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## ‘NOTHING LIKE TEXTILES’: MANUFACTURING TRADITIONS IN TEXTILE ARCHAEOLOGY

### ABSTRACT

Textiles are evaluated mainly in regard to their visual appearance and technical features of textile production. From a modern point of view, it is their optical perception that is most often displayed in reconstructions. This, however, can rarely be achieved due to the poor and fragmentary preservation of archaeological textiles, which hinders gathering basic information about details of the production technique. Sources illustrating garments or putative textile patterns are often additionally consulted to achieve a better understanding of the textiles. Over the past two decades, the author has made an effort to present a different approach to textile archaeology, that is to demonstrate that the significance of textiles was predominantly governed by culture-specific production techniques whose differences were optical – *i.e.* at the first glance imperceptible even for experts.

Textile patterns were predominantly applied during production. There was little subsequent embellishment where textiles acted as a carrier of the decoration. This means that patterns were rarely additionally integrated after the basic weave was complete, for instance as in the case of embroidery. In consequence, archaeological textiles assume a different cultural and historical significance than previously thought. They are not merely objects whose surfaces served as carriers for culture-specific patterns. In this context, embroidery is of particular significance, as it is a procedure for subsequent decoration of fabrics. In this article, the author presents prehistoric, including the Bronze and Iron Ages, textile finds that have been described as embroidery but are actually a combination of weaving and wrapping weaving techniques.

### STRESZCZENIE

#### „NIE MA JAK TKANINY”. TRADYCJE WYTWÓRCZE W ARCHEOLOGII TEKSTYLNEJ

Celem artykułu jest przedstawienie tezy, konsekwentnie wysuwanej przez autorkę w ciągu ostatniego dwudziestolecia, zgodnie z którą o znaczeniu tekstyliów decydują kulturowo warunkowane techniki ich produkcji. Techniki te mogą być jednak często nierozpoznawalne na pierwszy rzut oka nawet przez specjalistów. Wzory wbudowywane były w tkaniny w czasie ich

wytwarzania, a dodatkowa, uzupełniająca dekoracja, jak np. haft, stosowana była wyjątkowo i jej znaczenie było szczególne. W artykule omawiane są przykłady wzorzys-tych tekstyliów z epoki brązu i żelaza, które opisywane były jako tkaniny haftowane. Zdaniem autorki, wzory tych tkanin powstały jednak w efekcie kombinacji techniki tkackiej i techniki okręcania nitek wokół osnowy.

**Keywords:** prehistoric textile traditions, combination of weaving and wrapping weaving techniques, flying threads, embroidery

