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Oseberg 18C geometric patterned fragments: How were they woven? Are there any close parallels?

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Abstract

The patterned textiles from the Oseberg grave have fascinated us for over a century and have been studied and described by many researchers. The patterned textiles depicting figurative scenes are well known and documented. Less well known are the fragments with geometric patterns, number 18C.

In this work, the 18C fragments were analyzed focusing on the technique, and samples were woven to provide an understanding of how they were made. The technique was shown to be 2/1 soumak. Once the technique was understood, it was possible to search for further parallels. This article presents the results of the analysis and weaving experiments, shedding new light on how the 18C Oseberg grave textiles were made, and describes what parallels could be found among other soumak textiles in Viking Age Scandinavia.

Keywords: Soumak, Decorative textiles, Oseberg burial, Viking Age, Scandinavia

9.1. Introduction

More than a decade ago I first saw Sofie Krafft's drawing of the 18C fragments, and wondering how they were woven has fascinated me ever since. The opportunity to study the weaving technique of 18C came in 2018, while attending a course in Analysis and Reconstruction at Sätergläntan, Institute of Crafts, Sweden. I was fortunate enough to have the chance to study the fragments in person at the Museum of Cultural History, University of Oslo, Norway. The aim of this project was to analyze the fragments from the weaver's perspective, produce weaving samples, and finally present a suggestion as to how they may have been woven.

Excavated in 1904, the Oseberg ship burial in Norway was dated to 834 AD (Bonde and Christensen 1993: 157). The burial contained an astonishing number of textiles, with a wealth of tapestries, silks, clothing, and various other decorative fabrics. For decades now, the textiles have been studied, described, and published. However, the most attention has been paid to the textiles patterned with pictorial scenes: the famous Oseberg tapestries. Much less attention has been awarded to the fragments with geometric patterns, such as fragment 18C.

The studies of the Oseberg textiles were begun by Hans Dedekam in 1916 (2006: 12), whose work was then followed by that of Bjørn Hougen (1940; 2006), Anne-Stine Ingstad (1992; 2006), Margareta Nockert (2006), and most recently Marianne Vedeler (2014; 2019). All these authors have published works on the Oseberg tapestries, including more or less detailed descriptions of the weaving techniques.

9.2. The 18C fragments

In the grave chamber, a bundle of various textiles was found, compressed together over time since the burial. The bundle was assigned the number 18 at the excavation (Vedeler 2014: 287). Sofie Krafft drew the entire bundle of textiles in 1922, with fragments 18C in colour (Figure 1). In Krafft's drawing, the thin pattern lines are red, yellow, and white, with black for the areas with bare warp threads. Ola Gelmuyden also painted the geometric pattern of 18C during the excavation, but in less detail (pictured in Christensen and Nockert 2006: 11). He mentions bare warp threads visible between the pattern lines, and that it is also unclear whether the pattern is woven as diamonds or squares, both of which could be possible (Hougen 2006: 68).



Figure 1. Drawing by Sofie Krafft, 1922. Bundle no. 18 with 18C in colour. (Photograph: E. I. Johnsen © Museum of Cultural History, UiO)

9.3. Weaving technique

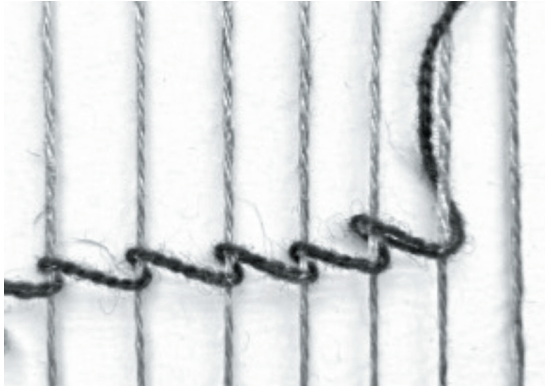


Figure 2. 2/1 soumak. (Photograph: M. Wallenberg)

Hougen describes the weaving technique used for the Oseberg tapestries as a form of brocading, woven with a now-disappeared linen weft (Hougen 1940: 89). In his posthumously published manuscript, Hougen suggests that this missing linen weft might have been used (1) either only between the motifs, or (2) for the full width of the tapestries, only interlacing with the warp threads between the motifs. Nockert instead describes the Oseberg tapestries as made in a free-form tapestry technique. She was not able to completely exclude the possibility of an occasional weft thread for the

geometrical motifs, but like Hougen, believes that if that is the case, the weft would only interlace with the warp threads between the patterns (Nockert 2006: 133). Greta Arwidsson previously introduced the term “Oseberg technique” for the combination of soumak and tapestry after a suggestion by Agnes Geijer (Arwidsson 1954: 97). The geometric patterned fragments 18C are included in Hougen’s chapter on the tapestries, where they are briefly described and regarded as being essentially woven in the same way (Hougen 2006: 66).

