Lise Ræder Knudsen

Tacit Knowledge and the Interpretation of Archaeological Tablet-Woven Textiles

Introduction

In the last 30 years I have been working – more or less intensively - on the technical analysis of archaeological tablet woven textiles. In the beginning I was working 8 hours a day weaving reconstructions of ancient tablet weaving under the guidance of Egon Hansen at Moesgård Museum, Denmark. He made the patterns for reconstruction on the basis of publication photos of prehistoric tablet woven borders (Hansen 1990). I made quite many reconstructions using these patterns and the goal was to work fast and make bands and borders in complicated techniques of a regular size and quality. Sadly Egon Hansen died in 1989 and there was a need for someone to take over the work on technical analysis of new archaeological finds of bands such as those from the grave of the Celtic chieftain from Hochdorf in Germany (Banck-Burgess 1999). I had some part time jobs making new reconstructions for museums in Denmark, Norway and Germany during the time I studied to become a conservator.
But without thorough documentation the value of reconstructions in a museum is limited. Lise Bender Jørgensen encouraged me to write about my work on tablet weaving and she took the task of being my mentor (Ræder Knudsen 1994). Without her help and encouragement I guess I would never have had the courage to deliver an article. Since then I have analyzed and published articles on numerous ancient tablet woven borders from all over Europe.

In March 2003 an important meeting concerning the research field of archaeological textiles took place in Copenhagen, Denmark and Lund, Sweden: "Ancient Textiles, Production, Craft and Society" under edition of Carole Gillis and Marie-Louise B. Nosch. Lise Bender gave a paper "The World according to Textiles" where she explained that textile research started with questions like *what, how, when* and *where* - for instance *what* kind of textiles were found in an excavation, *how* had they been made, *how* were the garments worn, *when* and *where* was this textile technique invented and *what* did the garments look like. "But these questions represent only a first step towards understanding the language of archaeological textiles. What questions can we ask to gain deeper knowledge and better understanding?" she asks (Bender Jørgensen 2007, 8). And subsequently, we understand that questions starting with *why* will take us to another level of understanding. A way of answering some of the *why*-questions is through experimental archaeology.

In this article I will look at the way we normally collect information from archaeological textiles. I will divide the knowledge gathered from an object into 3 different types according to the methods by which we are able to collect information: Visual techniques, chemical techniques and experimental techniques. It will be emphasized that experimental techniques often make the researcher able to get deeper insight. Solid knowledge on techniques and materials is needed to describe a find according to the usual classification of the specific type of textile – but even more important, it is necessary to be able to interpret de-

tails that do not justify our normal expectations. And this may often lead to interesting information about the working methods of the person who produced the textile and the society behind.

Ways of collecting data

In any object made by human hand a wide range of information is embedded. Information about the material it is made of and from where it came, information about the transformation of the material into an object and information about the use and discharge of the object. All of this information bears evidence of deliberate acts of human beings.

The information embedded in an object can be arranged into categories in many different ways, but I have found it useful to develop a model, which separates knowledge gained from an object into 3 categories according to the method used to collect the information (Fig.1).

Visual information, which is the entire information one, can get using the eyes.
Chemical information, which is the entire information one, can get using chemical analysis.
Experimental information, which is the entire information one, can get using practical experiments.

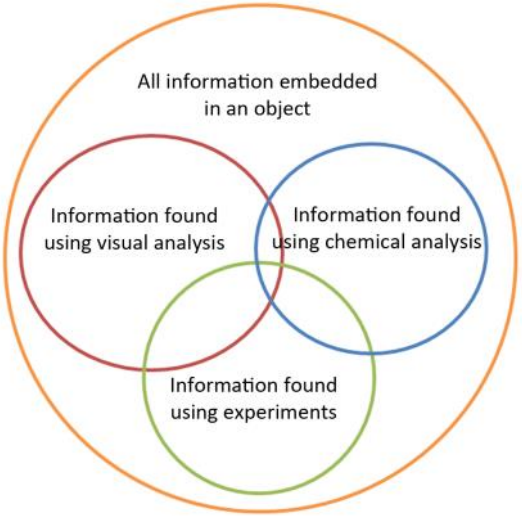


Fig.1:
A graphic model of the information embedded in an object. Three circles represent three methods of collecting information. Within the large circle, but outside the three circles we find information, which we are (not yet) able to demonstrate. The circles overlap as the same information sometimes can be found using different methods. Depending on the equipment and experience of the researcher, the inner circles will become smaller or larger. Much experience both as a craftsman and a researcher, as well as access to well-equipped labs will provide more information (©Lise Ræder Knudsen).

Visual information

Usually any investigation of a textile starts a visual investigation. Chris Caple have provided a method of systematic visual analysis of objects of any material called FOCUS (formalized object and construction sequence) (Caple 2006,26-32). Penelope Walton and Gillian Eastwood have provided the very useful little booklet: "A brief guide to the cataloguing of archaeological textiles" (Walton and Eastwood 1988) which is a great help starting registration of textiles.