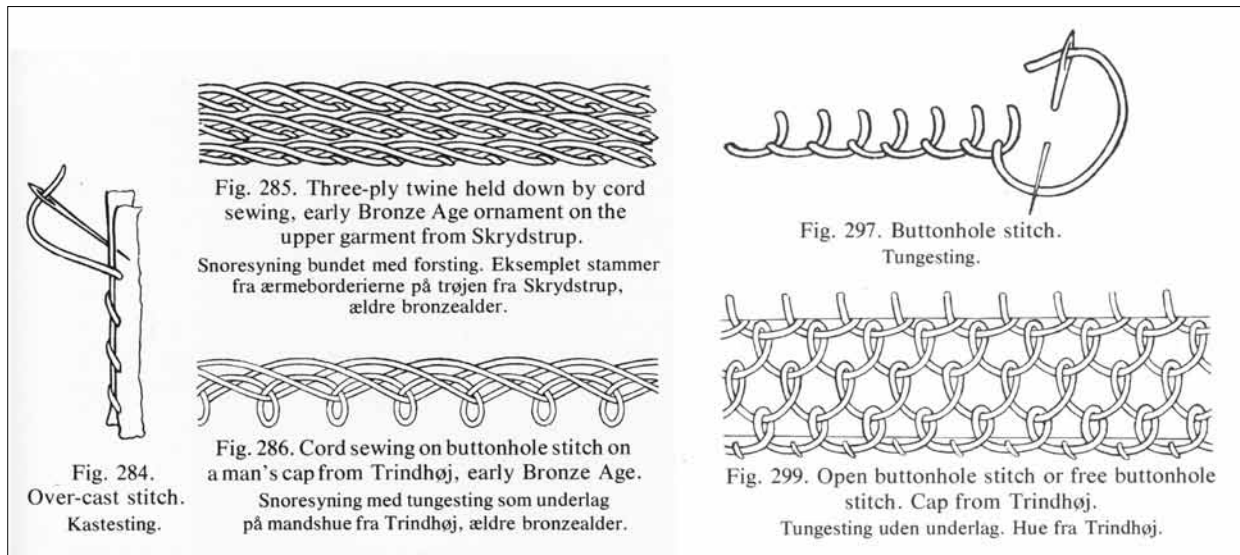


Fig. 1. After Margarete Hald who highlighted the need to distinguish between ornamental embroidery, used purely as decoration, and ornamental seams, such as “overcast stitch, buttonhole stitch (both free and as filling), pile sewing and cord sewing” (Hald 1980: 279, 281, 284, Figs 284–297, 299).

### The measure of all things: textiles from Neolithic wetland settlements

The textiles from prehistoric pile-dwellings highlight how irreplaceable the use of textiles was in the everyday aspect of life at the time. The high level of knowledge and sophistication, which became very apparent by the Early Neolithic period, leaves little doubt that the method of production and materials at this level of sophistication were based on experiences stretching far back to the hunter-gatherer cultures of the Mesolithic period. With regard to textile manufacture, the beginning of weaving and use of fibre flax are frequently emphasised as significant within the context of the Neolithic Revolution. At this stage of human history, however, textiles manufactured of wood bast and vessels of tree bark made a major contribution, enabling the introduction of working processes in the areas of animal husbandry, agriculture, fishery, domestic activities, storage, and house construction. The base stock includes the products of rope-making, sewn bark vessels, various nets for fishing, as well as gathering activities and storage, remains of coil-built baskets, fabrics, and countless variations of twining (Fig. 3) used for textiles performing various functions. Their application varies from sieves through vessels to pieces of clothing.

The prehistoric pile-dwellings around the Alps, especially in Eastern Switzerland and Eastern France (Rast-Eicher 1994; 1995; 1997; Médard 2000a; 2000b; 2006; 2010; Rast-Eicher, Dietrich 2015), Southwest Germany (Feldtkeller, Körber-Grohne 1998), and Northern Italy (Bazzanella *et al.* 2003) have yielded a corpus of

Neolithic and Bronze Age textiles which witness a highly-developed textile craft.

### Prehistoric fabrics: manufacturing traditions from the Neolithic to the Iron Age

An examination of patterned fabrics from the Bronze and Iron Ages reveals their uncanny relations with Neolithic textile craft: a pattern of any given kind was worked into the fabric during its production. Subsequent decoration of textiles was uncommon (Banck-Burgess 1998; 1999; 2012; 2014; 2017). While the manufacturing techniques for weaving and colour patterns are self-evident, further research is still required in the case of the techniques for fabrics with additional pattern threads.

#### Bronze Age

The early Bronze Age fabric from Pfäffikon-Irgenhausen is one of the best-known finds that shows supplementary threads which were incorporated while weaving the ground weave.

The patterned weave was discovered in the 19<sup>th</sup> century. Fragments of it can be found in many museums all over the world (Altorfer 2010: 166–168; Altorfer *et al.* 2000/01). One fragment is dated to the Early Bronze Age, 1700–1440 BC (Rast-Eicher, Dietrich 2015: 55, 143). Emil Vogt already recognised that elaborate pattern had been woven into the fabric during production (Vogt 1937: 76–90). His detailed drawings show a weft-wrapping/soumak technique (Vogt 1937: Figs



Fig. 2. The ongoing process of reconstruction of the fabric from Pfäffikon-Irgenhausen/CH (Early/Middle Bronze Age; 1700-1440 BC). The pattern was worked into the fabric during weaving (Igel 2016).

