

# Viking Women: Aprondress

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This article focuses on the garment that was worn by Viking women together with the characteristic oval brooches. While it has been called many things by researchers over the years (e.g. trägerrock and hängerock), I will use what is currently thought to be the old Norse name for the garment (Ewing [2006](#), p. 37), namely *smokkr*. Just as for other Viking garments, the archaeological evidence is fragmentary, and the scholars do not agree on the interpretation of what little evidence exists. My intention with gathering different archaeological facts and interpretations is to make my own best guess, which of course may differ from yours :-)

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## Facts: Archaeological evidence

### Birka

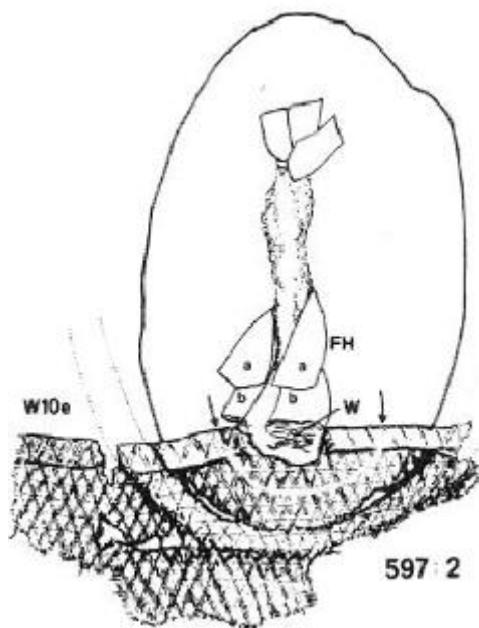
The main excavation of Birka was conducted in the 1870s by Hjalmar Stolpe, yielding a large amount of textile material from the 9th and 10th century. The textile fragments were stored, and later analysed by Agnes Geijer ([1938](#)) and Inga Hägg ([1974](#), [1986](#)).

More than a hundred of the 128 graves with oval brooches contained fragments from the smokkr (Hägg, 1974). The majority of fragments are small fabric loops that once fastened the smokkr to the brooches. Some of these loops have fragments of the main part of the smokkr attached, thus making it easy to identify which fragments belong to the smokkr. This is the basis Geijer used to identify smokkr fragments. However, most of the loops are unattached, and in these graves identification of smokkr fragments (aside from the loop) is made by Hägg based on *where* the fragment is found in relation to the different layers in the grave.

### The shape of the smokkr

The majority of smokkr fragments from Birka are tiny, and thus give limited information about the shape of the garment. However, sufficiently has been preserved to show that the smokkr was finished at the top by folding the edge towards the inside and stitching it in place. No other seams have been found among the smokkr fragments (Hägg 1986, p. 62).

Grave 597 differs from the rest, in that unusually large woollen smokkr fragments have been preserved.



The grave contained one fragment of woollen cloth with press marks and traces of wear from the edge of an oval brooch, indicating that it had been worn on the inside of the brooch and thus was a part of the front of the smokkr. The upper edge had been folded. If the piece is placed under the brooch according to the wear marks, there is a piece missing from the upper edge at the position where the loops would have been fastened (597: 2). This fits well with the fact that woollen fibres were found on one of the linen loops at the bottom of one of the brooches (Hägg 1974, p. 44).

Both sides of the woollen fragment is torn, but one of the tears fits closely with another large fragment of the same cloth. When combined, these fragments create the largest remaining piece of a smokkr in the Birka material (597: 3). Its 22 cm long preserved edge would have run along the front of the smokkr, from one brooch to the other.

The grave also contained a piece of the same woollen cloth, pressed together with remains of the body and fragments of an outer garment. According to Hägg, the layers - if they have been interpreted correctly - indicate that this smokkr fragment probably comes from the back of the smokkr (Hägg 1974, p. 44).

597. Öglor av linne kring nålhållaren i båda spännbucklorna och kring nålfästet i den ena. Vid änden på den undre av nålfästesidans öglor syns trådar och fibrer av ylle (W) från den vävnad, vid vilken öglan varit fäst, 597:2. I graven fanns för övrigt ovanlig store stycken av yllekypert. De har alla lossats från spännena ved tidigare tillfällen och i görligsta mån slätats ut, dock inte så att karaktäristiska veck, missfärgningar och nötingsmärken gått förlorade.

Ett stycke diamantkypert (W10) är fargat av rost och har tryck och nötingsspår efter kanten på ena spännbucklan. Nära mitten på stycket fattas en del av fällkanten. När dette stycke passas in under spännbucklan, 597:2, kommer spännets undre linneögla att hamna mitt för det ställe, där en del av fällkanten fattas. Antagligen är det just från detta ställe, som yllefragmenten nedentill på öglan härrör. Styckets läge under spännbucklan antyder, att det bör vara en del av kjolen framsida, 597:4.

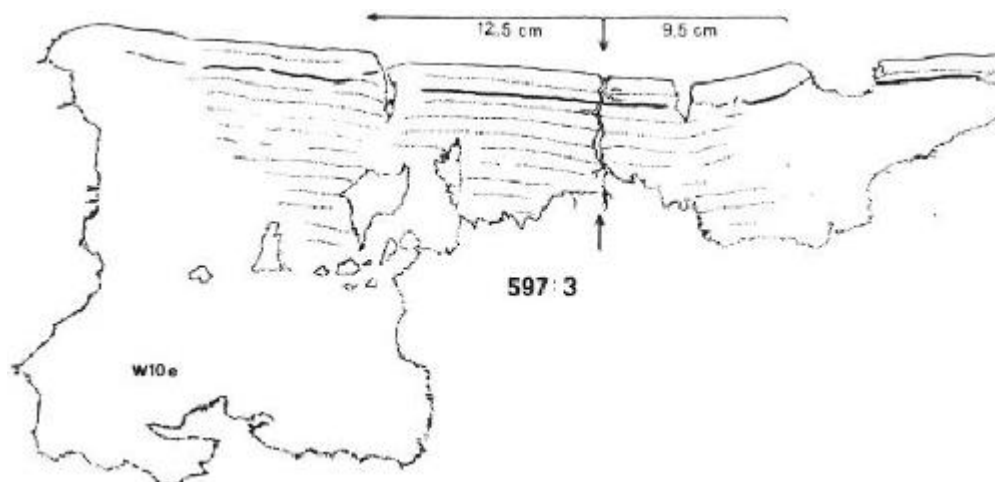
Troligen i närheten av spännbucklorna låg, enligt Geijer, en klump med textilier och annat organisk material. Den innehöll förmultnade rester av kroppen och ett stycke W 10 av samme kvalité som det i ena spännbucklan. Därnäst följde lämningar av ett ytterplagg m.m. Lagerföljden visar - om den er rätt uppfattat - att det måste röra sig om ett avsnitt från dräktens ryggsida. Detta W 10-fragment bör alltså komma från kjolens bakstycke.

Det stora stycket diamantkypert, 597:3, t.v., torde vara identisk med det ena av de två fragment, som enligt Geijer täckte ovansidan på den ena spännbucklan. En noggrann jämförelse mellan detta stycke och de andre W 10-fragmenten från graven visar, att det och kantstycket, 597:2, måste härröra från ett och samma plagg, alltså kjolen.

Material från kjolens framstycke har med andra ord kommit att hamna på skalet till den ena spännbucklan, och det bör ha skett på så sätt, att spännan under förmultningen sjunkit djupare ned än omkringliggande tyglager, i vilka de bäddades in. Särskilt om kvinnan legat något på sidan i graven, vilket läget på spännbucklar och pärlor eventuellt antyder, kan det känn ha inträffat, att en del av kjolens framstycke vikts in över skalet på ena spännbucklan.

En detaljgranskning av väven och dess söndertrasade kantar visar, att de båda styckena har passning som 597:3 visar. De utgör tillsammans det största bevarade avsnittet av kjolen i hela birkamaterialet med sammenlagt 22 cm.

*Hägg 1974, p. 44, illustrations p. 126*

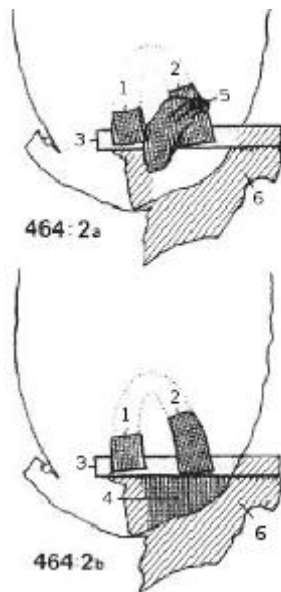


## Lining

Several of the Birka graves contain evidence indicating that the smokkr could have been lined. One of these is grave 464 (fig. 464:2b). Attached to the remains of a linen loop (1-2) was a fragment of fine dark blue wool (6). The wool had a linen fragment (4) lying against its

inside and a silk band (3) had been folded over the top of both fragments like a bias tape (Hägg 1974, p. 39-40).

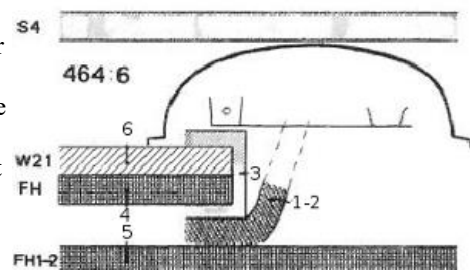
Hägg (1974) interprets the evidence as a blue woollen smokkr, lined with linen and decorated with a silk band along the top of the dress. A small fragment of linen from the serk (5) was lying on top of the loop, indicating that at least in this case the smokkr had been worn directly over the serk (fig. 464:6). The top of the silk band, and thus the top of the smokkr, reached about 2 cm up into the brooch. This means that the front loops of the smokkr was fairly short and would have been completely covered by the brooches.



464. På flera ställen i spännet fanns slätt linne från särken. Vid nålfästet fanns en linneögla (mittdelen saknas) från kjolens framstycke. Under öglans fästepunkter skymtade ett sidenband (3). Öglans ena fästepunkt (2) var delvis täckt av ett löst, lätt hoprynkat särklinnefragment (5). Fragmentet, som var hårt av rost, mjukades upp i svag EDTA-lösning och destillerat vatten, varefter det kunde lyftas så att hela det bevarade sidenbandet blev synligt, 464:2 b. Detta visade sig kanta ytterligare linnefragment (4) upptill. Under hele 4 låg ett ansenligt stycke (6) av fin, blåsvart yllekypert, W21, med avigsidan in mot linnefragmentet och rätan ut mot dräktens and framsida. Yllekyperten fortsatte ensam en bit ut över brättekannten. Den avslutades uppåt av en mot avigan vikt, ca 4 mm bred kant.

Sidenkantbandet tycktes, så långt det var bevarad, ligga vikt också kring kypertstycktes övre kant så att kanterna till linnefragmentet (4) och kypertfragmentet var samlade under ett och samma kantband av siden. I och genom detta band var hängselkjolens ögla (1-2) fäst. Det hophållna stycket av sidenband, linne(-foder) och yllekypert har nått ca. 2 cm upp bakom spännbucklan.

Det större av de fragment (utenför spännbucklan), som Geijer beskriver, har två vikkanten, som bildar ett hörn, medan övriga sidorna är avnötta eller avslitna snett mot vävens riktning. Den övre av dessa oavslutade kanter passar ganska exakt mot den kant, som yllekyperten under höger spännbuckla vänder utåt, 464:5. Hörnstycket har tydligen legat uppviktt ett par, tre centimeter runt högra brättekanten mot spännbucklans skal.

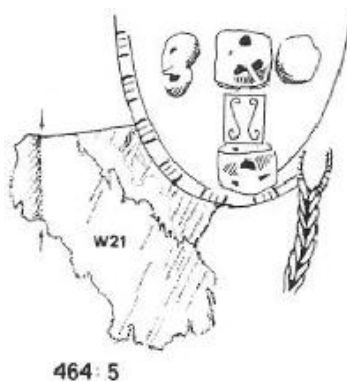


Hängselkjolens linneögla kring nålfästet i ena spännbucklan var alltså fäst i ett linnefodrat, sidenbandskantat stycke av fin, treskaftad yllekypert (W21). Detta stycke bör då rimligen vara en rest av själva kjolen, eller, rättare sagt av ett av de ögleförsedda stycken, som bars utanpå särken. Ytterligare fragment från denna kjol finns bevarade, några tillsammans med ock närmest inntil rester av den bronskedja, i hvilken kniven var upphängd. Kedjan bör ha legat direkt mot (särkens och) kjolens bröststycke (464:6).

Hägg 1974, p. 39-40, illustrations p. 121

Av de fragment från framstyckets övre kant, som har bevarats, finns troligen ett enda hörnstycke, nämligen det från grav 464. Ca 4 cm utanför spännbucklans kant har detta stycke slutat med en vertikal kant. Om den enbart varit nedfällad mot avigan eller om den anslutit till ett annat stycke (bakstycket), framgår inte av fragmentet.

Hägg 1974, p. 54



The grave contains several other fragments of the dark blue wool. One fragment appears to have been torn off from the larger brooch fragment. It is folded along two sides, creating a corner about 4 cm outside of the edge of the brooch (464:5). It is unclear whether the vertical edge of this corner was hemmed or if it was fastened to another piece of the smokkr (Hägg 1974, p. 39-40, 54).

Fragments of the dark blue wool were also found attached to a bronze chain and knife hanging from the brooches, indicating that the smokkr at least was long enough to reach to the hip (Hägg 1974, p. 40).

The evidence for lined smokkr is very limited. This could indicate that few smokkr were lined, but the scarcity of evidence could just as well be explained by the difficulty in deciding whether the fragments belong to a lining, an inner smokkr or a serk. Also, a lining is closer to the body and thus more likely to deteriorate.

Of the more than 100 graves with smokkr fragments, Inga Hägg describes 36 in detail in her analysis in 1974. Several of these contain fragments that probably stem from an inner dress or lining in addition to remains of a woollen smokkr. Almost all of these inner dresses or linings were made from linen (Hägg 1974, p. 50). The exception is grave 973, with a smokkr of woollen broken diamond twill with a lining of repped wool, and woollen loops made of the same fabric as the lining (Hägg 1974, p. 47). The twill and the repped wool meet at the edge of the smokkr and the seam has been covered by a string. There is also one grave (954) that contained a woollen smokkr fragment with loose stitches which indicates that the smokkr originally was lined, but there are no traces left of the lining itself (Hägg 1974, p. 47).

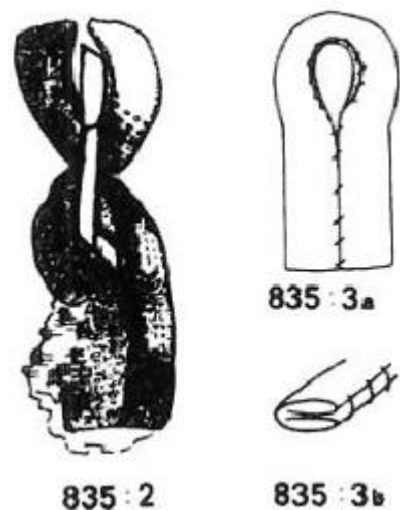
The fragments of lining that are found at Birka are too small to ascertain whether the smokkr was fully or just partially lined, although Geijer (quoted in Hägg 1974, p. 58) leans towards a partial lining.

### Smokkr loops

The smokkr was fastened to the brooches with loops made from folding a strip of cloth and stitching over the edges. Loop fragments are found in 105 graves in Birka. The majority of the loops were made from linen. Only 14 graves contain one or more woollen loops and 22 contain one or more silk loops (Hägg 1974, p. 49). Sometimes the loops contained an inner core of a stronger fabric. This is the case for several of the silk loops where the silk is covering a linen core (Hägg 1974, p. 54).

The stitches could run along the side or the middle of the loops. The loops from grave 835 were stitched along the side (fig 835:3b) (Hägg 1974, p. 45), while [grave 465](#) contains at least one loop with stitching along the middle (Hägg 1974, p. 42-43). Hägg points out that side stitching might result in a stronger loop, because the fabric is folded in four layers instead of the three layers of a middle stitched loop.

The loops that have been found attached to smokkr fragments are open from the part that lie around the pin until the base at the edge of the smokkr (Hägg 1974, p. 54). The one exception is the front loops (at the bottom of the brooches) in grave 835 which were sewn closed, except for a couple of cm at the end (fig. 835:2 and 3a). The back loops were torn, and so we don't know whether the same treatment was given to the loops that once ran over the shoulder (Hägg 1974, p. 45).



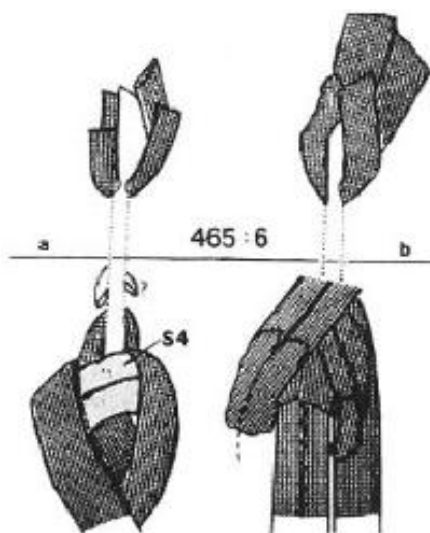
**835.** Långa sidsömmade öglor av yllerips, W22, upptill och nedtill i båda spännbucklorna. De från kjolens framstycke är sammansydda mitt fram till verkliga hängslen och enbart ett par centimeter har lämnats som öppna öglor.

*Hägg 1974, p. 45, illustration p. 130*

I de bevarade exemplen är kjolens öglor öppna från den del, som ligger kring nålen, ned till basen, där kjolen tar vid. Ett undantag från denna regel är ylleripsöglarna i grav 835.

*Hägg 1974, p. 54*

Unlike grave 464 with its single linen loop at the bottom of one brooch, the large majority (70 of 105) of the graves have at least one brooch with several loops at either the top or bottom of the brooch, or both (Hägg 1974, p. 103-105). One example is grave 465. Each brooch in this grave has 2 loops at the top. One of the brooches has 3 linen loops at the bottom; the other has 2 or possibly 3 linen loops plus 1 silk loop (S4) at the bottom. The longest of the linen loops at the bottom of brooch I (465:6 b) continued down to the edge of the brooch. Hägg believes that this and the silk loop at the bottom of brooch II was used to hang tools like scissors or other decorative items from the brooches, and thus was not part of the smokkr (Hägg 1974, p. 42-43). This still leaves two loops at the top and two at the bottom of each brooch.

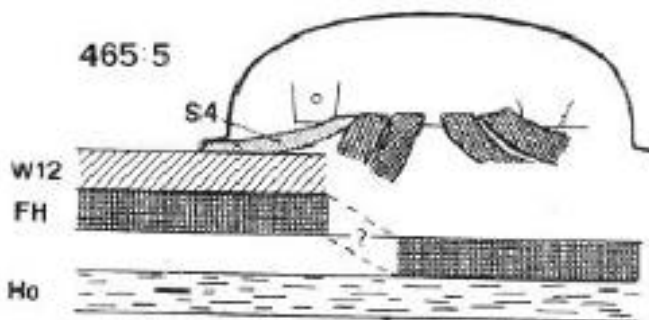


**465.** Spännbuckla I, 465:6 b: innerst kring nålhållaren sitter en ögla av relativt grovt linne och utanför den en annan av finare linne. Kring nålfästet finns minst tre linneöglor, varav en med tydlig mittsöm. Spännbuckla II, 465:6 a, har 2 linneöglor kring nålhållaren, den ena av (numera) blått linne. Vid nålfästet finns 2-3 (?) linneöglor hårt inkapslat i korrosion samt ett sidenband.

Från graven kommer ett par lösa fragment av yllekypert, W 12. Ett stort stycke av samma W 12-kypert finns bevarat i utsprungligt läge, pressat mot förmultnade trärester från gravens botten, 465:1. Trästyckets form visar tydligt, att det med vidhäftande textilier ursprungligen legat under ena spännbucklan. Detta stycke yllekypert, avslutat med en rak vikkant, är på mitten täckt av en kraftig rostutfällning av samma slag, som den över och runt nålfästet i spännbuckla II. Om man passar in yllekypertfragmentet under spännbucklan efter formen på trästycket, kommer rostutfällningarna att täcka varandra, 465:1. Kypertfragmentet hamnar med vikkanten ca 3 cm upp i spännbucklan i samma läge, som kypertfragmentet från förangående grav. I själva verket måste ylletyget

även i detta fall härröra från kjolens framstycke, 465:5.

En linneögla kan, liksom i grav 464, antingen ha varit fäst i ett foder eller eventuellt direkt i kypertstycket. Den längsta av öglorna kring nålfästet i spännbuckla I, 465:6 b, bör ha fortsatt över brättekanterna på kjolens framsida, där det förmodligen burit upp sax, kniv och/eller kam. Sidenbandet vid nålfästet i den andra spännbucklan är antagligen också bärband för ett redskap, eventuellt för den pryl som fanns i graven.



De övriga två öglorna nedtill i varje spännbuckla korresponderar mot nålhållarsidans två öglor och torde därmed ganska säkert kunna antas komma från kjolen. Den ena av dessa ögglor hör då rimligen till den yttre kjolen av yllekypert (W 12), medan det andra paret möjligen kan sättas i samband med det linnefragment, FH, som skymtar under yllematerialet på 465:1. Det är givetvis också tänkbart, att linnet i detta fall härrör från serken.

*Hägg 1974, p. 42-43, illustrations p. 121*

## Colour

The *woollen* fragments found at Birka are currently fairly dark in colour and discoloured by rust or by the decomposition of the body in the grave. Hägg doesn't mention which tests (if any) has been used, but states that it is very difficult to identify the original colours of the woollen fragments. The two colours that can be identified is dark blue and dark brown (Hägg 1974 p. 52). In addition, one of the graves (1090) contains fragments of what might have been a woollen smokkr made from a striped fabric, with blue and reddish brown 5 mm wide stripes, and possibly decorated with a tablet-woven woollen band (Hägg 1974, p. 48).

**1090.** Öglor kring nålhållare och nålfäste i båda spännbucklorna. Materialet i öglorna är tuskaftat ylle. Fragment av vad som kan vara en linneögla finns dessutom i den ena spännbucklan.

Från samma grav kommer lösa stycken av ylleväv. Båda yllesorterna är tuskaftada, den ena, W 28, är en mörkblå ripsväv. Den andra, W 33, beskrivs av Geijer som randig i två färger, blått och rödbrunt, ränder ca 5 mm breda. Till detta fragment hör enligt Geijer vad möjligen kan vara ett brickvävt prydnadsband av ylle. Spännbucklornas öglor ser snarast ut att vara av det senare slaget, W 33, och det är därför kanske rimligt att tänka sig, att det av Geijer beskrivna kulörta fragmentet med ränder och prydnadsband skulle vara en del av kjolen.

Utom dessa textilier finns även bevarade en del lösa linnefragment tillsammans med rester av revben. Det är dels kantstycken med fällvirkning och söm, dels delar av öglor. Dessa fragment skulle möjligen kunna härröra från ännu en kjol (öglor med rester av framstyckets övre fällkant under någon av spännbucklorna), nämligen den inre omlottkjolen, som då skulle ha varit av linne.

Hägg 1974, p. 48

Most of the *linen* fragments appears to be undyed, but there is at least one exception. Grave 563 contains a blue linen fragment that has been folded and decorated with a red twined cord. The appearance of blue and red on the same fragment, which thus has been exposed to the same discoloration, shows that the colours must be original instead of a result of metal corrosion (Hägg 1974, p. 44).



1a

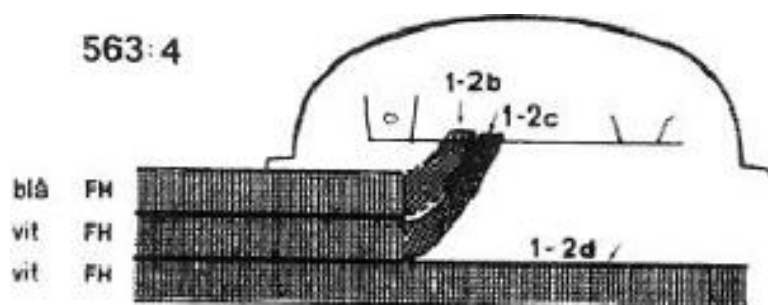


2a

**563.** I ena spännbucklan fanns linnefragment i flera lager (*fig 1-2a*). Sedda från dräktens framsida består dessa av blått linne i 3-4 skikt (troligen ett avsnitt av kantfällan), det yttersta prytt med en röd snodd (*563:4 1-2b*). Fragmentet tväras av 3 å 4 efterstygn. Det blå linnen låg utantill på en ursprungligen vitt (?), nu rostfärgad linneögla (*563:4 1-2c*), vars övre del fattas. I öglans nedre del fanns ett par nära nog upplösta stygn, som troligen anknutit öglan till kjöldelen, *563:1-2c*. Innerst låg ett lite stycke rostfärgat, ursprungligen vitt (?) särklinge utan annan förbindelse med de övriga textilierna än själva korrosionen (*563:4 1-2d*).

Den andra spännbucklan har rester av samma blå linne, som lager 1 i föregående, här i en ögla. Över den, dvs innanför denna ögla i drakten, fanns rester av ljus, rostfärgat linne, av samme kvalitet som (*den rostfärgade öglan i den andra spännbucklan*). Troligen rör det sig även här om resterna av en ögla.

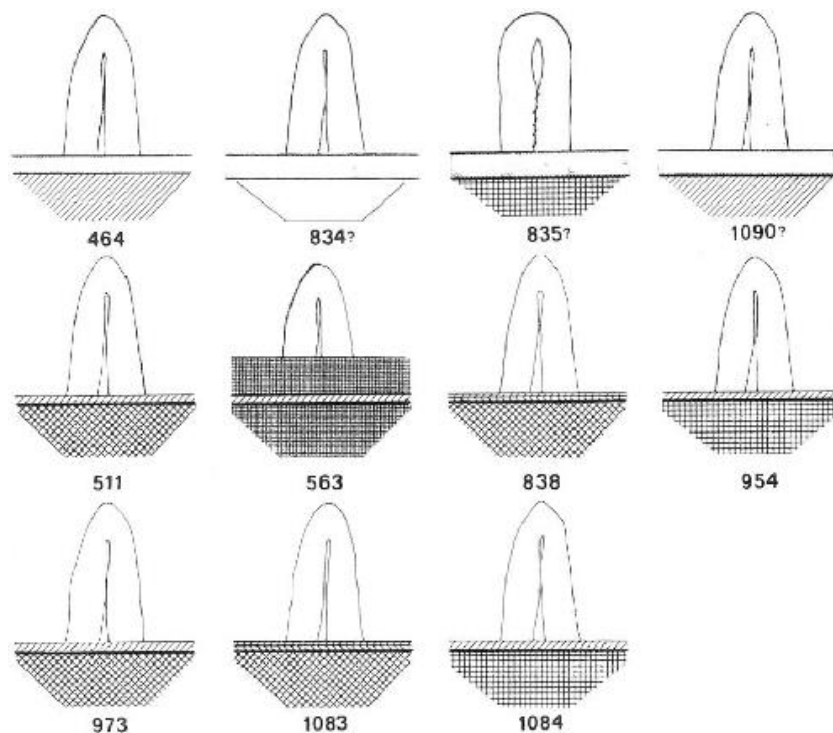
Hägg 1974, p. 44, illustrations p. 125



## Decoration

Among the more than hundred graves with fragments of the smokkr, only 11 show traces of decorative bands of one type or another (Hägg 1974, p. 52). The nine decorated woollen smokkr have bands or cords that are folded over or lie along the top of the smokkr. The decorative cord on the linen smokkr (563) is placed a bit beneath the top, where it covers both the stitches that keep the hemmed edge in place and the fastening stitches for the loops. Hägg comments that the hemming stitches would usually be invisible on wool, but would show up clearly on linen. She believes that the reason that the cord has been placed lower on the linen smokkr could be to cover the stitches.

The last grave with a decorated smokkr is grave 834. No smokkr fragments were attached to the linen loops, however, fragments of rough linen cloth were found around a scissor, possibly from the smokkr. A decorative band of silk lay unattached across the bottom of the pin in one of the brooches (Hägg 1974, p. 45). It may have run along the edge of the smokkr as shown in the illustration below, but could also have been fastened further down.



- 464: woollen smokkr, a silk band folded over the top of the smokkr
- 834: unknown material in smokkr, a silk band is found at the bottom of the brooch, it may have been used to decorate the smokkr
- 835: woollen smokkr, remains of a silk band under the linen loop. Possibly decorating the top of the smokkr, or used to hang tools
- 1090: woollen smokkr, possible remains of a tablet-woven woollen band
- 511, 973, 1084: woollen smokkr, cord (identified as wool in Hägg 1986, p. 62)
- 563: linen smokkr, a red cord (identified as wool in Hägg 1986, p. 62)
- 838: woollen smokkr, a braided cord (no info on what it was made of)
- 954: woollen smokkr, a wool cord
- 1083: woollen smokkr, a cord (no info on what it was made of)

## Haithabu

Various excavations of the former Viking settlement of Haithabu, near Schleswig Holstein in Germany, have yielded a large amount of 10th century textile material. A majority of the preserved fragments were found in the harbour. These fragments were the remains of clothing that had been torn up, coated with tar, and used as ship's caulking (Hägg [1984](#)). Excavations also uncovered textile fragments from the settlement and graves of Haithabu (Hägg [1991](#)).

Due to the presence of tar, Haithabu harbour yields unusually well preserved textile fragments. However, the harbour finds provide no information on the position of each fragment on the body. Thus, identification of which garments each fragment belong to are based solely on their shape. Each garment that can be identified however, provide a fascinating glimpse of how everyday clothing may have looked.

Many of the garments found at Haithabu appears to have been cut to fit the body. Hägg (1984, p. 214) points out that not only does each garment fill a specific function, but the tailoring craft is more advanced than earlier. Patterns are no longer solely based on the rectangular fabric coming off the looms, but instead uses pieces cut on the diagonal, in curved shapes etc. to create garments tightly fitting the body. The many remnants of cut-offs confirms the impression of more sophisticated cuts and shaping.

De många efter kroppens former snävt skurna plaggen i Hedeby, t.ex. skjortan och byxan i mansdräkten eller tunikan och hängselkjolen i kvinnodräkten, visar att den dräkthistoriska utvecklingen nu nått en nivå, där dräktens olika delar genom tillskärning och sömnad givits olika, mycket bestämda funktioner. [...]

