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Zeventiende- en achttiende-eeuwse kleding van walvisvaarders opgegraven op Spitsbergen
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Summary

Excavated 17th and 18th Century whalers' clothing from Spitsbergen

Chapter 1 discusses the start of Dutch involvement in whaling in northern waters. Following the establishment of the Northern Company in 1614 dozens of whalers lived and worked till about 1660 in the settlement of Smeerenburg, that was located on the coast of Amsterdam Island in northwest Spitsbergen (Svalbard). After about 1650 the whales were no longer processed on land but at sea, and subsequently it was only to bury their dead that the whalers came on shore.

During three expeditions in the period of 1979-1981, the Arctic Centre University of Groningen not only excavated the houses, blubber ovens and cemeteries, but also recovered many hundreds of textile fragments, including complete items of clothing. The textiles can be divided into two groups. The first, consisting of wool and linen fabrics, was excavated in and around the houses of Smeerenburg (SMB), that can be dated roughly to the period 1614-1660. The second group consists of a unique collection of woollen workmen's clothing recovered from the graves on the island of Zeeuwse Uitkijk (ZU). These finds can be roughly dated to the period 1650 to 1750.

Prior to the presentation of these textile remains, a number of research questions were formulated, such as which materials and techniques were used, what clothing was worn by the men, whether it is possible to identify specifically workmen's clothing, whether there were modifications in response to the climate, what are the similarities and differences with both current fashionable dress and the apparel of farmers or fishermen. Comparison with other excavated items of clothing is also undertaken and in addition, queries concerning the function of the houses, the status of the whalers and the burial ritual are considered.

To facilitate comparison with other excavated garments, Chapter 2 contains a short summary of the history of textile research in the Netherlands, presenting the finds from different periods. Also discussed are other sites in the Arctic where textiles have been recovered, such as the textiles left in 1597 by the overwintering sailors in the Behouden Huys on Nova Zembla, the garments of Basque whalers from Red Bay, Newfoundland (Canada, last quarter of the 16th century) and clothing of whalers in Danish Island on Spitsbergen (17th/18th century). It also describes how the textiles from Smeerenburg and Zeeuwse Uitkijk were salvaged, cleaned and restored.

To provide a background for the examination of the textile finds, Chapter 3 describes the materials and techniques employed in the manufacture of textiles in the 17th and 18th centuries. It appears that especially animal fibres such as wool and silk remain well-preserved in the soil. Wool was used from the Bronze Age, while silk was only introduced into the Netherlands during the late Middle Ages. Though linen was already known from the Neolithic period, soil provides poor preservation conditions for this plant fibre. Other vegetable fibres such as hemp and cotton have not yet been recovered. Besides the fabrics made of these fibres, loose plucks of hair can also be identified: cut human hair or scraps of fur. Until the nineteenth century the preparation of fibres has not changed much, except that wool was plucked in prehistoric times, from the Iron Age onwards sheep were shorn.

The techniques used for the production of the fabrics found on Spitsbergen are limited to felt making, plaiting, knitting and weaving. Other known techniques of the period such as bobbin lace, looped needle-netting and sprang are absent either because these were employed for costly products or because they were made of linen, a fibre that will not survive under these conditions.

From Medieval times the yarns required for almost all the techniques were spun on spinning wheels. Prior to the 18th century virtually all textiles were made with single spun yarns. As in the late Middle Ages, the 17th and 18th centuries exhibit distinct preferences in the twist direction of the yarns, depending on the weave.

Although felt-making is an ancient tradition, hardly any finds of felt have been reported from excavations until the end of the 16th century. From then on, felt was very popular for the manufacture of hats.

The history of knitting is fraught with uncertainty, but from the end of the 16th century numerous fragments of knitting, with or without relief patterns have been excavated. Knitwear requires plied yarns. This is also true for plaiting, where at least three yarns are crossed with each other.