120, 123–124, 127–128, 131–132, 133–138, 143, 149, 150). Simultaneously, his meticulous descriptions do not match the term 'brocaded' and its uses (Vogt 1937: 76–90). The term 'brocade' suggests that the supplementary threads are interwoven while weaving the ground weave. This is not the case for the fabric from Pfäffikon-Irgenhausen. There, the supplementary threads were looped in while the ground weave was woven.

The textile from Pfäffikon-Irgenhausen has been discussed from different perspectives concerning its manufacturing technique. While Antoinette Rast-Eicher still classifies it as embroidery (Rast-Eicher, Dietrich 2015; Rast-Eicher 2017), Hildegard Igel has demonstrated that the pattern was looped into the weave vertically, horizontally, and diagonally during weaving (Igel 2016; Bank-Burgess, Igel 2017). In a complicated experimental process, including cultivation of flax, the processing of the flax fibres, spinning, and dyeing, the fabric was reconstructed by Hildegard Igel in close cooperation with professional embroiderers (Igel 2016) (Fig. 2).

In this controversial discussion, Antoinette Rast-Eicher argues in favour of the following points: firstly, the decoration is embroidered because the ground threads are pierced; secondly, the design does not always follow

the same shed in straight lines; thirdly, one direction of the weave is more stretched and must therefore be the warp. In this system the patterned threads lie. Therefore they could not be woven in (Rast-Eicher, Dietrich 2015: 96; Rast-Eicher 2017).

Hildegard Igel, who made different reconstructions of this weave, can oppose this view with the following counter-arguments: firstly, during weaving, it is not a problem to incorporate supplementary threads – looping around the warp and flowing further in the direction of the patterns until the next warp is looped; secondly, when fabrics are removed from the loom, a weaver calculates a 10% shrinkage for the warp but only a 5% reduction for the weft. This means that the system to which the patterned threads were added is undoubtedly the weft because it has less shrinkage, due to which it looks stretched. Thirdly, there are very few threads for which loose ends are visible, unlike what is characteristic for embroidery; fourthly, there are many floating threads on the back of the motifs of squares and dots, which an embroiderer would avoid to save time and yarn; fifthly, the repeated pattern on the horizontal and vertical borders would have been exactly the same if they had been embroidered. Weaving required to keep the pattern



Fig. 3. Countless variations of twining are characteristic for the prehistoric pile dwellings of Southwest Germany. The pile dwelling of Degersee (De19 527/477-1; Kat.-Nr.125; Banck-Burgess 2015: 270, Abb.10, Landesamt für Denkmalpflege Baden-Württemberg).

threads on the surface, which inevitably resulted in some kind of variations in the patterns; lastly, during the reconstruction small mistakes became noticeable after a few passages of the weft. Therefore, single pattern threads were pulled out and replaced. In this process the pattern thread sometimes pierced threads from the ground weave.

In connection with the Bronze Age find from the North Italian wetland settlement at Lago di Ledro (the province of Trento), where a tabby weave fabric featured an integrated elaborate diamond patterning (Perini 1970: 224–229; Bazzanella *et al.* 2003: 170–171), Barber posits that the origin of fabrics with complex float techniques may be traced back to finds from Neolithic wetland settlements in Switzerland (Barber 1991). In the meantime, it has been assumed within the discipline of textile archaeology that the twine-weave warp fabrics from Neolithic lakeside settlements represent the predecessors of those with complex float techniques (Fig. 3).