Klädesplagg, som huvudsakligen är sammansydda av större och mindre firsidiga tyglängder kan i och för sig vara funktionsbestämda, men kan inte betecknas som produkter av en avancerad tillskärarkonst. I sådana fall baserar sig mönstret på den i vävstolen givna formen. När emellertid inte de firsidiga och rätvinkliga tyglängderna bildar utgångspunkten för mönstret utan kroppens former, så att stoffytorna måste skäras till på diagonalen, i bågförm, i kilstycken osv. uppkommer en i princip helt ny uppbyggnad av snittmönstret. De här analyserade mönstren vittnar om stor erfarenhet i tillskärningskonsten: såväl fastheten som elasticiteten, olika på tygets olika ledder, har utnyttjats maximalt i hängselkjolen, att döma av de bevarade fragmenten (Nr. 14A-B). [...]

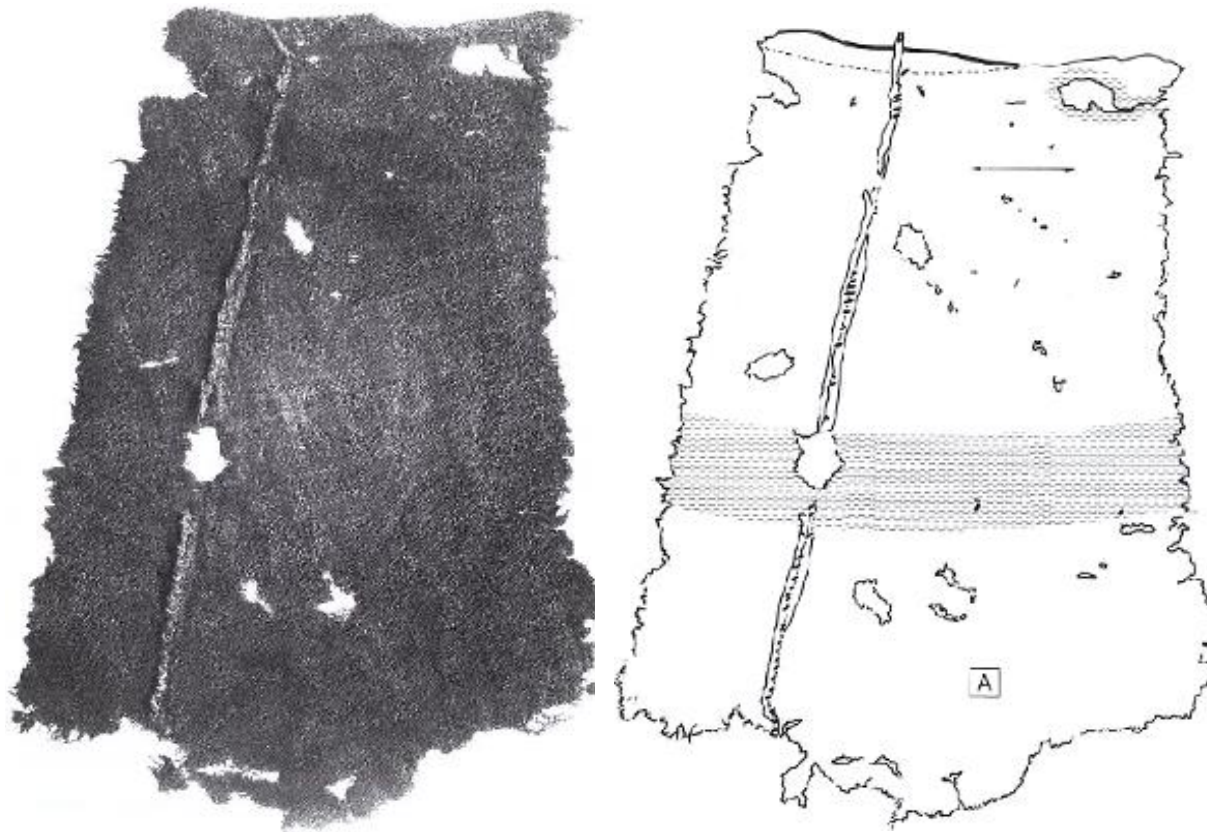
Exemplen av detta slag är många, de här anförda torde räcka till för att visa, att dräkten i Hedeby befunnit sig på ett högt utvecklat stadium. De många resterna av tillskärningsspill bekräftar detta intryck.

*Hägg 1984, p. 214*

### The smokkr from the harbour

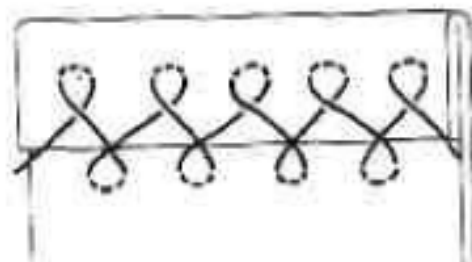
Two fragments of a fine repped wool tabby were identified as potentially belonging to a smokkr. The fabric had been dyed brown (Hägg 1984, p. 38).

The largest fragment (**H14A**) is 30 cm high, 16-23 cm wide and 0.1 cm thick. The fragment is roughly wedge-shaped with one side that has been cut in a straight line, and one that curves slightly. Both sides have stitch holes, thus confirming that the fragment originally had seams along both sides, connecting it to other pieces of the garment.



*Illustrations: Hägg (1984, p. 39)*

The upper edge (16 cm) has been created by turning over 1 cm of the selvedge towards the inside and stitching it in place with "Ösenstich". There is a hole (2.5 x 1 cm) close to the top, surrounded by a felted area. The bottom edge (23 cm) is torn (Hägg 1984, p. 38).



*Illustration: Hägg (1984, p. 150)*

A dart (26.5 cm long) runs parallel to the straight side of fragment A, from 7 cm below the upper edge down to the tear at the bottom. Unlike modern garments, the ridge of the dart appears to be on the outside of the smokkr. The width of the dart varies (2-5 mm), and the widest point is about 15 cm below the top edge. Here the garment shows traces of wear; the cloth is felted in a band across the garment and a hole has been worn through at the dart.



A thin piece of braid has been stitched in place on top of the ridge formed by the dart on **H14A**. The braid extends beyond the dart up to the top of the smokkr. It has deteriorated considerably but appears to be 1-2 mm wide, made of six two-ply threads (Z-spun, S-plyed), three red and three yellow (Hägg 1984, p. 38).

*Illustrations: Hägg (1984, p. 39 and 41). Red line added to illustration of braid for emphasis.*

The other fragment (**H14B**) is 12 by 25 cm and is torn at both the top and the bottom. One of the side edges has been preserved, complete with stitch holes (1). The other side is less preserved, and there is no stitch holes. Traces of the dart (2) remain, although not of the braid. This fragment is wider than **H14A**, leading Hägg (1984, p. 38) to postulate that it would have been positioned a bit lower on the body.



### Other smokkr remains from Haithabu

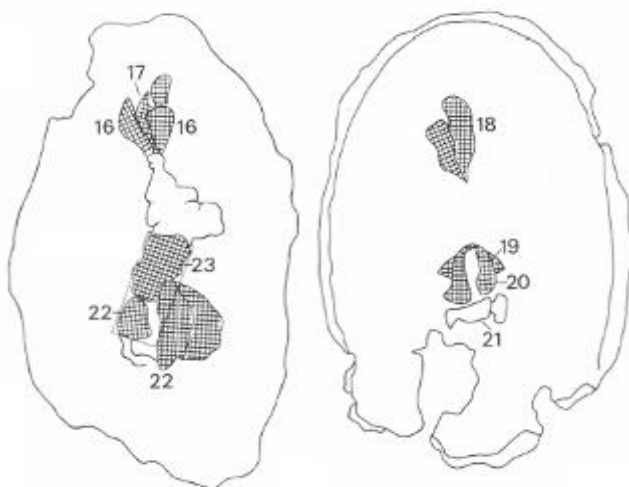
Only 1% (16) of the examined graves at Haithabu graveyard contain oval brooches. This is a clear indication that while the smokkr was still in use, it was definitively not the only type of garment worn by the Haithabu women (Hägg 1991).

The only fragments from the Haithabu graveyard that can be clearly identified as belonging to a smokkr is the loops, usually made from a fine linen cloth (e.g. grave **159/1960** and **182-185/1960**). In addition grave **159/1960** contain fragments of a two-shaft woollen cloth that may have come from the smokkr, if the layering of the grave has been interpreted correctly (Hägg 1991).

Av hängselkjolen finns bare bandöglorna från hängslena bevarade (t.ex. [159/1960, 182-185/1960]) och små fragment, om vilka man inte med säkerhet kan säga att de verkligen härrör från kjolen. Bandöglorna är mycket fina [...], i regel av linne. Av vilket material övriga delar av kjolen bestod är oklart. En ripsartad tuskaftsväv av ylle från grav 159/1960 [...] kan, av mikrolagerföljden att döma, möjligen härröra från hängselkjolen. Hägg 1991, p. 277 (illustration numbers removed or exchanged for grave numbers)

### Grave 159/1960

A girl was buried with two oval brooches, a rectangular bronze fibula and a knife with a leather sheath and wooden handle. There were several textiles in the grave, but here the focus will be on possible smokkr loops.



Both oval brooches had loops made from a smooth linen tabby and loops of a tabby with stripes made by alternating between z- and s-spin in the warp threads. There were at least three loops in each brooch, possibly more (Hägg 1991, p. 135-148).

*Illustration: Hägg 1991, p. 143*

The right brooch had one thin loop of tabby-woven linen (18) at the top of the brooch and two at the bottom (19 and 20). There was a third band (21) that lay across the pin. However, this band is made of a material that is probably taffeta silk (untwisted weft threads, dense weave and glossy surface), which together with the transverse position makes it likely that it was sewn along the upper

edge of the smokkr as decoration. A loose fragment of an iron pin that probably belongs to the brooch has preserved a part of a linen band (159:27), with warp threads that alternate between z-spun and s-spun.

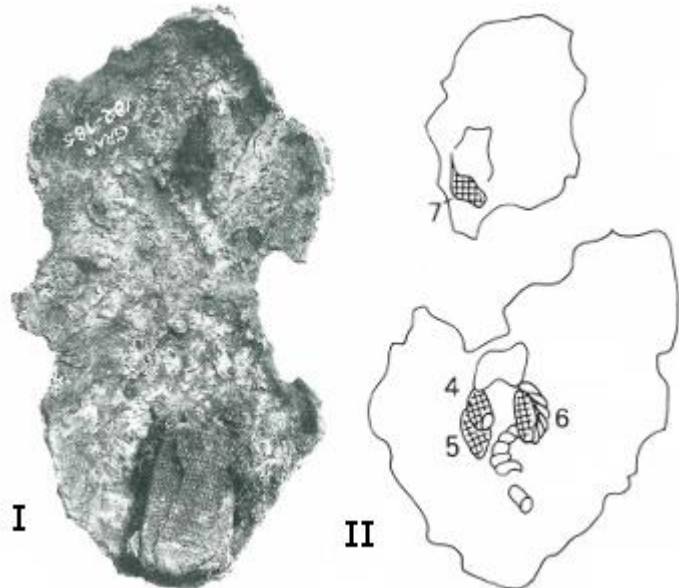
The left brooch had two thin loops of finely woven linen tabby (16 and 17) at the top of the brooch and a wide, particularly fine loop (22) from a fabric with warp threads that alternate between z- and s-spun, at the bottom of the brooch, underneath a fragment (23) probably belonging to a linen serk.

Finally, there are some loop fragments that have been detached from the brooches and stored separately. One of these (159:25) have remains of stitches along one side, another (159:24) have the same alternately z-spun and s-spun warp threads as mentioned above. However, it is uncertain which of the brooches these fragments belonged to.

### *Grave 182-185/1960*

Woman's grave with two oval brooches. There were several textiles in the grave, but here the focus will be on probable smokkr fragments.

Brooch I has a loop (182-185:3) of very fine tabby weave at the bottom. Brooch II is very fragmented, but the bottom of the brooch has two remaining loops (4 and 5) of a similar fine weave, in addition to a cord (6) of 6-8 z-spun threads in s-ply that may have been used to hold beads. Traces of a strap (7) in tabby weave lie by the broken pin holder in brooch II (Hägg 1991, p. 148).



*Illustration: Hägg 1991, p. 149 and 151, slightly modified.*

In addition, there is a part of a linen band detached from one of the brooches (182-185:12). The band is 7 mm wide and has a seam along one side. The fabric is very fine, possibly blue, with tightly woven individual (currently) red threads in warp and weft, which together form a check pattern. A part of this band is rusted onto (182-185:13) a second, loose, pin fragment, on which there are also traces of shirt linen (182-185:14). Similar fabric remnants, small but recognizable, adhere to two other pin remnants (Hägg 1991, p. 152).

Von einer der Fibeln abgelöst ist auch ein Bandrest (182-185:12; z 29 F/10 mm x z 8 F/5 mm) mit Seitennaht. Die Breite beträgt 7 mm, das Gewebe ist sehr fein, eventuell blaufarbig, mit engewebten einzelnen (jetzt) rotfarbenen Fäden in Kette und Schuß, die zusammen ein Karosmuster bilden. Ein Teil dieses Bandes ist an ein zweites, loses Nadelfragment angerostet (182-185:13, z 8 F/3 mm x z 4 F/2 mm), auf dem außerdem Spuren von Hemdleinen (182-185:14, z 8 F/4 mm x z 6 F/5 mm) erhalten sind. Ähnliche Stoffreste, klein, aber doch erkennbar, haften an zwei weiteren Nadelresten.  
*Hägg 1991, p. 152*

## Køstrup

A small graveyard in Køstrup, Fyn in Denmark was excavated in 1980-1981, revealing a grave, referred to as ACQ, where several textile fragments had been preserved. Among other things, the grave held two oval brooches (of the type P 51), eight beads and an iron knife with sheath. The grave is dated to the 10th century, based on the grave goods (Lindblom ([1993](#), p. 154-155, 157).

Most of the textiles were found in connection with the oval brooches. One of them (**x505**) had a lump of textiles inside. The other (**x501**) had turned in the grave so that the underside pointed upwards and had preserved less material (Wielandt [1980](#)).

### The woollen smokkr

Inside brooch x505 was a relatively large fragment (**x541**) of a smokkr. It consisted of several pieces of woollen tabby, woven with 26/10 threads per cm (Wielandt 1980, p. 199) and had been dyed blue (Rasmussen & Lønborg [1993](#), p. 175).



Photo by Hilde Thunem at Odense Bys Museer. x541 and seam 585. [Large version \(1.1 MB\)](#)

The upper edge of the smokkr had been created by cutting the fabric parallel to the weft, folding 4-5 mm of the cloth over and overcasting. The remains of a vertical seam (**x585**) join two pieces of the fragment along their selvages by overcast stitches (Wielandt 1980, p. 193). This seam is currently ca 1.9 cm long, although it originally probably ran from the top to the bottom of the smokkr.

To stykker lærreds- eller rettere trendrepsvævet uldstof med hver sin egkant er syet trådlige sammen med kastesting (x585). Der er derefter klippet en kant trådlige med islættet. Kanten er bukket 4-5 mm om og der er kastet over sømmen  
*Wielandt 1980, p. 193.*



Photo by Hilde Thunem at Odense Bys Museer. Seam x585. [Large version \(820 KB\)](#)

## Pleating

One end of the smokkr fragment has tiny pleats, 2-3 mm deep and 3 mm wide. The pleated part is currently approximately 7.6 cm long (Thunem [2015](#), [2017](#)). The longest pleat is torn 4.3 cm from the top of the smokkr, making it uncertain whether the fabric was just pleated near the top, or if the pleats ran further down.



The pleated part is currently approximately 7.6 cm long (Thunem [2015](#), [2017](#)). The longest pleat is torn 4.3 cm from the top of the smokkr, making it uncertain whether the fabric was just pleated near the top, or if the pleats ran further down.

*Photo by Hilde Thunem at Odense Bys Museer. Details of x541. Large version [left \(530 KB\)](#), [right \(2.1 MB\)](#)*

The pleating starts 11 cm from the vertical seam (Wielandt 1980, 193). Rasmussen and Lønborg (1993) suggest it was created by drawing the cloth together in pleats by a single linen thread. However, if that was the case, the thread must have deteriorated in the grave, as Wielandt (1980) explicitly states that there is no gathering thread.



I selekjolefragmentets ene ende ses resterne af et gauffreret stykke, der har siddet midt mellem fiberne, velsagtens for at give kjolen vidde. Gauffreringen ser ut til at være fremkommet gennem en simpel rynkning med en hørtråd.  
*Rasmussen & Lønborg 1993, p. 176-177*

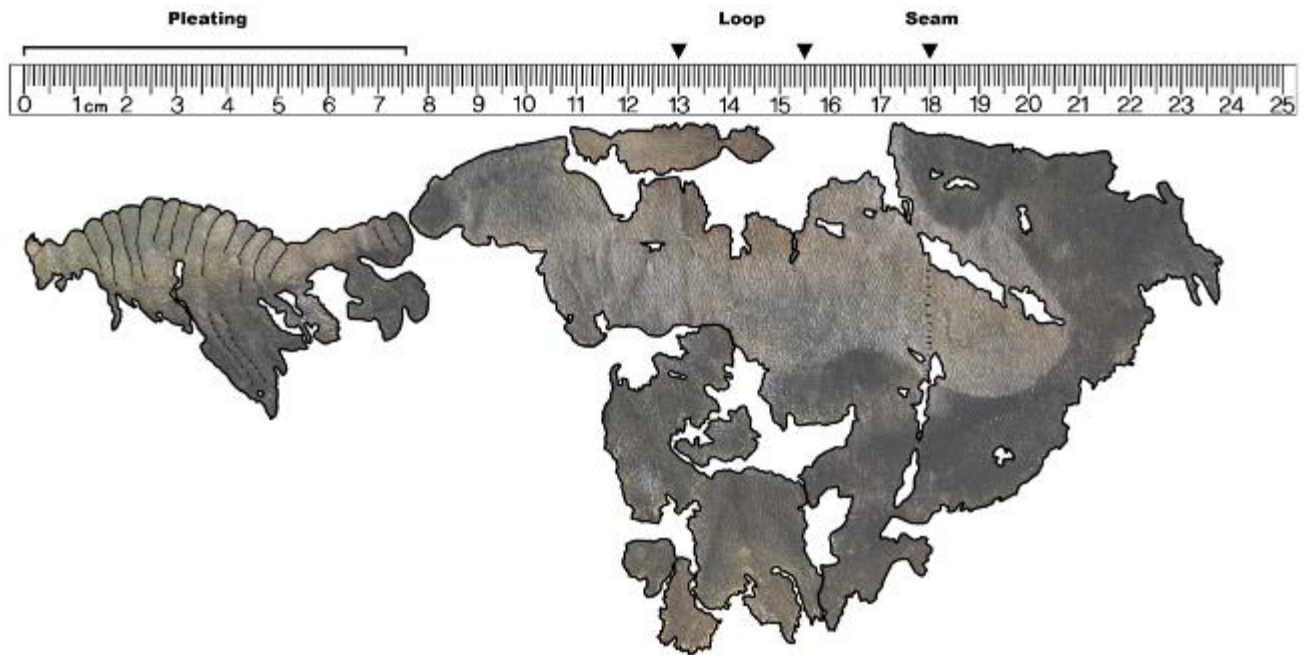
Dessuden var tekstilet rynket eller måske rettere plisseret, da der ikke fandtes nogen rynketråd, i den ene side.  
*Wielandt 1980, p. 199*

## Overall shape of the fragment

Just below the top of the smokkr were two holes, respectively 2.5 cm and 5 cm from the vertical seam, indicating that the front loop had been fastened here (Wielandt 1980, p. 193).

11 cm fra sømmen ved egkanterne langs ombukningen begunder en tæt rynkning, der fortsætter fragmentet ud. Mellem sømmen og rynkningen (henholdsvis 2,5 cm og 5 cm) fra sømmen ved egkanterne er to huller under den ombukkede søm. Her sad en strop (x569), der på dette sted var så nedbrudt, at der ingen bindinger var intakte.  
*Wielandt 1980, p. 193*

Using the information given by Wielandt, and later photographs of how the smokkr fragments are puzzled together by the museum (Ewing 2006, plate 4 and Rimstad [1998](#), fig. 37), it is possible to create a sketch of how the fragments relate to each other and to the loop. The smokkr piece is roughly 25 cm long, running from the middle of the dress, under the oval brooch and down under the arm. It reaches only 10 cm down from the edge, and so gives no information on the length of the smokkr. As mentioned above, the pleating starts 11 cm from the vertical seam.



*Fragment x541 and seam x585, illustration by Tor Gjerde and Hilde Thunem*

## Woollen smokkr loops

Four woollen loops were found, two inside each brooch. All were identified as belonging to the woollen smokkr (Wielandt 1980).

### Brooch x505

#### Upper loop x570

Woollen tabby, 24/14 threads per cm, Z/Z (Wielandt 1980). According to illustrations included in the current find documentation, this loop has a linen core.

*Photo by Hilde Thunem at Odense Bys Museer. Fragment x570. [Large version \(771 KB\)](#)*



#### Lower loop x569

Woollen tabby, 22/15 threads per cm, Z/Z. The loops were attached to a decorative band (Wielandt 1980).

The original loop would have stretched from the top of the smokkr, past the tablet woven band and around the pin inside the brooch. Currently, the loop is heavily deteriorated at the end that would have been fastened in the smokkr (the longest surviving piece is 3.9 cm) and no part of the loop survives above the band. The loop strap is 1.0 - 1.3 cm wide.

*Photo by Hilde Thunem at Odense Bys Museer. Fragment x569. [Large version \(1.6 MB\)](#)*



## Brooch x501

### Upper loop x518

Woollen tabby, 22/18 threads per cm, Z/Z. The strap was created by folding a piece of fabric 2-3 times towards the middle, and then once around the middle, making the final result 6-8 layers thick (Wielandt 1980).

The loop strap currently appears to be 1.1-1.4 cm wide and torn at a length of 3.8 cm.

*Photo by Hilde Thunem at Odense Bys Museer. Fragment x518, [large version \(1.2 MB\)](#)*



### Lower loop x543

Woollen tabby, 22/10 threads per cm, Z/Z, upper part of the loop (Wielandt 1980).

The loop is broken in two and has a x-number for each part

### x520

Woollen tabby, 21/13 threads per cm, Z/Z, lower part of the loop (Wielandt 1980).

*Photo by Hilde Thunem at Odense Bys Museer. Fragment x520 and x543. [Large version \(1.2 MB\)](#)*



Rasmussen and Lønborg (1993, p. 176) give more details on the construction of each loop.

Two of the loops had been made of strips of the same fabric as the smokkr, that had been folded so that no cut edges were visible and overcast along the side (as shown leftmost in the illustration).



Then there was one loop (x570) with a linen core of folded linen fabric. The smokkr fabric had been folded around the core and overcast along the side (rightmost in the illustration).

*Illustration: Rasmussen & Lønborg 1993, p. 177*

The last strap was folded and overcast along the side, but was made from a less finely woven woollen tabby than the smokkr. Unfortunately, Rasmussen and Lønborg do not refer to the x-numbers in their report, making it hard to ascertain which one this was.

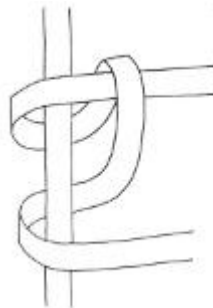
## A linen band

A strip of linen tabby (22/22 threads per cm) had been folded so the resulting band was four layers thick and 0.4 cm wide. This band loops twice around the pin at the bottom of brooch x505, and was clearly put on before the woollen smokkr loop (x569) was threaded onto the same pin (Wielandt 1980, p. 200).

Rasmussen and Lønborg (1993, p. 177) give further details, stating that the band is blue and have been overcast along one side. Their illustration of the looping of the band around the pin shows that this is not an ordinary smokkr loop.

*Photo by Hilde Thunem at Odense Bys Museer. x572.*  
[Large version \(200 KB\)](#)

Smal tekstilstrop. Stroppen er snoet en ekstra gang om nålen i spænde x505. Der rent faktisk to stropper - en i hver ende. Man kan i den ene endetydeligt se at den smalle strop må først have været sat om nålen i fjederenden inden den brede strop x569. Analysen viste at stroppen består af et stykke lærredsvævet stoff af hør, der er lagt 4-dobbelt så stroppen får en bredde på 0.35 cm. Trend: 22 z-spundne tråde/cm og islæt: 22 z-spundne tråde/cm - målt over 0.25 cm.  
*Wielandt 1980, p. 200*

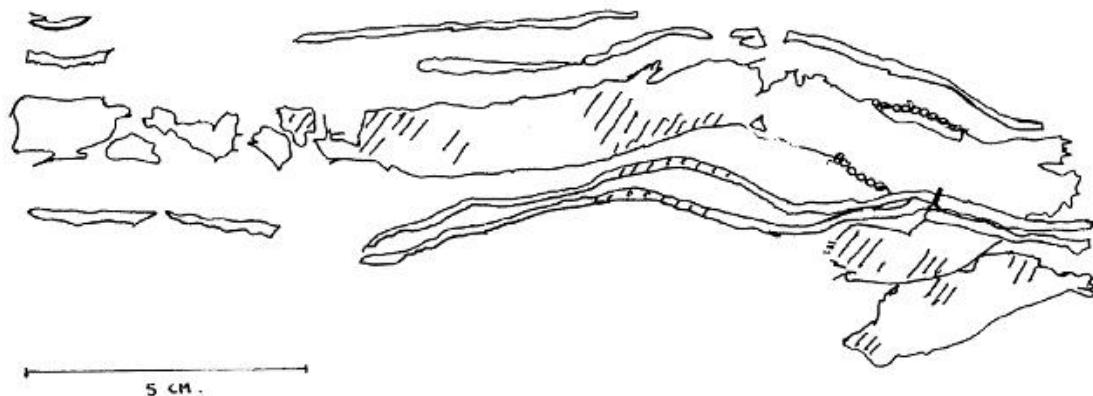


I fibel x505's ene side er bevaret dele af et ca. 5mm bredt, blåfarvet hørbånd, fremstillet af 4 lag ombukket lærred med en kastning langs den ene side, der tolkes som rester af et bærebånd til ophængning af nøglen og kniven.

*Rasmussen & Lønborg 1993, p. 177, illustration p. 178*

## Decoration

The main decoration appears to have been a tablet woven band (x584), surrounded by a pair of woollen strings on each side. The largest fragment that remains is 13.3 cm long and 13-14 mm wide. In addition, there were a few small fragments clearly belonging to the band.



*Overview of fragments of tablet woven band: Odense Bys Museer, unknown artist.*

The tablet woven band was constructed using a two-hole tablet weave technique. Several decorative figures had been created by brocading with wool yarn in different (but so far unidentified) colours (Rasmussen & Lønborg 1993, p. 177). The warp consisted of 14 threads

in a two-ply (Z/S) wool yarn that had been dyed in a dark blue colour (Wielandt 1980, p. 194).

The band was fastened to the front loops (but not the smokkr itself) by overcast stitches, and was probably approximately 20 cm long (Rasmussen & Lønborg 1993, p. 177).

Mellem fiblene, langs selekjolens vandrette søm, har et mørkeblåt, ca 14 mm bredt mønstret brikbånd af uld været anbragt, oprindeligt ca 20 cm langt. Brikvævningen er udført som tohulsbrikvævning med totrådet ultråd i trenden, mens islætten, der i dag ikke kan iakttages, har sandsynligvis vært av hør. Mønstrene der er fremstillet i uldbrochering, er udført med forskellige tråde i forskellige farver, der desværre ikke kan bestemmes, men som i dag fremtræder i rødlige, brunlige og gullige nuancer. Båndet har været hæftet med kastninger til selekjolens forreste stropper.

*Rasmussen & Lønborg 1993, p. 177*



*Photo by Hilde Thunem at Odense Bys Museer. x584 (outside of garment). [Large version \(610 KB\)](#)*

Two wool strings were running along each side of the tablet woven band (Wielandt 1980, p. 194). However, it is unclear to which degree they were fastened to the tablet woven band. According to Wielandt, they were sewn to the band with stitches remaining in two places, while Rasmussen and Lønborg state that stitches in the two lower strings and the smokkr indicate that they were stitched to each other and to the smokkr in just one place.

Pyntebåndet består af et mønster-vævet midterstykke og to par snoede bånd, der er påsyet midterstykket. [...] De påsyede snorer af uld er i den ene side s-tvundet og i den andre side z-tvundet. De har været syet på midterbåndet med en uldtråd (2 z-spundne tråde er s-tvundet). To steder er disse sting bevaret.

*Wielandt 1980, p. 194*

Langs begge sider af brikbåndet er anbragt to uldsnore, fastsyet med kastesting til stropperne, men hvis eventuelle fastgørelse til brikbåndet er usikker. Sting i de nederste snore og i selekjolen indikerer dog, at disse snore et enkelt sted har været hæftet sammen, både indbyrdes og med selekjolen.

*Rasmussen & Lønborg 1993, p. 177-178*

## **Pskov**

In 2006, a chamber grave containing two oval brooches and textile remains was excavated in Pskov in Russia. The grave is dated to the mid-10th or early 11th century.

No trace of a body was found, but the remains of a birch-bark container, where the brooches and textiles appear to have been stored, was recovered from a block of soil under the floor of the grave (Zubkova et al. [2010](#), p. 291-292). This had protected the textiles from the decaying

body and allowed more of their surfaces to remain in contact with the preservative metal of the brooches. However, without knowing where the fragments would have been positioned on the body it is harder to identify the garments they belonged to.

[...] the main bulk of the textiles placed in the container consisted of linen tabby cloth folded in several layers. In addition, it was ascertained that all the elements made of silk were covered on the reverse side by a thin layer of degraded linen tabby, with the exception of the tucked-in edges and connecting seams. These facts, as well as traces of the sewing threads, enable us to state that all the silk parts were sewn onto a linen garment.

*Zubkova et al. 2010, p. 292*

A total of eleven textile fragments were preserved in the birch container, consisting of two types of fabric: linen and silk. After analysing the textiles, Zubkova, et al. (2010, p. 292) concluded that they originated from two garments made of fine blue linen tabby with silk facings—an underdress and a garment that had been fastened with oval brooches.

### Loops

One of the oval brooches had remains of linen straps on its pin. Zubkova et al. (2010, p. 292, 298) notes that there were more than one loop, but does not mention the precise number.