Normally, I use a paper, pencil and photography and write down all my notes on a particular find of a tablet woven textile. Afterwards, I transfer the information to a database where it is easy to compare information on different tablet weavings (Fig.2). I prefer paper and pencil at first because making little sketches are so useful and it is easy - compared to doing the same on a computer.
Visual analysis often answers questions beginning with: *How* and *what*.

Site/name:	Owner:	Museum number:	Dating:
Size and appearance, drawing:	Picture:	Analysis drawing:	Weaving pattern:
Technique:		Number of pattern tablets:	
Thread count, warp:		Number of tablets in all:	
Thread count, weft:		Number of edge tablets:	
Threads: Spinning/twining:	Color:	Fiber type:	
Threading pattern:			
Geographical area:	Finding context: Grave, bog find, weapon deposit, other.	Male/female context:	Other grave goods:
If woven to/sewn to a fabric, information about the fabric: Weave: Thread count: Warp and weft Spinning/twining of warp and weft:			
Other information:			

Fig. 2:
Scheme for registration of visual information during analysis of archaeological tablet-woven textiles. A paper version is often useful at the owner museum and later the data can be transferred to a database (©Lise Ræder Knudsen).

Chemical information

While looking at a tiny fragment of a textile, lots of questions can be asked which we are not able to answer using visual information and experience. Chemical analysis can often reveal some of these questions for instance about the original colors (e.g. High Performance Liquid Chromatography), about the date of the textile (e.g. ^{14}C dating) and about its origin (e.g. Strontium isotope analysis). New and better methods are developed and we will constantly be able to collect more information. A very good overview on the methods used on textiles can be found in Andersson Strand et al, 2010 and Caple 2006 provides an overview of methods also suitable for other materials.
In many textile research projects there is a need for chemical analysis, but often small budgets puts a limit to the amount of analysis available.
Chemical analysis often answers questions beginning with: *When, where* and *what*.

Experimental information

Visual analysis often raises questions, which are difficult to answer just by use of visual- or chemical analysis or ones imagination. It is often useful to try an idea for real and thus gain new information about for instance working methods, tools and materials.
Eva Andersson Strands work on spindle whorls, loom weights and the quality of textiles (Andersson Strand) and Lena Hammarlunds work on visual grouping of textiles (Hammarlund) are very good examples. Experimental methods often answer questions beginning with: *How, what* and *why.*

Tacit knowledge

Lise Bender Jørgensen claims that experimental archaeology is able to bring us further information and provide us with a better understanding (Bender Jørgensen 2007, 8). It is also my experience since my efforts in understanding the ancient tablet weaving methods would have been impossible without practical experiments and solid craftsmanship. In my master thesis I wrote about technical analysis and reconstruction of tablet woven borders. In this work I really wanted to present my working methods and provide others with the tools I had developed. But I must admit that I have not seen many people using these methods. Instead, I receive mails like, “Could You look at this strange tablet weave – we would like to know how it was made and what else you are able to tell about it”. I realized that reading about a method and using your own methods on the basis of many years of practical experience are two different things. My eyes see thread combinations, which most others do not see. It is a question of many, many hours of practical work on reconstructions in combination with many hours of studying archaeo-

logical finds of tablet woven borders. It is a question of knowledge “in the eyes and hands”, normally referred to as “tacit knowledge”(Polanyi 1966), which is difficult to pass on to others.

Lise Bender Jørgensen has provided several articles on craftsmanship and tacit knowledge and she is constantly integrating the knowledge from other research fields such as philosophy into the community of textile research (Bender Jørgensen 2003, 30-36; Bender Jørgensen 2007a, 7-12; Bender Jørgensen 2007b, 8-11; Bender Jørgensen 2012, 240-254) and she has emphasized that cross disciplinary research will raise our level of understanding archaeological textiles.

In the following two cases new information of common archaeological interest was gained from the study of textiles with tablet woven borders, combined with craftsmanship and research questions starting with “why”.

Tablet-woven borders on Etruscan semicircular cloaks

In Italy near the village Verucchio some 15 km west of Rimini a group of aristocratic tombs were found. They are dated between 725 BC and 650 BC and they contained very rich grave goods (von Eles 2002, 5-11, 273-275). As the preservation conditions concerning organic material were extremely well, also a large amount of textiles were found. The excavation took place in the 1970s, but at that time little was done to preserve and analyze the textiles. In 1996 Dr. Annemarie Stauffer, professor at Cologne University of Applied Sciences started a project on the conservation and analysis of the male garments from Verucchio (Stauffer 2002, 192-219, Stauffer 2012, 242-253). I was involved, as several tablet woven borders decorated the textiles in manners that were unusual (Ræder Knudsen 2002, 220-234, Ræder Knudsen 2012, 254-263). Though a lot of interesting information was gained from the study of the Verucchio textiles, I will just look at the production method of borders of the large semicircular cloaks found in a chieftain’s grave referred to as tomb 89.