The finds assemblage from the Lago di Ledro includes another fabric with an inwoven pattern. While for a long time this fragment was not described as being embroidered (Bazzanella, Mayr 1995: 120; Bazzanella *et al.*

2003: 170–171), in 2012, in a short list of various textile finds, Bazzanella called it a “textile fragment with festoon embroidery” (Bazzanella 2012: 206). Presumably, this was done in regard to the fabric from Irghausen. Based on its similarities with the fabric from Irghausen, Rast-Eicher and Dietrich (2015: 109) described this find as embroidery.

Description of other fabric fragments with additional pattern threads poses similar difficulties. In the case of the Copper Age, one of the fabric finds from the Spanish cave ‘Cueva Sagrad I’, Sierra de Tercia (Murica; c. 2200 BC) was interpreted as embroidery (Rast-Eicher, Dietrich 2015: 109) – probably due to graphical rendering of the original illustration (Alfaro Giner 1992: 26, Fig. 8; 2012: 338, Fig. 16.4). Yet, the researcher editing these finds, Carmen Alfaro, has not mentioned the term ‘embroidery’ in any publication (Alfaro Giner 1992; 2005; 2012).

With other Bronze and Iron Age presumably embroidered fabrics it quickly becomes apparent that they in fact had nothing to do with embroidery whatsoever. A comparison with finds from the Nordic Bronze Age reveals that only selvages, rather than ‘real embroideries’, have been recorded there, too. It was Margarete Hald who pointed out to the need to distinguish between ornamental embroidery, used purely as decoration, and ornamental seams, such as “overcast stitch, buttonhole stitch both free and as filling, pile sewing and cord sewing” (Hald 1980: 279, 281, 284, Figs 284–286, 297, 299) (Fig. 1). The functional significance can, of course, coincide with a decorative character, as in the case of the Early Bronze Age find from Skrydstrup in Jutland, which also had a decorative selvedge. Around the neck opening there was a seam construction (Broholm, Hald 1940: 93; Hald 1980: 279; Fossøy 2014: 79). Hald describes it as a “three-ply twine held down by cord sewing” (1980: 281, Fig. 285). Based on her view that the shape of this woman’s garment resembled a half-skin poncho, Magarethe Hald discussed and named the upper garment from Skrydstrup a ‘poncho’. She suggested that the decorated stitches on the upper arm were “perhaps the relic of a decorative detail camouflaging a gore in the skin to give it extra width” (Hald 1980: 345, 347, Figs 417, 426). However, there is no doubt that the part of the cloth showing decorative stitches is a construction component. The close connection between construction seams, stitches, and embroidery is also mentioned by Fossøy (2014) who notes: “Embroidery is defined here as seams that extend beyond what is necessary for the practical construction of the clothing and therefore have a decorative effect” (2014: 79).

Likewise, the finds from Skrydstrup, as well as other finds from the Scandinavian Bronze Age period, all demonstrate ornamental seams. In the case of Borum Eshøj and Egtved, there are blanket strokes “around the neck opening and the sleeve openings” (Broholm, Hald



1940: 85). True embroidery, such as the purely decorative stitches on the Viking-period fabric finds in Jutland (Munksgaard 1984), is not relevant for the Bronze Age. Real embroidered stitches are here interpreted as an ornament that rests on the basic fabric and is reduced to the function of a carrier of decoration.

In the case of the presumed blouse from Flintbek (North Germany, Period II) (Ehlers 1998: 162–165; Bergerbrant 2010: 22), we are dealing with stitched-on twines at the border of the fabric. Similarly, the twine fragments of the grave find from Heiligenthal in Lower Saxony also derive from a selvage (Ehlers 1998: 166–170, NS 11.2b). The manner of their attachment remains unclear. The well-preserved fabric remains from Emmer-Erfscheidenveen in the Netherlands (province of Drenthe/13<sup>th</sup> century BC), considered to be a part of the garment of a male bog body, have also decorative border reinforcements. Comis describes them: “all the fragments have one or two hems finished with an embroidered decorative band made of very thin, dark brown Z-plyed yarn” (Comis 2003: 194–197, especially 194).