At least one of the loops was removed from the brooch. It measures roughly 4 cm from the top to the bottom (where it is torn) and is ca. 1 cm wide.

*Photograph: Zubkova et al. 2010, p. 297*



[...] a second bronze oval brooch was discovered. On its pins straps of linen and a fragment of a collar from a garment made from a similar linen textile were preserved. [...]

*Zubkova et al. 2010, p. 292*

### A garment fastened by the oval brooches

One of the textile fragments in the Pskov grave had remains of linen loops fastened to it, indicating that it was part of a garment that was fastened by the oval brooches (Zubkova et al. 2010, p. 297). However, the shape and dimensions of the fragment leave open the question of whether it was a Slavic sarafan, a Scandinavian style smokkr, or something in between.

The fragment had a total length of 1,5 m and a width of more than 30 cm. It consisted of strips of three different types of samite silk that had been carefully stitched together, and had a thin layer of degraded linen tabby covering the back, confirming that it had decorated a linen garment (Zubkova et al. 2010, p. 292).



*Photograph: Kolpakova [2012](#). Silk fragment from the Pskov grave.*

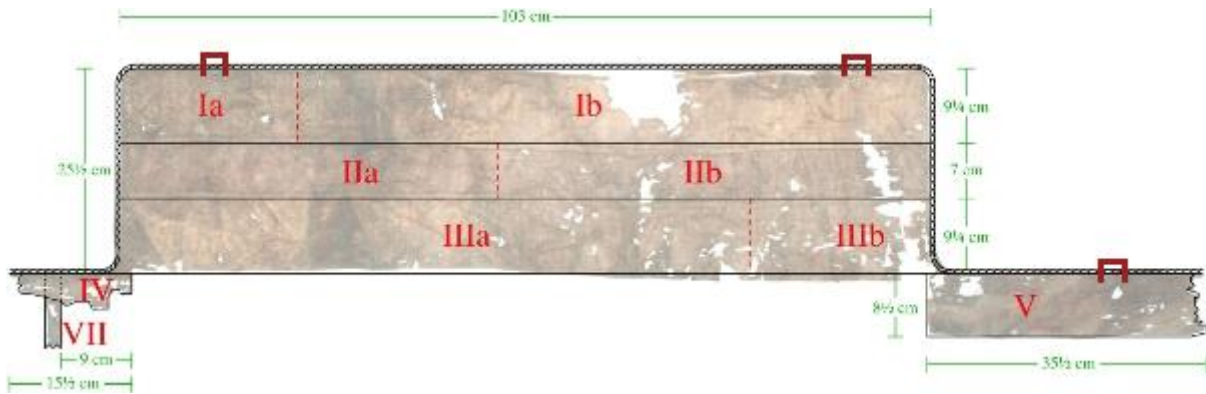
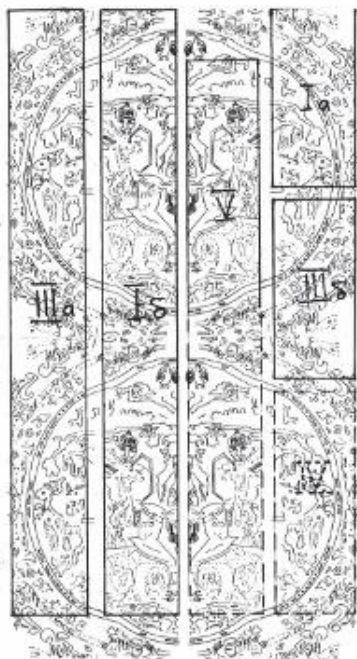


Illustration by Tor Gjerde and Hilde Thunem, based on Zubkova et al. 2010, p. 292 and drawing p. 294. The smokkr had a circumference of at least 150 cm (probably longer, as IV and V do not survive in their entirety), whereof the central part was 103 cm long.

The base of a blue linen loop had been preserved on one side of the central piece. At an equal distance on the opposite side, traces of needle holes and sewing threads were found, with the spacing between the holes matching the width of the preserved loop fragment. Additionally, remnants of sewing threads and traces of a loop were identified 20 and 25 cm from the point where one of the side bands (V) connected to the central piece (Zubkova et al. 2010, p. 292). Unfortunately, there is not enough preserved of the last side band (IV) to determine whether it also featured a loop in a corresponding position on the opposite side.

On the broad central area of detail no. 6, at equal distances from the centre, the base of a strap of blue linen on one side, and the traces of needle holes and the remains of sewing threads on the other, have been identified. The distance between the holes was equal to the width of the preserved fragment of the strap. On one of the narrow lateral strips of the detail described, at a distance of 20 and 25 cm from the place to which it is attached on the broad central part, the remains of threads and traces of sewn on straps have also been recognized (Fig. 49.5). The general symmetry of detail no. 6, as well as the symmetrical position of the remains of one of the straps, and the traces of a similar one on the central part, all suggest the presence of the identical straps on its second narrow lateral strip.

Zubkova et al. 2010, p. 297



The upper (I) and lower (III) silk bands on the central piece, and the side bands (V and IV) were made of a samite with a golden-pink pattern on a blue background with green bands. Close examination of the strips revealed that they were part of a woven hunting scene showing Bahram Gur, who ruled Persia in the 5th century. The fabric had been cut into strips with no apparent concern for the integrity and direction of the original fabric design. Fabrics with a similar (although not identical) motif are known from finds throughout Europe (Zubkova et al. 2010, p. 293-295).

Illustration: Zubkova et al. 2010, p. 295

The middle silk band (II) was made from a reddish-violet samite. Finally, the upper edge of the fragment was trimmed with two different types of samite silk (Zubkova et al. 2010, p. 293).

In addition to the large silk fragment, several 4.5 cm wide reddish-violet samite strips were found in the grave. One edge of these strips had been finished using the same technique as the trim on the large silk fragment.

The reverse side was covered with remnants of linen, suggesting that the strips were sewn onto the hem of one of the linen garments in the grave (Zubkova et al. 2010, p. 296, 298).

If this interpretation is correct, it is one of the few instances of evidence we have for decoration of the bottom of a Viking Age garment. Unfortunately, due to the find context, it is not possible to determine which of the two garments featured the silk-trimmed hem.

## Minor finds

These finds may not have the sizeable fragments mentioned above, but they still provide additional information on the smokkr. For example, there have been found pleated remains other than the Køstrup smokkr, and several of the minor finds have more than two loops in each brooch, proving that the appearance of multiple loops aren't limited to Birka.

## Værnes, Tråstad and other finds

### *T 16136 and T 16137 at Værnes*

In 1940, two grave mounds containing brooches and smokkr fragments were excavated at Værnes, in Norway. The grave with the most remains (**T 16136**) contained two oval brooches of type P42, that can be dated to the period 850-900 (Petersen [1928](#), p. 51), a brooch of Irish origin, 17 glass beads, 1 amber bead, and several textile fragments.

The textiles were examined by Blindheim ([1945](#)) five years later. Most of the textiles had been separated from the brooches and stored as two lumps of textile material (Blindheim 1945, p. 144). However, there were still small textile fragments within one of the oval brooches. Blindheim did not draw their stratigraphy, but it is possible to discern it by closely following her description, and the photographs taken by NTNU Vitenskapsmuseet.

Innerst mot spennens skall ligger en tvunnet snor, - nå delvis løs, men den har vært ført i en løkke om nålehodet og knyttet om dette. Snoren er tvunnet av to ullgarnstråder som begge består av fire totrådede, s-tvunnete tråder. Tvingningen er jevn og fin. Litt lenger ute og nå helt fastrustet til nålehodet ligger det nok en snor. Om også den er av ull, kan en ikke si med sikkerhet. Den ligger som den første tråden, i en løkke om nålehodet, og endene er knyttet på oversiden av dette rett ovenfor nåleskjeden.

Utenfor disse snorene kommer det så en liten bite av et stoff som har vært brettet om og falt, så det er tydelig at vi her har kanten av et eller annet plagg. Det er nok igjen til at en kan se at det har vært et fint ullstoff, vevet i gåsøyemønster, men tetthetsgraden kan ikke avgjøres. Ytterst er det rester av et annet, noe grovere, toskaftet stoff, muligens et linstoff. Det ligger, etter det en nå kan se, i en kort løkke om nålehodet.

*Blindheim 1945, p. 144*



*Photograph: NTNU Vitenskapsmuseet, T 16136 - back of the brooch with textile fragments, [large version \(25 MB\)](#)*

If we follow Blindheim's description, the following stratigraphy emerges.

**(1)** Closest to the inside of the shell of the brooch is a twined string; now partially loose, but which has been threaded in a loop around the pin hinge and tied around it. The string is twined from two woollen yarns, both consisting of four two-ply, s-spun threads. The twining is even and neat.

**(2)** Slightly further from the shell and now entirely fastened by rust to the pin hinge is a second string. Whether this too is made from wool cannot be ascertained. Like the first string, it lies in a loop around the pin hinge, and its ends are tied on the body-facing side of the pin where this protrudes from the sheath fastening it to the hinge.

**(3)** Further from the shell than these strings is a small piece of fabric that has been folded and stitched, so it is clear that here we have the edge of a garment. Enough remains that it can be recognised as a fine woollen fabric, woven in goose eye pattern; though the thread density cannot be determined.

**(4)** Furthest from the shell lie remnants of another, somewhat coarser, tabby fabric, possibly linen. From what can now be seen, it lies in a short loop about the pin hinge.



*Sketch of stratigraphy by Tor Gjerde and Hilde Thunem, based on Blindheim's description and photo of brooch, first published in Viking vol. 90 (Thunem [2025a](#))*

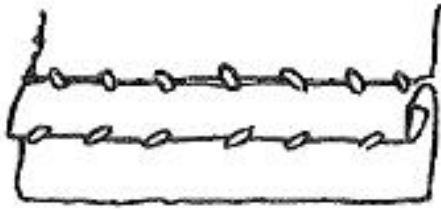
*Translation of Blindheim 1945, p. 144, numbers added to connect the text in the description with the illustration*

In addition to the tiny twill fragment inside the oval brooch, five fragments of the broken diamond twill currently survives. The twill is very finely woven, with ca 32 threads per cm, and each diamond is ca 0.5 cm wide and 0.4 cm high.



*Photo: [Universitetsmuseenes Fotoportal](#), broken diamond twill fragments. [Large version \(19.7 MB\)](#)*

The largest of the broken diamond twill fragments have a 0.3 - 0.4 cm wide hem, where the fabric has been folded twice and stitched in place. A woven band has been whip stitched to the edge. The band is woven with a technique also known from the Oseberg tapestries. It is preserved in its full width (1.1 cm, 14 threads) at one place (Blindheim 1945, p. 144-145).



*Illustration: Blindheim 1945, p. 145*



*Photo by Hilde Thunem at NTNU Vitenskapsmuseet. Broken diamond twill with band. [Large version \(0.3 MB\)](#)*

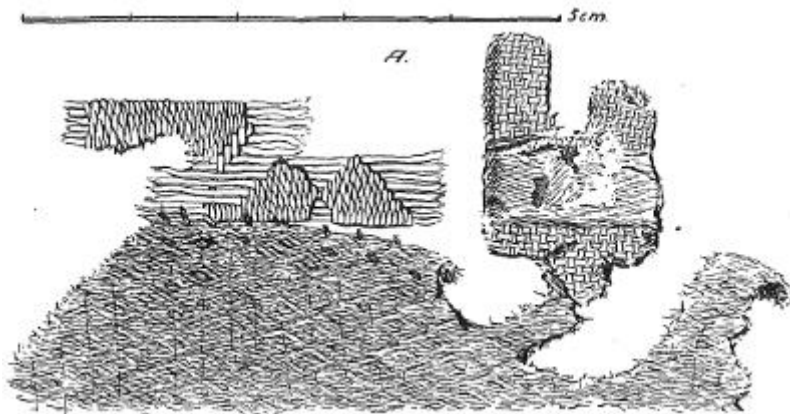
There is one other fragment of broken diamond twill that show evidence of a hem. Along one of the sides, ca. 3.3 cm of the hem has been preserved. The fragment is torn on the remaining three sides. One of the sides is folded, but there is no trace of stitches or other indications that this fold was part of the construction of the dress. It is thus likely that the fold happened in the grave (Thunem [2025b](#)).



*Photo by Agnes Raaness at NTNU Vitenskapsmuseet. T 16136 - fragment of diamond twill with hem. [Large version \(0.6 MB\)](#)*

Folds also show up in two of the remaining three pieces of diamond twill; one has a fold in the middle of the fragment, and the other is folded along one of the sides. However, there is no trace of stitches or other indications that these folds are intentional instead of being a result of the deterioration in the grave (Thunem 2025b).

According to Blindheim (1945, p. 144) there was a small piece of tabby fabric (possibly linen) that appears to be split into two narrow straps of some sort attached to the largest diamond twill fragment. Although the tabby fragments are currently stored separated from the twill, Blindheim's sketch shows how they were attached when she examined the find.



*Illustration: Blindheim (1945, p. 145)*

*Photo: Universitetsmuseenes Fotoportal, modified by Hilde Thunem. T 16136 - fragments of linen. [Large version \(2.5 MB\)](#)*

Tett inntil det diagonalmønstrete stoffet lå rester av et fint ullstoff i gåsøyemønster. Tettheten er ca 32 tråder pr cm. På to av bitene er det i den ene kanten en smal fall, som den på det fine ullstoffet inne i spennen. Til det ene hefter det en liten stump av et vevet bånd som vevteknisk er ganske interessant. Det er på et sted bevart i full bredde, så denne kan fastslås, den er 1,1 cm. Som en kan se ligger renningen åpen på visse partier. Den har bestått av 14 tråder. [...] Det er festet til fallen på det fine ullstoffet med enkle kastesting (Fig. 1c). Som en ser av tegningen og fotografiet, hefter det en liten bite lin(?) også til dette stykket. Formen på denne biten er litt uklar, men det ser snarest ut til at det er kløvet i to lisser eller smale bånd.

*Blindheim 1945, p. 144-146*

Blindheim interpreted the fragments of broken diamond twill as belonging to a smokkr, with a hemmed edge and decorated with a woven band. However, at the time she published her report, the existing theory was that smokkr often were worn in pairs. Trying to fit the evidence to the theory, Blindheim proposed that the linen loop inside one of the brooches and the small pieces of linen found in the grave belonged to an inner smokkr made from linen. Furthermore, she suggested that the broken diamond twill smokkr may have been held up by the twined strings (Blindheim 1945, p. 156-157).

Reconsidering the evidence in light of the new theories and finds that have emerged over the years, Thunem (2025a, 2025b) arrives at a different conclusion; proposing that the woman wore a single smokkr from broken diamond twill, held up by linen loops, while her beads were threaded on the two twined strings. This is a better fit with the stratigraphy inside the oval brooch.

The other Værnes grave, **T 16137**, was also examined by Blindheim (1945 p. 147). This grave contained a pair of oval brooches, whereof one had preserved some textile fragments. One or two strings were found around the bottom of the pin, partly covered by a piece of fabric that might be a loop. It is, however, very hard to make out the details due to the rust.

De to andre kvinnegravene fra Værnes var mindre rikt utstyrt - bare med et par ovale spennere i hver. Inni den ene av spennene fra haug 7 [T 16137] sitter det igjen noen tekstilrester omkring nålehodet. Her er det ennå vanskeligere å få øye på detaljene, men en kan tydelig skjelne [...] en eller to tvunne snorer innfiltret i et stoff, som ligger rundt nålehodet det og, som en stropp eller liknende. Det viste seg at det er toskaftet. Nåleskjeden ligger her, som på den første spennen, helt fri.

*Blindheim 1945, p. 147*

### *C 26936 Tråstad and other finds*

One of the oval brooches found at Tråstad, grave **C 26936**, in Norway contained possible fragments of two straps looped around the brooch pin in a figure of eight. One of the straps is made from fabric (linen?). On the outside of this strap are small fragments of a twined string, and a finer string has been tied to the bottom of the pin (Blindheim 1945, p. 158).

En kan skjelne to stropper som ligger i en 8-tallsløkke rundt nålehode og stilk. En er av stoff (lin?), og utenfor denne er det små rester av en tvunnet snor. I enden av nålehodet er det dessuten knyttet fast en meget finere snor. I graven fant en også små rester av ulltøyer i minst tre ulike kvaliteter, et fint og et grovere gåsøyemønster og en eller muligens to diagonalkyperter.  
*Blindheim 1945, p. 158*

Another minor find examined by Blindheim (1945, p. 158) is **C 27220** from Lammøya in Norway. One of the oval brooches found here has preserved several linen fabric loops. One is very well preserved, lying around the bottom of the pin. Around the pin itself there is fragments of one or two loops. There are also traces of linen at the point of the pin, indicating that the brooch held in total at least three loops, possibly more. The other brooch lacks the pin, but has traces of fabric at both ends of the brooch.

På den best bevarte spennen ligger det ved partiet omkring nålehodet rester av flere stropper av lin. En er meget godt bevart og knyttet fast til selve nålehodet. Rundt stilken ligger det rester av iallfall en, muligens to seler til. Her fins det dessuten linrester ved nåleskjeden. På den andre spennen mangler stilken, men inni nålehodet ligger det rester av noe som tydeligvis har vært en stropp (av lin?). Også ved nåleskjeden er det noen ubetydelige tekstilrester, men disse er for rustet til at en kan si om det er lin eller ull.  
*Blindheim 1945, p. 158*

Finally, Blindheim (1945, p. 158) referred to several finds that she knew only through descriptions in the finds catalogue from Bergen Museum. Find **B 8953** from Kirkeide and **B 9060** from Hopperstad were described as having remains of strings within the brooches. She also mentioned finds **C 18436** from Berven and **C 19179-85** from Berg. According to the catalogue descriptions, these oval brooches pierce the smokkr fabric at one end, while the other end has a loop (Blindheim 1945, p. 159).

Det sees tydelig at Spænderne have været anbragte paa den Maade af en af Klædningsstykkets Fliger har været indstukket paa Naalen (gjennomstukket af den) og en anden fæstet ved Hjælp af en om Naalen indenfor Naleskjeden lagt Strop av andet Slags Tøi.  
*Blindheim 1945, p. 159. C 18436 Berven (find from 1896).*

Det kan ogsaa her, ligesom paa enkelte andre i senere Tid indkomne Exemplarer iakttages at Naalen foruden at gaa igjennem et Stykke Tøi har baaret en Strop.  
*Blindheim 1945, p. 159. C 19179-85 Berg (find from 1898).*

### **Sandanger, Vangsnes and other finds**

Holm-Olsen (1972, 1976) examined textiles in several women's graves as part of her analysis of Viking Age textiles from Western Norway. However, she worked only with the textile fragments that were separated from brooches and other items, giving no information on whether there were fragments still attached to the brooches (Holm-Olsen 1972, p. 104). The textiles were later re-examined by Bender Jørgensen (1986).

In eight of the graves there were textile fragments with hemmed edges. All the hems had been made in the same manner, by folding the fabric over twice, so that each hem consisted of three layers of fabric (Holm-Olsen 1976, p. 199).

#### *Grave B 10720 at Sandanger*

One oval brooch of type R 648 was lying on the chest of the deceased, together with an animal shaped brooch. The brooches lay in a lump of textiles, birch bark and thin twigs. The second of the oval brooches was found roughly 1.25 m outside of the grave. While no longer in its original position, it was found in the exact same soil layer as the artifacts inside the grave (University Museum of Bergen, [finds register](#)). The oval brooch type indicates a date of 800-900 AD (Petersen 1928, p. 26-33).

Among the textile fragments there were three fabric loops. Two of the loops are preserved in their entirety and are still sewn to fragments of the garments they once were a part of. The last loop has loosened from whatever fabric it once was stitched to. All three loops had been made by folding a strip of diagonal twill several times and stitching it together (Holm-Olsen 1972, p. 104; 1976, p. 199).

Tre av hempene er av diagonalkypert, de består av flere lag sammenbrettet og sammensydd stoff. Den ene hempen er løs, de to andre er sydd fast til hvert sitt stoffstykke. Av de to siste hempene er den ene sydd fast til et stykke av samme sort stoff (Fig. 51-52), den andre er sydd fast til et ringvendstoff (Fig. 54-55).

*Holm-Olsen 1972, p. 104*



The loose loop is made from a diagonal twill with a thread count of 17 x 11 threads per cm. It is 0.6 cm wide (Holm-Olsen 1972, p. 23-27, 104, 107, 115).

*Photo by Reidar Bertelsen, Holm-Olsen 1972, Fig 53, p. 115. Modified by Thunem.*

One of the other loops are made from the same diagonal twill as the loose loop. It is still sewn to a fragment of broken diamond twill (28 x 11 threads per cm) that has a 6-7 mm wide hem made by folding the fabric twice (Holm-Olsen, 1972, p. 23-27, 103-104, 106, 116). The loop is 0.6-0.7 cm wide, and there is ca. 2 cm from the hem to the top of the loop.



*Loop and a potential smokkr fragment (front). Photo by Reidar Bertelsen, Holm-Olsen 1972, Fig 55, p. 116*

The third loop is made from a different diagonal twill (26 x 13 threads per cm). It is sewn to a fragment of the same diagonal twill, with a 5-6 mm wide hem that was made by folding the fabric twice. The loop is 0.4-0.5 cm wide, and ca. 2.3 cm high (Holm-Olsen, 1972, p. 103-104, 107, 115).



*Loop and a potential smokkr fragment (front). Photo by Reidar Bertelsen, Holm-Olsen 1972, Fig 52, p. 115*

Holm-Olsen (1972, p. 108-109) interpreted the loops and fragments as belonging to two woollen smokkr:

- One smokkr was made of broken diamond twill with a 6-7 mm wide hem made by folding the fabric twice and stitching it in place. It has one loop of a diagonal twill still attached. The fabric loop that had been separated from its smokkr was of the exact same type of diagonal twill, and so presumably belonged to the broken diamond twill smokkr.

- The other smokkr was made of a finely woven diagonal twill. It had a 5-6 mm wide hem, made by folding the fabric twice and stitching it in place. It has one remaining loop, which is made of the same finely woven diagonal twill as the smokkr itself.

Hempene må skrive seg fra to forskjellige seleskjørt, den ene av diagonalkypert, det andre av ringvend. Skjørtet av diagonalkypert har hatt hempe og skjørt av samme stoff, skjørtet av ringvend har hatt en hempe av diagonalkypert. Sammen med den tredje hempen er ikke stoff av selve skjørtet bevart. Hempen er av diagonalkypert, av samme kvalitet som hempen på ringvendskjørtet.

*Holm-Olsen, 1972, p. 109*

There was a fourth loop in the grave, sewn to a fragment of another finely woven broken diamond twill (33 x 15 threads per cm) with a hem consisting of a woven starting border. A plaited cord had been stitched along the hem (Holm-Olsen 1972, p. 23-27, 103-104, 106, 114). However, the loop appeared to be made of cord, and Holm-Olsen believed it to be too slender to carry the weight of a smokkr. Furthermore, as there is already evidence for two different smokkr in the grave, she argued that it is unlikely that the woman wore a third smokkr of yet another fabric (Holm-Olsen, 1972, p. 104, 109). Given the information currently available, I have chosen to not include it among the evidence for smokkr.

#### *Grave B 5625 at Vangsnes*

A single, damaged, oval brooch, of the type R. 652/P 51 was found with a lump of textiles corroded to the pin (Schetelig [1904](#)). The grave is dated to the tenth century (Holm-Olsen 1972, p. 33).

The lump of textiles contained several fragments of woollen tabby or repped weave, whereof the largest fragment was pleated, with evenly distributed pleats. The fragment is 11-12 cm long, and is torn ca. 5 cm from the top edge (Holm-Olsen 1972, p. 55; Bender Jørgensen 1986, p. 264). The pleats are 2-3 mm deep and rounded (Holm-Olsen 1976, p. 201).



*Photo by Reidar Bertelsen in Holm-Olsen 1972, Fig 44, p. 112*

The edge of the pleated fragment was made by folding the selvedge of the fabric once, and whipstitching it in place creating a 0.5 cm wide hem (Holm-Olsen 1972, p. 14, 55). A dye analysis showed traces of indigotin, indicating that the fabric had been dyed blue (Stoltz [2018a](#)).

According to Holm-Olsen (1972, p. 104-105; 1976, p. 201) the find contained two additional pleated fragments. However, they may have been lost by the time Bender Jørgensen (1986) examined the find, as she made no mention of them. The rest of the fragments were unpleated. It was not possible to determine if this was due to the pleating disappearing in the grave, or that only part of the garment was pleated (Holm-Olsen 1972, p. 104-105; 1976, p. 201).

Tre fragmenter av et toskaftstoff, B 5625 Vangsnes, er plisserte. Plisseringen er jevn og regelmessig og tilsvarende helt den Agnes Geijer har beskrevet fra Birka. Foldene er to-tre mm dype, og de framstår i tversnitt som en sammenpresset bølgelinje (Geijer 1938, 16). De plisserte Birkastoffene er imidlertid alle av lin, mens stoffet fra Vangsnes er et ullstoff. De øvrige fragmentene av toskaftstoffet fra B 5625 Vangsnes viser ikke spor av plissering. Om dette kommer av bevaringsforholdene, eller om bare en del av stoffet opprinnelig var plissert, er vanskelig å avgjøre.

*Holm-Olsen 1976, p. 201*

Based on the pleating, Holm-Olsen (1972, p. 109; 1976, p. 203) tentatively proposed that the tabby may have belonged to a woollen serk, similar to the pleated linen serks found at Birka in Sweden. While the Birka serks were the only evidence of similar pleating known to Holm-Olsen, more information about pleated garments from the Viking Age has come to light after her report.

The similarities with the pleated smokkr fragment found in grave ACQ at Køstrup led Ewing (2006, p. 33) to interpret the pleated fragments in grave B 5625 as part of a smokkr instead of a serk, as first suggested by Holm-Olsen. This is, in my opinion a plausible explanation of the evidence. The large pleated fragment has a hemmed horizontal edge that fits well with being the upper edge of a smokkr. Furthermore the pleats have the same shape and dimensions as the pleating in the smokkr from grave ACQ at Køstrup. Finally, the Køstrup smokkr was partially pleated, with parts of the smokkr left plain (Thunem 2015, p. 62). A similar arrangement could explain the mix of pleated and plain tabby fragments in grave B 5625 at Vangsnes.

The find included several fragments of a 1.5 cm wide tablet-woven band, with the largest fragment measuring 8 cm in length (Bender Jørgensen 1986, p. 264).



*Photo by Alf Edgar Andresen in Stolz [2018b](#), front and back of the band fragments*

This band was woven using 20 tablets, where the two outermost tablets had four threads each, and the remaining tablets had two threads each. Several decorative figures were created through brocading with wool yarn, and possibly with now-missing linen yarn. The similarities with grave ACQ at Køstrup are striking, and it is thus perhaps not surprising that Stoltz (2018a) determined through experimental reconstruction that the band from Køstrup and the band from B 5625 were likely woven using the same technique.

Unfortunately, due to the lack of a recorded stratigraphy of the finds in grave B 5625, the exact position of the tablet-woven band is unknown. However, the band has a slightly rounded stain, that may come from laying under an oval brooch. Given the proximity to the oval brooch and the similarities with the Køstrup find, it is likely that the band was used to decorate the pleated smokkr.

## Kaupang

Two women's graves containing textiles were excavated in 1949 at Bikjholberget in Kaupang in Norway. The area around the graves had been disturbed, and finds might have been moved out of their original context. The textiles were analysed by Ingstad (1979).

### *Grave C 27997 B*

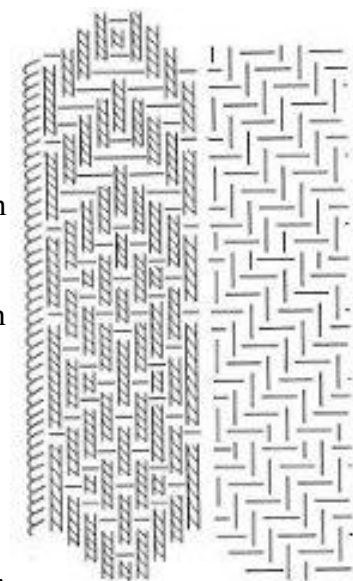
The grave is dated to the period 800-900 AD. Some of the artefacts recovered from the grave were three oval brooches (two JP 37s and one JP 27), textile fragments, a weaving sword, a shield boss and an arrowhead (Skre 2007, p. 116-117). The area around the grave had been disturbed, and some of the grave goods may originally have been part of a nearby grave of a man (Ingstad 1979, p. 158).

All the textiles were made of wool. There was one fragment of a coarse tabby (8 Z x 8 Z threads pr cm), and eleven fragments of chevron twill with a thread count of 18-20 Z x 10 Z threads pr cm. The chevron twill is loosely woven, resulting in somewhat varying thread counts in the different fragments (Ingstad 1979, p. 158).

*Illustration: Ingstad 1979, p. 159*

One fragment of the chevron twill has a hem where the fabric has been turned over twice and stitched in place. The fragment is 4.5 cm x 5 cm, and the hem runs parallel to the weft. A narrow tablet woven band (0.6-0.9 cm wide, with 9 threads in the warp) has been whipstitched along the edge of the hem. A wool cord made from twining several woollen threads together has been stitched along the other edge of the tablet woven band. Some of the other chevron twill fragments also had small pieces of the tablet woven band attached (Ingstad 1979, p. 158-159).

Stoffet har en fall, som er bøyet inn to ganger, slik at tøyet der ligger i tre lag. Borden er sydd til kanten av fallen med jevne kastesting utført i totrådet S-ullgarn. Bordens bredde er noe ujevn - 0,6 cm - 0,9 cm, og den består av 9 dobbelte S-tvunnete ulltråder, som utgjør renningen, innslaget er Z-spunnet. Borden er vevet i mønster, som det fremgår av fig. 2. Til den kanten som ikke er sydd fast til stoffet er der med kastesting utført i totrådet S-tvunnet ulltråd påsydd en fast og jevnt tvunnet ullsnor, som består av flere dobbelte S-tvunnete tråder.  
*Ingstad 1979, p. 158-159*



Ingstad interpreted the fragment as part of a smokkr, partly based on the similarities to the smokkr fragment with a woven band that had been found at Værnes (grave [T 16136](#)). The tablet woven band could have run along either the top or the bottom of the garment. Ingstad suggested that the woollen cord sewn to the edge of the band indicated that it was placed at the bottom of the smokkr to protect it from wear. Similar cords have been used to protect against wear in Norwegian and Danish folk costumes (Ingstad 1979, p. 159).