The most commonly used technique is weaving, where at least two thread systems intersect. Although in the late Middle Ages simple weaves such as tabby and twills dominate, from the 16th century more complex weaves come into use. Narrow braids could be made by means of tablets or the fingers (fingerloop braids).

Fabrics can then be dyed with vegetable dyes such as madder, weld and woad. Woollen fabrics were sometimes fulled and roughened. With linen fabrics, bleaching was the most important process. After these operations the textiles are ready to be used for the manufacture of clothing. Here, different stitches, seams, hems and pleats can be used.

Chapter 4 presents the technical data on the excavated textiles and hair. Specific finds are more fully discussed in the catalogues.

Smeerenburg (1614 to about 1660)

In Smeerenburg most textiles are made of wool (579 pieces, 89%). Fabrics and yarn of linen and silk occur less frequently (respectively 98 pieces, 9% and 11 pieces, 2%). Very preliminary measurements of the wool fibre diameters have shown that many textiles were made from wool of medium fine quality. The relatively high percentage of linen is exceptional because linen is rarely, if ever, preserved in the soil. Silk is not to be expected since this is a luxury material. From the settlement there are just two plain silk fabrics, two braids and seven lengths of sewing thread. Noteworthy is the discovery of leather breeches in the forge.

A total of 67 yarns were found, 51 of these the remnants of vegetable (linen) sewing thread, which is always S(Z,Z)-ply. In addition to the seven S(Z,Z)-plied silk sewing threads there are nine woollen sewing and darning yarns present that are twined in different directions. In and around the houses fragments of 54 different woollen knitted fabrics were found, including fragments of a cap. All the fragments were knitted in the round in stocking stitch. Most fragments are from numerous stockings with decorative stripes and lozenge-shaped and block relief patterns, as well as a single sock. The majority of the (light) brown stockings belong to the group coarse knitted fabric with 10-30 stitches per 10 cm. Only eight stockings are of the finely knitted type with more than 51 stitches per 10 cm. The finest stockings are made of dark blue S(Z,Z,Z,Z)-plied yarn. Amongst the plaited braids are a woollen ribbon and a linen band used as a hat ribbon.

Most textiles are woven. The vegetable and silk fabrics are always in plain weave. In the case of woollen cloth it is possible to distinguish between broad and narrow fabrics. About 60% of the wide woollen fabrics are, as in the Late Middle Ages, woven in tabby or plain weave. More than 25% are woven into four-shed twill (K 2/2). Three-shed twill 2/1 is only 9% of the cases. Exceptional fabrics are some textiles in satin weave and cross twill, two wool damask fabrics with flower and leaf motifs, a double weave with French lilies and a multicolored tapestry fabric. The weave of eight mixed fabrics, where only the woollen yarns are preserved, cannot always be identified.

A relatively large number of woollen cloths have a selvedge which may consist of thicker and/or plied warp yarns. Sometimes the selvedge has a different colour than the base fabric, or there are additional, different coloured weft yarns incorporated in the selvedge. Thanks to the presence of the selvedge the warp direction can be established with certainty. Furthermore, it appears that the warp threads are thinner and more strongly twined than the weft threads. In some fabrics one or more weaving flaws can be distinguished.

Narrow fabrics comprise a silk ribbon and a tablet woven silk ribbon, which together with semi-circular pieces of a woollen fabric constitute decorative clothing elements. Similarly the remains of a half-silk tablet woven band undoubtedly served as an embellishment on a garment.

Although the majority of the textiles from Smeerenburg have turned brown in the soil, other colours, such as blue, red, purple, blue-green and black are still visible on dozens of woollen fragments. Most

of the fabric will have been dyed after weaving, but the presence of multiple colours in a single fabric shows that individually dyed yarns were also used.

About 60% of the woollen fabrics were felted on one or both sides. Whether this constitutes deliberate processing of the fabric or is the result of roughing caused by use and/or washing is unclear.

Numerous fragments with one or more rows of sewing holes indicate that the complex consists predominantly of the remnants of clothing.