### Early Iron Age

Iron Age finds from Europe that have been published as embroideries (Hundt 1985: 108; Grönwoldt 1993: 23) are weaves where additional pattern threads were worked into the fabric during the manufacturing process. This method is known as ‘the flying thread’ and was frequently used for intricate pattern designs on fabric surfaces. The best examples for this are textiles from two Early Iron Age burial mounds: the early Celtic princely tomb in Eberdingen-Hochdorf, Kr. Ludwigsburg (Fig. 4) (Banck-Burgess 1999: 185, 281, Taf. 23) and the Hohmichele (Altheim-Heiligkreuztal, Kr. Biberach) (Fig. 5) (Banck-Burgess 1999: 56–58, Figs 18–23, 203) in Southwest Germany, both yielding textiles which used to be referred to as embroideries (Riek, Hundt 1962: 203; Hundt 1985: 108–110, Fig. 125). The technique of adding supplementary threads during the weaving process, which is often found described within the context of Egyptian textiles between the 4<sup>th</sup> and 9<sup>th</sup> century AD (Verhecken-Lammens 2013), was already practised during the Bronze and Iron Ages in Europe (Banck-Burgess 1999: 55–63).

The technique used in the manufacture of the Slovenian fabric fragment from Nové Zámky, found as a filler in a La Tène-Period bracelet and described as “embroidery” (Bender Jørgensen 1992: 107; Pieta 1992), was probably comparable to that used for the fabric from Pfäffikon-Irgenhausen, namely a combination of weaving and wrapping weaving techniques.

Examination of the Mediterranean area yielded similar information concerning the decoration techniques. In his study *‘Beiträge zur griechischen Kunst’*, one of the foremost connoisseurs of the Greek art, Ernst Buschor (1886–1961), pointed out that Homer did not

mention embroidery anywhere, “but only ever speaks of weaving” (Buschor 1912: 30). Von Lorentz emphasises that in regard to the description of Greek finds it has been pointed out repeatedly that the patterns of these fabrics were inwoven and that up to the beginning of the Hellenistic period the Greeks had no word for ‘embroidery’ (von Lorentz 1937: 219). As far as there are detailed descriptions of Greek patterned fabrics, all which they mention is the tapestry weave, where piling threads are manually inwoven as required by the pattern width.

The famous linen fabric from Koropi in East Attica, referred to as embroidery and dated to the end of the 5<sup>th</sup> century BC, has not been subjected to dedicated analyses yet. The pattern is diamond-shaped and within each of the diamonds there is a walking lion depicted (Beckwith 1954: 114; Richter 1965; Banck-Burgess 1999: 227; Spantidaki 2016: 81, 112, Fig. A.67–75). Concerning the embroidery from Koropi, Stella Spantidaki refers to John Beckwith, who published the find in 1954. In her catalogue, she mentioned that “an analysis of traces of the thread used for the embroidery is necessary in order to have the complete picture” (2016: 12).

Stella Spantidaki also describes the difficulty with distinguishing between the terms ‘weaving’ and ‘embroidery’ in Greek, which denote two fundamentally different techniques. The term *‘hyphanto’* (weaved) is currently used for embroidered decorations. Spantidaki expounds that the term *‘katasitikos’* (κατάστικός), which is the “closest term to embroidery in written sources”, literally means to mark downwards, hence the connection to embroidery. In the same context, she notes that the decorative patterns that are visible in textile iconography could also be created using supplementary weft techniques (2016: 81, 153).

In the context of a richly decorated male tomb from Lefkandi on the Euboea, which is dated back to 825 BC, a piece of fabric with filled meander hooks was described. The pattern had been formed with additional floating threads in the chain (Popham *et al.* 1982; Barber 1991: 197; Banck-Burgess 1999: 229). Woven silver and gold threads were described in connection with silk fabrics from Nigrita in Tsagariin Nomos Serres, which were dated to the turn of the 4<sup>th</sup> and 3<sup>rd</sup> century BC (Walter 1940: 280; Granger-Taylor 1987: 29; Banck-Burgess 1999: 229).