Cloak M1 measures 257 cm x 82 cm and along the semicircular side a tablet woven border with a zig-zag pattern of 36 tablets each holding four threads follows the rounded edge (Fig. 3). Of the 36 tablets 17 tablets have the same turning direction throughout the pattern. But if you twist the tablets in the same direction for more than 20 - 30 cm you will soon have difficulties using the tablets (Fig. 4).

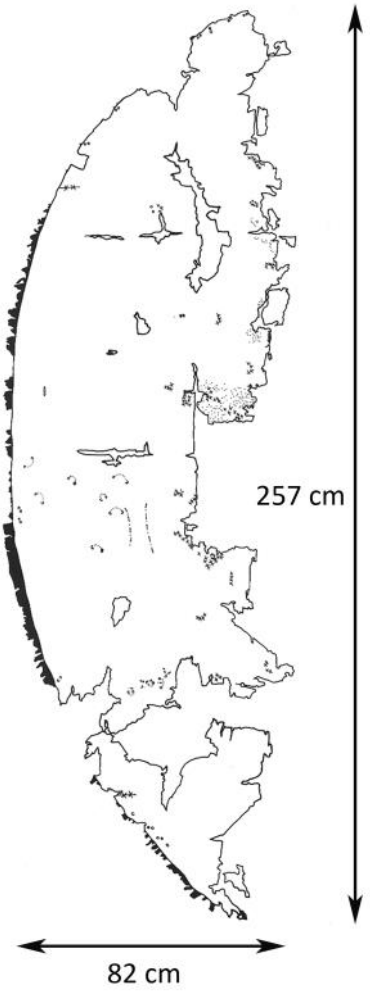
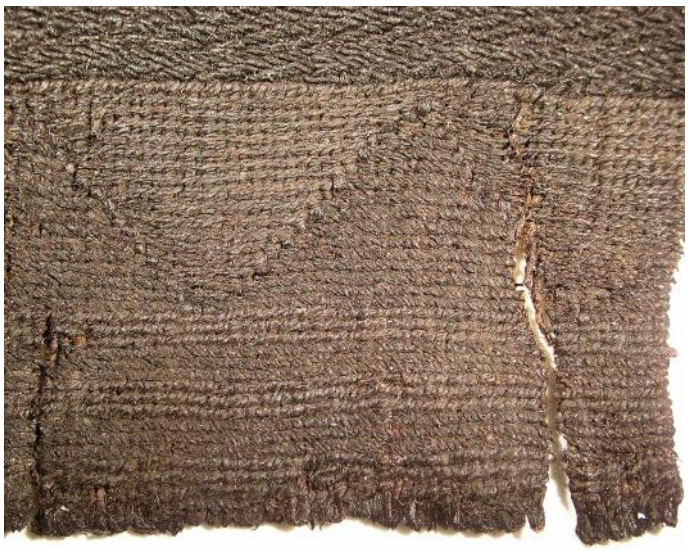


Fig. 3:
Cloak M1 from Veruccio had a tablet-woven border along the curved edge (Drawing: ©Annemarie Stauffer)

Fig. 4:
Edge of a cloak from Etruscan Verucchio dated about 700 BC. The border was tablet-woven and had a triangular pattern. The tablets of part of the border was twisted the same around all the time, but there were found no turning point of the tablets at any of the borders of the many garments from the site. Why? (©Lise Ræder Knudsen).



Usually, when working on a tablet weave the end of the warp is tied to something solid; it could be a stick in the ground, a beam of wall or ceiling. When a twist in the band is produced by twisting the tablets, a similar twist in the opposite direction will occur on the far side of the tablets (Fig.11). When the tablets are twisted for a long distance in the same direction and nothing is done to untwist the warp threads behind the tablets, the warp will become so hard twisted, that at some time it will be impossible to turn the tablets at all. Normally, one will start to turn the tablets in the opposite direction before this moment. This will untwist the warp threads behind the tablets, but it will make a tiny "scar" – or turning point - across the border. This is often seen in prehistoric tablet weavings as well as in tablet woven borders from recent times. But there were no traces of such "scars" in any of the material from Verucchio even if there were much tablet weaving preserved and some of these borders could be followed for more than a meter. Why were there no turning points of the tablets?

When searching for an answer I came across different equipment of unknown use found in women's graves in Verucchio and also rather common in other Iron Age graves from Etruscan Italy. They are spools made of clay and often found in groups of similar size (Fig. 5). An idea came up – what if the spools were used for tablet weaving and in some way could help untwisting the warp threads and at the same time act as warp weights? An experiment was set up and clay was formed as spools and fired. A finished twill fabric was bought and one edge made into fringes of about 10 cm. A tablet loom was prepared and hung from the ceiling. The four threads from each tablet were winded up around a spool. A spacer made of bone helped the hanging spools not to be entangled (also a copy of an archaeological object of unknown use – but that is another story). The fringes of the fabric thus served as wefts of the border and in this way a border could be woven to a curved edge as well as even edges (Fig. 6). The tablets could be twisted in the same direction for as long time as wanted as the spools would untwist the warp threads. And furthermore, when more yarn was needed for the border, it would be easy to unwind some yarn from each spool and continue weaving.