Hougen divides the patterns and various techniques of the Oseberg tapestries into twenty-one main groups, with two types of contours surrounding the patterns. The contours, one of them being a soumak, is not categorized as a main pattern group as it does not cover the surface of a pattern. 18C is described as mostly made in the soumak contour technique (Hougen 2006: 76–78). In soumak, the weft is wrapped over some of the warp threads, and then back around a few of the same threads. The most basic form of soumak wraps over two warp threads and back under one, called 2/1 soumak (see illustration Figure 2). More types of soumak and classifications are discussed in Emery (1994: 214–228) and Collingwood (1968: 183–204).

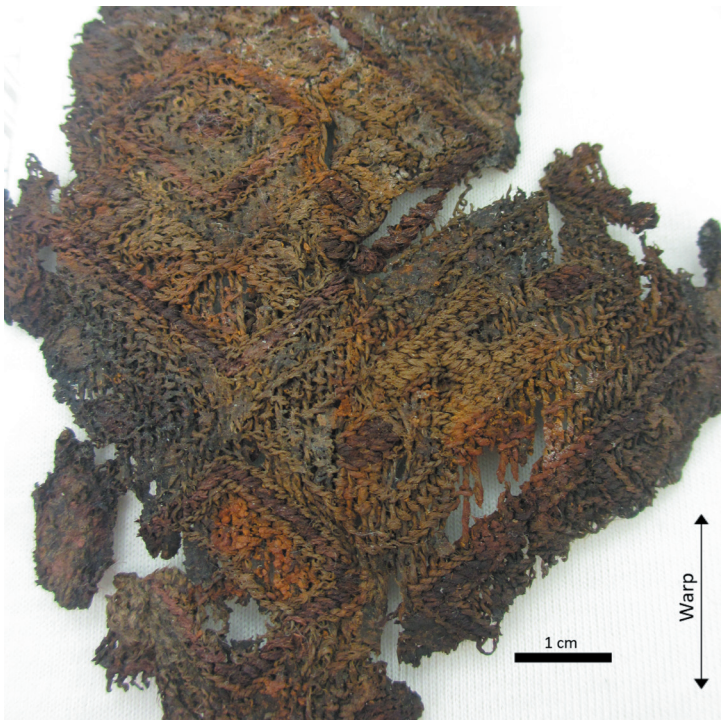


Figure 3. The largest of the analyzed fragments, measuring ca. 9.5 x 7 cm, showing all three of the main motifs, large and small diamonds and a rectangle. (Photograph: M. Wallenberg)

9.4. Analysis

At the time of my analysis the largest of the fragments were on exhibition and consequently could not be examined, but several of the smaller fragments of 18C were available for visual inspection and analysis with a USB-microscope. They were also photographed. It was only possible to view the fragments from the front, but as the warp threads were bare in many places, it was still possible to follow individual threads in detail.

The pattern is easy to see without magnification, and is a repeating pattern which can be divided into three main motifs: one “large diamond”, one “small diamond” and one “rectangle” (Figures 1 and 3). The motifs have slight individual variations such as the occasional change in colour or an extra row of red soumak stitches in the middle of one of the “large diamonds”.

The threads can be seen clearly, as they wrap around the warp threads in soumak stitches. The pattern is formed by diagonal rows of soumak lines.

The soumak threads, as mentioned above, are sometimes visible through the gaps between the warp threads, moving from one pattern section to the next at the reverse. It was not possible to detect any traces of a tabby ground weave. Considering the diagonal orientation and movement of the stitches, the conclusion was that the geometric shapes must have been woven as diamonds, and not from the straight side of a square.

Both the warp and soumak threads are two-ply woollen yarns, Szz. There are 11–12 warp threads per cm with an estimated thread diameter of ca. 0.4–0.5 mm, and a twist angle of ca. 30–35°.

The diameters and twist angles of the soumak threads are more difficult to estimate. The threads differ both between colours and within the same colour, and are sometimes as thick as the warp threads, but generally slightly thinner. They often have a lot of twist, but the range varies widely: from 15–55°, possibly due to twist being added or removed from the threads during the wrapping motion around the warp threads. An example of this wide range can be seen in Figure 6, where the soumak threads in the photograph on the left have much more twist than the soumak threads in the photograph to the right, despite coming from the same motif and placed just over 1 cm apart.