#### *Grave C 27997 C*

The grave is dated to the period 800-850 AD (Skre 2007, p. 116-117). It is the richest female burial in the entire Kaupang complex, containing a 30-40 year old woman that in all probability had been buried in a boat. In addition to a couple of oval brooches, she had an equal-armed brooch, a rectangular brooch, four arm-rings and three different types of chains (Ingstad 1979, p. 160).

This burial has yielded c. 41 textile fragments. Some of these still lie in cakes of several layers, others have clear imprints of the bronze objects with which they were entangled. As far as it is possible to tell, the fragments represent five different fabrics. Three of these are in broken lozenge twill, one is a 2/2 diagonal twill, and one is a tabby. Several of the fragments have a black crust on one side, and this may mean that the grave once held a fabric of vegetable fibre, which has now disappeared. This may well have been a linen fabric.  
*Ingstad 1999, p. 267*

Two of the broken diamond twills were found in close contact with jewellery worn around the woman's neck, and are believed to have been part of a cloak or other overgarment. Likewise, the tabby is interpreted as a possible scarf or shawl, due to its fineness and loose weave. That leaves us with the last broken diamond twill and the 2/2 diagonal twill as potential smokkr fragments (Ingstad 1979 p. 162, 1999 p. 267-268).

The 2/2 diagonal twill is evenly woven, with a thread count of 16 Z x 10 Z threads per cm. There are currently approximately five fragments in storage. Some of them are part of fabric loops that were discovered inside the oval brooches. When initially found, each brooch was observed to contain multiple loops. However, by the time the textiles were analysed, only one loop remained relatively intact (Ingstad 1979, p. 160).

In addition to the loops, fragments of the diagonal twill were found on the bracelets on an arm lying close to or on top of the body. According to the find report, the same fabric was found on the rectangular brooch. Originally, there was also a fragment of diagonal twill with a stain corresponding to the size of the brooch, indicating that it had been pinned to the outside of the diagonal twill garment (Ingstad 1979, p. 162).

Videre foreligger ca. 5 fragmenter av et diagonalkypertstoff med 16Z/10Z pr cm<sup>2</sup>. Noen av disse skriver seg fra hemper, som har vært brukt til å feste et seleskjørt til de ovale spennene. De heftet opprinnelig til nålefestet, og da de ble funnet, ble der observert flere hemper til hver spenne. Nå foreligger det bare en nesten fullstendig hempe og noen bruddstykker av samme.  
*Ingstad 1979, p. 160*

Oval brooches in the grave indicate that the deceased was wearing at least one smokkr. Given that some of the loops were made of diagonal twill, and that the same twill were worn on the body (as evidenced by the bracelets and rectangular brooch) Ingstad interprets this fabric as belonging to a smokkr (Ingstad 1979, p. 162).

Av funnopplysningene går det frem at det til de ovale spennene har vært festet ett eller to seleskjørt ved hjelp av hemper. Det ene seleskjørtet har vært av det diagonalvevete kypertstoffet. Alle armbåndene ble funnet i nær kontakt med dette. [...] To armbånd ble funnet tett sammen ovenpå det, og det er da sannsynlig at kvinnens arm, som har båret disse, har ligget der. Følgelig må dette kypertstoffet ha vært det ytterste skjørtet.  
*Ingstad 1979, p. 162*

The last of the fabrics, the broken diamond twill, was finely woven with a with a thread count of 34-36 Z x 16 Z threads per cm. A total of 25 fragments were recovered from the grave.

Two of the fragments were split several places into strips, and several others existed only as narrow strips. One fragment appeared to have 3–4 pleats, each measuring 0.4–0.5 cm in width. Finally, one fragment consisted of several layers, with a small, circular hole - possibly from a needle - passing through all the layers. From this, Ingstad concluded that the fabric may have been pleated, and that the extensive splitting could be due to wear along the edges of the pleated folds (Ingstad 1979, p. 161-162).

De fleste fragmentene - 25 - må skrive seg fra dette stoffet, til tross for noe vekslende trådtett fra stykke til stykke. To av fragmentene er sterkt oppsplittet i smale fliker, og flere andre er bare strimler. Ett fragment synes å ligge i tre-fire 0.4-0.5 cm brede plisser. Av dette er det nærliggende å slutte at stoffet kan ha vært plissert, og at den sterke oppsplittingen muligens kan skyldes slitasje i kanten av foldene. Videre foreligger et fragment i flere lag, og tvers gjennom lagene er der et ganske lite sirkelrundt hull som etter en nål.  
*Ingstad 1979 p. 161-162*

Traces of the broken diamond twill were also found on the rectangular brooch, indicating that it had pierced through a garment made of this fabric, in addition to the smokkr made from 2/2 diagonal twill. Ingstad proposed that there might have been an inner smokkr made from the fine broken diamond twill, which may have been longer than the outer smokkr to display the pleats. This could explain the presence of multiple loops in each of the oval brooches. The rectangular brooch, having traces of both fabrics, would have been pinned to the front of the smokkr (Ingstad 1979, p. 162).

Det er trolig at hun under den diagonalvevete stakken har båret enda et seleskjørt, da det opprinnelig heftet flere hemper til nålefestet på hver spenne. Kan hende har dette vært av det fine c-stoffet i ringvend, som muligens har vært plissert. Dette har trolig vært sidere enn overstakken, slik at plisseene har kommet frem nedenfor den.

Videre opplyses det om at der til den rektangulære spennen heftet stoff i to ulike kvaliteter, både i ringvend og diagonalkypert. Der forelå også opprinnelig et fragment av diagonalkypert med avtrykk av en gjenstand som i størrelse svarer til den rektangulære spennen. Ut fra dette kan vi kanskje slutte at denne spennen har vært stukket tvers igjennom både diagonal- kypert- og ringvendstoffet, og at det siste må ha vært det underste. Det er sansynlig at spennen har sittet foran på barmen og holdt de to stakkene sammen.  
*Ingstad 1979, p. 161-162*

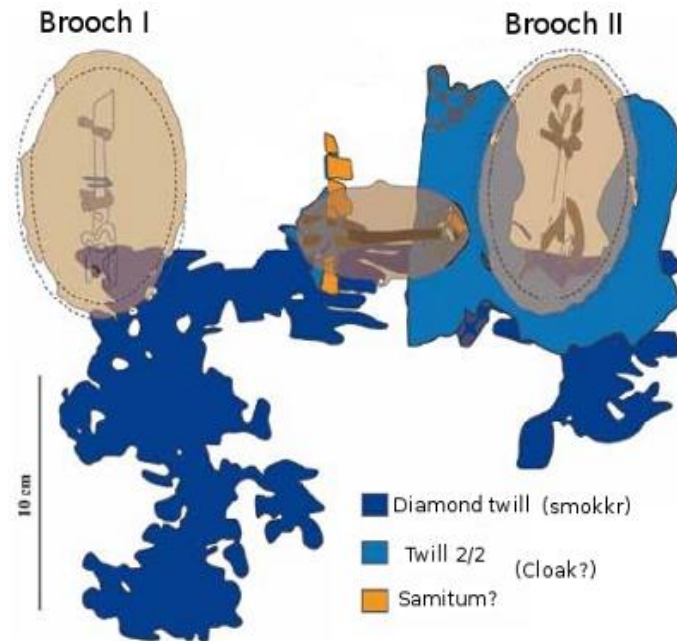
## Veka, Hopperstad and Hyrt

Several graves from Western Norway were excavated in the late 19th and early 20th century. Most of the textiles have been separated from the brooches, but by using old photographs, marks made from the brooches on the textiles, and direction of the weave, Lukešová (2011) was able to reconstruct the position of the textiles in relation to the brooches.

Three of the graves have been described in more detail: grave **B 6228** at Veka, grave **B 9060** at Hopperstad and grave **B 4864** at Hyrt. All three graves had a pair of oval brooches of type R 652 (Lukešová 2011, p. 149), an oval brooch type that was in use from the end of the 9th century to the end of the 10th century (Petersen 1928, p. 67).

*Grave B 6228 at Veka*

Grave B 4864 at Veka in Voss, Hordaland contained two oval brooches and a third brooch, that had been placed between them. Several textiles was found; woollen broken diamond twill, woollen 2/2 twill, and samitum fabric, probably in silk Lukešová 2011, p. 156-157).



The broken diamond twill is interpreted as part of a smokkr. The largest fragment has an upper hem created by folding the fabric towards the inside.

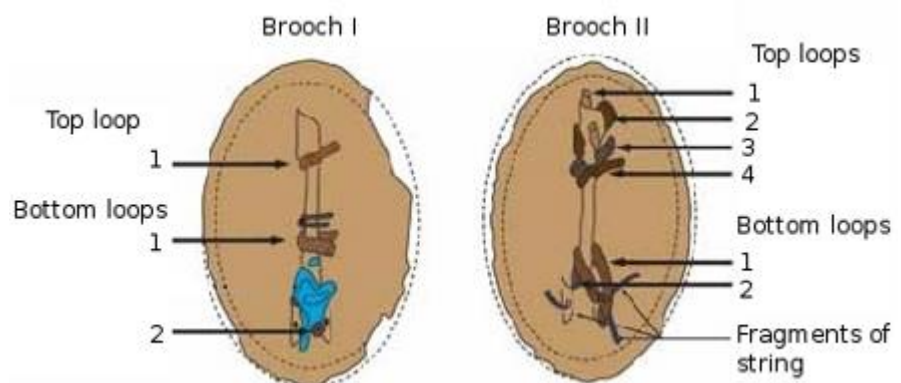
There are stitch holes at two places on the fragment, which Lukešová believe is the remains of where the loops were fastened to the smokkr. Using this to place the brooches give a distance of 19.5 cm between the brooch pins. The length of the preserved upper hem is 27 cm (Lukešová 2011, p. 156).

*Illustration: Lukešová 2011 p. 160, Modified by adding English text.*

She notes that most researchers believe that the oval brooches were usually worn with the pin pointing upwards, and that she agrees with this placement (Lukešová 2011, p. 155). Given the lack of detailed records from the excavations, I assume that her orientation of the brooches in B 6228 is based on what is most common, even if it results in there being more loops at the top of brooch II than on the bottom.

Brooch I had one loop at the top and two at the bottom, while brooch II had four loops at the top and two at the bottom. In her description of the number of loops Lukešová (2011, p. 155, 160) doesn't mention any details regarding what materials the loops are made of.

*Illustration: Lukešová 2011 p. 160, Modified by adding English text.*



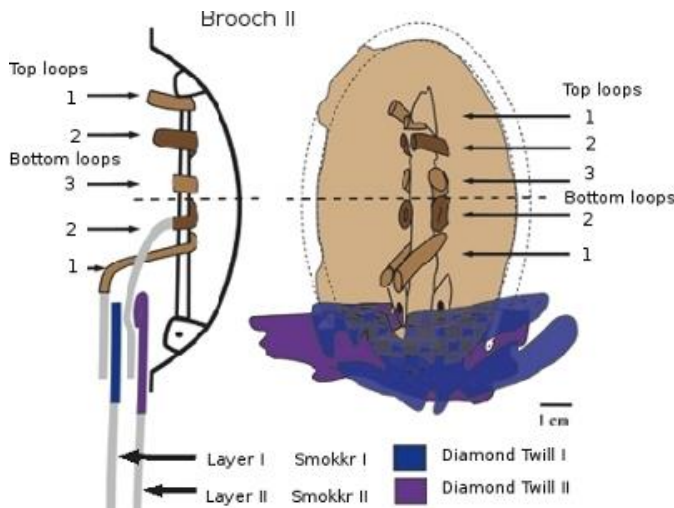
She suggests that the loops at the top of the brooches may have fastened at least one smokkr, and possibly some other garment (Lukešová 2011, p. 155).

Funnet fra Veka inneholdt to ovale spennere samt en komplett tredjespenne (midtspenne). [...] Jeg mener det er rimelig å tro at det største stykket diamantkypert i dette funnet må tolkes som rester av en selekjole. Fragmentet har en bevart øvre fald med huller etter en søm på hver side, noe som jeg tolker som rester av en stroppesøm. Avstanden mellom nålene på begge spennene kunne måles til 19,5 cm, mens lengden på den bevarte kanten er 27 cm.

*Lukešová 2011, p. 156*

### Grave B 9060 at Hopperstad

Grave B 9060 at Hopperstad in Vik, Sogn og Fjordane, contained two oval brooches. One of the brooches had three loops at the top and one at the bottom, the other brooch had three loops at the top and two at the bottom.



There were two fragments of diamond twill inside one of the brooches, one placed with the warp running horizontally, the other with the warp running vertically. Both are interpreted as smokkr fragments, based on their position in the brooch (Lukešová 2011, p. 161).

*Illustration: Lukešová 2011 p. 161, Modified by adding English text.*

The fragment closest to the body (diamond twill I) is placed with the warp running vertically. The fragment is from

the upper edge of the garment, and there are clear stitch holes from where a loop once was fastened.

The second fragment (diamond twill II) is placed with the warp running horizontally. The upper edge is a selvedge. There is a seam running parallel to the top of the garment, 2-2.5 cm from the selvedge. As this smokkr would have been worn farthest from the body, she speculates whether this seam was meant to fasten a decorative band (Lukešová 2011, p. 161).

Funnet fra Hopperstad inneholder to ovale spenner. Spenne I har tre øvre stropper og en nedre stropp. Spenne II har tre øvre stropper og to nedre stropper. På grunn av tydelige flekker på to fragmenter av diamantkypert var det mulig å plassere disse helt nøyaktig på innsiden av spenne II. Siden renningen på disse to fragmentene går i forskjellig retning betyr det at de må være rester av to ulike plagg (selekjoler). Det ene fragmentet (diamantkypert I) har tilhørt plaggets øvre kant. Stykket har tydelige huller etter søm for en stropp. Retningen på renningen er vertikal. Dette er mest trolig rester av en selekjole.

Det andre fragment (diamantkypert II) har en jarekant som øvre kant (retningen på renningen er horisontal) og representerer sannsynligvis en ytterligere selekjole. Sømmen på dette stykket løper parallelt med den øvre kanten med en avstand på 2-2,5 cm. Dette kan være sømmen som festet pyntebåndene til kjolen.

*Lukešová 2011, p. 161*

### Grave B 4864 at Hyrt

Grave B 4864 at Hyrt in Voss, Hordaland, contained two oval brooches and the remains of a third brooch. One of the brooches had a single loop at the top, while the other had preserved two loops at the top and two loops at the bottom of the brooch. There was also a small piece of yarn at the bottom of the last brooch. No traces of the smokkr itself remain (Lukešová 2011, p. 155, 160).

### Fløjstrup

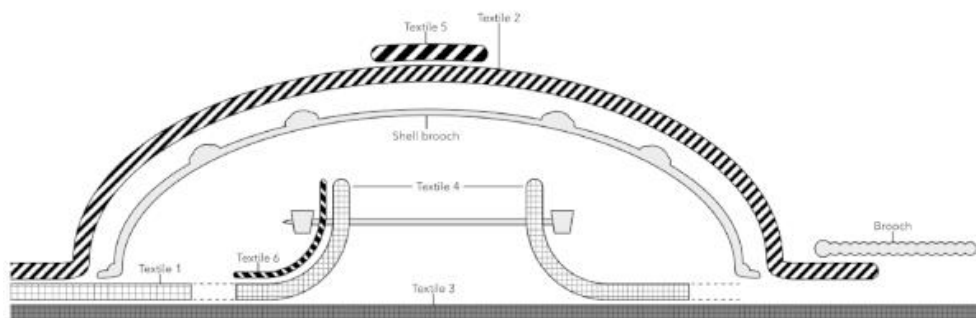
A Viking Age grave was excavated in 1898 in Fløjstrup, Jutland, Denmark. The grave contained partial skeletal remains, two oval brooches with textile material attached, several

loose textile fragments, a third brooch (made from a repurposed key), a knife, and a clay spindle whorl. The oval brooches were of type R 648 (P27/28), dating the grave to 800-850 AD. Both were found near a fragment of the right scapula. One oval brooch had turned, probably during the deterioration of the body, so that the back of the brooch was facing upwards. The textiles were analysed by Rimstad et al. (2024).

One, possibly two, loops were preserved around the pin of one of the oval brooches (C9261). The loops were made from a tabby, designated as textile type 4, that was Z/Z spun with a thread count of 16 x 14 threads per cm. The fabric appeared to have been folded lengthwise, creating straps consisting of several layers. The best preserved loop was 0.8 cm wide, and currently ca. 2 cm long. A similar loop was visible inside the other oval brooch (C9262), but it was too heavily mineralised for further analysis (Rimstad et al. 2024, p. 80-81).

Although no fragments of the smokkr were found fastened to the loops, a small piece of unbalanced woollen tabby fabric (1.5 x 0.7 cm), designated as textile type 1, was discovered inside one of the oval brooches (C9261) and tentatively identified as part of the smokkr. A loose fragment (1.5 cm x 1.5 cm) of unbalanced tabby with the same thread count was found on a bone fragment, likely from the lower left arm, suggesting that the arm may have been positioned close to the body during burial (Rimstad et al. 2024, p. 80-81, 89).

The tabby was Z/Z spun, with a thread count of 18-20 x 10-12 threads per cm. Both warp and weft contained traces of indigotin, indicating that it had originally been dyed blue (Rimstad et al. 2024, p. 81, 87). A similar unbalanced tabby was used in the smokkr in grave ACQ at Køstrup.



*Illustration: Rimstad et al. 2024, p. 89. A schematic interpretation of how the textiles could have been connected.*

Finally, a fragment of a 4 mm wide cord (possibly wool) made of about 8 smaller cords was found underneath the pin at the pin base in oval brooch C9261. One possibility is that it was decorating the top of the smokkr (Rimstad et al. 2024, p. 80, 89). Alternatively, it could be a tool band used to suspend the knife that was found in the grave.

Textile type 1: Remnants of an unbalanced wool tabby textile, z/z spun with 18–20/10–12 threads per cm (C9266a) was found attached to a human bone, which is most likely from the lower left arm (Fig. 7.1). A textile with the same unbalanced thread count was observed inside the oval brooch C9261, though the visual impression is not the same. This could be due to the more mineralized state of this textile, or it could represent a completely different textile, though this seems more unlikely. [...]

Textile type 4: One, and possibly two, straps were found still sitting around the needle of the oval brooch C9261 (Fig. 7.5). The straps are woven in a balanced tabby, z/z spun with 16/14 threads per cm. The most well-preserved is only 0.8 cm wide and is encircling the needle. It seems to have been folded lengthwise and thus consist of several layers of textile. Remnants of a similar strap are visible in the oval brooch C9262, though its mineralized state makes further analyses difficult.

*Rimstad et al. 2024, p. 80*

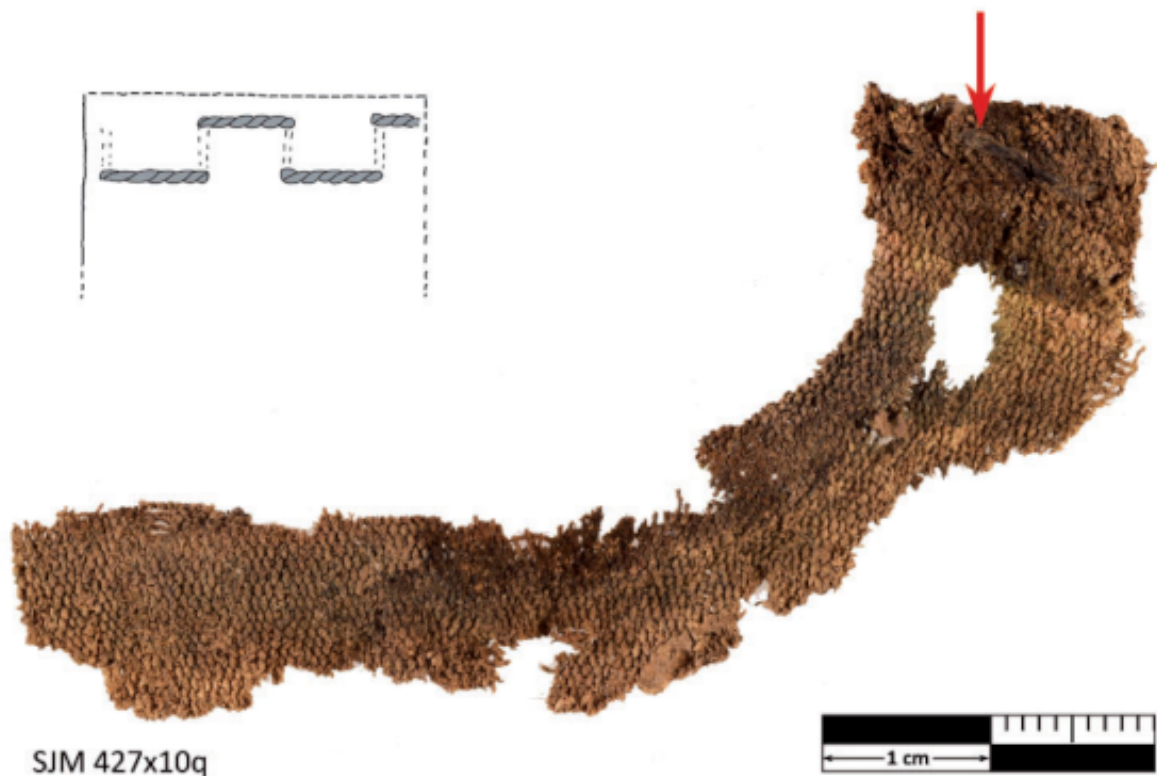
## Bryndum - grave G12

The excavation of a Viking Age cemetery in Bryndum, Jutland, Denmark, in 2016, revealed a grave (G12) containing two oval brooches with attached textile remains. The textiles were analysed by Mannering et al. (2025).

The brooches were found beneath bits of straw. They lay approximately 7 cm apart, with their domed surfaces turned upwards, indicating that the deceased had been buried laying on their back. The brooches were further identified as Berdal type JP 23/24. The brooch style and the carbon dating of two straw samples indicated that the burial took place in the ninth century (Mannering et al. 2025, p. 25-27).

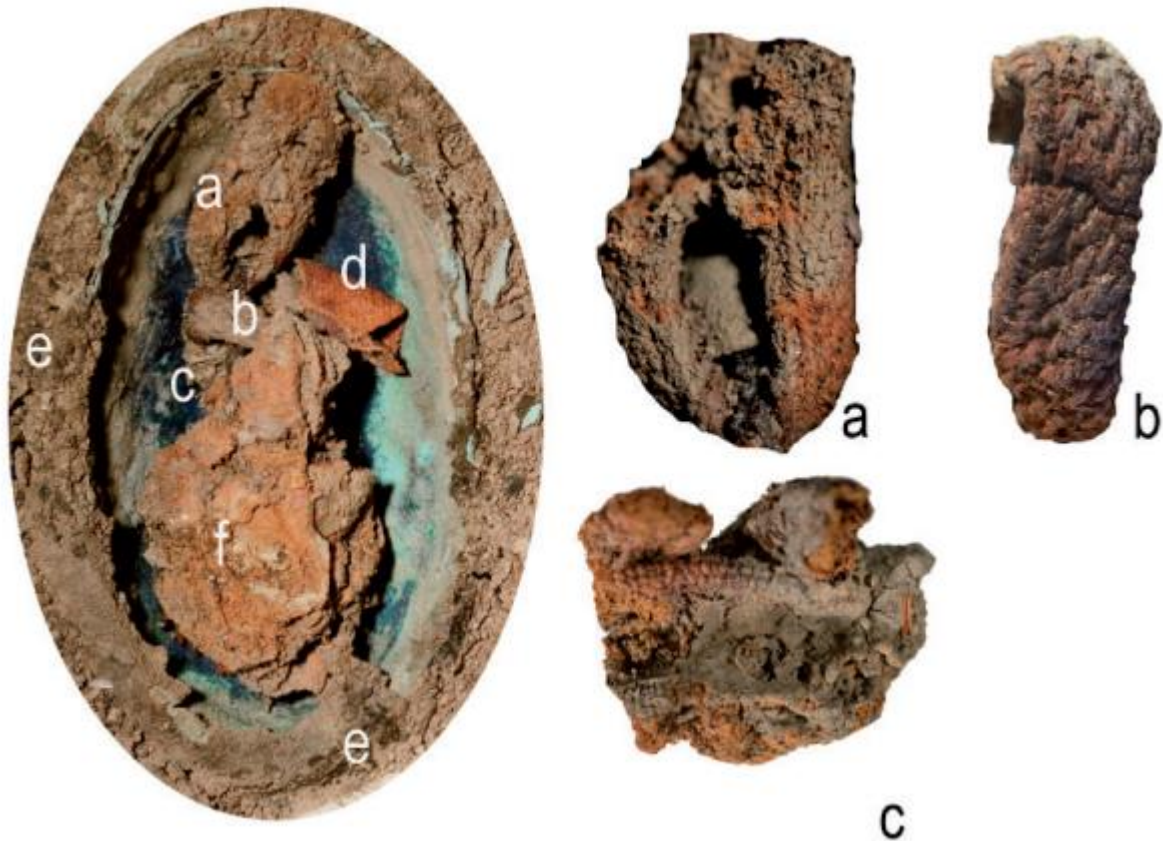
A few other artefacts were recovered from the grave. A faceted amber ring (interpreted as a pendant), an amber bead, and a glass bead was found close to the oval brooches. A knife lay on the right side of the deceased, while several indeterminable fragments of iron were found on the left side. There were also traces of a wooden coffin (Mannering et al. 2025, p. 25-26).

The best preserved of the oval brooches (designated *x10*) lay on the right side of the body, and it was here most of the textiles were found. Inside the lower part of the brooch, following the brooch rim, there was a fairly large fragment (*x10q*) of woollen tabby, interpreted as part of a smokkr. The tabby has a markedly unbalanced weave, with 31 x 10-15 threads per cm. When discovered, it appeared almost black, but later analysis showed that both the warp and weft had been dyed with a dye containing indigotin (probably from woad), indicating that the smokkr was originally dark blue. At one end of the fragment there is remains of a hem that had been created by folding the fabric and fastening it with a line of staggered running stitches (Mannering et al. 2025, p. 33-35).



*Drawing and photo by Ræder Knudsen in Mannering et al. 2025, p. 35-36. Fragment x10q of tabby found inside right oval brooch, along the lower edge. Folded hem on the right (red arrow).*

Fragments of in total four straps were found at the top and bottom of the oval brooches. The best-preserved one was found at the pin hinge of the right brooch, still sewn to a fragment of the tabby. It was constructed from an approximately 1.4 cm wide tablet-woven band that had been folded lengthwise and sewn along the edge, creating a round strap. It had been bent into a loop, ca. 3 cm long (Mannering et al. 2025, p. 35, 39).



*Illustration: Part of figure 10 in Mannering et al. 2025 p. 37, images by Conservation Centre Vejle.*

Inside the right oval brooch:

- a. tablet-woven upper strap
- b. tablet-woven lower strap
- c. fragment of tabby, with two ends of the lower strap (b) sewn to the folded upper edge of the tabby
- d. folded fragment of textile made of plant fibres (from inner garment)
- e. fragment of upper edge of the tabby garment along lower edge of the brooch. Hem on the right
- f. fragment of folded/pleated textile made of plant fibres (from inner garment, probably underdress)

The inside of the left brooch held a small fragment of the tabby in addition to remains of straps found around the pin hinge and pin catch. The straps in both oval brooches appear to have been constructed in the same manner. They are approximately 0.6 cm wide, and while the length of the upper straps are unknown, the lower straps were short enough that the upper edge of the smokkr was found inside the oval brooch. Due to heavy mineralisation, it was not possible to determine whether the straps were made from wool or plant material, nor whether they were dyed (Mannering et al. 2025, p. 35-36, 39).

Further important features recorded inside the right brooch are the textile lumps located approximately at the upper end of the pin. These are heavily mineralised by the iron salts coming from the brooch pin (x10s, figs. 10 a, b and c). Together, they form a strap that was still visibly sewn to the parts of Textile 3 that touch the pin base at the lower edge of the brooch. Fragments of altogether four straps are preserved in situ around the pin catches

and pin bases, showing that textile straps were placed around the pins coming from positions above and below the oval brooch. The strap preserved around the pin base of the right brooch is the most well-preserved specimen, and from this it is clear that it consists of a roughly 1.4-cm-wide tablet-woven band. This band was sewn together lengthwise using a S-2z-ply sewing thread, creating a round and sturdy strap (fig. 10).  
*Mannering et al. 2025, p. 35*

Textile 3, which was found underneath the oval brooches, is a fine unbalanced deep blue wool tabby. The presence of a folded edge located in the layer found immediately under the edge of the brooches, as well as the straps connected to the folded edge placed around the pin catches and bases, suggest that this was a kind of dress held in place by the brooches on the chest. All four straps (two inside each brooch) are quite small and delicate, about 0.6 cm wide and with a strap length of ca. 3 cm. Although it is not possible to know if the upper straps were originally much longer, the lower connection to Textile 3 indicates that they were in fact not visible beyond the rim of the oval brooches.  
*Mannering et al. 2025, p. 39*

## Adwick-le-Street

In 2001, a grave containing two oval brooches, a bowl, a knife and a key, was discovered in Adwick-le-Street in South Yorkshire, UK. Both oval brooches belong to the P37 series, but while they are similar in design, they are not identical. One is type P37:3 while the other is type P37:12, tentatively placing the burial at the end of the 9th century, or possibly the beginning of the 10th (Speed and Walton Rogers [2004](#), p. 51, 64-65, 74-75).



Photo: *Heen-Pettersen 2013, p. 72*

Both brooches contained remains of slim loops made from a fine linen tabby with a thread count of 24/Z x 24/Z per cm (Speed and Walton Rogers 2004, p. 76).

Each loop seems to have been constructed as a cut strip folded lengthways, with the raw edges turned in and pressed flat, to give a neatly made strap 4 mm wide. In places the straps have a blue tinge, but analysis by absorption spectrophotometry has shown this to be from corrosion rather than dye. The loops [...] are likely to have been a natural white.  
*Speed and Walton Rogers 2004, p. 76*

Each brooch had one linen loop at the top and bottom of the brooch. In addition there was a bundle of yarns possibly forming a second loop behind the first at the bottom of the left brooch (AB). The brooch worn on the woman's right side (AC) may have had the remains of a second set of linen loops, in addition to a plied cord at the bottom of the brooch (Speed and Walton Rogers 2004, p. 76).