The question was: "Why are there no turning points of the tablets of the Verucchio cloaks?"
And the answer: "Probably because a weaving method using little spools as loom weights for the threads of each tablet was used. This method allows the twist on the far side of the tablets to untwist itself and thus there are no need for changing the turning direction of the tablets".

Thus a simple textile technical question have provided more information about a working method as well as proposed a solution to an ongoing dispute among archaeologists about the function of spools (Gleba 2008, 140-141).

Fig. 5:
Spools made of fired clay were common objects often found in female burials of Iron Age Italy. Their function has not been certain, but there has been several suggestions: Toys, yo-yos, spacers for pottery kilns, spools for holding and storing yarn or loom weights for light weight fabrics (Gleba 2008, 140-141) (©Lise Ræder Knudsen).

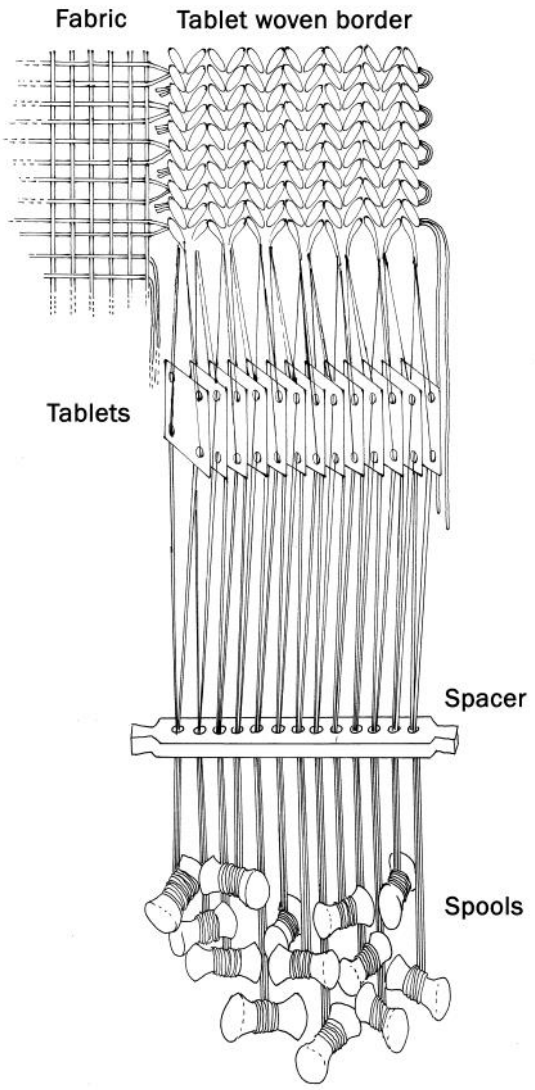


Fig. 6:
Weaving a tablet-woven border to the edge of a fabric using spools to wind up the yarn from each tablet. In this way the excess twist on the opposite side of the tablets will unwind itself and there will be no need for a turning point of the tablets. The working method is rational and quite easy, the spools functions as well as loom weights and holders of extra yarn. The spacer keeps the threads in position and prevents entanglement of the warp threads. The spacer is also a copy of an object of unknown use found in the same graves containing spools (©Lise Ræder Knudsen).

Twisted loops on a large cloak from Thorsberg

The weapon deposit Thorberg situated some 25 km southeast of Flensburg in Northern Germany have yielded a large amount of very well preserved objects from the Iron Age. The environment in this bog has preserved many textiles - among these are fragments of several cloaks. The most famous of the cloaks are the large cloak from Thorsberg (Prachtmantel 1, F.S.3686 belonging to Landesmuseum Schloss Gottorf), a blue and white checkered woolen fabric edged by the widest tablet woven borders known from the Iron Age. One of the edge borders was woven using 178 tablets.
In 2005 the Danish Research Foundation established a center of excellence at University of Copenhagen and Center for Textile Research (CTR) was a reality. One of the research programs was “Danish Textiles and Costumes from the Iron Age” and the study of textiles from weapon deposits was one of targets. Dr. Susan Möller-Wiering was the main investigator (Möller-Wiering 2011) and I was asked to deliver a chapter on tablet weaving from weapon deposits for the final publication (Ræder Knudsen 2011).

