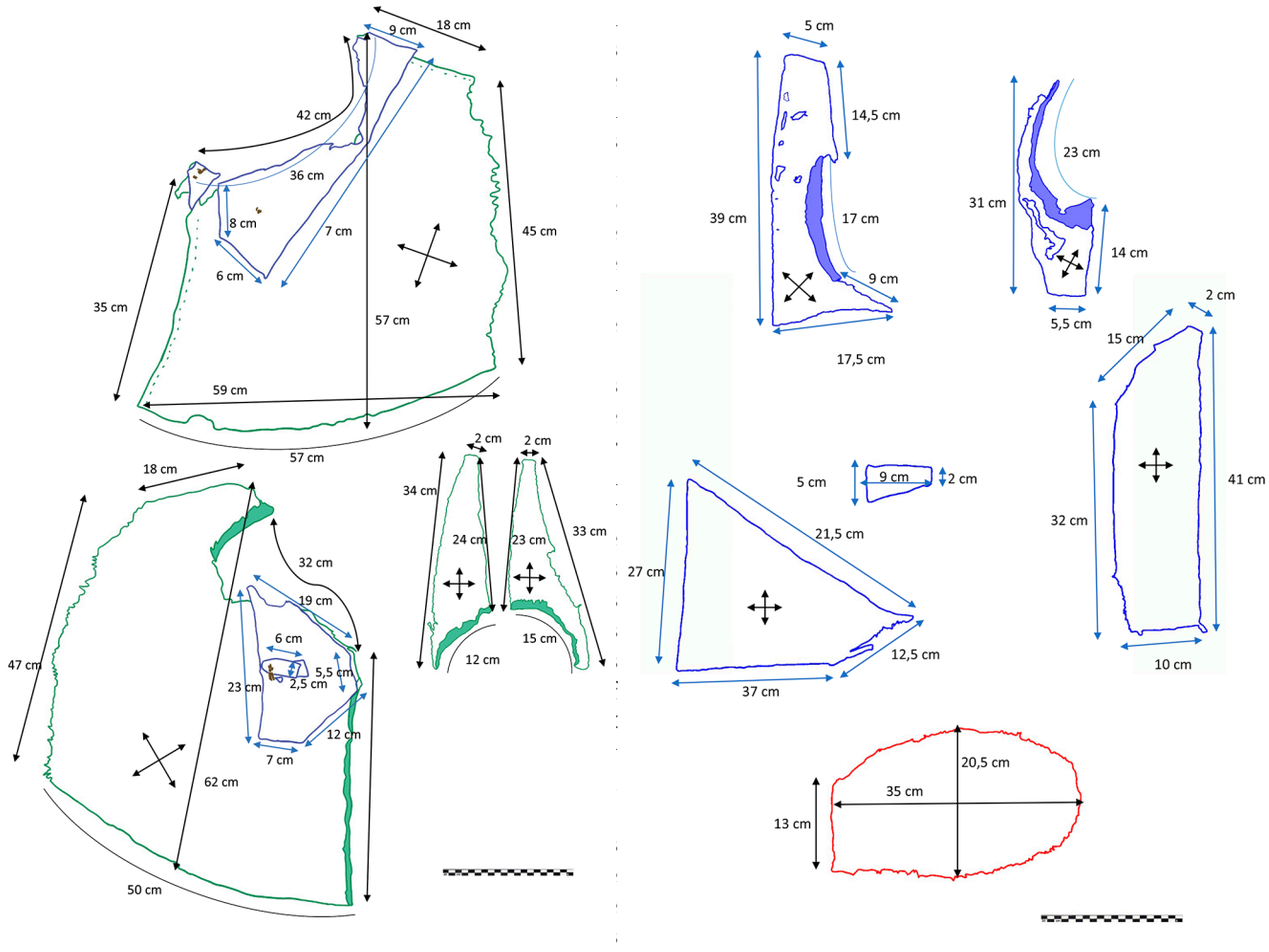


Fig. 17: Drawings of all the Vong pieces (Image: Charlotte Rimstad)

(table 6). The two cumulative frequency curves vary only slightly and the histograms are also almost identical (fig. 15 and fig. 16). The difference in the quality classifications as D (66% < 40.49 µm, 34% > 40,5 µm, 5% > 60.49 µm) and CD (80% < 40.49 µm, 20% > 40.5µm, 2% > 60.9 µm) are because there are 2% more fibres measuring more than 60 microns in Sample 1. Unpigmented fibres and fibres with different degrees of pigmentation are mixed in these yarns.

The results from the fibre analyses indicate that the raw wool used for these three types of textiles had a broad range of different fibre thicknesses varying from the very fine to coarse with the coarsest measuring less than 100 microns. This type of wool appears in Danish textiles from the Late Iron Age onwards, and the Vong results are comparable to results from analyses of Viking Age textiles (Skals et al. forthcoming). It appears that this type of wool made it possible to produce different yarns for different purposes. In Danish Viking Age textiles, yarns with a majority of coarse fibres were generally used for warps. This characteristic has also been recorded in the Old Norse textiles from Greenland (Walton Rogers 2003). Based on the identification of the coarse fibres occurring in the supposed weft thread, it is thus likely that the warp and weft direction in textile C37593 should be switched.