On brooch AB one of the loops passes around the hinge and the other passes around the tip. Behind the strip at the hinge there is a bundle of four or five Z-spun yarns which seems to form a second loop, mirroring the path of the first. On brooch AC, there is again a loop at both ends of the pin, but here there is also a second layer of the same material behind the first, which may represent a second set of loops. A series of coarse threads are entangled with the hinge end of this pin and from this emerges a plied cord (Z2S), approximately a millimetre thick, which follows an irregular path towards the edge of the brooch.  
*Speed and Walton Rogers 2004, p. 76*

Walton Rogers proposed that the bundle of cords at the left brooch served as a replacement for a loop, presumably as a running repair, and that originally there would have been two loops at the bottom of the brooches and one at the top. The smokkr itself was not preserved. The plied cord in the right brooch is interpreted as a tool band for the knife (Speed and Walton Rogers 2004, p. 77).

## Cumwhitton

In 2004 two oval brooches were discovered by a metal detectorist, resulting in the excavation of a grave (given the grave number 1) at Cumwhitton in Cumbria, UK. The brooches were of type P51, variant B1, dated to the early tenth century (Paterson et al. 2014, p. 56, 153).

The grave contained a fragment of the skull of the deceased, a glass bead close to the head, an iron key and a small knife at waist-level, and remains of an iron-bound wooden box placed at the feet and containing various items (Paterson et al. 2014, p. 54). The textiles were examined by Walton Rogers (Paterson et al. 2014, Appendix 2).

*Illustration: Paterson et al. 2014, p. 126*

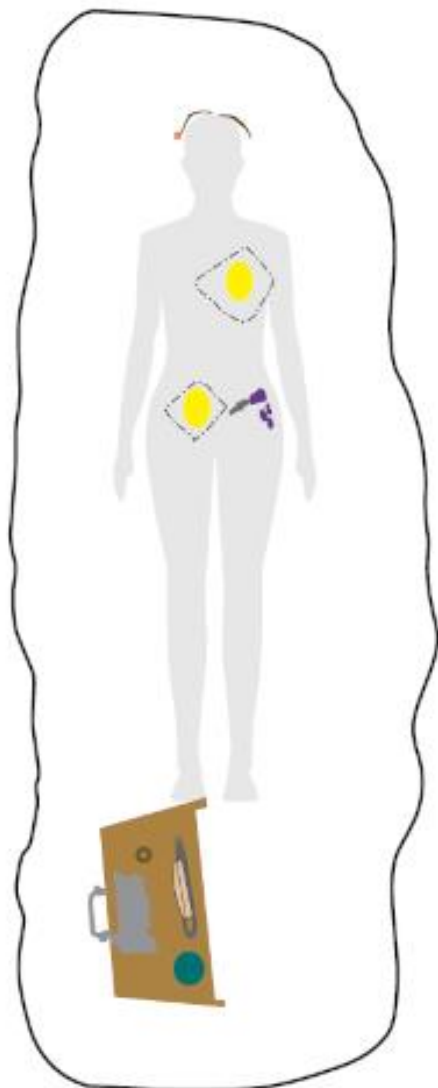
One of the oval brooches (**10003**) had folded strips of flax or hemp tabby fabric (20 Z x 10 Z threads per cm) forming a loop around the pin-catch and one, possibly two, loops around the pin-hinge. There was a detached fragment of one of the loops, showing that they were constructed by folding a strip of fabric lengthwise, with the raw edges inwards, and stitching along the edge with running stitch (Paterson et al. 2014, Appendix 2, p. 226-227).

A detached fragment of one of the loops was particularly well-preserved and proved to be a strip folded lengthways, raw edges inwards, to make a strap 10 mm wide: the folds were held in place by a lengthways row of running stitch [...] worked in S-spun yarn, 1.0 mm in diameter, stitches 4-5 mm long.

*Paterson et al. 2014, Appendix 2, p. 226-227*

There was fragment of very fine (36 Z x 30 Z threads per cm) flax or hemp tabby fabric on the back of brooch 10002, in addition to one loose fragment of the same fabric. Walton Rogers noted that the fragment on the back of the brooch ran across the line of the loops (Paterson et al. 2014, Appendix 2, p. 226, 228). Finally, there was a cord, 1.5 mm in diameter, arching over the area of the pin-hinge (Paterson et al. 2014, Appendix 2, p. 226).

The other oval brooch (**10002**) had less textile material. There was a fragment of Z/S medium-weight wool fabric found at the pin-hinge end of the brooch. Walton Rogers identified this as potentially belonging to a smokkr. The weave of the woollen fabric could not be identified, nor the thread count. A fragment of medium weight Z/Z (possibly linen)

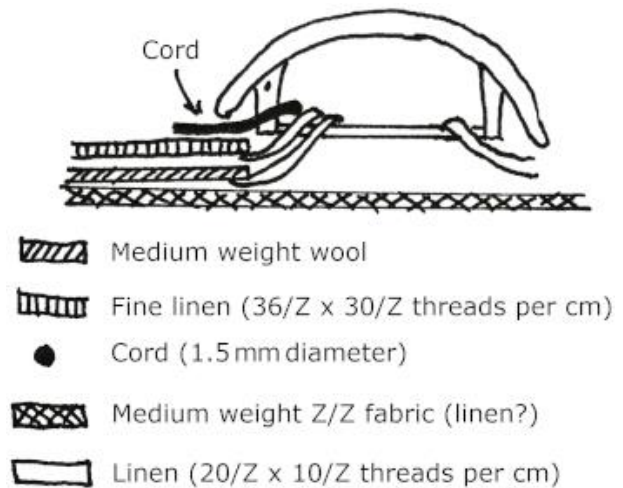


fabric lay on top of the wool fabric, possibly an underdress (Paterson et al. 2014, Appendix 2, p. 226, 228).

The key and knife may have slid to the side of the body – neither have traces of the potential smokkr fabric. Instead the key have remains of the same fabric that was found underneath the wooden box (presumably a cover for the base of the grave), and the knife have traces of a thick woollen fabric - possibly a blanket (Paterson et al. 2014, Appendix 2, p. 225-226, 228).

Walton Rogers proposed that the deceased wore a woollen smokkr, held up by linen loops and over a linen serk. She further suggested that the possible extra loop at the pin-hinge of brooch 10003 could indicate an extra garment suspended from the brooches, and that the very fine linen running across the line of the loops could represent edging or trimming of the woollen smokkr, or could be the fabric of the extra garment, if it existed. The cord is interpreted as a tool band (Paterson et al. 2014, Appendix 2, p. 227-228).

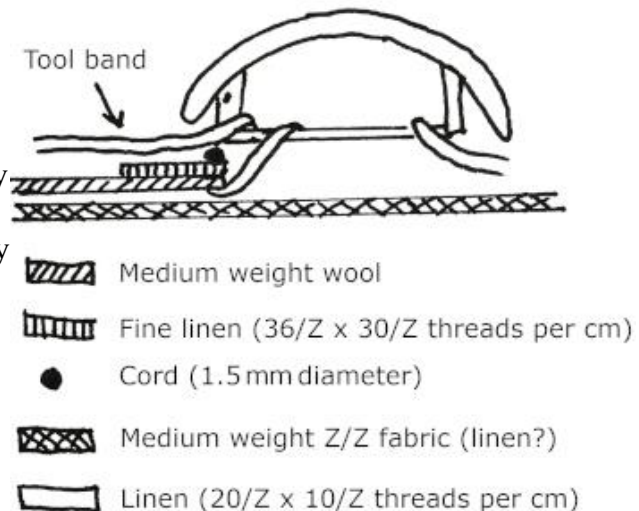
*Illustration by Hilde Thunem of the interpretation by Walton Rogers*



The cord is relatively thin, however, raising the question of whether it would be suitable for hanging the knife or the key. An alternative interpretation is that the extra linen loop in brooch 10003 was part of a tool band, suspending one or both of the tools. The cord could have been decoration, sewn along the edge of the smokkr, which could explain its position arching over the pin-hinge.

Since the woollen smokkr fabric and the very fine linen were found in different brooches, their relative positions within the stratigraphy remain unknown. While the linen may have lined the smokkr, its fine weave suggests it was more likely on the front of the garment as a finely woven band or edging.

*Illustration: Hilde Thunem. Alternative interpretation of the textiles*



## Ketilsstaðir

A Viking Age grave was discovered in 1938 at Ketilsstaðir in northeast Iceland; it contained the remains of a woman laid on her left side. She had been buried with two oval brooches of type P 52, and the left side of her face lay against one of them. This had preserved part of her skull and tissue from her left cheek. Carbon dating of two textile samples and a tooth indicate that the woman was likely buried within the period 910-980 (Hayeur Smith et al. 2019, p. 95, 97, 101, 119).

Other gravegoods within the burial included a trefoil brooch, 42 beads, textile fragments, one touchstone and a second possible touchstone or whetstone, fragments of a bone knife handle, a spindle whorl and an unusually shaped piece of blue-grey chalcedony.

*Hayeur Smith et al. 2019, p. 97*

Several textile fragments were preserved in the grave by the oval brooches. However, there appears to be little to no documentation of their original positions relative to one another or to the brooches, as indicated by the lack of such descriptions in the later analyses of the textile material. One fragment (designated *K12438-4a*) was identified as probably part of a smokkr by Hayeur Smith et al. (2019 p. 107, 109). It is a woollen broken diamond twill, Z/Z, with a thread count of 9 x 5 threads per cm. Along one edge of the fragment is a tablet-woven band (*K12438-4b*), that Hayeur Smith identified as the starting border of the fabric.

The tablet-woven band (weft-faced with both warps and wefts plied Z2S) that decorated the apron's upper margin had a light-cream-coloured central band flanked by two brown bands on either side (*K12438-4b*). [...] it has a faint wave-like motif - one of the simpler motifs that can be produced with tablet weaving.

*Hayeur Smith et al. 2019, p. 109*



*Photograph by Ívar Brynjólfsson in Hayeur Smith et al. 2019, p. 107*

Dye analysis detected traces of indigotin in the broken diamond twill, indicating that it may have been dyed blue with woad. By contrast, the tablet-woven band did not test positive for indigotin and may have been left undyed (Hayeur Smith et al. 2019 p. 109-110). The lack of detectable dye on the tablet-woven band calls into question whether the band is integrated into the rest of the fabric as proposed by Hayer Smith, or if it was stitched along the edge.

Measuring from the photograph in Hayeur smith et al. (2019 p. 107), the tablet-woven band is approximately 1.5 cm wide and 9.5-10 cm long, while the fragment of broken diamond twill measures ca. 2 x 4.7 cm.

Another textile fragment from the grave was a woollen 2/2 twill, Z/S, with 9 x 7 threads per cm. This fragment (*K12438-3*) also tested positive for indigotin. It bears an imprint from a brooch, and two of its sides have been folded, leading Hayeur Smith et al. (2019 p. 110) to interpret it as part of a smokkr strap. They further noted that "*fragments of such straps are commonly found preserved on the inside of oval brooches and are occasionally found*

*wrapped around the pin on the underside, as was the case here, where its coarser twill was mineralised along with the linen tabby" (Hayeur Smith et al. 2019, p. 110, my underlining).*



*Photograph in Hayeur Smith 2015, p. 36. Possible strap.*

Measuring from the photograph in Hayeur Smith (2015 p. 36), the fragment is currently approximately 2.3-2.4 cm wide (with the sides folded) and 8.3 cm long. The report does not mention preserved stitches, but they may have deteriorated in the grave.

Lastly, there was another fragment (K12438-1) that was initially believed to be part of the smokkr (Hayeur Smith 2015, p. 34).



*Photograph in Hayeur Smith 2015, p. 34 of fragment K12438-1.*

However, further analysis has found that it is of a different fabric; a fragment of herringbone twill, ZZ, with a thread count of 11 x 11 threads per cm. Due to its position inside the left oval brooch, Hayeur Smith et al. (2019 p. 107) proposed that it could derive from the smokkr (if composed of different fabric panels) or from a shawl or additional garment. In the absence of additional evidence, the interpretation must remain speculative, especially in light of the current

lack of evidence for smokkr constructed from panels of multiple fabrics in the extant finds.

The apron itself, represented by fragment K12438-4a, was wool diamond twill, ZZ-spun with a thread count of 9/5. Pieces of an additional item (K12438-1), initially thought to belong to the same smokkr, were found under the shell of the left oval brooch, retaining its domed shape. Given its location, it is obvious that this piece was connected in some way to K12438-4a and to its tablet-woven band. However, further analysis suggested that while K12438-4a was a part of the smokkr made with a diamond twill, K12438-1 was probably a herringbone twill, ZZ spun and with a thread count of 11/11.

*Hayeur Smith et al. 2019, p. 107*

## Peripheral finds

Because all we have are fragments of the smokkr, it may be relevant to examine other garments for inspiration. Caution *must* be used when extrapolating from such finds as they may be radically different from the smokkr, but they may still be useful in demonstrating which tailoring techniques and patterns were known to the Vikings.

### Huldremose

This is the closest we get to a "proto-smokkr" and is perhaps the most relevant peripheral find in regards to interpreting the construction of the smokkr.

The woollen peplos from Huldremose in Denmark dates from 210-30 BC. It has been woven in a single piece on tubular loom, and forms a tube without seams, 168 cm long and 264 cm round. It is similar in design to the ancient Greek peplos, but would have been too long for the wearer unless the top part was folded down, or it was hitched up at the waist with a belt.

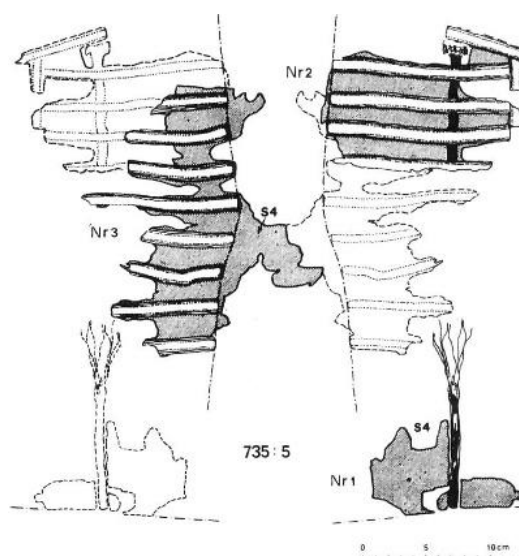
Dresses like this might be seen as precursors to the Viking smokkr.



### Birka grave 735

There are several theories regarding what type of garments was found in this grave, from a man's tunic to a woman's smokkr. Either way it can be helpful to know exactly how the disputed fragments looked when making up your mind as to which interpretation to believe.

In grave 735 a man and a woman (possibly holding a small child) had been buried close to each other. The bones had deteriorated to such a degree that only the teeth of the two adult skeletons remained. This provides a challenge when trying to sort out which of the textile fragments belonged to the man and which belonged to the woman.



The grave contained large amounts of silver and gold tablet woven bands, silver thread embroideries and the largest pieces of silk twill that has been found in Birka. Because of the lack of skeletons it is unclear which textile fragments belonged to the man and the woman respectively.

Piece **nr 1** (figure 735:5 bottom right) consists of a tablet woven band between two fragments of silk twill.

The fabric along one edge of the piece has been folded towards the inside, and there are traces of wool on the fold. The direction of the weave in the silk twill indicates that the folded edge was either at

the top or the bottom of the piece. The shape of the piece combined with the traces of wool lead both Geijer and Hägg to conclude that the fold ran along the bottom of the piece and was probably stitched to a woollen cloth.

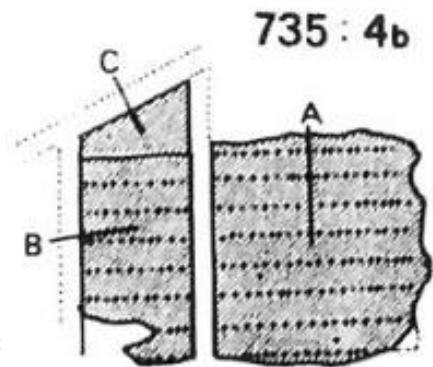
Stycke 1 (735:5) består av ett brickband, B18, mellan två sidenkypertstycken. Den nedre kanten har en enkelt vikning mot avvigan, och på vikningen finns lämningar av ett ylleytyg, vid vilket stycket kan ha varit fastsytt.

Att döma av vävens riktning i sidenkypertdelarna bör stycket ha suttit med vikkanten uppåt eller nedåt i dräkten. Vikkanten med yllerester samt styckets disposition talar kanske snarast för att det skulle ha suttit som 735:5 visar, med den vikta kanten nedåt.

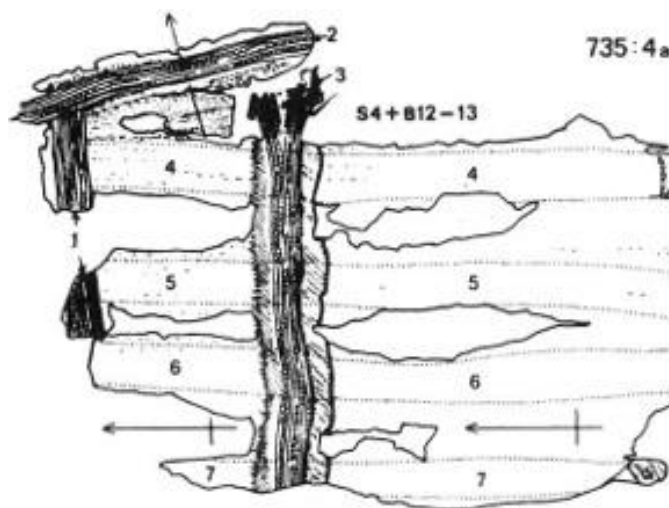
Inga Hägg: *Kvinnodräkten i Birka*, p 74, illustrations p 128

Geijer suggests a reconstruction where piece 1 is placed with the folded edge of the silk twill along the waist area of the person wearing the garment. The lower part of the garment would consist of wool stitched to the silk. She proposes that piece 1 was connected to another piece (**nr 2**, figure 735:5, right side).

Piece nr 2 consists of three separate pieces of silk twill, A, B and C (735:4 b). Between fragment A and B runs a tablet woven band (735:4 a, band 3) identical to the tablet woven band in piece 1. Along the edge of fragment B there is another tablet woven band (735:4 a, band 1). Additionally there is a tablet woven band running diagonally along the top of piece 2 (735:4 a, band 2). A gore of silk twill (fragment C) fills the space between fragment B and the band, but does not continue across the vertical bands. The three bands (1-3) seem to have been part of the *construction and shaping* of the garment.



The four tablet woven bands (735:4 a, band 4-7) that run horizontally across the piece seem to have had a mainly *decorative function*.



These bands lie on the outside of the silk twill, and crosses on top of the vertical bands. The decorative effect has been strengthened by varying the stitching so that every other band has been fastened with the same type of stitches. Thus half of the bands have been fastened by small, invisible stitches, the other half by blanket stitching.

Three of the horizontal bands are sufficiently preserved that the ends of the bands still remains. They have been folded and stitched in place on the silk

twill (piece A) at one end. The other ends (that meet the vertical band 1) have also been folded and are kept in place by a seam.

Här är brickbandet B18 hopfogat med ett annat, vertikalt gående band, som hör till ett annat stycke, nr 2. Detta stycke (735:4 a-b) består av tre sidenkypertdelar, A-C, og sju brickband, 1-7. Sidenkypertdelarnas fogning framgår av 735:4 a, som återger avigsidan: de två större delarna A och B ramar in det vertikalt placerade brickbandet nr 3. Över hela det hopfogade stycket AB ligger på rätsidan fyra brickbandstränsar, 4-7, varav tre med ursprunglig avslutning i båda ändrar. Åt ena hållet är bandändarna nedvikta och fastsydda mot sidentygets rätsida, åt det andra hållet möter bandändarna i rät vinkel et annat, vertikalt placerat band, nr 1, vid vilket de vikts ned och fästs med en söm.

Den tredje sidenkypertdelen på detta stycke, del C (735:4 b), fungerar som en kil mellan det snedfogade brickbandet överst, nr 2, och övriga delar. Kilen måste ha upphört vid det vertikala band 3, eftersom stycke A på andra sidan om detta band fortsätter upp över det horisontala band 4.

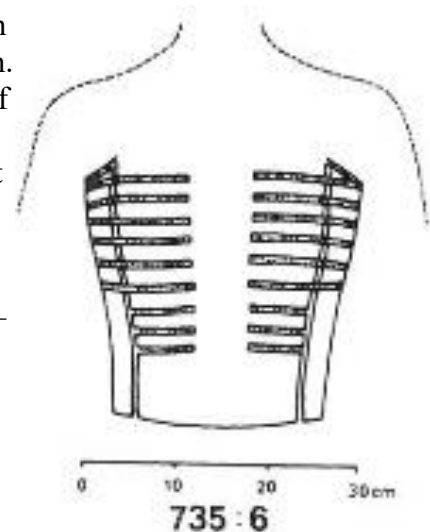
Det är ovisst, om band 2 fortsatt över band 3 på detta ställe. Det är emellertid tydligt, att brickbanden 2 och 3 har haft *konstruktiva funktioner* i samband med hela styckets kilning och fogning (ev. gäller detsamma även band 1). De fyra horisontelt påsydda tränsbanden har främst *dekorativ funktion*. Som Geijer påpekat förstärktes den dekorativa effekten genom den teknik, med vilken banden applicerats på stycket: vartannat infattat med langettsöm, vartannat diskret fäst med osynlig söm.

Inga Hägg: *Kvinnodräkten i Birka*, p 74-75

Lastly there is another piece from the same garment, piece **nr 3** (figure 735:5, left side). This piece lacks the vertical bands and upper gore, but has more of the horizontal decorative bands left intact than piece nr 2. It is clear that piece 2 and 3 is designed to sit on opposite sides of the chest of the wearer.

The horizontal bands have been folded and stitched down on the silk twill at one end. The other ends of the bands are torn. The bands have been adjusted in order to follow the shape of the body, so the band in the middle of the chest is longer than the one at the waist. This seems to have been a garment that was fitted to the body of the wearer (735:6).

The distance between the pieces are unknown, but it would at least have covered ca 30 cm of the chest (piece 2: 15 cm + piece 3: 16,5 cm). The height of the garment is even harder to calculate. The suggested reconstruction has a height of ca 32 cm. The neck and shoulder part of the garment is unknown.



Detta stycke har flera av de dekorativa tvärtränsarna bevarade än föregående men ingen likartad konstruktiv fogningsdetalj. Hela stycke 3 motsvarar ur funktionell synspunkt delen A på stycke 2 (735:4 b). De ursprungliga bandavslutningar, som finns kvar, är liksom där invikta åt ena hållet och nedsydda mot rätsiden.

Det är tydligt, att stycke 2 och 3 inte suttit på samma bröstorgshalva utan att de är parstycken. På nr 3 bör tvärtränsarna liksom hos parstycket 2 ha varit avslutade invid et vertikalt placerat brickband (jfr 735:4 a, band 1) på den sida, där brickbanden saknar avslutning. Själva sidentyget bör ha varit hopfogat i sidled med et annat stycke, som korreponderar mot del B hos parstycket 2, jfr 735:5.

De nedfällade tränsarna på stycke 3 slutar inte på en rak linje över varandra, vilket tydligt framgår, om man med ögat följer de vertikala trådarna i väven. De mellersta tränsarna slutar längre ut på kypertyget. Brickbanden har härmed anpassats efter bröstorgens välvning (jfr punkt-strecklinjerna på 735:5). Denna detalj, som går ut på at avpassa plagget efter kroppens former, bör ses i samband med kilskarvningen av stycke nr 2, genom vilken vidden i tyget ökades mot kroppens mitt.

När man altså adderar detaljerna hos de här beskrivna styckena 1, 2 och 3, vilka obestridligen hör til samma plagg, får man den bild, som demonstreras på 735:5-6. Stycke nr 3 bör ha legat på höger sida av bröstet med de invikta og nedsydda bandändarna mot kroppsmitten, medan stycke nr 2 låg på vänster sida med kilskarven avsmalnande ut mot sidan. De inbördes avstånden mellan styckena är givetvis ganska ungefärliga. Tillsammans måste de emellertid ha täckt bröstet med ca 30 cm på bredden (stycke 2: 15 cm + stycke 3: 16,5 cm). Den sammanlagda höjden är svårare att beräkna; enligt den här föreslagna rekonstruktionen kan den ha varit ca 32 cm. Hur axelparti och halsöppning varit utformade är oklart.  
*Inga Hägg: Kvinnodräkten i Birka, p 74-75, illustrations p 128*

### *Some interpretations*

Geijer interpret the fragments of metal tablet woven bands and silk from female graves to be decoration of the smokkr. In the case of grave 735 however, she believes that all these fragments belonged to the man's clothing, based on where they were placed in the grave. Inga Hägg disagrees. According to her, all that can be inferred from Stolpe's original drawing of the grave is that the largest textile fragment covered the chest of one of the adults but that it is in no way certain which of them it was. They were buried so close to each other that their clothing may have intermingled during deterioration.

The oval brooches was found laying upright on their edges, a strong indication that the woman had not been placed on her back in the grave, but rather had been buried beside the man in a sitting or half crouched position (possibly with their knees touching). According to the drawing of the grave, one of the brooches lay with its inside towards the largest textile fragment (piece 3). Hägg comments that this could be interpreted in two different ways; *either* the textile fragment is from a garment that the woman wore beneath her smokkr, *or* the brooch has been turned around in the grave during decomposition and lies on the man's chest, on top of the remains of a garment worn by him. Neither the grave drawing nor the layering of the fragments gives a clear indication of which alternative is correct. She therefore turns to the fragments themselves.

There are additional tablet woven bands in the grave. According to Hägg these appears to have been part of a fragment that looked similar to piece 2 or 3, but with richer and broader tablet woven bands, probably a separate garment of the same type, but of a larger size. She sees no reason that the man should be wearing two garments of the same type, and so concludes that Geijer was mistaken when deciding that all the decorated fragments were from a man's garment. Hägg believes that the woman and man were wearing similar garments - probably tunics. The smaller garment (piece 1, 2 and 3) with the slimmer bands was worn by the woman, while the one with richer bands and possibly also the silver embroideries belonged to the man.

Hägg ([1983](#)) believes that the garments are two out of several that were decorated with silk and metal tablet woven bands, and that all these tunics were imported to Birka from the Kiev-Byzantium area. She argues that in addition to importing the tunics themselves, the Birka Vikings adopted the custom of using these garments as signifiers of rank within the royal court, from Kiev.

Thor Ewing on the other hand, believes that the fragments described above come from a smokkr. His theory is discussed in the chapter on the shape of the smokkr further down in the article.

## Interpreting the facts

That is the end of the hard evidence, and we're entering the land of interpretations. No complete smokkr has been found, although the archaeological evidence contains some larger fragments. This means that when we want to reconstruct the garment we must combine the archaeological evidence with other (and less reliable) sources, like poetry or illustrations.

### The construction and use of the loops

From the archaeological evidence, we know that the smokkr, however it may have looked, was suspended by fabric loops and fastened by the oval brooches. Although a man's garment from the Migration Period has been found with a loop, this fastening method appear to have fallen out of use in Scandinavia during the Iron Age (Hägg 1974, p. 55-56). The loops of the smokkr, therefore, cannot be understood simply as a continuation of an earlier clothing tradition. The dense weave of the finely woven broken diamond twill used in many of the Birka smokkr would not readily have accommodated the 4-5 mm thick iron pins of the oval brooches without risking damage to the threads (Hägg 1974, p. 52). At the same time, imported eastern garments using loops and buttons have been found at Birka. Hägg (1974, p. 55-56) suggested that these may have inspired the adoption of textile loops in the smokkr as a means of fastening the garment without piercing its valuable fabric.

### Fabric and construction

Linen loops were usual, even in graves where the smokkr itself was made of wool. For example, in the analysis by Hägg (1974, p. 103-105) of textile material from graves at Birka in Sweden, only 14 of the 105 graves with preserved textile loops contained one or more loops made of wool, while silk loops were found in 22 graves.

When woollen loops were used, they were sometimes made from a simpler fabric than the smokkr, as in Birka grave [973](#) (Hägg 1974, p. 47) or grave [B 10720](#) from Sandanger (Holm-Olsen 1976). There are exceptions, like grave [ACQ](#) at Køstrup (Wielandt 1980), where three loops were made of the same fabric as the smokkr and only one loop was made of another, coarser cloth (possibly because there was no smokkr fabric left). Since the loops would have been subject to wear from the pins of the oval brooches, the practice of using linen or a simpler woollen fabric may reflect a preference for using a more durable or less valuable fabric for this part of the garment (Thunem 2025a, p. 136).

The loops were usually constructed by folding a strip of cloth several times lengthwise, after which the side edge was whipstitched closed (Hägg 1974 p. 54, Rasmussen and Lønborg 1993 p. 177, Øien and Heen-Pettersen [2024](#) p. 200). Occasionally, the strip of cloth was folded towards the middle and whipstitched close, as in Birka grave [465](#). The potential loop from the grave at [Ketilsstaðir](#) may also have been constructed in this manner.

Some loops had an inner core of a stronger fabric. This is the case for several of the silk loops from Birka, where the silk is covering a linen core (Hägg 1974, p. 54), and for grave [ACQ](#) at Køstrup, where one loop had a layer of woollen fabric around a linen core (Rasmussen and Lønborg 1993). While most loops were made from strips of fabric, grave [G 12](#) from Bryndum in Denmark had loops that were made of a tablet-woven band that had been folded lengthwise and stitched along the side.

The smokkr loops vary in width but are generally relatively narrow, as shown by the examples in the table below.