The large cloak from Thorberg was preserved as large fragments mounted on a modern woolen fabric, which means that most of the backside was not visible (Fig. 7). The size of the cloak as it was mounted was 1,68 m x 1,68 m. The fabric was 2/2 twill and the weft threads of the fabric was single s-spun threads whereas the warp threads were single z-spun threads. The borders were woven using different qualities of yarn making a striped pattern. Most of the yarn of the borders has survived very badly or not at all, while only the warp of the finishing border was well preserved, but fragments of all four tablet woven edges could be detected. All borders are woven with tablets threaded alternately and all tablets were twisted the same way around. Along one edge a tablet border of about 136 tablets was seen. It was analyzed and it was obvious that this was a finishing border

Fig. 7:
The large cloak from the weapon deposit Thorsberg was mounted on a brown fabric which was severely damaged by light in exhibition. Originally there were tablet-woven borders along al four edges but due to decomposition only part of the lower border and traces of the three other borders could be found. I: Lower border, II: Upper border, III: Right border, IV: Corner where the width of the left border can be seen. (Photo: ©Roberto Fortuna).

(Ræder Knudsen 2011, 170, 184-185). When the finishing border was established the opposite edge had to be the starting point of the weave and the remaining two edges had to be the side borders. This was important to notice as the manufacture of the different borders on a fabric were not always the same and the way they were woven might yield information about the loom used to produce the cloak.

Only a small part of the warp of the upper border was preserved, but loops from the fabric which served as weft of the border was preserved very well (Fig. 8). Warp threads of 9 tablets could be detected. Some of the loops did not reach the outer warp thread. The loops were all firmly twisted and the two legs of one loop were both lying in the same shed.

The right side border was very similar to the upper border but only warp threads of about 8 tablets could be detected. The loops of the right side border were not twisted at all (Fig.9).

Fig. 8:
The upper edge of the cloak had firmly twisted loops outmost, which were of different length (©Lise Ræder Knudsen).

Fig. 9:
The right side of the cloak had loops which are not twisted –why? (©Lise Ræder Knudsen).

Fig. 10:
The lower left corner of the Thorsberg cloak. The arrow shows a single loop from the twill fabric indicating that also this side was originally made using the interlinking method. The width of the left border could be seen even if the border itself was only partly preserved (Photo: ©Roberto Fortuna).

The left side border was only preserved as a ghost impression. The warp threads of the left side border was used as the weft of the lower finishing border, and as the finishing border was well preserved it was possible to discern the approximate amount of tablets of the left side border to 178. Only at one point a tiny bit of twill fabric was preserved at the point where the left edge border and the fabric would have met. At this point it was possible to find a single loop formed by two neighboring weft threads of the fabric (Fig.10).

The cloak had great many details preserved which could yield interesting research questions, but in this case we will concentrate on a few:

Why was a single weft loop found in the area between fabric and left border?
Why were the weft loops of the right side border not twisted and the similar loops of the upper border firmly twisted?

It was formerly believed that the cloak and the side borders were woven together in one process on a warp weighted loom (Schlabow 1976, 63-65, abb.117). Schlabow had a reconstruction made, which needed the work of two skilled weavers for a year. One of the difficult tasks for the weavers was the manufacture of the side borders. Based on this cloaks with wide tablet woven borders were interpreted as highly valuable. Already in 1986 Lise Bender Jørgensen put a question mark to that interpretation (Bender Jørgensen 1986, 151-152).

I have previously seen a wide tablet woven border woven to a cloak fabric, where the fabric and the border seemed to be wo-