Equally well-known is a magnificent fabric of purple and gold in which burned bones of a noblewoman in the royal tomb of Vergina (Macedonia) were hammered. The grave is dated to the 4<sup>th</sup> century BC. A fabric from a small gold shrine in the same grave is also described by Flury-Lemberg as tapestry weaving (1988: 234). Andronikos describes the pattern in the following way: “Spiral meanders border each of the four sides; within this are pliant branches, leaves, blossoms, flowers and rosettes amongst which sit two swallows” (1984: 194). Further finds from

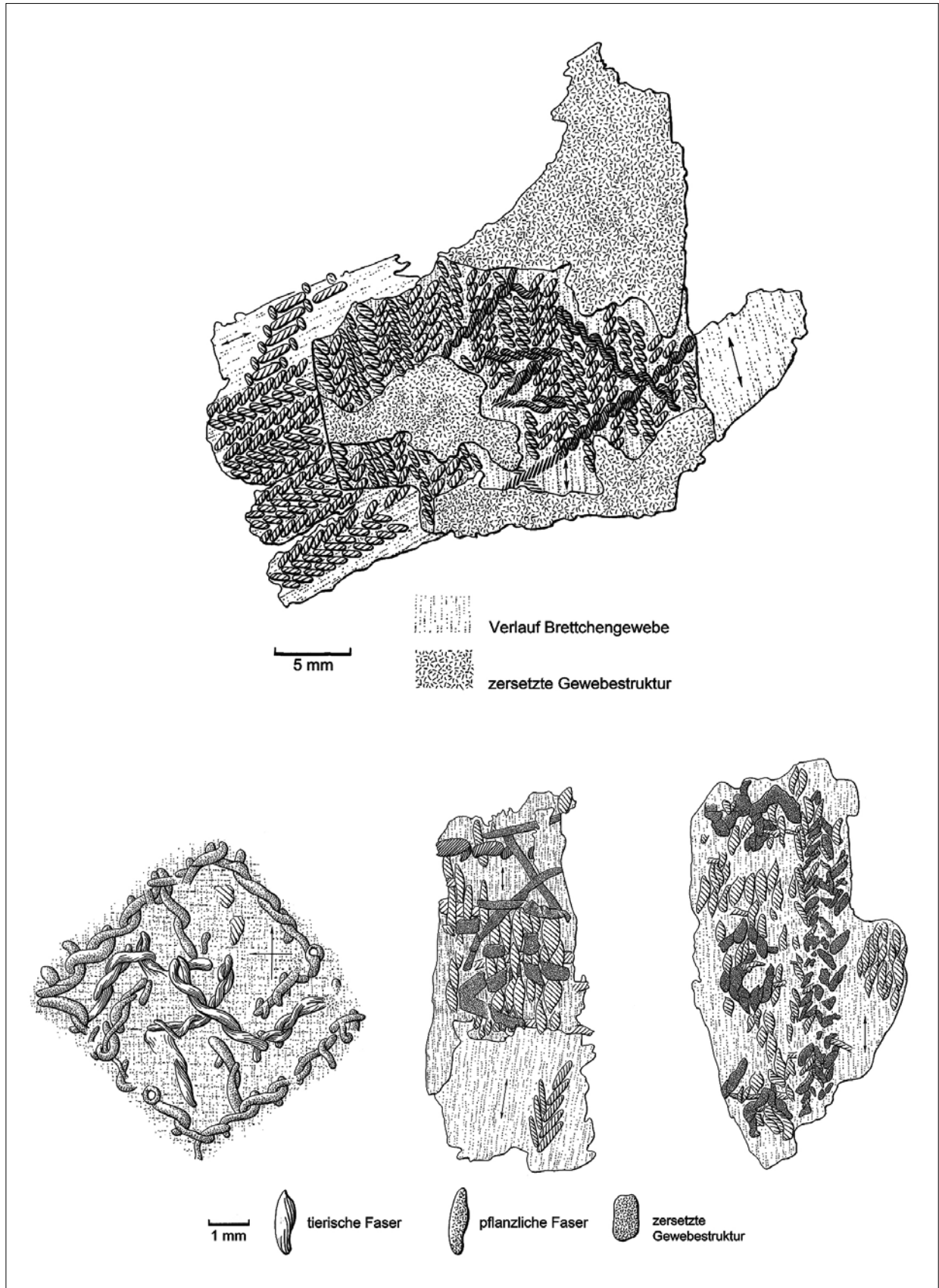


Fig. 4. Textiles from the Early Iron Age tomb Eberdingen-Hochdorf (Kr. Ludwigsburg): the additional pattern threads were worked into the fabric during manufacture (Soumak); a technique known as 'the flying thread' (Landesamt für Denkmalpflege Baden-Württemberg).

Greece and Italy (Banck-Burgess 1999: 227–232) demonstrate that all patterns which underwent a textile analysis are believed to have been woven into the fabric during production.

### Nothing like textiles: on value and pattern hooping

Attempts at demonstrating the significance of archaeological textiles with reference to traditions of manufacturing techniques (not technical features) have so far received little attention. In present-day textile manufacturing, an imaginary guide to assessing its significance is either based on the material or a calculation of the time invested. It is difficult to prove what other aspects affecting the significance of prehistoric textiles were most relevant, but it is clear that material and investment in time were only two of the factors. Of equal importance was the manner or purpose of the production of the fabrics and patterns.

The example of the early Celtic textiles from the princely tomb at Hochdorf reveals an interesting phenomenon. While the production techniques represented indigenous traditions, foreign patterns were also assimilated

(Banck-Burgess 1999: 52–89, esp. 53–65, 128). The notion that in European prehistoric textiles patterns were created predominantly during the production of the fabric structure suggests that textiles are set apart from other classes of material, such as ceramics or metal, as the surfaces on these objects were only decorated at a later stage, so they can be considered carriers of decorations. On the other hand, textiles are unique in that they possess an extremely mobile and communicative character in the form of garments and other similar products. Why then were other forms of decoration not chosen instead, such as embroidery, which, from a practical point of view, would have been simpler and significantly more time-saving?

This is what we are dealing with. A category of finds which retains its very own culture-specific attributes of production but at the same time acts as an important medium of communication. This demonstrates an inherent significance of this material category. There was no such thing as a textile carrier material that acted only as a medium for decoration, which means pattern hooping was used only under certain conditions. The answer to one of the research questions posed in the interdisciplinary CinBA-a HERA Research Project *‘Exploring Creativity in Craft Production in Middle and Late Bronze*