Grave finds	Width of loops	Source
B 10720, Sandanger, Norway Three fabric loops (wool)	0.4-0.5 cm, 0.6 cm, and 0.6-0.7 cm	Measured from photo in Holm-Olsen 1972, p. 115-116
Adwick-le-Street, UK Fabric loops (linen)	0.4 cm	Speed and Walton Rogers 2004, p. 76
Pskov, Russia Fabric loop (linen)	ca. 1 cm	Measured from photo in Zubkova et al. 2010, p. 297
Cumwhitton, UK Fabric loops (linen/hemp)	1.0 cm	Paterson et al. 2014, Appendix 2, p. 226-227
Ketilsstaðir, Iceland Fabric loop? (wool)	ca. 2.3-2.4 cm	Measured from photo Hayeur Smith 2015, p. 36
ACQ, Køstrup, Denmark Four fabric loops (wool, one with a linen core)	1.3-1.4 cm, 1.0-1.2 cm, 1.1-1.4 cm, and 1.3 cm	Measured from photo in Thunem 2017
T 28348, Hestnes, Norway Fabric loop (wool?)	0.9 cm	Øien and Heen-Pettersen 2024, p. 200, 213
T 28198, Skeiet, Norway Two fabric loops (unknown)	0.4 cm and 0.7 cm	Øien and Heen-Pettersen 2024, p. 204, 214
T 28198, Skeiet, Norway Two fabric loops (unknown)	0.4 cm and 0.4 cm	Øien and Heen-Pettersen 2024, p. 205-206
Grave G12, Bryndum Tablet-woven loop (unknown)	0.6 cm	Mannering et al. 2025, p. 35-36, 39

*Some of these graves contained more loops than listed in the table, but the rest were not sufficiently preserved for their width to be measured.*

### Alternatives to loops

Blindheim (1945) suggested that using string instead of fabric loops to suspend the smokkr appeared to have been common in Norway, referring to [three graves](#) (T 16136, T 16137 and C 26936) where there were found strings inside the oval brooches. She further noted that according to the description in the finds register, there were two more graves (B 8953 from Kirkeide and B 9060 from Hopperstad) that had smokkr that had been fastened by strings. However, Lukešová (2011) did not mention strings fastening the smokkr in her [examination of B 9960](#). I would therefore treat the evidence that Blindheim has gained solely from the written description in finds registers with caution.

It is also worth noting that all three graves examined personally by Blindheim had remains of *at least one fabric loop* in addition to the strings. Her identification of the strings as substitute loops was closely linked to the assumption that the women were wearing two smokkr. An alternative interpretation, however, is that the deceased wore a single smokkr, fastened by linen loops, while the strings were either decorating the smokkr or suspending beads from the brooches. Strings used as decoration or protection from wear is known from e.g. Birka graves [511, 973, 1083, 1084](#) (Hägg 1974) and grave ACQ at Køstrup (Wielandt 1980, p. 194, Rasmussen and Lønborg 1993, p. 177-178). Likewise, bead strings made of wool or linen have been found in e.g. grave [182-185/1960](#) at Haithabu (Hägg 1991, p. 148) grave ACQ at Køstrup (Rimstad 1998, p. 20, 33), grave B 4864 in Hordaland (Lukešová 2011, p. 157) and grave 11 at Skeiet in Trøndelag (Øien and Heen-Pettersen 2024, p. 206-207). Furthermore, interpreting the strings as bead strings (hanging in front of the smokkr), corresponds better with the observed stratigraphy in grave T 16136 (Thunem 2025a, 2025b).

It cannot, of course, be ruled out that strings were used instead of fabric loops in some cases, for example as replacements for a loop that had broken (Adwick-le-street, Speed and Walton Rogers 2004, p. 77). This may be what occurred in the find from grave B 4864 at Hyrt in Hordaland, where one of the upper loops in an oval brooch consists of a braided cord (Lukešová 2011, p. 161). It is also possible that there were cases where an oval brooch pierced the fabric of the smokkr directly, instead of being attached to the brooch by a loop. Blindheim (1945) refers to two finds from Vestfold (**Berven** and **Berg**) that are described as having one loop, and one end of the smokkr fastened directly to the brooch. Unfortunately, Blindheim did not examine these finds herself, and the descriptions date from the 1890s, a time when textile analysis was poorly developed. Consequently, there is a definite possibility that the evidence may have been misinterpreted.

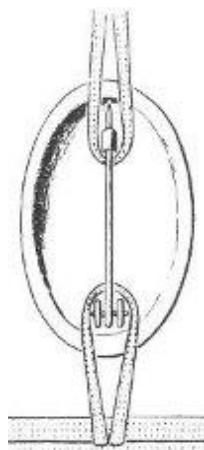
### Number of loops in each brooch

Based on the placement of the loops in the oval brooches, the prevailing interpretation is that a smokkr had a total of four loops holding it in place: two loops at the front of the dress and two loops at the back (Hägg 1974, p. 49). This would leave two loops inside each oval brooch (front loop at the bottom and back loop at the top).

However, Hägg (1974, p. 103-105) found that in 70 of the 105 Birka graves containing smokkr fragments, more than one loop occurred at the top or bottom of the brooches. More than two loops per brooch also appear in western Norway (Lukešová 2011, Holm-Olsen 1976), Haithabu (Hägg 1991) and in England (Speed and Walton Rogers 2005), demonstrating that this is not solely a Birka phenomenon, nor can be attributed to eastern influence on Birka clothing. This indicates that more than two loops inside each brooch was a usual and widespread phenomenon.

### Length of the front loops

Geijer (1938, summarized in Hägg 1974, p. 49) interpreted the length of the front loops on the basis of a fragment from Birka grave 1084, in which the remains of a loop were sewn to the edge of the smokkr. The top of the loop is missing, but the preserved part is approximately 3 cm long. Geijer proposed that the loop had torn where it met the lower edge of the brooch and that the surviving fragment originally hung beneath the brooch. Thus, her interpretation gave the front loop an estimated length of about 6.6 cm.



*Interpretation by Geijer  
Ewing 2006, p. 27*



*Interpretation by Hägg  
Hägg 1974, p. 134*

When examining the same fragment, Hägg (1974, p. 49) drew a different conclusion. She noted the slightly rounded edge of the bottom of the smokkr fragment, and suggested that this is due to the fragment decomposing along the lower edge of the brooch. From this, she concluded that the surviving fragment is the part of the smokkr and loop that were *inside* the brooch, and that the brooch in grave 1084 would have covered both the loop and 2-3 cm of the top of the smokkr.

Further evidence is found in Birka grave [597](#) and [464](#), where wear marks on the smokkr fragments indicate a position that places roughly 2-3 cm of the top of the smokkr inside the brooches. After examining several other graves at Birka, Hägg (1974, p. 50) concluded that this is the usual position of the smokkr in relation to the brooches, and thus that the front loops would have been short enough to be completely covered by the brooches.

grave-number	decor	smokkr	lining/ inner smokkr	loops	height in brooch (cm)	grave-number	decor	smokkr	lining/ inner smokkr	loops	height in brooch (cm)
464	band	W21	FH	FH	2	847	-	FH?	-	FH	-
465	-	W12	FH?	FH	3	849	-	W10?	FH	FH	2
466	-	W10?	FH	FH	2-3	856	-	W10?	-	W	2-3
507	-	W10i?	-	W	?	857	-	W19?	FH?	FH	1-2
511	string	W10	-	FH	2-3	860A	-	W10?	-	FH?	-
521	-	W14?	-	FH	-	901	-	FH?	-	FH	-
539	-	FH?	FH	FH	-	946	-	W22	-	W22?	-
550	-	W10	-	FH	2-3	954	string	W24	FH?	-	3-4
563	string	FH	FH	FH	1-2	959	-	FH?	-	FH	-
597	-	W10	-	FH	2-3	973	string	W10	W30	W25	3
602	-	W13?	FH?	FH	2	987	-	W22?	-	FH	-
606	-	W10?	-	FH	3?	1062	-	-	FH?	FH	-
731B	-	FH?	-	-	-	1083	string	W10	-	FH	-
834	band?	FH?	-	FH	2	1084	string	W	-	W30?	2-3
835	band?	W22	-	W22	2	1087	-	FH?	-	FH	2-3
838	string	W10	FH?	FH	2	1090	band?	W33?	FH?	W33	-
839	-	W29	FH	FH	3	1934,1	-	W10	FH	FH	2-3

*Analysis by Hägg (1974, p. 50). W indicates wool, FH flax or linen. "Height in brooch" is how much of the top of the smokkr that was covered by the brooches.*

This is confirmed by the two potential smokkr loops preserved intact in grave B 10720 in Sandanger, which are respectively 2.1 and 2.5 cm long (Holm-Olsen 1972, p. 115-116). The loops from the front of the woollen smokkr in grave ACQ at Køstrup may have been longer, as one of them is torn at 3.9 cm (Thunem 2017). However, as it is currently not attached to the smokkr front, it is not known how much of the loop showed above the edge of the smokkr.

Many of the well-preserved loops that have been found attached to smokkr fragments are open from the part that lie around the pin until the base at the edge of the smokkr (Hägg 1974, p. 54, Holm-Olsen 1972, p. 115-116). One exception is the front loops in grave [835](#) at Birka which were sewn closed, except for a couple of cm at the end.

### Length of the back loops

Numerous loop fragments have been preserved at the top of the brooches. To date, however, none have been found still attached to fragments of the smokkr. The loops are torn either at the upper edge of the brooch or inside it, and the parts that originally extended beyond the brooch has not been preserved. If the back loops had been of a similar length to the front loops, so that approximately 2-3 cm of the back of the smokkr was covered by the upper part of the oval brooches, we would expect smokkr fragments to be preserved with the back loops at a rate comparable to those found at the lower part of the brooches. The absence of such fragments therefore indicate that whatever their length was, the back loops were longer than the front loops.

Furthermore, several graves at Birka have remains of an outer garment preserved above the brooches and beneath the decomposed remains from the body. In these graves, however, *there is no trace of the back of the smokkr, even though the layer beneath the body is preserved inside the brooches*. Hägg (1974, p. 50) interpreted this to mean that the back of the smokkr probably did not reach higher than up to the shoulder blades of the person wearing it.

Många gånger finns det lämningar av ett yttre livplagg både ovanpå spämbucklornas skal och under förmultningsrester från kroppen - emellanåt med avigsidan (i den mån en sådan kan urskiljas) vänd uppåt = inåt. Delar av kjolens rygparti anträffas aldrig rakt under spämbucklorna; detta tycks inte ha nått högre upp än till skulderbladen.  
*Hägg 1974, p. 50*



One possibility is that the back loops ran over the shoulders and down to the upper edge of the smokkr at the back. Alternatively, they may have been sewn to broader straps that ran over the shoulders (Rimstad 1998, p. 27). The lack of direct evidence means that both solutions are possible, but at present we have no means of determining which is more likely.

There is likewise no evidence for the precise position of the back loops on the back of the smokkr. However, shoulder straps set slantwise across the back are known from other garments, like e.g. the Russian sarafan (Bau [1982](#), p. 23, 38), and this arrangement works well in practice.

*Photograph: Hilde Thunem. Back view of smokkr.*

Focusing on the earlier Iron Age clothing, Mannering ([2024](#)) has suggested that the smokkr may be a direct continuation, in the form of a peplos suspended by short loops at both and back. A reconstruction following this principle has been tested by Lewins ([2010](#)), and proved workable in practice, although a belt was used to keep the fabric in place.

In my view, however, we should not underestimate the changes brought about by the introduction of loops and oval brooches at the beginning of the Viking Age. The oval brooches differ markedly in shape, and therefore function, from their predecessors; the early Iron Age bow brooches, designed to gather loose folds of fabric, and the saucer brooches, which were fastened directly at the edges of the garment. The domed shape of the oval brooches makes them well suited to hold fabric loops while lying flat against the body (Ewing 2006, p. 25). Their specialized shape, and the fact that they are seldom used in relation to other garments, suggest that the oval brooches were designed mainly with the smokkr in mind. The creation of a new type of brooch positioned on the upper chest instead of on the shoulders (as for the Iron Age peplos), together with the introduction of loops for suspending the garment, indicate that the smokkr differed in significant ways from its predecessor.

As noted above, the current archaeological evidence indicates that smokkr had longer back loops than front loops. The graves from Birka with a well-preserved stratigraphy cannot be taken as conclusive for all smokkr, but at present there are no finds with clear evidence for a smokkr back reaching higher than the lower edge of the oval brooches. It remains possible, however, that a transitional form existed between the Iron Age peplos and the smokkr in its final form. Such a garment may have resembled the reconstruction proposed by Mannering.

## Tool bands

When comparing the total number of loops found at respectively the top and bottom of the brooches in Birka, Hägg (1974, p. 49) found that there are significantly more loops at the bottom. There is more metal surrounding the pin in the lower part of the brooch, which increases the chances of conserving nearby fabric, but if this was the sole explanation the top and bottom loops should have the same fabric distribution. This is not the case.

Out of 22 graves with one or more silk loop, only *one* silk loop is found at the top of a brooch. This clearly indicates that the silk loops had a very specific function to fulfil on the *front* of the garment. Combined with the fact that remains of silk bands have been found attached to different tools, Hägg (1974, p. 49) found it likely that these silk loops were used to hang tools from the brooches. This could also explain some of the long linen loops, that were torn at the bottom edge of an oval brooch, like the loop in Birka grave 465. Such bands would have extended beyond the lower edge of the brooch and down in front of the smokkr.

Birka isn't the only place where tool-bands have appeared. In grave ACQ at Køstrup there was a blue linen band that was believed to be a band for carrying tools (Rasmussen and Lønborg 1993 p. 177). In Adwick-le-Street a plied cord found in the right brooch was also identified as a tool-band (Speed and Walton Rogers 2004, p. 77).

Although the majority of the loops are usually found at the bottom of the brooch, there are exceptions. At Veka there are four loops at the top of one of the oval brooches and only two at the bottom. However, as Lukešová (2011) are not reporting on the material(s) the loops are made of, it is unknown whether these are more or less likely to be tool bands.

## Shape of the smokkr

Our knowledge of the smokkr comes primarily from textile fragments preserved in graves and from occasional stray finds. Unfortunately, these fragments are small, and no single find provides sufficient material to allow a complete reconstruction of the garment. It is also likely that the smokkr varied over time and between regions, so that the garment worn by a 9th century woman in Birka would have differed from that worn by a woman in 10th century Haithabu. However, while we can't just simply glue together the pieces from different finds to create a single, unified garment, we can with some caution draw on the total find material when chasing the underlying shape of the smokkr.

When working with the material, it is important to remember that the interpretations of the fragments relies heavily on prevailing theories about the appearance of the smokkr, theories that are subject to change as new evidence emerges. This is especially evident when it comes to the shape of the smokkr.

The archaeological evidence shows that the smokkr was suspended by textile loops fastened by the oval brooches. It reached at least hip-length and was occasionally lined, either fully or partially. As noted above, a smokkr leaves two loops in each oval brooch, one at the bottom and one at the top of the brooch. However, there are often more loops in each brooch. While some of these additional loops derive from tool bands, this cannot explain all cases where more than two loops occur in one or both oval brooches. The presence of multiple loops therefore constitute a central challenge in the various theories about the shape and construction of the smokkr that have been proposed by scholars over time.

## The Birka material

This is the first of the large textile finds from the Viking Age, and thus have been the source of different theories and interpretations over the years.

### *Interpretation by Agnes Geijer (1938)*

The first theory about the construction and shape of a smokkr was proposed in 1938 by Agnes Geijer. It is solely based on the evidence from Birka, as these were the only Scandinavian textiles from the Viking age that had been analysed in detail at the time.

The textile fragments identified by Geijer as belonging to the smokkr showed no show traces of having been shaped by cutting. Instead, there are a large number of fragments with a folded and hemmed edge, and these edges followed the thread direction of the fabric. Even lining, whenever it is present, is laid parallel to the direction of the weft or warp (Geijer, summarized by Hägg, 1974 p. 53-54).

Av alla de bevarade fragmenten, som säkert eller troligen kommer från kjolen, finnes inget med spår av tillskärning, däremot finns det ett stort antal kantbitar med fällsömmar, som följer tygets vävriktning på ena eller andra ledden. Ibland, som i gravarna 511 och 838, är tyget dubbelvikt längs kanten med vikningen i vävens riktning. Även fodertyget, när sådant förekommer, är lagt efter vävens riktning, t.ex. i grav 973. Det är därför uppenbart, vilket redan andra författare, framför allt Geijer, hävdar, att hängselkjolen i Birka inte kan ha varit ett tillskuret och efter kroppen avpassat plagg utan ett stycke otillformat material, färdigställt i vävstolen.

*Hägg 1974, p. 53-54*

This led Geijer to conclude that the Birka smokkr was not cut and shaped to fit the body. Instead the garment was constructed from rectangular pieces of cloth that was almost unaltered after leaving the loom. The only modifications were:

1. hemming the edge,
2. adding loops for the brooches,
3. occasionally adding lining and
4. occasionally adding a decorative band on or near the top

In the absence of other smokkr finds for comparison, Geijer chose to examine traditional garments from the Finno-Baltic region when interpreting the Birka finds. The Baltic Hurstut dress, first documented in 1776 (referenced in Bau, 1982, p. 34) is a large rectangle of fabric, wrapped around the body with the ends creating an opening at one side. It is held up by a *single* shoulder band sewn to the upper corners of the dress. Outside of it, the same type of dress is worn, with the opening at the other side of the body, so that both sides are covered by at least one layer of fabric (Hägg 1974, p. 56).

*Illustration: Hägg 1974, p. 53*

Geijer based her interpretation of the smokkr on the same logic as the Hurstut dress, although with some modifications to better fit the evidence at Birka.

She proposed that the smokkr was a rectangular piece of fabric, wrapped around one side of the body, with the vertical edges creating an opening at one side. The smokkr was held up by two short loops at the front and two longer loops running over the shoulders to the back.





Unlike the Hurstut dress with its single shoulder strap sewn to the corners of the fabric, the smokkr loops were placed some centimetres from the edge at the side opening.

When two such smokkr are worn in overlapping pairs, the side opening of the overdress shows the inner smokkr instead of revealing the serk (Geijer 1938, p. 153-155). Such an arrangement would also result in two loops at the top and two at the bottom of the oval brooches, as is found in many of the graves at Birka.

*Illustration: Geijer's interpretation of the construction of the smokkr as two rectangular pieces of fabric, fastened with loops and hanging below the oval brooches. Illustration by Aino Ossletten Gjerde and Hilde Thunem, first published in Viking vol. 90 (Thunem 2025a).*

#### *Interpretation by Inga Hägg (1974 and 1986)*

Inga Hägg took up work on the Birka material in 1974. By studying the sequence of textile remains that were attached to oval brooches and other metal objects from the graves, she managed to identify more fragments as possible smokkr parts than Geijer had done (Hägg 1974, p. 7, 49-50).

The largest fragment she identified was from the front of a smokkr, with an upper edge that stretched from one oval brooch to the other (grave [597](#), Hägg 1974, p. 44). She also mapped the number of loops in each oval brooch and pointed out that even though there was not always the same number of loops at the top and bottom of each brooch (after excluding the tool bands), there was no pattern as to which side was missing loops. Furthermore, the graves with the best preserved material showed almost total correspondence between the loops in both oval brooches. She thus agreed with Geijer that each smokkr was fastened symmetrically with four loops, two in front and two over the shoulders. However, as mentioned above, she concluded that the loops in front were so short that some of the upper edge of the smokkr was covered by the oval brooches (Hägg 1974, p. 49-50, 52, fig. 40).

Based on her studies of the finds, she concluded that smokkr could be worn singly or in pairs, for example with an outer smokkr of wool and an inner one of linen. In addition, as e.g. grave [464](#) demonstrates, there were also instances of fully or partially *lined* smokkr, worn without an inner dress (Hägg 1974, p. 50-51).

Because the upper edge of the smokkr lay horizontally in the oval brooches, instead of the part of the edge where the side opening was located hanging downwards, she believed that the dresses must have been held close to the body. This could have happened either through the use of some form of belt (now disappeared), or by their having been sewn together at the side or the back. She proposed that if a belt was used, it would have been made of textile material, possibly sprang (Hägg 1974, p. 54-55).



*Hägg's interpretation of the smokkr as a closed tube enclosing the body. Such a smokkr could be worn singly (left) or in pairs (right), leaving two or four loops, respectively, in each oval brooch. Illustration by Aino Ossletten Gjerde and Hilde Thunem, first published in Viking vol. 90 (Thunem 2025a).*

Hägg (1974, p. 57) found it especially likely that the wool strap dresses were sewn together. She noted that the fragments from the front of the woollen smokkr always lie in *a single layer* around the body, with no traces of an inner wraparound woollen smokkr. She also drew parallels to the woollen peplos found at Huldremose in Denmark. The peplos is dated to 350-30 BC (Mannering [2017a](#), p. 22).

Som analysen av materialet från de enskilda gravarna har visat, ligger de ofte anseliga fragmenten från framstycket alltid i ett enda skikt under spämbucklorna, även när textillagren är väl bevarade. Det finns således inga spår efter en inre omlottkjol av ylle i de många gravar som har bevarade delar av kjolens framstycke. Det mest sannolika torde därför vara att åtminstone *yllekjolen varit slutet i sidorna*.  
Hägg 1974, p. 54 - 55

After working with the textile finds from Haithabu harbour (Hägg 1984), Hägg revisited the Birka evidence, arguing that, despite the fact that e.g. grave 597 contained a large fragment where no other seams than the upper hem were discovered, the smokkr "must be classified as belonging to the tailored type of garments." In support of this interpretation, she referred to the smokkr fragments from Haithabu (Hägg 1986, p. 62). This represents a clear departure from Geijer's view that the smokkr at Birka was made from fabric left largely unaltered from the loom.

Reste eines solchen Wollrocks liegen aus etwa 25 Gräbern vor, [...]. Die grössten Rockfragmente kommen aus dem Grab Bj 597 (abgebildet in Hägg 1974, 126). Sie stammen vom Vorderteil und haben ursprünglich die Brust in einem zusammenhängenden Stück unter und zwischen den Spangen bedeckt. Nach oben schliessen sie mit einem geraden Rollsaum ab, andere Nähte sind nicht vorhanden. Trotzdem muss der Trägerrock zu den zugeschnittenen Gewandtypen gezählt werden [...].  
Hägg 1986, p. 62

*Interpretation by Flemming Bau (1982)*

Flemming Bau (1982) introduced an alternative interpretation of the Birka evidence. His point of departure is ten female figures found on picture stones, silver figurines and tapestries from

the Viking Age. He noted that even though they mostly show the woman from the side, none of the figures show a side opening of the kind envisioned by Geijer (Bau 1982, p. 16).

Instead, the figures appear to wear several different garments, including something that can be interpreted as a cloak or a train hanging from the shoulders, an apron in front, and various forms of cloaks or shawls (Bau 1982, p. 14-16).

Bau's interpretation of clothing worn by the figures:

- a. serk, apron and cloak
- b. apron?, smokkr and cloak
- c. apron
- d. serk, smokkr and caftan
- e. apron, smokkr and cloak
- f. apron, smokkr and train
- g. serk, apron?, smokkr and caftan
- h. apron, smokkr, train and cloak
- i. apron, smokkr, train and cloak
- j. apron, smokkr and cloak

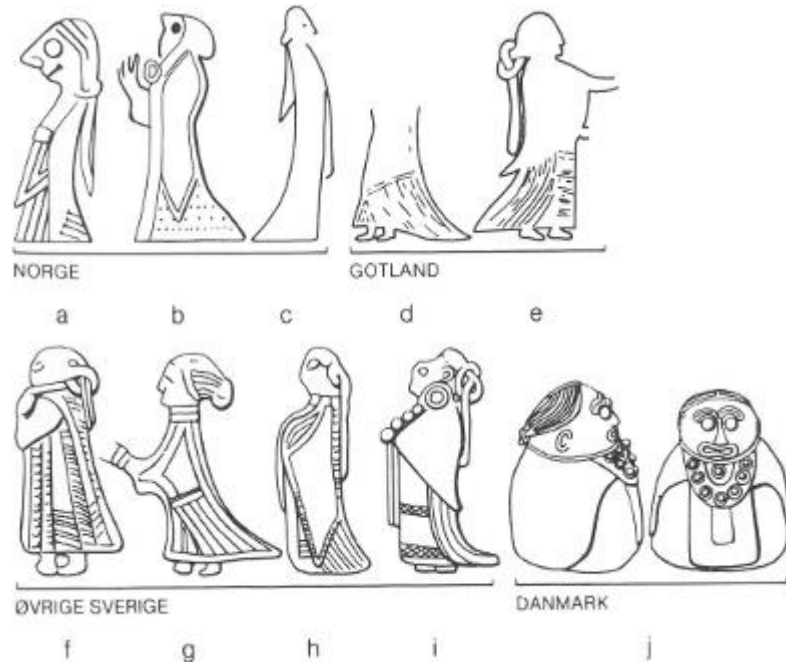


Illustration: Bau 1982, p. 15

According to Bau (1982, p. 16) **f**, **h** and **i** indicate that there could be a *separable train* fastened at the shoulders, since in at least one of these figures (**f**) the back extends higher than what would be the case for the traditional interpretation of a smokkr with long back loops. He further interpreted the trailing garments in **h** and **i** to be trains worn over another garment.

In figure **e**, the backward-flowing lines of the train are interrupted by a hanging panel of fabric at the front. Figure **f** is interpreted as having a strip of fabric hanging down the front, with an underlying garment glimpsed at the side. Finally, the figures **c**, **h**, **i**, **j** all appear to have a cloth hanging down in front. Some of these are significantly shorter than the other garments. Based on these illustrations Bau suggested the presence of a *separable apron* fastened on the chest (Bau 1981, p. 16).

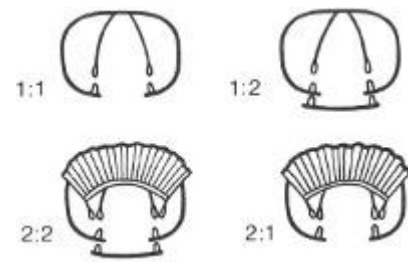
Der er tydeligt slæb på alle figurer, bortset fra f, men det er tilsynelatende forskellige klædningsstykker, der danner slæbet. d og g viser ubrudte linier fra kvindens front og bagud i et slæb. Kun en lille trekant af den underliggende klædning lades synlig foran. Uden på disse to klædningsstykker bæres en slags trøje eller lignende. Ved figur e afbrydes de bagudrettede linier i slæbet med en hængende bane stof foran.

Ved figurerne f, h og i hænger slæbet ned fra skulderpartiet og ikke fra kvindens forside, som ved de tidligere omtalte figurer. Sølvfiguren f viser tydeligt et skulderslæb, foran hænger en stofbane og en underliggende klædning skimtes. På figur h og i ses et slæb, der specielt for i's vedkommende tydeligt bliver båret uden på en anden klædning med mønsterborter. På begge, og tilsynelatende også på c, hænger et klædningsstykke ned foran, men ikke så langt ned som slæbet. Endeligt ses foran på guldspillebrikken j et hængende klædningsstykke.

Bau 1982, p. 14-15

Based on this iconography, Bau proposed that the smokkr was worn in combination with a separable apron, a train, or both at the same time. This would give four combinations of loops in each oval brooch:

- 1 loop at the bottom and one at the top: a smokkr
- 2 loops at the bottom and 1 loop at the top: a smokkr plus a separable apron
- 2 loops at the bottom and 2 at the top: a smokkr plus a separable apron and train
- 1 loop at the bottom and 2 loops at the top: a smokkr plus a separable train



*Illustration: Bau 1982, p. 25, part of figure 9.*

Due to the deterioration of the fabric after burial, the majority of graves at Birka do not preserve a complete and symmetrical set of loops in both brooches. Hägg (1974) interpreted cases with unequal number of loops above and below in the brooches as the result of poor preservation. In contrast, Bau (1982, p. 17-19, 25) proposed such asymmetry to be evidence of separable aprons and trains. One example is grave [597](#), with one loop at the top and several at the bottom, where he proposed that the large fragment in the grave come from a separable apron instead of from the smokkr.

No fragments in the Birka material have been conclusively identified as belonging to a train. Nevertheless, Bau (1982, p. 31) noted that several of the figurines show lines running down the back that may indicate that the train was pleated. Of the 46 Birka graves Bau reviewed and interpreted, he believed the number of loops indicated that in 18 graves the smokkr was worn without either apron or train, while each of the other combinations occurred in 6 - 7 graves (Bau 1982, p. 18).



While he disagreed with Geijer's proposed side opening, Bau suggested that the smokkr was open in front, and that *the opening was only covered in those cases where it was worn together with a separate apron*. This could explain why some graves have keys and scissors with remains of linen from the underdress (the serk) without there, according to Bau, being a preserved layer from the smokkr between the linen and the metal. If the smokkr was open in front, tools in tool bands could have slid to the side and ended up directly against the serk (Bau 1982, p. 22-27).

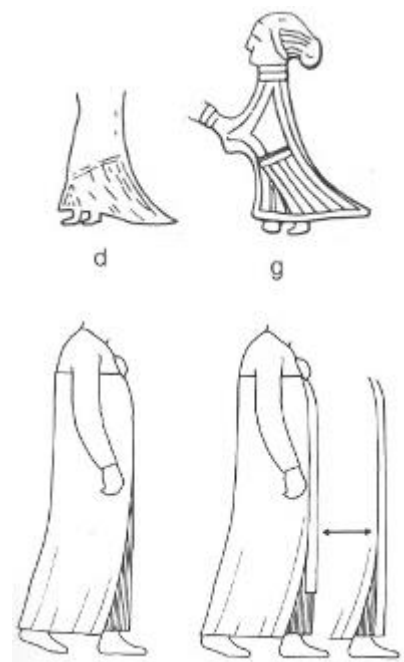
*Illustration: Bau's interpretation of the construction of the smokkr. Such a smokkr could be worn on its own or together with a separable apron or a train. Illustration by Aino Ossletten Gjerde and Hilde Thunem, first published in Viking vol. 90 (Thunem 2025a)*

Furthermore, if an open smokkr was worn without the apron, it would show the front of

the underlying garment. In a handful of Birka graves (e.g. grave [735](#)), there is evidence of tunics decorated with silk and tablet-woven bands that were worn underneath the smokkr (Hägg 1974, p. 92-93). Bau (1982, p. 28-29) argued that such decoration was unlikely to have been hidden, and that a front opening would display it.

He also challenged Hägg's observation that the preserved edge of the smokkr fragments runs in a straight line across the width of the oval brooches. Bau pointed out that there is only a few finds where the edge has been preserved across the brooch, and that if the loop was fastened a few centimetres from the corner (as may be the case in grave [464](#)), there would not necessarily have been a substantial amount of fabric beyond the loop that needed to be held close to the body (Bau 1982, p. 21-22).

In addition, several of the brooches at Birka were found fully or partially overturned in the graves. Bau argued that this is more consistent with an open-fronted smokkr than with a closed one, since a closed smokkr would have been more likely to keep the brooches in their original positions during decomposition (Bau 1982, p. 27). An open-fronted smokkr would also have shifted away from the serk and apron when the woman was walking, creating a small triangle in front where the underdress would be visible, which could explain the small triangle seen in two of the figures (**d**, **g**).