Amongst the hair remains examined are three plucks of cut human hair. The largest concentration of hair was found in the graves of the overwintering men. Considering their tresses are between 15 and 22 cm long, these men did not cut their hair during the harsh winter. The remaining animal hair could not be determined further.

Zeeuwse Uitkijk (ca. 1650- ca. 1750)

At 85%, woollen fabrics are also dominant in the graves on Zeeuwse Uitkijk. The percentage of linen is much smaller than in Smeerenburg, particularly because fewer pieces of sewing thread have been found (7%). Silk fabrics are absent, though seven silk sewing threads were used for reinforcing and finishing buttonholes. There is indirect evidence that cotton fabrics were present in the first half of the 18th century.

The woollen textiles consist of yarns (14%), knitwear (16%) and fabric (nearly 70%). Felts and braids are absent. The woollen yarns, primarily S(Z,Z)-plied, were mainly used as sewing and darning yarns. Embroidery floss was found in only a single grave.

36 fragments of knitting belonging to 33 caps were recovered from the graves. These hats are mostly hand knitted in the round and can be classed in the category of coarse and medium fine knitwear.

Some finely knitted hats may have been made of flat machine knitted fabric. Amongst the remaining knitwear are 14 stockings from five graves. All the stockings are hand, round knitted. No finely knitted stockings have been found in the graves.

In addition, the graves contained eight coats, four breeches (or remnants thereof), an embroidered cloth and bag, possibly of linen. Due to the numerous patches and the fact that some garments consist of several different types of cloth a total of 222 different fabrics could be distinguished. The linen fabrics are always woven in tabby weave, while the wide, woollen fabrics employ tabby and four-shed twill in equal proportions. It is striking that in the first half of the 18th century a few textiles in satin weave appear.

The colouring of both the caps and the garments remains well preserved. Analysis has identified the colouring agents indigo and madder, but at least two caps from the first half of the 18th century use yarn dyed with imported cochineal. The coats are dark (4x), (light) brown (2x) or have light brown/green stripes (2x). Small woven designs occur on one of the latter coats. The woollen linings are predominantly brown. The breeches are light brown (2x) or dark brown (2x) coloured. Mixed fabrics, where only the woollen weft threads are still present, occur on patches as well as piping along edge of the coats. In several garments a selvedge can be identified near a seam (14x). These selvedges exhibit considerable variation such as the doubling of the warp threads and/or thick and/or plied warp threads, usually in the same colour as the basic fabric. Only one fabric exhibits transverse stripes in the selvedge.

Thanks to the presence of a selvedge on a few fabrics the width of the original cloth can be determined. The greatest preserved widths are 87.0 and 90.0 cm. Narrow fabrics were used as garters or piping sewn along the edges of the jackets. These are woven in tabby, or cross twill and twill 5/5, but two tablet woven bands and a complex weave were also found.

To what extent the cloth was originally fulled or secondarily felted can no longer be determined. Many repair patches are still in place on the garments, so that felting on the reverse is not visible. Wear may also have removed the felted surface. However, the two jackets with woven stripes could not have been fulled as the designs would have been obscured.

Although most (linen) sewing thread has decayed, the different types of seams, hems and darns can be distinguished. Woollen yarns were not only used for darning but also for embroidery.

Numerous plucks of hair were found inside the caps. If enough survived it was possible to identify straight, wavy or curly hair. The length of the hair ranged from 2.0 to 15.0 cm. There is no evidence of braids or pigtailed to keep long hair out of the face.

Chapter 5 focuses on the garments and the other textile finds. As a result of the excavated clothing it is possible to reconstruct the entire wardrobe of the ordinary workman. In the first half of the 17th century the whalers from Smeerenburg wore a black, broad-brimmed felt hat with low crown, sometimes decorated with a ribbon round the crown. The hats were often modified because they were not practical in the wet and windy climate. Two felt hats are cut in such a way that could be worn as a sou'wester under a knitted cap so that the wearer's neck remained dry during work.