All of the stitches in the patterns are made in 2/1 soumak and pass over two warp threads and wrap back under one. The simple 2/1 soumak stitch is used in three slightly different ways, and examples of these are outlined in Figure 4.

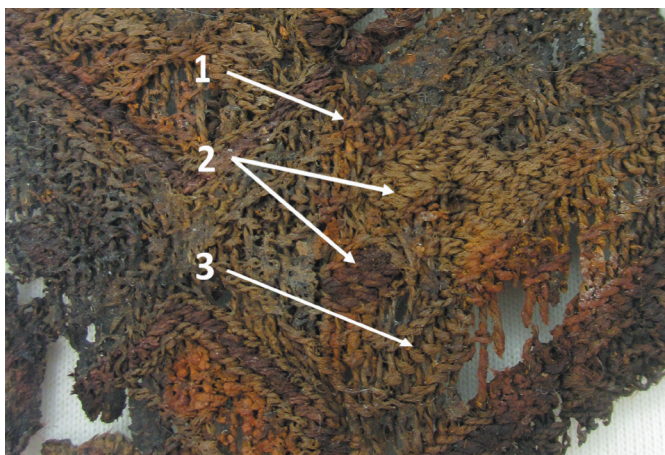


Figure 4. Close-up of the fragment in Figure 2, showing the three different ways the soumak stitch was used: 1) The stitch wrapped with one thread, 2) The stitch wrapped using two threads, and 3) The stitch wrapped with one thread and the short loop of the stitch at the front. (Photograph: M. Wallenberg)

1. The stitch is wrapped with one thread. In Krafft's painting these rows have a yellow colour.

2. The stitch is wrapped using two threads together. This is used exclusively for the red and very light- coloured stitches.

3. The stitch is wrapped with one thread but with the short loop of the stitch on the front of the fragment, over one warp thread, and wrapping back under two threads. This is used only in one row, close to the edge of the “rectangles.” These stitches now look brown in colour, but on the largest fragment in the exhibition, they appear to be of a lighter colour, possibly yellow or white.

In most of the fragments, the areas between the soumak lines show bare warp threads, or are covered in a crust of completely dissolved threads. In the best-preserved fragment (Figure 5) it is possible to see small, ghostly remains of threads in several places using a USB-microscope (Figure 6). Following the movement of these threads, it is evident they go over two warp threads and wrap back under one. These stitches are also in 2/1 soumak, and follow the same diagonal direction as other, much better-preserved soumak stitches. It is therefore very likely that the entire surface was originally covered in soumak, although the presence of a different type of stitch in another area such as inside the “small diamond” cannot be ruled out.

It is currently not possible to say what type of material or what colour these dissolved soumak threads once were, as no fibre or dye analysis was conducted. For the Oseberg tapestries overall, missing threads were assumed to be linen or some other type of plant fibre (Hougen 2006: 75; Nockert 2006: 133; Vedeler 2019: 30). However, in Greta Arwidsson’s description of one fragment in the Oseberg technique from Valsgårde 7, she notes that the two different colours in the fragment display very different levels of decomposition, one being well preserved and the other severely degraded. The two threads appear to be of the same material, so Arwidsson attributes the different levels of degradation in the fragment to the different dyes used (Arwidsson 1977: 84). Future analyses of fibre and dyes used in 18C will hopefully answer these questions.



Figure 5. The best-preserved fragment measures ca. 6 x 5 cm. (Photograph: M. Wallenberg)



Figure 6. Two instances where missing soumak threads can be found going over two warp threads and wrapping back under one, encircled in white. (Photographs: M. Wallenberg)

9.5. Weaving

In preparation for analysis and sample weaving, small test pieces were woven to gain an understanding of the different soumak techniques. In so doing, training was achieved in both the appearance of the finished product as well as the “feel of the craft”, i.e. the hands and eyes were trained in the performance of this specific weaving. This training was also helpful to better understand the previous research. Narrowing down the soumak techniques to the simplest of soumak stitches, 2/1 soumak (see Figure 2), weaving tests were made with and without a ground weave as well as by building the pattern in horizontal or diagonal soumak rows. Different ways of creating shapes and figures, various ways of filling surfaces, methods of moving from motif to motif, and of changing the direction of threads were also investigated. During the weaving tests, it was apparent that the threads’ behaviour and appearance may change depending on how they are manipulated by the weaver. For example, the amount of twist might change, and increase or decrease.