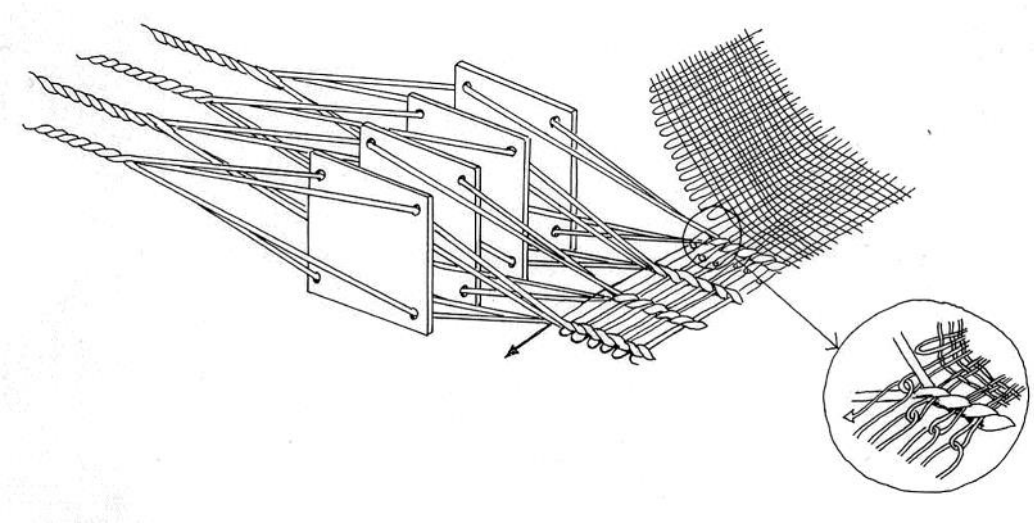


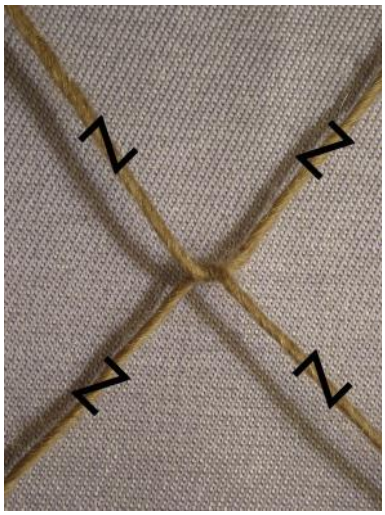
Fig. 11:
The principle of weaving a tablet-woven border to the edge of a fabric. The loops of the selvedges of the fabric links together with the main weft of the border. When the weaving process is finished the joint linking between the border and the fabric is invisible (Drawing: ©Michael Højlund Rasmussen).

ven together at the same time (Ræder Knudsen 1998, 81-84). It was thus easy to detect the single loop at the left side border of the Thorsberg cloak and in this way get a notion that the fabric could be woven first and the tablet woven borders could be woven invisibly to the edges afterward using the loops of the selvedges to link with another weft thread (Fig. 11).

At first we thought that the different twist of the loops of the upper edge and the right edge could be a question of how hard the weft- and warp yarn of the fabric was twisted. But even if there seemed to be a slight difference it was so little that it could not explain the difference.

Many loops were found along the right side and the upper side of the fabric. Compared with find of a single loop at the left side we had an indication that originally a border of unknown width was added at all three sides of the fabric.

Furthermore, it was important to look at the fact, that the warp threads of the fabric are z-spun while the weft threads of the fabric are s-spun. What would happen if a tablet woven border was added to the left-, upper- and right side of the fabric using a weft thread of unknown twist to link with the loops of the fabric?
A tiny experiment was set up: Two z-spun threads were crossed and allowed to twist – but they did not (Fig. 12 and 13). An s-spun- and a z-spun thread was crossed and allowed to twist and they did firmly (Fig. 14 and 15). Thus a weft loop and a weft thread linking inside the shed of a tablet border would immediately twist if they were of different spinning direction and they would not twist if they were of the same spinning direction.



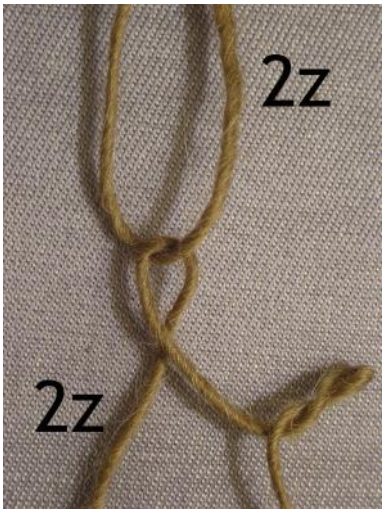
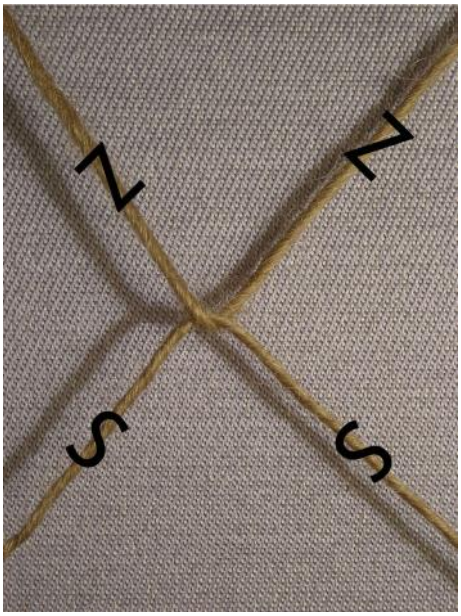


Fig. 12:
Two z-spun threads cross are joint in a cross (©Lise Ræder Knudsen).

Fig. 13:
When the threads are allowed to twist they refuse (©Lise Ræder Knudsen).



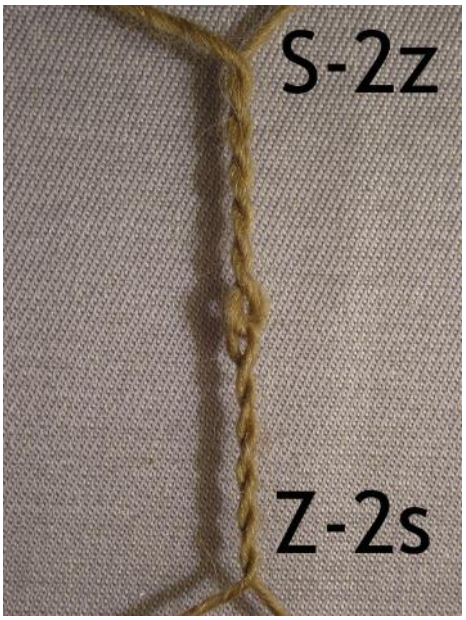


Fig. 14:
A z-spun and an s-spun thread are joint in a cross (©Lise Ræder Knudsen).