Although only a single fragment of a knitted cap was found on Smeerenburg these caps will undoubtedly have been worn. Most of the caps were found on Zeeuwse Uitkijk, where 34 were recorded, 33 of which could be recovered. The caps can be divided into three main groups:

A. single caps: hemispherical shape, with or without a turned up edge and decorated with a stalk or a bobble on top (14 examples). All except one of these caps were hand knitted in the round. Coarse knit type with 20-25 stitches and 25-40 rows per 10 cm, light brown and blue in colour, sometimes with coloured stripes or blocks on the folded edge. Dating: second half of the 17th/first half of the 18th century;

B. double caps: cylindrical with blunt ends, with one end pushed into the other. A distinction can be made between caps knitted in the round (9 examples) and caps made of two rectangles of knitted fabric sewn together (6 examples). Coarse and medium fine knitwear, often with coloured stripes or 'cloud-like' motives, created by dyeing the yarn in different places (dating first half 18th century). The caps are often finished off very regularly on the upper edge. Caps made of two rectangular pieces are cut to include two ear-flaps. At the top the pieces were cut into shape and sewn together. Dating: second half of the 17th and first half of the 18th century;

C. double caps with a separate inner cap. This group includes four caps where the outer cap consists of two narrow pieces of knitting (c. 20,0 cm wide) which are probably machine-made. The knitting is of very fine quality with more than 51 stitches per 10 cm and 61 to 100 rows per 10 cm. On the sides rather messy transitions between colours are visible. The caps are lined with a knitted cap of type A (3x) or with a cap made of a woven cloth (1x). Dating: first half 18th century.

In addition to the knitted caps there is also a leather cap, consisting of four segments and lined with woollen cloth. A strip of fur was attached along the upturned edge. The fur hat dates from the first half of the 18th century.

The shape and dimensions of a woollen fabric, 12.0 cm wide is suggestive of a scarf or kerchief.

Only in Smeerenburg was a long woollen shirt with short sleeves recovered. No shirts are preserved on Zeeuwse Uitkijk, although the impressions of striped cotton (?) shirts are occasionally visible on the inside of coats or breeches.

In both Smeerenburg and Zeeuwse Uitkijk short woollen jackets with long, narrow sleeves were found. A few fragments from Smeerenburg can be assembled to form a hip length jacket with a high waistline, which was closed at the front with laces. The men who are buried on Zeeuwse Uitkijk in the second half of the 17th century wore blue, waisted jackets with short skirts. The front closure consists of a row at between 22 and 34 buttons. The woollen lining of these three jackets is still more or less intact, but it can no longer be established whether a linen interlining was also originally present. One jacket does possess two triangular shoulder pads under the lining at the back. On all the jackets the sleeves are only sewn to the top of the armhole, leaving the armpit open in order to increase freedom of movement. One jacket is virtually unused: there are no repair patches and nearly all the original metal buttons are still present. The other two jackets have been frequently repaired: one of them has no fewer than 54 different patches.

One of the men buried around 1700 wore three jackets over one another, two of them similar to the 17th century jackets. In contrast, the third jacket has only five, relatively large button holes, which indicates a later date. Two other coats of the first half of the 18th century are loosely fitted and have no skirt. One of these jackets has numerous brown and green longitudinal stripes with woven-in designs while the other has light brown and green longitudinal stripes, each 8.5 mm wide.

The excavated breeches show a development from very wide, gathered breeches open at the front (two from Smeerenburg and one in a grave from the second half of the 17th century), to narrower breeches with a flap or a button closure dating to the first half of the 18th century. All the breeches are made of light brown or dark brown woollen fabrics. Remarkable is the pair of leather breeches, which were probably worn by the blacksmith in Smeerenburg.

In addition to the more or less complete garments, numerous fragments with distinctive pleating, seams and button holes excavated on Smeerenburg probably also belong to clothing.