It was also apparent that the possible extra ground weft, even if only used occasionally, does not work with these types of diagonally-built patterns. The diagonal patterns are woven to create diamond shapes, and in several of the patterns in the 18C fragments, the same soumak thread can be followed running up one side, turning at the top and then running down the other side of the diamond shape. If a ground weave was present at one point, there would be two different soumak threads coming together at the top of each diamond. If it was instead the same thread, it would have been visible on the reverse side, moving from one side of the diamond to the other for every row; since this is not the case for these fragments, they cannot have included any tabby ground weave. The partial use of extra ground weft would mean that all soumak threads must meet at the same horizontal row from time to time, and this is not seen anywhere in the analyzed fragments. During the test weaving process, the use of extra ground weft greatly hindered the weaving of the patterns and created a very uneven fabric.

Three samples of 18C were made: two using a small frame and one using a modern tapestry loom. The pattern was drawn schematically, due to the many missing soumak stitches, and the drawing was referenced along with photos of the fragments during weaving. The number and position of the well-preserved soumak stitches defined the available space for, and number of, the missing soumak stitches.

Both millspun and handspun wool yarns were used for the samples. The handspun yarn had more twist and therefore a better resemblance to the original, but the stitches behaved in much the same way for both the millspun and handspun yarns. The same type of yarn was used both for the visible and the missing soumak threads. The millspun yarn, ca. 9500 m/kg, yielded a very good likeness in size to the fragments, disregarding any potential shrinkage.

The weave was begun at the lower edge of the weaving frame, building the patterns up in diagonal lines, and weaving in sections, motif by motif (see Figure 7). In the original fragments, double rows of red stitches can be seen in some places (Figure 7, left). While weaving, problems sometimes arose when two motifs or sections within a motif met, due to the available space for the next motif or section being too big. This difference in size was found to depend either on how much the stitches were tightened and beaten in, or on differences in thread thickness. The occasional double rows of red stitches in the original fragments may well have been used to compensate for similar differences in size between motifs, by adding an extra row of stitches to make a motif slightly larger.

The geometric pattern and the building up of the motifs in diagonal lines were logical and made the weaving simple and efficient, and the pattern size was easy to maintain visually. Errors such as accidentally putting eleven stitches in one row where there was supposed to be ten were clearly visible, and easily corrected. The challenging aspect during weaving was the small scale.

The benefit of training is important to keep in mind, and the time spent doing a first sample differs greatly from repeating this process multiple times. The first pattern repetition for the samples of 18C, including one large diamond, one small diamond, and two rectangles took three days, including documentation, photos, measurements, and counting threads. Weaving the third sample took a single day, including documentation.

It is not possible to specify what type of loom may have been used for the original, as there are no surviving starting borders or selvages on the fragments that can be traced to a specific tool or loom. Without a ground weave there is no need for a shed or heddles, and a simple weaving frame would work perfectly well. A convenient option for weaving 18C would be a simple frame or a vertical two-beam loom of any size.

9.6. Comparisons to other archaeological soumak textiles

Among the Oseberg textiles are several tiny fragments labelled by Ingstad as Oriental soumak, after Geijer's division of soumak into two main groups: Nordic and Oriental. These tiny and degraded fragments are described as woven with the occasional row of tabby weft. Some of the fragments have a wool warp, while others are just loose soumak loops where the warp has disappeared (Ingstad 1992: 204; 2006: 227).

In the appendix to Hougen's chapter on the tapestries, Nockert discusses some fragments not mentioned by Hougen, including fragments 24A. These have a geometric design composed of thin



Figure 7. Sample one, building up the motif. Blue was chosen for the missing soumak threads in sample one, as it was initially easier to work with a contrasting colour. (Photographs: M. Wallenberg)

pattern lines with bare warp threads between them. The contours are definitely made in soumak technique, but the other threads are harder to define. Nockert describes 24A as being the closest in comparison to 18C from Oseberg (Nockert 2006: 136). 24A is therefore very interesting, and should be examined further.

Apart from Oseberg there are further examples of figurative tapestries with soumak contours found in Norway, with finds in Haugen, Rolvsøy, as well as Bø and Jåtten in Rogaland (Hougen 2006: 73–75; Vedeler 2019: 34). From the recently published drawings of Miranda Bødtker (Bender Jørgensen and Moe 2020) it seems that there are additional fragments of interest, with geometric patterns apart from the figurative tapestries among the textiles from Grønhaug.