*Illustration: Bau 1982, p. 15, 25, part of figure 3 and 9*

Dresses with a front opening are known from Baltic, Slavic, and Russian folk costumes, and even though there is no direct connection between these garments and Viking Age women's dress, Bau argued that they developed from a common dress impulse and that their existence thus strengthens the interpretation of the smokkr as a garment with a front opening.

He used this material as a basis when placing the back loops of the smokkr close together at the hem, and running slantwise over the shoulders, like e.g. the Slavic-Russian sarafan documented in 1973 (Bau 1982, p. 32-39).

#### *Interpretation by Thor Ewing (2006)*

When interpreting the shape of the smokkr, Ewing (2006) considered a range of textile finds, of which Birka was only a part. He cited Birka grave 597, grave ACQ from Køstrup and the Haithabu fragments as evidence that the smokkr was closed in front, instead of open as Bau (1982) proposed.

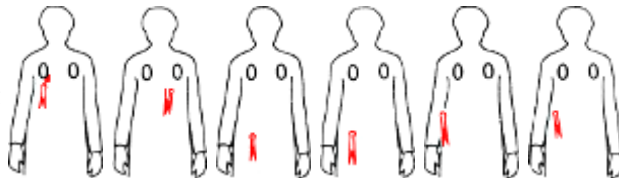
Ewing noted that there is no evidence for an open-fronted garment worn *without an apron* in the ethnographic comparative material Bau presented. An open smokkr would definitively reveal the underlying tunic, but given that the decorated tunics were rare, the majority of open fronted smokkrs would just expose the underwear at precisely the areas one should expect to find covered. Wearing the smokkr without a separable apron would be impractical, as the dress would tend to swing to the sides, but if the apron always was worn, it would cover up the tunic underneath (Ewing 2006, p. 31).

Ewing (2006, p. 35-37) also argued that there is no need for an open smokkr to explain the linen left on the metal implements hanging from the brooches. If a linen smokkr or a linen apron or forecloth was present, or the implement simply hung inside the smokkr, it would easily have come in contact with linen.

### Smooth linen

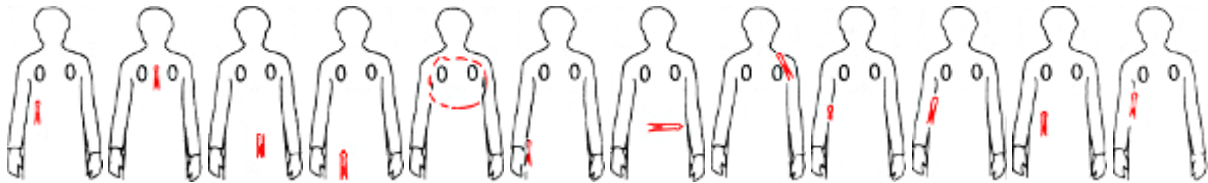
<b>Grave</b>	464	465	515	550	637	1888 N
<b>Tool</b>	scissors chain	scissors knife	scissors	scissors	scissors	scissors

### Placement



### Pleated linen

517	597	703 B	791	834 B	838	943	978	980	1062	1084	1159
scissors	scissors	scissors or knife	scissors	chain- links	scissors	scissors	scissors?	keys	scissors	scissors?	scissors



*Illustration: Bau 1982, p. 26-27. Overview of position of tools found with traces of smooth or pleated linen. Text translated and red colour added for emphasis.*

Finally the poem *Rígsþula* describes the dress of a farm wife:

Sat þar kona... sveigr var á höfði, smokkr var á bringu, dúkr var á halsi, dvergar á öxlum.  
There sat a woman... a sveigr was on her head, a 'smock' on her chest, a cloth was at her neck, 'dwarf'  
brooches at her shoulders.

*Rígsþula (translation by Ewing, 2006 p. 37)*

In the poem, the dress held by the brooches is called a "smokkr", a word related to the verb *smjúga* (to creep through). This is probably a reference to the way the garment is put on, where the wearer creeps through the dress until arms and head emerges on the other side, another indication that the smokkr was a closed garment.

Ewing concluded that there were clearly possible variations in the style of the smokkr, just as there were in the style of the brooches. The various number of straps attached to the brooches suggest various combinations of garments, including the possible presence of a separable apron or backcloth, or an inner and outer smokkr. However, *the assumption should be that the basic garment worn with the oval brooches was a closed dress of one form or another, and that these brooches would not have been worn without such a dress (Ewing 2006, p. 33).*



*Illustration: A closed smokkr, possibly worn together with a separable apron or a train, as proposed by Ewing. Illustration by Aino Ossletten Gjerde and Hilde Thunem.*

Sharing Bau's scepticism towards a decorative tunic being worn beneath a closed smokkr, he suggested an alternative explanation of the decorative bands found in some of the women's graves at Birka. These bands appear to be found in two distinct areas, either near the shoulders or below the arms. However, when they are found in both positions (Birka graves 965 and 950) they differ in type from one area to another.

Ewing (2006, p. 34-35) argued that this could be an indication that the bands are decorating two separate garments, and that the bands placed below the arms, as e.g. in grave [735](#), could be decorating a smokkr.



*Illustration: Ewing's suggested interpretation of the tablet woven bands found in grave 735 at Birka. Illustration by Hilde Thunem*

*Further comments by Inga Hägg (2009)*

Hägg (2009) has commented on Bau's interpretation, noting that it is strongly influenced by the figurines of Valkyries and other female entities in Viking art. However, none of the figures Bau examined are clearly shown wearing a smokkr with oval brooches, and their clothing may be interpreted in several different ways.

In addition, according to Hägg (2009), the suggestion of an open fronted smokkr can be rejected directly on grounds of the archaeological evidence. Roughly 25 graves in Birka contained significant fragments from the front of the woollen smokkr, including a fragment that ran from one brooch to another (grave [597](#)) which Hägg does not agree is a part of a separable apron. She further referred to the Haithabu fragments and "a host of other Scandinavian finds" that reaffirms that the smokkr covered the front, and was closed around the body.

En omfattande spridning i handböcker och populärlitteratur fick den danske grafikern Flemming Baus färgstarka bilder av kjolen under 1980-talet och framöver (t.ex. Hvass, *Jernalderen* 1980 och Burenhult, *Arkeologi i Norden* 1999). Hans rekonstruktion var starkt påverkad av ett antal vikingatida framställningar av valkyrior och andra kvinnliga väsen i dräkter som kan tolkas på olika sätt, dock i inget fall visar de en hängselkjöl med spännbucklor.[...] Förslaget om en öppning framtill kan avskrivas direkt. I Birka har ansefliga fragment från yllekjolens framsida bevarats i bortåt 25 av gravarna, ofta fixerade i ärg och rost under de ovala spännbucklorna. I ett fall har ett sammanlagt 22 cm brett stycke bevarats, därav 12-13 cm från partiet upptill på bröstet mellan de båda ovalspännena. I Hedeby, Birkas handelspartner i det dåtida Danmark, har man funnit ett 30 x 23 cm stort stycke från sidan och ryggen till en yllekjöl med vertikala fogsömmar och intagningar. Detta och en rad andra skandinaviska fynd stämmer med den tidigare för Birka vunna bilden, nämligen att yllekjolen täckt bröstet framtill och att det var slutet runtom i kroppens längdriktning.

*Hägg 2009*

## The Haithabu material

The [fragments H14A-B](#) from Haithabu harbour were found as part of a ship's caulking. Thus there were no accompanying oval brooches that could identify them as part of a smokkr. Instead, identification must be made based solely on their shapes.

According to Hägg, the shapes indicates that **H14A-B** are smokkr fragments. The hemmed edge would be at one end of the garment, as it could not have been stitched to another fabric piece. The wedge-shape would have been pointed with the slimmest part (16 cm wide) upwards. Additionally, the fact that the dart is deeper in the middle than at the edges, indicates that the fragments are not part of a completely different type of pattern, like a sleeve (Hägg 1984, p. 38-39).

Provided one accepts this identification, the fragments provide a wealth of information about the shape of the smokkr. Together, the two fragments form a wedge-shaped piece that once was stitched to other pieces along both sides, as indicated by the traces of seams.

Hägg (1984, p. 42) observes that the narrow cut and the dart indicate that the garment fit closely to the upper part of the body, and then flared out over the hips. In other words, this was a tailored garment. This places the Haithabu smokkr firmly among more complex garments with a defined function (Hägg 1984, p. 169). The tailoring makes it unlikely that it was left open, whether in side or in front, and thus strongly indicate that the smokkr was forming a closed tube around the body.

*Photograph: Hilde Thunem, reconstruction at the Historical museum in Oslo.*



The piece formed by the surviving fragments is only wide enough to have covered part of the body, e.g. the side or half of the back. According to Hägg (1984), a placement in front is less probable, as the dart is very shallow (p. 42). Due to the narrow cut, she believes there might have been an opening or slit, possibly closed by lacing, to allow the wearer to put the smokkr on (p. 170). Her reason for suggesting lacing as a possible solution is that according to old Norse clothing terminology, there was a type of tunic - dragkyrtill - that were "laz at siðu", that is, tied together along the sides (Falk 1919, quoted in Hägg 1984 p. 170).

Finally, she suggests that the smokkr *may* have been constructed from four parts, although this is necessarily guesswork as there is no evidence beyond the two fragments **H14A-B** (Hägg 1984, p. 213).

Även resterna av en hängselkjöl i tuskaftat ylle visar ett snävt snitt, som tillsammans med intagningarna kring livet starkt framhäver kroppens former. Plaggets slanka linjer betonas ytterligare genom en prydnadsfläta, som

fästs över en av sömmarna i dess längdriktning. Kjolen, som förmodligen bestått av fyra separat tillskurna tyglängder vidgade sig nedåt på samma sätt som tunikorna.  
*Hägg 1984, p. 213*

She believes that the widest point of the dart was placed at the waist, and that the worn hole and the felted area indicate that a belt had been worn with the smokkr (Hägg 1984, p.40). While the fragments are torn at the bottom, making the total length of the smokkr unknown, the distance from the waist area to the bottom of fragment **H14B** is roughly 25 cm (Hägg 1984, p. 170).

The hole at the top, probably caused by wear, may have been used as a temporary mechanism to attach a strap, e.g. by passing it through the hole and tying it (Hägg 1984, p. 40-41). It is possible that the Haithabu fragment, while originally part of an upper class smokkr, would have been passed on to a servant or slave when it became worn. This second wearer of the garment would not have owned brooches, but would probably simply have tied a strap to the front of the smokkr ([Hägg 1996](#), p. 14).

Från detta fyndkomplex kommer ett hängselkjolfragment som säkert ursprungligen hört till en välsituerad kvinnas dräkt. Yllematerialet och väven är av utmärkt kvalitet. Men när kjolen blev nött och trasig har sannolikt en träkvinna fått överta den. Kvinnorna på samhällets lägre nivåer ägde inga dräktspännen. [...] Hedebykjolen hade av sin andra ägarinna helt enkelt fästs över axlarna genom att hängslena knutit fast direkt i framstycket.  
*Hägg 1996, p. 14*

## The Køstrup material

Although [the fragments](#) from grave ACQ at Køstrup provide significant information about the smokkr, there is still a lot of room left for interpretation, as illustrated by Wielandt (1980) and Rasmussen and Lønborg (1993) each having their separate theories of how the blue woollen smokkr would have looked.

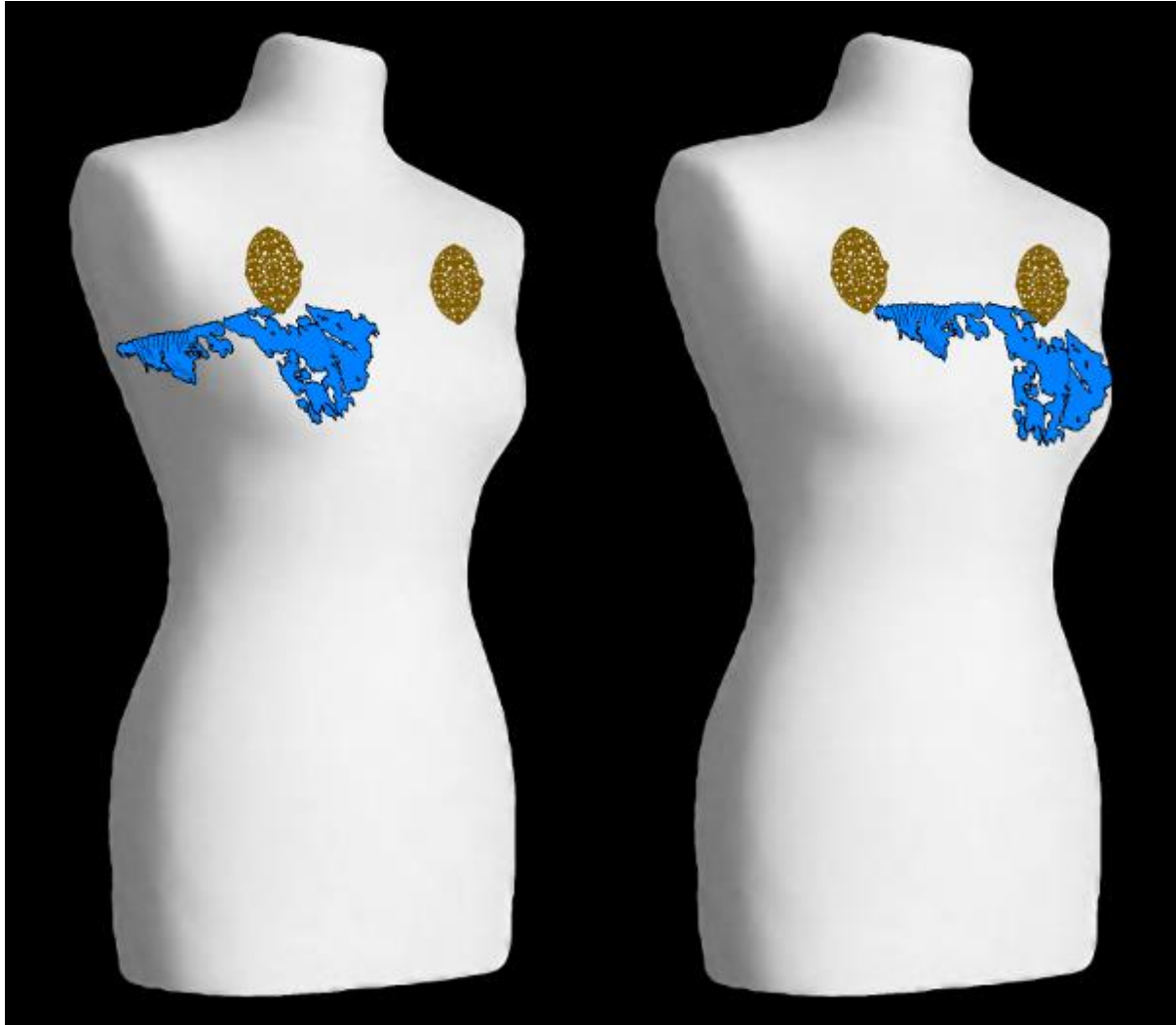
There is agreement that the woollen tabby inside brooch x505 and the four woollen loops are from a smokkr. However, Wielandt (1980) believes the pleating was placed *on the side* of the smokkr, while Rasmussen and Lønborg place the pleating *in the middle*, between the brooches.

Although none of them explain their reasoning, it has to depend on how they choose to orient the large fragment (**x541**) on the body. While it can be difficult to differentiate between the outside and inside of the pleated fragment, the inside of the rest of fragment x541 is identified by the stitches that run along the folded upper edge of the smokkr. Thus there can be no disagreement regarding which side of the fragment that was worn towards the body.

*Photograph by Hilde Thunem at Odense Bys Museer, x541 detail, [large version \(380 KB\)](#)*

The only other reason I can see for the two different conclusions is if they believe that brooch x505 was placed on different sides of the body. If the brooch is placed on the right, the pleating runs beneath the arm, as suggested by Wielandt (1980), while if it is placed on the left, the pleating will end up in the middle of the smokkr, as suggested by Rasmussen and Lønborg (1993).





*Illustration of alternative placements of brooch x505 by Hilde Thunem and Tor Gjerde.*

So what is the correct placement of brooch x505? First of all, brooch x501 had turned in the grave, meaning that at least one of the brooches had moved. This could be due to normal decomposition of a body placed on the back, but it could also indicate that the body was placed on the side. Thus, there is an inherent uncertainty in regards to which brooch was originally on the left and which was on the right of the body.

During the excavation, the piece of earth containing both brooches, textiles and glass beads was removed from the grave and "excavated" off the site (Lorentzen [1980](#), p. 170) adding further possibility that the orientation of the brooches may have gotten mixed up.

Mellem skrinet og gravens centrale del optoges et præparat (x494), dettes omfang samt placering i graven fremgår af T133. Præparatet inneholdt fragmenter af trekisten, to skålpænder med isiddende tekstiler, glasperler m.m.

*Lorentzen 1980, p. 170*

Wielandt (1980) doesn't mention brooch placement at all in her report. Rasmussen and Lønborg (1993) on the other hand explicitly places brooch x505 on the left and brooch x501 on the right. The brevity of their article means that there is no explanation of how they reached their conclusion. The only clue is a comment by Lønborg in the documentation held by Odense Bys museer, stating that Wielandt's excavation sketches are mirrored.

Unfortunately, the photographs from the excavation are missing, making it impossible to do a new analysis of the evidence.

However, another way to resolve the placement of the pleating is to approach the logic behind it. According to Wielandt (1980, p. 193-194) and Rasmussen and Lønborg (1993, p. 176), the purpose of the pleats was to increase the width of the garment.

Mellem spændet og sandsynligvis hele vejen under armen har spenceren været rynket for at give lidt vidde forneden.

*Wielandt 1980, p. 193-194*

I selekjolefragmentets ene ende ses resterne af et gauffreret stykke, der har siddet midt i mellem fiblerne, velsagtens for at give kjolen vidde.

*Rasmussen og Lønborg 1993, p. 176*

Although we lack the entire garment, the preserved fragments indicate that the smokkr was only *partially* pleated. Most of the 25 cm long fragment is in fact left unpleated. Considering the tiny size of the pleats (2-3 mm deep and 3 mm wide), the partial pleating appears more as a decorative element than a way to significantly increase width in the garment. While we should take care to not use modern aesthetics to interpret Viking clothing, in my opinion it makes more sense to place a decorative element according to maximum visibility, namely between the brooches, instead of hidden under the arms. A placement in the front have the added benefit that the increased width created by the pleating is placed where it is most useful during pregnancy (Thunem 2015).

There is general agreement that the Køstrup smokkr enclosed the body (Wielandt 1980; Rasmussen & Lønborg 1993; Rimstad 1998; Ewing 2006).

This is supported by the fragment. The preserved 10-13 cm of the upper edge on either side of the loop excludes the possibility of a frontal opening in the smokkr. It also makes it unlikely that the smokkr was open at the side that is preserved. Even more important is the vertical seam 2,5-5 cm from the loop. After all, Geijer's belief in a side opening is partly based on a perceived lack of seams in the existing Birka material (Hägg 1974). The presence of a seam connecting two selvedges clearly argues against such an interpretation for the Køstrup smokkr, as there is no reason that one would sew together two (or more) pieces of fabric and then leave one of the sides open.

Unfortunately, the fragments of the smokkr are too small to give more information on the shape of the garment, e.g. whether it originally was a simple tube, sewn together with a single seam, or consisted of several pieces, possibly cut to fit the body, as in the find from Haithabu (Hägg 1984).

Grave ACQ has the largest fragment of a pleated smokkr that has been found so far, but it is not the only one. Pleating (4-5 mm deep) is also known from smokkr fragments in [grave C](#) at Kaupang (Ingstad 1979), and probable smokkr fragments (2-3 mm deep pleats) in [grave B 5625](#) at Vangnes (Holm-Olsen 1976). Unfortunately, these fragments are too small to shed further light on the shape of such smokkr.

The decoration of the Køstrup smokkr was done in a manner unique to this find. The tablet woven band was fastened to the loops, but not the smokkr (Wielandt 1980, p. 193-194). This

is markedly different than e.g. Birka, where the decoration was stitched along the top of the smokkr.

The band had two strings running along on either side, stitched to the loops. There are two theories regarding the further fastening of the strings; they may have been stitched to the tablet woven band (Wielandt 1980), alternatively, the lower strings were stitched to each other and the smokkr in a single place (Rasmussen & Lønborg 1993), and the upper strings may have been arranged similarly.



*Illustration by Charlotte Rimstad 1998, cover page*

Rasmussen and Lønborg (1993) suggest that the clothing in grave ACQ may have been made solely for the funeral, referring to the description of a Rus (Swedish Vikings) funeral, by Ahmad ibn Fadlan, where an important man was buried in a set of garments made for the occasion.

### **The Pskov material**

Although Vikings sometimes travelled to Russia, it isn't a given that the remains in the Pskov grave are from a Viking smokkr. It was found together with oval brooches though, and the preserved linen loop also seems to indicate a smokkr, or something very similar.

Zubkova, Orfinskaya and Mikhailov use the smokkr interpretations of Agnes Geijer and Inga Hägg when interpreting the Pskov evidence, and call the resulting garment a sarafan (a Slavic garment that may be akin to the smokkr).

According to their interpretation the sarafan or smokkr was made from fine blue linen tabby. The large silk fragment was sewn onto the linen as decoration. The part made out of three silk strips was worn in the front, while the single silk strip at each side of it served as trim for the side and back of the garment. Finally, it was not possible to conclude whether the 4,5 cm wide reddish-violet samite strips was used to decorate the hem of the smokkr or underdress.

The smokkr loops were made from the same blue linen as the smokkr. Unfortunately, with the exception of two loops on the central piece, it is very unclear from the report exactly how many loops there were. The archaeologists note that there are "remains of threads and traces of sewn on straps" on one side strip (V) 20 and 25 cm from where the strip is fastened to the central piece. They further state that the general symmetry of the large silk fragment suggests "the presence of the identical straps on its second narrow lateral strip" (IV). This might be read as an assumption that both side strips had more than one loop.

To make matters worse, the report doesn't say how many loops were found inside each brooch. Also, the archaeologists question the presence of an extra apron or train (which would mean more loops).

Moreover, detailed examination of the inner parts of the brooches with the traces of a pair of straps on the pins have led us to question the presence of either a pinafore or a train as proposed in F. Bau's reconstructions [...] Zubkova et al. 2010, p. 298

At the same time, their reconstruction show only four loops, two at the front and two at the back of the smokkr. Nor have they included a separate apron or train.

The thing that strikes me as most peculiar with the Pskov smokkr is its dimensions. Provided that the scale in the photograph is correct, the part of the fragment that covers the front of the smokkr is roughly 1 m long. Unfortunately, we cannot see the traces of the loops in the photograph, which means that their position has to be estimated from the drawing in Zubkova et al.(2010, p. 294), which is less precise. Here the front loops are roughly 10 cm from each side of the central piece, leaving about 80 cm between the loops. (That is a Viking Age lady of truly heroic proportions!)

Using the placement of all the silk strips in relation to the Bahram Gur pattern, we can estimate the maximum length of the less preserved strips (IV and V). If almost the entire Bahram Gur cloth was used as decoration, the smokkr would have had a circumference of roughly 2 m. Even if it wasn't, and the back loops were placed at a shorter distance from each other than the front loops (like on a dungaree skirt), the smokkr would have been very wide in front.



*Illustration by Hilde Thunem*

Zubkova, Orfinskaya and Mikhailov do not mention this issue in their report. However, before it was published, the authors temporarily published [a preliminary report](#). It contained two illustrations of alternative ways of wearing such a smokkr; either by letting the front fall in a large fold on the chest, or by folding the front in an accordion fold. As there was no discussion of either, we do not know which of them the authors found to be most likely, or why they chose to omit them in their final report.

### **Interpretation by Annika Larsson (2008)**

In [2008](#) a new interpretation of the smokkr was proposed by Annika Larsson. Her theory is mainly based on the Pskov find, but due to Pskov being situated on a trading route from Birka towards the east, she argues that the Pskov fragments are also relevant when interpreting the Birka evidence. Her reconstruction appears to combine elements of the Pskov find with elements from Birka.

As mentioned above, the large silk fragment believed to have decorated the top of the Pskov smokkr has a central "flap" (made of three silk strips) that is higher than the rest of the fragment. According to Larsson, if this is placed on *the front* of the smokkr, as Zubkova, Orfinskaya and Mikhailov suggest, the upper edge will be level with the throat. This would require the oval brooches to be placed on top of the shoulders, which is unlikely. She also states that the width of the flap would leave it in folds down towards the stomach, something that would hide the string of beads that were hung between the brooches. (There is no mention of beads in the Pskov report - perhaps Larsson is thinking of Birka, where several of the graves contained beads?)

Instead Larsson proposes that the flap was placed at *the back* of the smokkr, reaching the neck of the woman wearing it. She proposes that it was pleated, decreasing the width into something reasonable at the top of the smokkr while leaving plenty of width at the bottom of the garment.

This is an interesting way of dealing with the extreme width of the Pskov smokkr. However, if the silk was pleated, shouldn't there be traces left of the pleats, or at least the stitches used to fasten them? (The stitch holes mentioned in the Pskov report are all tied to the presence of smokkr loops.) It is of course possible that they have deteriorated with time, but the lack of clear evidence weakens the theory of pleating somewhat. Also, Annika Larsson's interpretation places the largest and most decorative part of the silk fragment at the back of the smokkr, where it may be hidden by hair, shawls or cloaks. This seems counterintuitive, even keeping in mind that Vikings had a different approach to fashion than modern people.



[...] samt en näst intill komplett överdel från et hängselkjolsliknande plagg. Slående är att det inte handlar om någon tubliknande konstruktion, såsom tidigare hävdats, utan ett mycket brett plagg som inte alls varit lika högt fram og bak. Det skiljer faktisk så mycket som 30 centimeter mellan fram og bak, och man kan till och med skönja spår av en uttrigning i vardera sidan för armarna. De bevarade detalerna visar ett plagg helt utan sidsöm. [...] Tolkningen är att plagget burits på det sätt som vi traditionellt brukar visa. Men här finns et stort problem - nämligen att det förmodade framstycket på det bevarade fyndet är hela 1 meter brett! Då det fästes i spännbucklorna bildas en drapering av tyg över magen som mera påminner om ett antikt ideal. Det är tiltalande tanke, men till detta skal läggas ett antal halsband som utgår från samma spännen, och som helt skulle försvinna in bland tygerna och antagligen inte synas alls. För att armrिंगningen på plagget ska fylla någon funktion innebär det dessutom at det förmodade framstyckets överkant hamnar högt upp i strupen. Det gör att några spännbucklor i realiteten inte får plats på framsidan av kroppen - möjligen mitt uppe på axlarna.

Det hela är alltså en orimlig tanke när den prövas i verkligheten, hur trevlig den än kan tyckas vara på en tecknad bild. Jag tror därför inte det är framstycket vi har att göra med - utan ryggstycket. Placerat i nacken som vilket annat plagg som helst, med det 1 meter breda tyget i lagda veck, bildas nämligen ett släp som motsvaras av ett antal bevarade vikingatida kvinnofigurers klädsel.

Annika Larsson: *Förbjöd kyrkan den vikingatida kvinnodräkten?*, p 6, photo [Uppsala universitet](http://www.uu.se)

Larsson refers to the small valkyrie figurines and states that they show that the smokkr is open in the front (while she doesn't give any further reasoning for this, I assume that she is building on Flemming Bau's interpretation). Her interpretation of the Pskov evidence is of a garment that looks like the trains worn by some of these figurines. She suggests that decorative chains or strings with beads were strung across the frontal opening to keep the smokkr from slipping off the shoulders.

When she places the flap at the back of the smokkr, the rest of the trim ends up at waist-height, leading her to place each brooch on top of the breasts (instead of the usual position just below the clavicle). According to her, Hjalmar Stolpe's illustrations of the Birka graves show the brooches in this position, and Ibn Fadlan's account of how the Rus women wear a box on each breast supports this. She states that the traditional explanation that the brooches have ended up lower as the corpse rotted is a prudish interpretation.

Redan en blick på Hjalmar Stolpes gravplaner från 1800-talets utgrävningar i Birka, skvallrar om att de bäge ovala spännbucklorna som följt med de döda kvinnorna i graven, antagligen suttit mitt på värdera bröstet. Mot

detta anför de traditionella tolkningsföreträdarna att spännbucklorna har fallit ned när liket ruttnat, och att det aktuella läget därför inte speglar spännenas ursprungliga plats, som anses ha varit under nyckelbenen. Detta förefaller vara en rätt pryd tolkning.

Att spännbucklorna skulle ha suttit på bröstet styrks också av en samtida arabisk källa, som berättar at de vikingatida kvinnor hade dosor av järn, silver, koppar eller guld, fastsatt på bröstet, där en kniv var fästad. Alltefter rikedom bar hon också många halsbånd. Detta nedtecknades av Ibn Fadlan, en muslimsk resenär, då han år 921 mötte nordbor vid floden Volga under deras handelsresor österut. Beskrivningen är samtida med Birka, och den stämmer överrens med gravfynden.

*Annika Larsson: Förbjöd kyrkan den vikingatida kvinnodräkten?, p 5*

Inga Hägg (2009) is to put it mildly, somewhat critical towards this interpretation. Her arguments against Bau's open fronted smokkr are equally applicable to Larsson's interpretation. Hägg also notes other discrepancies between the Birka evidence and Larsson's proposed reconstruction.