To protect their hands from the cold the whalers in Smeerenburg wore woollen mittens, made of woven fabrics. These were only discarded after frequent patching. On the assumption that most of the holes would occur on the inside of the hand, there are three or four right and one left hand mitten.

Also from Smeerenburg are fragments of at least five woollen hose: knee length stockings made from woven (not knitted) fabric. Often it is the leg portion, but there are also characteristic inserts which were originally let in at the ankle. The hose are purple (1x), brown (2x) and some dark blue (2x) coloured.

However, most whalers on Smeerenburg wore knitted socks (1x) or stockings (minimum 33 pieces). Woollen socks and stockings are all hand knitted in stocking-stitch, and frequently display relief patterns in the form of ornamental stripes, an ornamental seam on the backs of the leg and/or lozenge or block-shaped motifs at the ankles. Most knitted stockings are now light brown (originally white?). But the very fine socks are dyed dark blue or black. The medium fine knitted stockings are predominantly (dark) brown. Three stocking tops have cross or floral design knitted in red yarn. The casting-off stitches vary considerably. There is a seam under the heel.

Long stockings were found in five graves on Zeeuwse Uitkijk. Sometimes only the leg portions were preserved, and in two graves the stockings did not match. In two other graves, the whalers wore two pairs of stockings over each other. These stockings, which date from the second half of the 17th and the first half of the 18th century, were hand knitted in the round in stocking-stitch. Almost all the stockings are light brown (white?) in colour with just one stocking knitted with mottled yarn. Occasionally the stocking is decorated with a ornamental seam welt or a diamond relief pattern on the ankle. Some stockings had been repeatedly patched on the sole. In one case it is evident that the deceased had a leg injury: the stocking had been cut open at the front to treat the wound and was then tied up with a woollen strip. Garters were found in two graves, one carries the woven motto: PITIE DEMOY GRAND DIEU DAMOUR.

Some garments from Smeerenburg were fastened with laces, with or without chapes at the ends, or hooks and eyes. Most garments were fastened with bone, wooden (?) or metal buttons. In the 17th century the buttons are relatively small, but they increase in size in the course of the 18th century. Many buttons are smooth, others are decorated with grooves, beading and floral motifs. Two 18th-century buttons are gilded, while another example of the same period consists of a wooden core with a metal foil covering the upper surface.

As has been mentioned earlier, the felt hats were frequently cut up. The wide brims supplied at least nine pieces which, given the form, must have served as insoles in leather shoes. And indeed, in Smeerenburg there are dozens of low, laced shoes with a small heel that were not really suitable for the climate. In order to keep their feet warm the men made use of such insoles.

In addition to the clothing, a few exceptional woollen textiles were found in the settlement, including two fragments from the decoration of a jacket, two damask fabrics with woven floral and leaf motifs (dress fabric), a double weave with French lilies (upholstery?), a multi-coloured tapestry fabric, a felt cone (to cover the handle of a fleshing knife?), dozens of patches and two brushes or swabs.

Similarly, there were some exceptional finds in the graves in Zeeuwse Uitkijk, such as a cloth with coloured appliques in the form of stripes, circles and birds combined with small embroidered motifs. Similar cloths are known from North-Holland in the mid-17th century, but executed in silk. In addition, a linen bag with the letters BB painted on and remnants of a linen towel or shirt were found. In four graves there are indications for the presence of a pillow under the head: not only were feathers found, but there are also imprints of a chequered pillowcase on the back of a cap. To keep the arms or legs of the deceased together, a leather wristband (1x) or a leather ankle strap (1x) were used.

To investigate whether the textiles shed light on the function of the excavated houses in Smeerenburg distribution diagrams are presented in Chapter 6, recording significant textile finds per period and location. Relatively few textiles were found in and around the houses, with the exception of house 2 in SMB I where a concentration of clothing corresponds with other items that suggest a living area with bedsteads. Most of the textile waste was deliberately discarded at the back of the houses. On the basis of datable garments, distribution maps were made of the excavated graves in Zeeuwse Uitkijk. From the distribution, it appears that the dead were buried at random throughout the cemetery for about 100 years.