A further comparison is provided by the textiles from the Danish castle Boringholm dating from 1300 CE to 1400 CE. These were analysed and classified as hairy medium (Østergård and Walton Rogers 2006) according to Ryder's fleece type system (Ryder 1983). Although not all the calculations from the Boringholm textiles have been published, there seems to be a correlation with the wool types from Vong. The fibre analyses indicate the use of a typical local wool, and that the preparation of the wool for spinning and weaving conformed to well-known local standards.

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The Vong clothing pattern

In 1950, Hald published a drawing of the patterns of four of the Vong pieces (Hald 1980, 69) but based on the current analysis, it is likely that all pieces belong to the same clothing item (fig. 17). The difficult and still unsolved question is what sort of garment was it? Based on the textile and wear analysis it is most likely that the two larger and two smaller 2/1 light wool twill fragments constituted the lining of the garment but it is uncertain how they should be pieced together and if other vital parts are missing.

The two largest pieces are cut in a similar specific shape, which suggests armholes and shoulder seams. However, they are not large enough to make up a complete garment. The two smaller fragments, which also almost mirror each other, may have been some kind of gusset or part of the neck opening. The remains of a few flax fibres or threads on both sides of this textile indicate the presence of a middle and inner lining. It is therefore likely that the light wool twill was never visible in the original clothing item. The ten smaller dark blue wool tabby pieces have a much more fragmented appearance. Nevertheless, interpretation of the wear on the textile and the attractive original colour suggest that they probably belong to the outer front side of the garment. The pieces can be placed in different ways but are not numerous enough to cover the whole surface of the inner lining. If this interpretation is correct, it places the clothing item in the category of secondary production and illustrates the reuse of textiles. This is not unlikely considering the bog context in which it was found.

It can be argued that the preserved pieces have some similarities with the later style of waistcoat (in Danish, a *brystdug*) from Lolland-Falster in southern Denmark dated to the 19th century (fig. 18). The waistcoat's armholes are constructed by the front and back pieces as well as smaller additional pieces sewn onto the front (Andersen 1960, 118–119). The two largest pieces from Vong are too uneven in their cut, and lack the part that should constitute the back and neck pieces, to be a complete garment. Another possibility is that the pieces constitute the hood that in later periods was worn under a hop-hat (Andersen 1960, 78, 101–107). Both options are possible and need to be supported by a 3D-reconstruction. In both cases the use relates to men's clothing in which the third oval piece of the brown 2/2 wool twill has no obvious function. Judging by the shape alone, it could be a pocket, or it may have been used as a patch for repair. Mending everyday clothing is a well-known phenomenon in many earlier and later clothing finds. In general, the finds show that in many societies, it was worth the effort and was a necessary standard practice to use and reuse clothing items and textile material until they became rags (Waagepetersen 1974; Jensen 1989; Ciszuk and Hammerlund 2013).



Fig. 18: Waistcoat (in Danish *brystdug*) from Lolland-Falster in Southern Denmark dated to the 19th century CE (Image: @ Museum Lolland-Falster)

On this basis, it can be concluded that the find is not complete and that something is missing to make it a functional clothing item, although there are no records of more textiles remaining in the bog or any additional later finds in the same area. On the other hand, it cannot be assumed that the peat diggers found or handed over all the textile pieces belonging to the find. This leaves an open question as to whether the Vong garment was complete or already a rag when left in the bog. The textile from Tvis in Denmark, dated to the 19th century CE seems to have suffered a similar fate (Mannering 2017), as opposed to the very careful and intentional bog deposits dating to the Early Iron Age (Hald 1980; Mannering et al. 2010).

Comparative sources for this type of garment are few (thus far) and it has not been possible until now to link the pieces to a known style or type of garment. It is hoped that this article will inspire colleagues with expertise in medieval clothing to include the Vong

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textiles in their future studies and help to solve the mystery of its form and function.

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Fragment no.	Image	Size	Edge
C37593, Fragment 1 On one side attached to C37594 F1 & F2		Shoulder to bottom: 57 cm Width: 59 cm Shoulder seam length: 18 cm Back seam length: 35 cm Sleeve bow length: 42 cm Bottom bow length: 57 cm Front seam length: 45 cm	7 mm folded edges Back seam: folded Traces of hem stitch along the lower edge and shoulder seam Torn at the front edge Sleeve bow: Fold, traces of stitches
C37593, Fragment 2 On one side attached to C37594 F3, F4 & F5		Shoulder to bottom: 62 cm Width: 46 cm Shoulder seam length: 16 cm Shoulder seam top: 6 cm Back seam length: 34 cm Back diagonal: 11 cm Sleeve bow length: 32 cm Bottom bow length: 50 cm Front seam length: 47 cm	
C37593, Fragment 3 Small fragment with diagonal edge		Length: 33 cm Width: 9 cm Bow: 12 cm Largest long edge: 34 cm Small long edge: 24 cm Top: 1 cm Tip: 2 cm	Fold on the upper edge, 1.5 cm All other edges have stitch holes
C37593, Fragment 4 Small fragment with arch-shaped edge		Length: 32 cm Width: 11 cm Bow: 15 cm Largest long edge: 33 cm Smallest long edge: 23 cm Top: 2 cm Tip: 2 cm	Fold on upper edge, 1.5 cm with seam All other edges have stitch holes