Hägg's comments regarding the Birka evidence	My comments regarding the Pskov evidence
<p><i>A smokkr open in the front:</i> The evidence argues against a frontal opening. Several graves contain fragments of the front of the smokkr. One of these (597) even has a 22 cm long piece of the front of a smokkr, including the 12-13 cm of fabric that ran between the brooches.</p>	<p><i>A smokkr open in the front:</i> The remains of the smokkr at Pskov were found inside a box inside the grave and thus give no information regarding where on the body it was worn. While the upper part of the smokkr hasn't been preserved in its entirety, it doesn't automatically follow that there must have been an opening somewhere.</p>
<p><i>Brooches:</i> The majority of graves in Birka and the rest of Scandinavia have brooches placed near the clavicles or high upon the chest. The grave finds Larsson refers to are a strict minority, and the position of the brooches near the breasts in these graves has been explained earlier. The decomposition of the body will have caused some of the brooches to move lower, helped by the fact that several of the bodies were buried in a sitting or crouching position.</p>	<p><i>Brooches:</i> The brooches at Pskov were found inside a box inside the grave and thus give no information on which position they were worn in.</p>
<p><i>Smokkr loops:</i> There is no evidence for the use of tablet woven bands as straps in the entire Scandinavian archaeological material. Larsson refers to Agnes Geijer's description of the Birka finds, but what Geijer actually reports is that the tablet woven bands ran horizontally under the brooches, not vertically over the shoulders as straps.</p>	<p><i>Smokkr loops:</i> There is no evidence for tablet woven bands in the Pskov find. The smokkr loops appear to have been made from the same blue linen as the rest of the smokkr.</p>
<p><i>Decoration:</i> Although the metallic tablet woven bands decorating the clothing of the women at Birka almost always were made from silver thread, the reconstruction uses golden bands. No bands have been found in a position lower than the hip at Birka, but the reconstruction still positions bands at the lower edges of the garments.</p>	<p><i>Decoration:</i> There is no evidence for tablet woven bands in the Pskov find, metallic or otherwise. The distinctive pattern of three strips of silk used at the top of the smokkr isn't visible in the photographs as they have been placed at the back of the smokkr.</p>
<p><i>Tunic and serk:</i> The decorated tunic has been placed inside the linen serk in direct opposition to the layering of the Birka graves.</p>	<p><i>Tunic and serk:</i> The Pskov find shows evidence for a blue linen serk with purple silk cuffs and possibly purple silk bands fastened to the lower edge of the dress.  This has little in common with the two garments shown in the reconstruction, but perhaps the layers beneath the smokkr were not based on the Pskov evidence.</p>

*Headdress:*

Skull fragments from Birka have metallic tablet woven bands that were sewn on to some kind of headdress, unlike the single band wrapped around the head worn in the reconstruction.

*Headdress:*

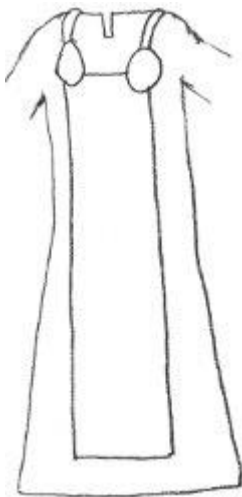
There is no evidence for a headdress in the Pskov find

To summarize, Inga Hägg is not terribly impressed with the quality of the research underlying Annika Larsson's work. She demonstrates that Larsson has ignored significant parts of the existing research when making her reconstruction of the smokkr.

Hägg maintains that the smokkr was a closed garment, referring to the traces of smokkr fronts from the Birka material and to the clear evidence from Haithabu and other Scandinavian finds. The 27 cm long fragment of a smokkr front from [Veka](#) also supports Hägg's conclusion (although it was still in storage when Hägg wrote it, and so cannot have been included in her "other Scandinavian finds").

### Two hanging panels

Lastly, there exists a suggested reconstruction where the smokkr consists of two separate hanging panels, worn over an underdress. The origin of this particular reconstruction is a bit unclear. I can't find any traces of it in the archaeological reports, instead it seems to originate with the illustrations by David Mallot in "Vikings in England" (1981). Since none of the archaeologists mentions it, I suspect that it could be the result of Mallot misinterpreting the evidence (the original archaeological reports in German and Scandinavian aren't all that accessible).



*Illustration by Hilde Thunem*

Despite its unclear origin, this reconstruction is the one that tends to appear in many of the coffee-table Viking books. Because it is so widespread, I decided to include it here along with my thoughts regarding to which degree it fits the existing evidence. You will have to make your own judgement of course.

Caution is required whenever we try to judge what the Vikings found practical, but to the modern mind this reconstruction is a fairly impractical garment. The back panel has a tendency to bunch up around the neck because of the pull of the brooches in front. The panels also give little protection against wind and cold, which for me personally is a significant drawback as I live in Norway.

When examining the archaeological facts it could be argued that the two panels might possibly fit the Birka evidence in the instances with a *single* loop above and below in each brooch. The numerous instances with multiple loops above or below in the brooches are harder to explain though, without resorting to some kind of additional garment worn with the panels.

To my knowledge there are no contemporary clothing traditions (like e.g. the hurstut dress or the peplos from Huldremose) that supports this reconstruction. The two-panel interpretation is also in direct opposition to the evidence uncovered in Køstrup and Haithabu.

## Wool or linen?

Basing her interpretation of the Birka smokkr solely on the loops and fragments attached to them, Agnes Geijer (referred in Hägg 1974, p. 49) concluded that the smokkr was usually made from linen. Inga Hägg takes a less conservative approach to the same evidence, and identifies several unattached pieces of woollen cloth as smokkr fragments, based on their layer in the grave, and their placement under the brooches. She concludes that the smokkr could be made of either linen or wool (Hägg 1974, p. 50). The existence of a linen smokkr at Pskov and woollen smokkrs at e.g. Haithabu, Køstrup and Kaupang, support this conclusion.

There is insufficient evidence to tell whether linen or wool were the preferred fabric used in the smokkr. Although more than hundred graves in Birka contained fragments of the smokkr, only 36 contain remains from the body of the dress itself. Given that wool is more easily preserved than linen it is not surprising that the proportion of wool versus linen in these graves is 25 vs 8. In reality, linen might have been more common than these numbers suggests (Hägg 1974, p. 51, 1986, p. 62-63).

While linen smokkrs appear both in early graves from the 9th century and the later graves from the 10th century, Hägg (1986, p. 63) remarks that the woollen smokkr is somewhat more common in the older graves. The two types of smokkrs found with grave goods of comparatively the same value, indicating that the choice of wool vs linen was not a matter of status (Hägg 1974, p. 51). Perhaps both were used interchangeably, with linen smokkrs in summer and woollen smokkrs in winter? Or perhaps it was a matter of taste? All we know for certain is that both types existed during the Viking Age.

## Decoration

The top of the smokkr appears to have been finished by folding 4-5 mm of its edge towards the inside and stitching it in place, or by folding it twice as evidenced by the finds from e.g. [Vangsnes and Sandanger](#). It could then be decorated in various ways; by folding a silk band over the top like a bias tape (Birka [464](#)), laying a string on top of the edge (Birka [973](#)), sewing a decorative woven band along the top (Birka [1090](#)) or fastening it to the edge ([Værnes](#)). Silk strips could also be appliquéd onto the smokkr ([Pskov](#)).

While the woollen smokkrs appear to have had their decoration either on or close to the top, it is possible that linen smokkrs had their decoration placed below the edge in order to cover the stitches that kept the hemming in place (Birka [563](#)). Finally, the [Køstrup](#) smokkr diverges from the other finds by fastening the tablet woven band and decorative strings to the loops, instead of to the top of the smokkr.

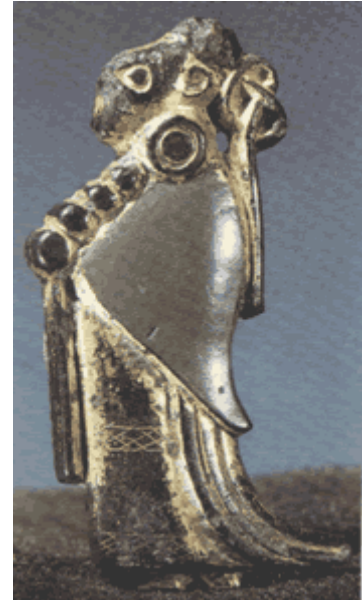
Decoration wasn't necessarily limited to the top of the smokkr. The smokkr fragments from [Haithabu](#) have long vertical darts decorated with a thin braid on top. The interpretation of these fragments as part of a back or side piece of a smokkr opens the possibility of decoration in other places than the front of the garment.

Finally, although it is disputed whether the garment in Birka grave [735](#) is a tunic or a smokkr, the heavily decorated front shows that several tablet woven bands were occasionally combined on a single garment. Stitching could also be used as decoration, as in grave [735](#) where half of the decorative bands are stitched in place using blanket stitch. As far as I know, however, no evidence of embroidering on the smokkr has surfaced so far.

Bearing in mind that only fragments of the decoration have been found, one relevant question is if the entire top of the smokkr would have been decorated (the Pskov smokkr), or only a small part of it (the Køstrup smokkr). Decoration might have been used sparingly due to the cost in material and labour. On the other hand tablet woven bands or other decoration might have protected the edge of the garment against wear (a theory advanced by Ingstad, 1979). The amount of decoration might even be something as simple as a matter of taste. Unless we find significantly more samples we will never know.

In addition to the top and sides, the smokkr may also have been decorated along the bottom. A fragment of a tablet woven band and woollen string from [Kaupang](#) may have been stitched to the bottom of the smokkr in order to protect against wear. And while we do not know whether the reddish-violet silk strips from Pskov decorated the hem of the smokkr or of the underdress, their presence demonstrates the existence of a decorated hem.

As pointed out by Hägg (2009), the female figures on the figurines and picture stones aren't usually shown clearly wearing oval brooches. Thus we can't be certain that they are wearing smokkrs. Nevertheless, the silver figurine from Tuna has decorative bands running along the lower part of her apron/dress/tunic, supporting the theory that the bottom edge of female attire could be decorated.



## To dye or not to dye?

Linen is difficult to dye when you don't have access to modern chemical dyes, so it is not surprising that most of the linen loops and linen smokkr fragments appear to be undyed. The exceptions are Birka grave [563](#) and [Pskov](#) where there is evidence of blue linen smokkrs. In addition, there are fragments of a linen underdress that may have once been dyed red in grave [762](#) in Birka.

Wool is fairly easy to dye using natural substances and many of the fragments of woollen cloth that has been excavated show traces of colour. Both the Køstrup smokkr and some of the Birka fragments were made of blue (or dark blue) wool. There were also dark brown smokkr fragments found at Birka, and the two fragments from Haithabu were dyed brown.

Not all smokkrs were made of fabric in a single colour, as shown by the smokkr fragments with blue and reddish brown stripes found in grave [1090](#) in Birka. The question is if other patterned fabric also was used in the smokkr. Grave T 16136 in Værnes contained a tiny woollen fragment woven in a two colour check pattern, and the graves [27/1963](#) and [159/1960](#) in Haithabu contain serk fragments of linen with blue and white checks, and blue and red checks, respectively. None of these fragments belonged to a smokkr, but they do demonstrate that fabric with checks were known and used among the Vikings.

The problems when trying to identify what kind of colours the smokkr may have had are, however, manifold. First of all, identifying the colour of the archaeological evidence is challenging, partly because it is difficult to separate colour originating from dye from rust or other discolouration, and partly because plant dyes decay in the ground.

Secondly the archaeological evidence only takes us so far. The fragments are just too few to give a correct picture. Although most of the dyed smokkr fragments are either blue or brown, it is unlikely that *every* Viking woman through the ages wore variations of just those two colours in her smokkr. [Priest-Dorman](#) have summarized which dyes were likely to be known and used by the Vikings, based on the analysis of a larger amount of archaeological evidence than just the smokkr fragments.

### Some thoughts on the length of the smokkr

This is almost impossible to discover purely by archaeology, because the metal artefacts preserving the fabric are placed on the upper part of the body. We know the smokkr was at least hip-length, since in grave [464](#) smokkr fragments are found attached to a metal chain and knife hanging down to the hip of the body. In addition, the Haithabu fragments would have reached to the hip.

Turning to the pictorial evidence, most of the figurines and picture stones are hard to interpret in regards to a) if they are wearing a smokkr and b) if so, what exactly on the figures represents it.



Female figure from Oseberg tapestry (Ewing 2006, p. 38).



Picture stone from Låbro, Sweden (Ewing 2006, p. 37).



Anglo Scandinavian carving from Pickhill in England (Ewing 2006, p. 45).

Unlike many of the figurines and picture stones, the Oseberg tapestries show women wearing something that might be an oval brooch. They wear floor length garments, but their sleeves have the same colour and pattern as the trailing trains, indicating that this is a dress or underdress, not a smokkr. The smokkr could be hidden under the "cloak" that runs from their shoulders, but if so, it is short enough to leave the underdress visible beneath.

The Låbro stone shows a woman wearing some kind of an overdress on top of a long underdress. If the overdress is a smokkr, the carving indicates that the smokkr would have

been short enough to show the underdress beneath it. Another possible interpretation could be that this is two smokkr worn on top of each other (e.g. like Kaupang grave C) with a pleated inner smokkr worn under a shorter outer smokkr.

Due to her shawl, it is not possible to tell if the silver figurine from Tuna (above) is supposed to be wearing oval brooches. As Hägg already has pointed out, this means that we can't know for certain whether she is wearing a smokkr or some kind of other garments. *If* she is wearing a smokkr, however, it appears to be floor length, combined with a short apron in front and a long, pleated train in the back. On the opposite end of the scale, Ewing (2006) refers to an Anglo Scandinavian carving from Pickhill in England that seems to show a woman wearing a very short suspended dress with a pair of brooches.

In summary, the pictorial evidence doesn't give any clear conclusion as to the length of the smokkr. Due to the lack of a Viking Age "smokkr control committee" traveling around and ensuring that everybody's smokkr were exactly the same length, we can safely say that some variation existed. It is just unknown how much.

If smokkr occasionally were worn in pairs, the length might have varied depending on whether the smokkr in question was meant to be worn alone (or with a separable apron or train), or if it was designed to be worn on top of another. It might also have been a matter of local custom, taste or temperature. Unless more evidence surfaces from the lower parts of the smokkr, which is highly unlikely, we will never know.

## My interpretation

Fortunately, more has been preserved of the smokkr, than of e.g. the serk. However, the smokkr fragments are still too small to give us a definitive picture of how the garment was constructed. And as shown above, even the experts can't agree on a most likely interpretation.

As a consequence, those of us that don't want to glue fragments of fabric to our bodies and call it a reconstruction, must use guesses and extrapolation when going from fragments to a wearable garment. Of course, I build upon the existing evidence and interpretations, but I refuse to delude myself into believing that my end result is anything else than educated guesswork.

Below are a set of assumptions I make before even beginning to reconstruct a specific smokkr.

### Assumption 1:

*The oval brooches were an integral part of the smokkr.*

The oval brooches are unique for the late Iron Age and Viking Age. They are markedly different in shape, and thus function, than their predecessors; the early Iron Age "bow brooches" (designed to gather loose folds of fabric) and "saucer brooches" (fastened directly at the edges of the garment). Their domed shape makes them well suited to hold the fabric loops while lying flat against the body (Ewing 2006, p. 25).

The oval brooches and smokkr was not the only garment worn by Viking women. However, it is believed to have been a unique Scandinavian garment, not worn by other cultures. Thus,

whenever oval brooches are found, they are interpreted as signifying the Scandinavianness of the wearer (Jesch [2015](#), p. 95-97). Their specialized shape, and the fact that they are seldom used in relation to other garments, indicates that they were designed mainly with the smokkr in mind.

But was the smokkr designed for them, or could it be worn without brooches? So far all smokkr fragments have been found together with oval brooches, with the sole exception of the fragments from [Haithabu harbour](#) (and the only thing we can conclude from that is that nobody in their right mind uses their jewellery for ship's caulking).

Unfortunately, as long as the oval brooches are *the* signifier of a smokkr, we may not be able to recognize a smokkr without them. (That is, provided that it exists in the first place, and have survived without the aid of the preservative metal salts.) Inga Hägg does speculate that the Haithabu smokkr could have been worn without brooches for a period of time, used by a servant or slave who tied a strap through the hole in the front (Hägg 1996, p.14). However, even if this was the case, it would be a secondary use of the garment, and not its original function.

The absence of evidence is not evidence of absence, so we cannot *prove* that the smokkr was never worn without brooches. However, the numerous graves containing smokkr fragments and brooches strongly indicate that it was usual to wear the garment together with brooches. It is thus likely that the brooches were an integral part of the smokkr, and that the garment needed their practical function, in addition to their role as status symbols of some kind (Thunem [2019](#)).

### **Assumption 2:**

*Viking women wore their oval brooches on the upper area of the chest.*

In graves where there are enough skeletal remains to allow for identification of the position of the brooches in relation to the body, most of the oval brooches turns out to be in the upper area of the chest. There are exceptions, where the brooches are placed on top of where the breasts would have been, but these are mainly graves where the women were buried in a sitting position. The lower placement of the brooches in these graves are explained by them slipping downwards as the flesh beneath them deteriorated (Hägg 2009).

Larsson (2008) disagrees with this interpretation, calling it prudish and proposing that the usual position of the tortoise brooches was on top of the breasts. However, she fails to explain how, if her theory is correct, the brooches would have moved upward from the breasts to the position where they are found in the majority of the graves. Lacking such an explanation, I will go with the theory that can explain all of the finds, namely the one by Hägg.

### **Assumption 3:**

*More than two loops inside each brooch was a usual and widespread phenomenon.*

Usually, trying to extrapolate what was usual in the Viking Age is a good way to make a statistician cry :-). However, the [Birka](#) evidence is more extensive than most. According to Hägg (1974) a total of 70 of the 105 Birka graves containing smokkr fragments have more

than one loop at the top or bottom of the brooches. Clearly, whatever these loops were holding up, it was widespread within Birka.

More than two loops per brooch also appear in western Norway ([Veka](#), [Hopperstad](#) and [Sandanger](#)) and in England ([Adwick-le-Street](#)), demonstrating that this is not solely a Birka phenomenon, nor can be attributed to eastern influence on Birka clothing. Thus, I assume that whatever caused the appearance of more than two loops was either an integral part of the basic smokkr or an accessory often worn together with it (at least when being buried). This is important because the attempt to explain the numerous loops is at the root of the various Birka smokkr interpretations.

#### **Assumption 4:**

*All smokkrs had the same underlying shape.*

While the oval brooches vary in their artwork, their basic shape and function stay the same during the entire Viking age. They also stay in the same position on the body, indicating that the smokkr did the same, and that it kept needing the brooches in that exact position.

I believe this is a strong indication that the *general* function and shape of the garment worn with the brooches remained constant. This assumption is further strengthened by the phenomenon of more than two loops per brooch appearing in several places, indicating a similar construction of the smokkr in different geographic areas and time periods.

#### **Assumption 5:**

*The underlying shape of the smokkr was a closed tube of some kind, with fabric loops held up by the oval brooches.*

Most of the smokkr interpretations with front or side openings were proposed at a time when there was few finds of Viking textiles, and the ethnographic material used by Geijer (cited in Hägg 1974) and Bau (1981) provided the only source of comparative garments. Currently, however, there are numerous finds of smokkr fragments from many different locations. While we cannot simply piece them together without regards to geography or time period, the collective find material provides a much better basis for reconstructing the general shape of the smokkr, than Baltic and Russian clothing documented around 1700-1800.

The most significant piece in regards to discovering the underlying shape of the smokkr is in my opinion the fragment from grave ACQ in [Køstrup](#). Regardless of whether the pleating was placed in the front or on the side of this smokkr, there is 10-13 cm of the upper edge preserved *on either side of the loop*. This excludes the possibility of a frontal opening, and makes it unlikely that the smokkr was open at the side that is preserved. Even more important is the presence of the vertical seam 2,5-5 cm from the loop, connecting the two selvages. This argues against an opening anywhere, as there is no reason that one would sew together two (or more) pieces of fabric and then leave e.g. one side open.

In conclusion, the archaeological evidence from grave ACQ clearly indicate a smokkr that enclosed the body of the woman wearing it, with no openings either in the front or sides. The assumption of a smokkr that was closed around the body is also supported by the two smokkr fragments from [Haithabu](#) harbour. They are part of a wedge-shaped piece that once

was stitched to other pieces along both sides. The top of the fragment was only 16 cm long, and its slimness as well as its shape (wider at the bottom than the top and) indicates that this was a tailored garment, probably with several panels. The tailoring makes it unlikely that it was left open, whether at the side or the front.



The only challenge with the Haithabu find, is that due to the fragments being found in the harbour we cannot know for certain that they belonged to a smokkr. However, the Køstrup find means that the evidence for a closed smokkr is not dependent on the Haithabu fragments.

Finally, we have the smokkr find from [Pskov](#). As it was found inside a box, we cannot know the orientation of the fragment. However, the fragment would have covered large parts of the body, and have no traces of an opening.



#### *Some further comments on the proposal of an open front*

Bau (1981) is the first to suggest that the Birka smokkr may have been open in the front. In order to do that, he explains the large pieces of the smokkr front at Birka (grave [597](#)) as part of a separable apron. While this is theoretically possible, as very little of the fragment in 597 is preserved beyond the brooches, a similar find at [Veka](#) shows the front of the smokkr continuing more than 7 cm after the loop. More importantly, the Køstrup and Haithabu finds provide clear evidence for a closed smokkr. In addition, while the orientation of the Pskov smokkr top is necessarily unknown, I find it reasonable to assume that the part with the most silk was worn in front. If so, that makes another smokkr with a closed front.

Bau introduces the open front partly to reconcile Hägg's findings of a decorated tunic *beneath* the smokkr with his argument that such a tunic would not have been hidden. However, the numerous loops he identifies as open-fronted smokkrs and separable aprons and trains, are also found in western Norway, a place where there is little reason to expect a Birka-style imported tunic requiring the smokkr to be open at the front.

I do agree that the presence of a highly decorated tunic beneath a less decorated smokkr requires some explanation. At the very least, these tunics represented significant wealth. In addition, Hägg ([1983](#)) states that similar tunics were used in the royal court in Kiev. According to her, the Birka tunics were probably imported from the Kiev-Byzantium area and were used as signifiers of rank by the Birka Vikings. In other words, not the kind of thing one would ordinarily hide away.

Ewing (2006 p. 34-35) tries to solve the dilemma by suggesting that the lower part of the decorations were not part of a tunic, but was sewn directly onto the smokkr. One problem with that theory is that the similarity with the Kiev tunics strongly indicates that the decoration at least originally belonged to a tunic. It is possible that the few Viking women who received such a tunic cut it into large pieces, which were then appliquéd onto their smokkrs and dresses for maximum visibility. As seen in the Pskov find, the Vikings were perfectly willing to cut and reuse pieces without regard for the original purpose or pattern of the cloth. However, Ewing's theory would also require Hägg to be mistaken when placing the upper and lower parts of the decorations on the same layer on the body.

I propose that an alternative explanation is that the tunic actually was worn under the smokkr (as Hägg's stratigraphy suggests), *even if it meant that some of the decoration was covered*. Being imported, the tunic would not have been designed with the smokkr in mind and could have had decorations in areas where a domestic tunic might not. Perhaps the tunic was normally worn together with a dress or skirt and was only combined with the smokkr at burials, where custom might have dictated that the deceased should wear *every* costly garment in her possession? Either way, a frontal opening is not needed for an explanation of the evidence related to the tunics.

### *Some further comments on the proposal of a side opening*

The main challenge with using archaeological evidence to conclusively prove or disprove a side opening is that it requires both sides of the smokkr to be preserved. However, the metal brooches are worn at the front of the body, making this unlikely to happen. There are, as far as I know, no finds where both sides remain. Nor has anyone found fragments that clearly belong to the vertical edge of a side opening.



The closest we get to proof in favour of a side opening is grave [464](#) at Birka, where two fragments of the upper hem of the smokkr are pieced together, making a larger fragment that ends in a vertical fold roughly 4 cm from the edge of one brooch. Unfortunately, it is not possible to tell whether this is indeed the upper corner of a side opening, or whether it is one side of a vertical seam that connects two pieces of a closed smokkr, like e.g. in the Køstrup or Haithabu finds.

If smokkr had a side opening only a few centimetres away from the brooches, one should expect the preservation of more corners, as all it would take is the "flap" folding over the brooch during deterioration. However, no other fragments with a possible corner has been found, in Birka or other places. In my opinion, this lack of evidence makes it more likely that the fragment from 464 is part of a vertical seam.

The reason Geijer (cited in Hägg 1974) proposes a side opening in the first place is that there is no clear evidence in the Birka material for other seams than the one running along the top of the smokkr. However, the Køstrup find provides clear evidence for a side seam. The same is true for the Haithabu find, provided one accepts it as a smokkr. As for the Pskov smokkr, one side has been preserved in its entirety, while the other is torn 24 cm from the front loop. Together, these finds provide pretty compelling evidence against a smokkr that was open in the side. Nor is there any need to introduce a side opening in order to explain the numerous loops found in the brooches. If Viking women were wearing two smokkr, as suggested by Hägg (1974, p. 50-51), they could both be closed.

Finally, while I believe that the sum of smokkr finds provide sufficient evidence to conclude on the general shape of the garment, if one wants to look outside the Viking Age, I agree with Hägg that the [Huldremose](#) dress (210-30 BC) provides a more relevant basis for comparison than the Hurstut dress (1776 AD). Although the Huldremose dress was made more than 800 years earlier than the smokkr, the technology available for creating textiles had not changed that much. The same cannot be said for the next 800-1000 years before the Hurstut dress makes its entrance.

### **Assumption 6:**

*Although all smokkr were a closed tube, their detailed appearance varied somewhat depending on the time and place they were worn.*

Even if they might have shared an underlying shape, it is likely that the appearance of an individual smokkr depended on the time and place it was worn, the status and possibly the taste of the wearer. Unfortunately, it is difficult to say how much variation there was.

For example, although the Birka smokkr fragments do not show evidence of being shaped by cutting, Hägg (1986 p. 62) classifies the smokkr as belonging to the tailored type of garments, like the one from Haithabu. Thus, after working with both sets of finds, she believes that their smokkr were constructed according to the same principles.

The Køstrup find may have conformed to the same basic principles, but the evidence is not conclusive. While the tiny pleating doesn't exclude a semi-tailored garment reminiscent of the Haithabu smokkr, the seam connecting two selvages may indicate an uncut piece of cloth sewn together in a wide peplos-style tube.

Finally, while its proportions leave a lot of questions, the remnants of the smokkr at Pskov clearly indicate that not all smokkr were tailored.

In conclusion, depending on how you look at the evidence, it can support an assumption of either large or small variations in the smokkr. With this in mind, I will use smokkr fragments from nearby areas when interpreting a find *unless there is clear evidence for that specific find having a different shape.*

### **Assumption 7:**

*The numerous loops within the brooches can be explained by tool bands, an extra smokkr and sometimes possibly separate aprons or trains.*

No interpretation of the smokkr is complete without explaining why more than two loops inside each brooch appears to be a normal and widespread phenomenon. Hägg makes a convincing argument for why some of the loops, especially the silk ones, probably were used to fasten tools like scissors or knives. While not all of the extra loops can be tool bands, this explanation would account for why there tend to be more loops in the lower part of the brooches (the front of the smokkr), than in the upper part (the back).

In the cases where there are two loops at the bottom *and* two loops at the top of a brooch, one possible explanation is that the deceased wore two smokkr, one outside of the other. This is the explanation Inga Hägg proposes when examining Birka graves with more loops than can be explained by a single smokkr and tool bands. The same conclusion is drawn by Ingstad (1979) when she interprets [grave C](#) at Kaupang. However, the Kaupang find is somewhat ambiguous, as only one loop remains out of the several Ingstad states were present when the grave was found.

A somewhat better preserved grave is [grave B10720](#) at Sandanger, where almost all the loops are still sewn to fragments of the garments they originally were attached to. Here, there are two different fragments, one of diagonal twill and one of diamond twill, each with a loop of

diagonal twill. Together with a loose loop of diagonal twill, this is a fairly strong indication of there being two separate garments suspended from the brooches. There is also a third fragment, of an undisclosed weave and with a thin loop. This is obviously not a tool band, but whether it is a third garment suspended from the brooches, or a separate garment (like a kaftan) that happened to be preserved with the brooches is hard to say from the current evidence.

Lastly, the grave at [Hopperstad](#) have two different diamond twill fragments with the characteristics of a smokkr (selvedge or hemmed at the top, positioned a few centimetres up in the brooch, with the top edge running horizontally along the width of the brooch). Like Sandanger, this is a clear indication that there were two separate garments suspended from the brooches. Unfortunately, the fragments are too small for us to be certain of whether this was two smokkr or a smokkr and e.g. a separable apron.

In summary, Sandanger and Hopperstad can, along with Kaupang and some of the Birka graves, be explained by two smokkr being worn. An alternative explanation, at least for some of them is that one of the garments is a separable apron or train as suggested by Bau (1981). After all, the smokkr doesn't have to be open in the front in order to have such accessories.

There is no clear archaeological evidence for such an apron or train, and some of the arguments against a smokkr with a side opening apply equally to these accessories (e.g. why haven't the corners of the apron been found?). At the same time, it would help explaining the sheer variety in the number of loops that are found, if you could have a separate apron or train in addition to one or two smokkr.

I remain very sceptical of the way Bau [uses the figurines](#) to explain the smokkr, especially because only one of them can be clearly identified as wearing oval brooches. However, I can imagine several benefits to both a decorative apron (showing status without having to buy enough fancy fabric for an entire new smokkr) and a practical one (protecting your smokkr from dirt). And the existence of a separable train would give the wearer a similar silhouette to the figurines without having to wear it daily. Of course, that is my modern practicality speaking...

In conclusion, I have a fairly firm belief in two smokkr being worn at times, while I remain very uncertain about the separable aprons and trains.

## **Case studies: specific reconstructions I have made**

When talking about reconstructions different people mean different things. Is it a reconstruction *only* if the same measurements have been used, or can you adapt it to fit your own body better? What about using different fabric? Or a different dye? Must it be worn and torn in the same places as the original to be a proper reconstruction? Use the same stitches?

All the practical issues aside, there is a larger one concerning how we reenactors and history nerds look as a group. If we all strive to our outmost to only copy exactly what is found, we will each of us be as historically correct as possible. Put us together however, and we will give the impression that the Vikings all wore uniforms. With that in mind, I study the evidence in order to understand the range of alternatives I have to play with, and then create my own garments inspired by the finds.



**The aprondress from  
Haithabu harbour**  
[urd.priv.no/viking/haithabu.html](http://urd.priv.no/viking/haithabu.html)



**The aprondress from  
Køstrup (grave AC)**  
[urd.priv.no/viking/kostrup.html](http://urd.priv.no/viking/kostrup.html)



**The aprondress from  
Værnes (T 16136)**  
[urd.priv.no/viking/vernes.html](http://urd.priv.no/viking/vernes.html)

**Reconstruction patterns by others:**

<http://urd.priv.no/viking/smokkr-patterns.html>

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