To put the results of textile research in a wider context, Chapter 7 first examines the differences between the settlement Smeerenburg, from the first half of the 17th century, and the graves in Zeeuwse Uitkijk, which date from the second half of the 17th and first half of the 18th century. This involves general textile waste on the one hand and garments on the other. Subsequently the developments in materials and technology are analysed.

Drawing on all the remains of garments, the clothing of the whalers is reconstructed for each 50-year period. Subsequently, the garments are compared to the textile finds from the Behouden Huys (1596-1597). Here, however, the sailors were on an expedition with cargo, including precious textiles, intended for officials in the Far East. It is therefore more logical to compare the garments to the late 16th century clothing belonging to the Basque whalers who lived and worked in Red Bay (Canada). These men also wore baggy woollen breeches, stockings, smocks instead of jackets but they did not wear caps.

The Zeeuwse Uitkijk discoveries are only comparable with the garments of 17th and 18th-century whalers that were found in graves at the nearby Danish Island. Excavated male garments of the 17th and 18th centuries include clothed bog bodies from the UK. Although there are some similarities, there are also many differences with these garments, whose dating is not always clear.

A comparison between the clothing worn on Smeerenburg and Zeeuwse Uitkijk with fashionable men's garments reveals that in the first half of the 17th century workmen's clothing was derived from the prevailing fashion. Later in the 17th century whalers continue wearing this type of clothing, as it was, apparently, suitable for the job. In the first half of the 18th century, the fashionable men wore a sleeveless waistcoat, a long over coat and tight breeches. This development is clear as far as the trousers on Zeeuwse Uitkijk, are concerned, but the jackets do not match.

The clothing of the ordinary man, both inside and outside the cities, is very similar to the excavated garments. This is clearly visible on, for example, ice scenes painted by Avercamp from the first half of the 17th century. The clothing depicted on paintings from later periods seems to differ from that of the excavated garments.

The clothing excavated on Spitsbergen finds can best be matched with the garments of fishermen and sailors as depicted on paintings. There is no specific whalers clothing nor specialised clothing for working in the Arctic. If the men were cold on Spitsbergen they wore several coats, pants and stockings over another.

On the basis of the complete garments, it is possible to reconstruct the body measurements. Thus even the head measurements and the foot lengths can be established by means of the caps and stocking feet. Moreover, most jackets were found buttoned-up, in other words, these jackets preserve the maximum

chest and waist dimensions. Together with the skeletal data, the clothing shows that most of the whalers were wiry in build.

Recognizable parts of sails and flags might have been expected amongst the waste on Smeerenburg but none have been found.

From the distribution of the textile finds in Smeerenburg it appears that only one house had a clear residential function, given the presence of a relatively large number of garments.

Although it is often recorded that people were buried wrapped in a cloth or a linen shroud, the excavation of Zeeuwse Uitkijk reveals that many of the deceased were buried in their everyday clothes. On the basis of the clothing it can be concluded that the cemetery on Zeeuwse Uitkijk was in use between the middle of the 17th and the middle of the 18th century. This is consistent with historical data: after this period there was a shift in whaling to other areas.

Thanks to the excavations in Smeerenburg and Zeeuwse Uitkijk we now possess a unique collection of garments belonging to workman from the 17th and early 18th centuries. More practical information is now available concerning the use of raw materials and technology, as well as on the patterns and techniques used to construct these garments. Because of the cold conditions the colours are also well preserved. Furthermore, it is possible to make additional statements about body size, cause of death and burial ritual.

It is, however, not possible to identify the linen undergarments due to differential preservation of materials. No specific clothing style can be associated with the whalers, and the place of manufacture of the garments remains obscure since mariners throughout Northern Western Europe wore the similar clothing.