Table 1. Technical details of the light brown 2/1 wool twill fabric

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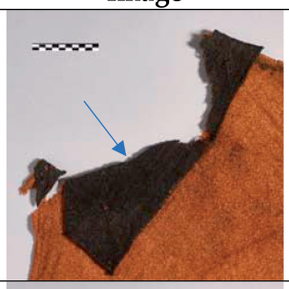
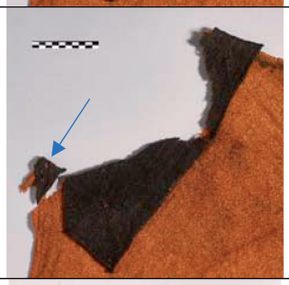
Fragment no.	Image	Size (mm)	Edge
C37594, Fragment Fragment 1 Attached to C37593, F1 with a leather string		Length: 42 cm Shoulder seam 9 cm Back seam: 6 cm Diagonal small edge: 8 cm Sleeve bow edge: 36 cm	
C37594, Fragment Fragment 2 Small triangle Attached to C37593, F1 with a leather string		Diagonal seam: 8 cm Height: 6 cm Top: 2 cm Sleeve edge: 4 cm	
C37594, Fragment Fragment 3 Large fragment Attached to C37593, F2 with a leather string		Length: 23 cm Small lower edge: 7 cm Back edge: 12 cm Shoulder diagonal edge: 5.5 cm Shoulder edge: 12.5 cm Full shoulder edge: 19 cm	
C37594, Fragment 4 Small upper piece Attached to C375943, F2 with a leather string		Length: 6 cm Width: 2.5 cm	
C37594, Fragment 5 Small lower piece Attached to C37593, F2 with a leather string		Length: 7 cm Width: 2.5 cm	

Table 2. Technical details of the black wool tabby fabric

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Fragment no.	Image	Size (mm)	Edge
C37594, Fragment 6 Large, rectangular fragment		Length: 43 cm Width: 12 cm Longest edge: 41 cm Lower edge: 10 cm Upper diagonal: 15 cm Upper top: 2 cm Smallest long edge: 32 cm	Longest edge has a seam, probably hem stitch
C37594, Fragment 7 Triangular piece		Length/bottom edge: 37 cm Width: 23 cm (tip to bottom) Edge a) 27 cm Small edge: 12.5 Edge b) 21. 5	Hem stitch along the sides
C37594, Fragment 8 Long fragments with bow		Length: 39 cm Width/height: 17,5 cm End: 5 cm Folded edge: 17 cm End tip: 9 cm Edge: 17.5 cm Width on the middle: 7 cm Fold: 2 cm	Seam along the edges
C37594, Fragment 9 Small fragment with arch		Length: 31 cm Width: 10 cm Lowest edge: 5.5 cm Smallest long edge: 14 cm Bow: 23 cm Longest long edge: 31 cm	
C37594, Fragment 10 Small rectangular piece		Length: 9 cm Width: 5.5 cm Upper edge: 5 cm Longest edge: 9 cm Lower edge: 2 cm	Fold on the widest edge.

Table 2. Technical details of the black wool tabby fabric

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Fragment no.	Image	Size	Edge
C37595, Fragment 1		35 x 20.5 cm	All edges are cut The straight edge is 13 cm long

Table 3. Technical details of the brown 2/2 wool twill fabric

Sample	% ≤ 24.49	% ≥ 25.5 ≤ 40.49	% ≥ 40.5	Range	Min.	Max.	Cat	No. of fibres
S.1 (warp)	64	27	9	14-29, 31-35, 37-41, 43-46, 51-53, 64	14	64	CD	160
S.2 (weft)	35	21	44	14-31, 33-59, 61-63, 71, 86	14	86	EE	169

Table 4. Fibre analysis of textile C37593 with the statistical results given in microns

Sample	% ≤ 24.49	% ≥ 25.5 ≤ 40.49	% ≥ 40.5	Range	Min.	Max.	Cat	No. of fibres
S. 1	38	55	8	14, 17-36, 38-39, 43-45, 47-48, 57	14	57	C	120
S. 2	44	41	15	12-31, 33-35, 37-39, 41, 43-46, 48, 52, 55, 61-62, 73	12	73	D	102

Table 5. Fibre analysis of textile C37594 with the statistical results given in microns

Sample	% ≤ 24.49	% ≥ 25.5 ≤ 40.49	% ≥ 40.5	Range	Min.	Max.	Cat	No. of fibres
S. 1	59	24	17	10, 13, 15-35, 37-40, 42-43, 45-52, 56-58, 61, 63, 65, 86, 96	10	96	D	160
S. 2	59	28	12	13-31, 33-34, 37, 39-46, 50-51, 53, 57, 59, 61	13	61	CD	137

Table 6. Fibre analysis of textile C37595 with the statistical results given in microns

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