In Birka, Sweden, there are two graves containing tapestry fragments with geometric designs and with soumak outlining sections of the pattern; this includes grave 739, dated to the 10th century AD, and grave 597 dated to the 9th century AD (Geijer 1938: 49; Nockert 2006: 134).

Swedish soumak finds include fragments from graves in both Vendel and Valsgärde. From the 6th century AD, ship burial XII in Vendel has yielded five very small and corroded fragments. Three of these have been identified as “*soumak*” with a ground weave, one as “*possibly soumak*”, and one as “*possibly soumak or twill*” (Malmius 2020: 91). Without the opportunity to analyze these fragments in person, and instead only relying on the descriptions and studying the photos of these fragments in Malmius’ dissertation, these fragments appear very twill-like in appearance. It is also worth noting that in the three fragments identified as soumak, the threads are described as single yarns with a z-twist (Malmius 2020: 91). Singles, however, would be very unusual to use as a soumak thread. In all the other finds described in this section, the soumak thread is always two-ply.

From three of the ship burials from Valsgärde, Sweden, Greta Arwidsson has documented finds of soumak fragments with geometric patterns. Valsgärde 6, dated to the 8th century AD, has several fragments with a geometric soumak pattern, but on a tabby ground weave (Arwidsson 1942: 87). Valsgärde 7, dated to the 7th century AD, contained several soumak fragments, with some made in the Oseberg technique and others with a tabby ground weave (Arwidsson 1977: 81–84). One of the fragments made using the Oseberg technique is particularly interesting. It has a row of diagonal soumak contour, as well as a few horizontal rows of 2/1 soumak to form the main motif (Arwidsson 1977: 84). In Valsgärde 8, dated to the 7th century AD, one fragment woven in Oseberg technique was found. The warp has completely disintegrated, but the pattern threads are well preserved, consisting of diamond shapes in tapestry with contours in soumak (Arwidsson 1954: 96).

It is also worth mentioning the 7th century AD soumak fragments from Sutton Hoo, England, described by Elisabeth Crowfoot. In Mound 1, two different types were found, one made using the Oseberg technique, SH14, and the other with a ground weave in 2/1 twill, SH7. SH14 has a diamond shape pattern outlined in soumak, and the inner part in soumak or tapestry. Crowfoot suggests that SH14 could be a Swedish import (Crowfoot 1983: 428, 456). Valsgärde 7 is of interest in connection with Sutton Hoo, SH14, as both are made using the Oseberg technique with soumak contours, as well as soumak for the inner part of the motif.

Also noteworthy is a fragment from Taplow, UK, with a soumak pattern on a tabby ground weave. Both SH7 from Sutton Hoo and the fragment from Taplow sometimes have the short soumak loop on the front of the fabric (Walton Rogers 2007: 83). Although Oseberg 18C is very different in comparison, the occasional use of the short soumak loop on the front of the textile is a feature they share.

The later Swedish soumak tapestries, including the four from Överhogdal dated 900–1100 AD, the Skog tapestry dated to the 13th century AD (Nockert and Possnert 2002: 74–76), and the Dal frieze, all have a tabby ground weave (Franzén and Nockert 1992). The narrow soumak frieze from Dal has only been dated by style to the 13th century AD. It differs somewhat from the other tapestries by having a ground weave in wool, while the white yarn used in the pattern is linen (Grenander Nyberg

1990). The choice of linen or another plant fibre for the white colour is interesting and one of the previously mentioned fragments with soumak details, Birka, grave 739 also uses linen for the white stitches (Geijer 1938: 54; Nockert 2006: 134).

9.7. Conclusions

These analyses show the missing threads to be 2/1 soumak stitches, making it likely that Oseberg 18C was made entirely in soumak and without a ground weave. Although it is not possible to conclude what type of loom was used, it is clear that a simple frame or some kind of vertical two-beam loom would work. With a better understanding of the technique used to weave Oseberg 18C, future analyses of fibre and dyes might make it possible to weave a full reconstruction, following the entire chain of production. As 18C was made in soumak and not woven like the Oseberg tapestries, other parallels were sought among the Scandinavian soumak finds. As these parallels either have a ground weave or are made in Oseberg technique, with some uncertain examples, 18C seems rather unusual. New analyses of the other geometric patterned fragments from Oseberg as well as those from other sites can potentially lead to new insights, expanding our knowledge of soumak weaving in Scandinavia.

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