Fig. 15:
When the threads are allowed to twist they do firmly (©Lise Ræder Knudsen).

If a tablet border was woven to all 3 edges with loops and a single s-spun thread was used as the main weft and linked to the loops inside the border, then we would have firmly twisted loops at the upper edge of the fabric and loops of no twist at the side edges. Other explanations could as well be possible, but I find this the most probable as it is rational and easy and do not involve a lot of work which has no obvious meaning.

The characteristics of the upper borders made it possible that the border was added after the manufacture of the fabric, which means that the fabric when finished from the loom had small loops of different length at the starting point of the weave and not a tablet border. This indicates that the fabric could be woven using a tubular loom and not a warp weighted loom (Ræder Knudsen 2011, 194-197, Möller-Wiering 2011, 73).

The questions were:
“Why was a single weft loop found in the area between fabric and left border?”
With high certainty the answer is:
“Because the fabric was woven first leaving small loops at the side and top of the fabric. The borders were woven to the edges using another thread to link with the loops in an invisible way inside the shed. This other thread have totally disintegrated and is now gone”.
“Why were the weft loops of the right side border not twisted and the similar loops of the upper border firmly twisted?”
“The main weft thread of the large table border, which are now gone was s-spun and thus created a firm twist when connected to the z-spun threads of the upper side of the fabric, while it did not create a twist when linked to the s-spun loops of the side borders”.

A full scale experiment weaving the Thorberg cloak would surely provide more information, but in this case meticulous visual study, experience with the study of other cloaks and a tiny practical experiment gave results, which might change the interpretation of the large cloak from Thorsberg. It must also affect the interpretation of other Iron Age cloaks as the large cloak from Thorsberg has been the type example.
The results indicated that cloaks with wide tablet woven borders were not woven as one piece, but the fabric was woven first and the borders added later. This means that the fabric could have been woven at one place and the borders woven to the fabric at another place. Furthermore, it means that cloaks with wide tablet woven borders were made in a rational way and even if they bear evidence of solid craftsmanship the work was not more complicated than the manufacture of other garments. Furthermore, it indicates that the large cloak from Thorsberg might have been woven on a tubular loom and not on a warp weighted loom. Previously, it was presented as the ultimate product of the warp weighted loom (Schlabow 1951, Schlabow 1965,54-55, Schlabow 1976, 47, 65).

Conclusions

Often the studies of textiles have been limited to asking questions starting with: *When, where, what* and *how*? This will provide some information, but if we want to get deeper knowledge it is important also to ask questions starting with *why.*
This article presents a scheme for description of tablet-woven borders, which is useful for the visual analysis, but more important the examples show that a system for analysis and a scheme are not enough if one wants to get deeper insight in prehistoric textiles and the society which produced them. Questions like *when, where, what* and *how* are often easy to fit into a scheme, while *why*-questions are often linked to the understanding of the fragment itself and the questions which will provide new insight do not follow a scheme. It is often in the unexpected tiny details the interesting questions and thus the interesting answers lye. Formulating interesting questions starting with *why* is best done by working in a cross disciplinary context - and practical experience in the craft of weaving as well as in the study of ancient textiles is needed.

Lise Bender Jørgensen has encouraged textile researchers to work cross disciplinary and to use both the working methods of academia and crafts to get a better understanding and deeper knowledge. And in her own work as editor, as project initiator and well as in the creation of networks she has constantly invited both academics and craftsmen.

Acknowledgement

Warm thanks go to Lise Bender Jørgensen for support and encouragement through many years. I also thank Annemarie Stauffer, Patrizia von Eles, Susan Möller-Wiering and Schloss Gottorf for the opportunity to work together on the textiles from Verucchio and from Thorsberg.

Literature

Andersson Strand, Eva et al. ”Old Textiles – New Possibilities.” In *European Journal of Archaeology*. 13:2 (2010): 149-173.

Andersson Strand, Eva. „From spindle whorls and loom weights to fabrics in the bronze Age Aegean and Eastern Mediterranean.” In *KOSMOS. Jewellery, Adornment and Textiles in the Aegean Bronze Age. 13th international Aegean conference held at Copenhagen, April 2010.* Aegaeum 33. 2012. 207-214.

Banck-Burgess, Johanna. Hochdorf IV. Die Textilfunde aus dem späthallstattzeitlichen Fürstengrab von Eberdingen-Hochdorf. Stuttgart: Konrad Theiss Verlag, 1999.

Bender Jørgensen, Lise. Forhistoriske textiler i Skandinavien. København: Det kgl. Nordiske Oldskrifteselskab, 1986.

Bender Jørgensen, Lise. “The Epistomology of Craftsmanship.” In *Textilien aus Archäologie und Geschichte. Fesrschrift Klaus Tidow,* edited by Lise Bender Jørgensen, Johanna Banck-Burgess and Antoinette Rast-Eicher, 30-36. Neumünster: Wachholtz Verlag, 2003.

Bender Jørgensen, Lise. “Archaeological Textiles between the Arts, Crafts and Science.” In *NESAT IX, Archäologische Textilfunde – Archaeological Textiles,* edited by Antoinette Rast-Eicher, Renata Windler and John Peter Wild, 8-11. Ennenda: ArcheoTex, 2007a.

Bender Jørgensen, Lise.” The World According to Textiles.” In *Ancient Textiles, Production, Craft and Society,* edited by Carole Gillis and Marie Louise B. Nosch, 7-12. Oxford: Oxbow Books, 2007b.

Caple, Chris. Objects, reluctant witnesses to the past. Oxon: Routledge, 2006.

Eles, Patrizia von. Guerriero e sacerdote. Autorità e communità nell’età dell ferro a Verucchio. La Tomba del Trono. Firenze:All’Insegna del Giglio. 2002.

Hammarlund, Lena and Vestergård Pedersen, Kathrine. “Textiles: appearance and visual expression – craft knowledge applied to archaeological textiles. In *NESAT IX, Archäologische Textilfunde – Archaeological Textiles,* edited by Antoinette Rast-Eicher, Renata Windler and John Peter Wild, 213-219. Ennenda: ArcheoTex, 2007.

Hansen, Egon. Tablet weaving: history, techniques, colours, patterns. Højbjerg: Hovedland, 1990.

Möller-Wiering, Susan. War and Worship. Textiles from 3rd to 4th-century AD Weapon Deposits in Denmark and Northern Germany. Oxford: Oxbow Books, 2011.

Ræder Knudsen, Lise. "Analysis and Reconstruction of Two Tablet Woven Bands from the Celtic Burial Hochdorf." In *North European Symposium for Archaeological Textiles V.* Edited by Gisela Jaacks and Klaus Tidow, 53 – 60. Neumünster: Textilmuseum Neumünster, 1994.

Ræder Knudsen, Lise. " An Iron Age Cloak with Tablet-woven Border: a New Interpretation of the Method of Production." In *Textiles in European Archaeology Report from the 6th NESAT Symposium 7-11th May 1996* GOTARC Series A, Vol. 1, edited by Lise Bender Jørgensen and Christina Rinaldo, 79 – 84. Göteborg: Göteborg University, 1998.

Ræder Knudsen, Lise. "Technical description of the Fragments of the Broad Tablet woven band found on the Big Cauldron from Eberdingen-Hochdorf." In *Hochdorf IV. Die Textilfunde aus dem späthallstattzeitlichen Fürstengrab von Eberdingen-Hochdorf*, 80-82. Stuttgart: Konrad Theiss Verlag, 1999.

Ræder Knudsen, Lise. " La tessitura con tavolette nella tomba 89." In *Guerriero e sacerdote. Autorità e communità nell'età dell ferro a Verucchio. La Tomba del Trono,* edited by Patrizia von Eles, 220-234. Firenze:All'Insegna del Giglio. 2002.

Raeder Knudsen, Lise. *"*Tablet-woven textiles from 3rd to 4th-century AD weapon deposits in Denmark and northern Germany.*"* In *War and Worship. Textiles from 3rd to 4th-century AD weapon deposits in Denmark and northern Germany* edited by Susan Möller-Wiering, 163-198. Oxford: Oxbow Books, 2011.

Ræder Knudsen, Lise. "Case Study: The Tablet-woven borders of Verucchio." In*Textiles and Textile Production in Europe. From Prehistory to AD 400,* edited by Margarita Gleba and Ulla Mannering, 254-263. Oxford: Oxbow Books, 2012.

Schlabow, Karl. „Der Thorsberger Prachtmantel, der Schlüssel zum altgermanischen Webstuhl." In *Festschrift für Prof. Schwantes zum 65. Geburtstag*, 176-201. Neumünster, 1951.

Schlabow, Karl. „Der Thorsberger Prachtmantel. Veröff. Des Fördervereins Textilmuseum Neumünster Heft 5. Neumünster. 1965.

Schlabow, Karl. Textilfunde der Eisenzeit in Norddeutschland. Göttinger Schriften zur Vor- und Frühgeschichte. Neumünster: Karl Wachholtz Verlag, 1976.

Stauffer, Annemarie. " I tessuti." In *Guerriero e sacerdote. Autorità e communità nell'età dell ferro a Verucchio. La Tomba del Trono,* edited by Patrizia von Eles, 192-219. Firenze:All'Insegna del Giglio. 2002.

Stauffer, Annemarie. "Case Study: The Textiles from Verucchio, Italy." In*Textiles and Textile Production in Europe. From Prehistory to AD 400,* edited by Margarita Gleba and Ulla Mannering, 243-253. Oxford: Oxbow Books, 2012.

Walton, Pelope and Eastwood, Gillian. A brief guide to the cataloguing of archaeological textiles. London: Institute of Archaeology Press, 1988.