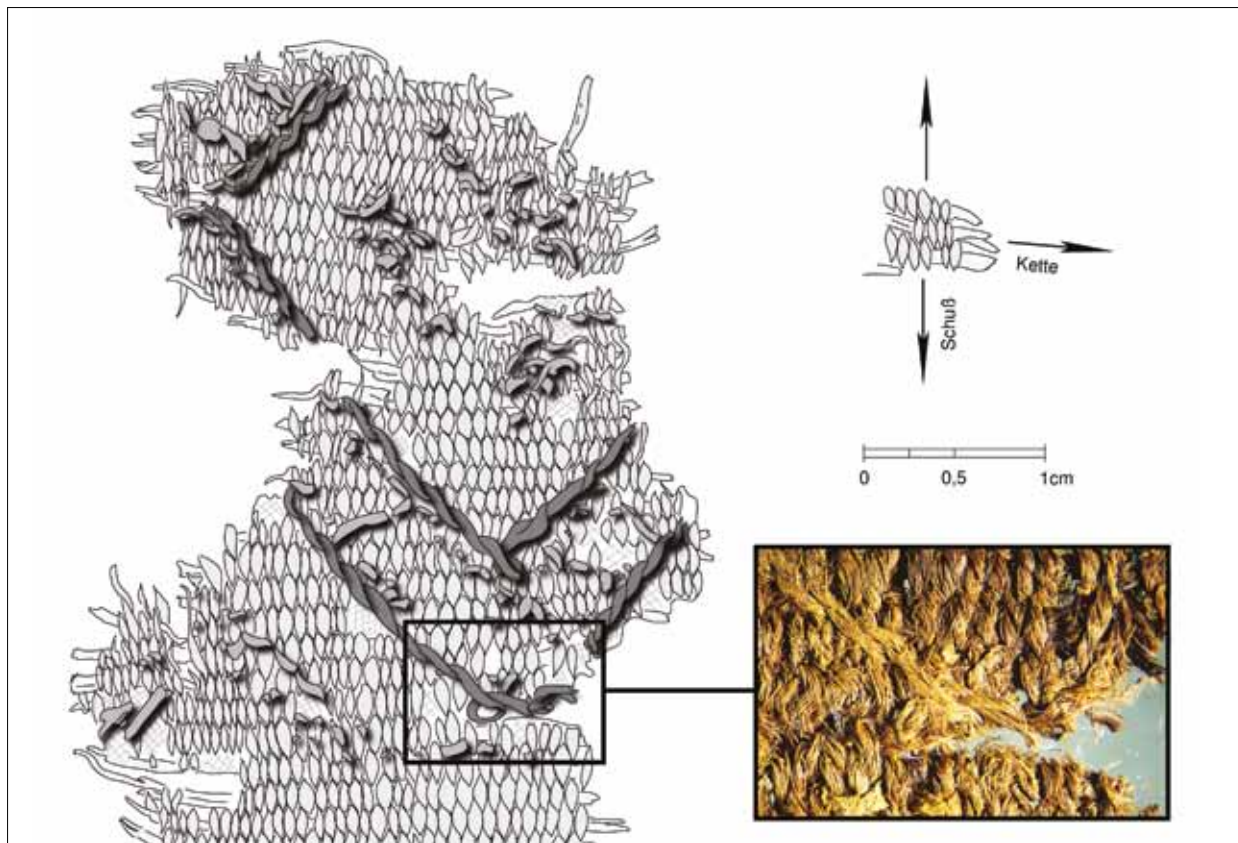


Fig. 5. Fabric from the Early Iron Age burial mound Hohmichele (Altheim-Heiligkreuztal, Kr. Biberach) shows the same technique: a combination of weaving and wrapping fabric techniques (Landesamt für Denkmalpflege Baden-Württemberg).

*Age Europe*, namely: “Do decorative motifs move between metals, pottery, and textiles?”, can thus be restricted insofar as the realisation of decorative ornaments in textiles was governed by principles which were strongly influenced by traditions of manufacturing techniques (Bender Jørgensen *et al.* 2013).

While from a present-day point of view the crucial factors affecting evaluation are deemed to be the visual appearance of textiles or, at best, also their feel and material, it appears that for prehistoric fabrics the method of manufacture was of equal importance.

## Conclusions

The derivation of weaving from wrapping weaving has now been universally accepted. Wrap-twining fabrics played an important role particularly during the Neolithic. The introduction of additional patterns in prehistoric textiles was frequently achieved by combining the techniques of weaving and wrapping weaving, like in the case of the Bronze Age fabric from Pfäffikon-Irgenhausen (CH), or the patterns of the Early Iron Age fabrics from the princely tomb in Eberdingen-Hochdorf (D). The fact that prehistoric textiles only have patterns which had been worked into the fabric during manufacture is a seminal discovery. It is thus possible to conclude that the method of production was of equal importance to the final appearance of the fabric. Subsequent decoration, as is common in embroidery, only existed in connection with selvages. Although it is much easier and

quicker to achieve patterns by embroidering rather than through a combination of weaving and wrapping techniques, the latter had largely been used in prehistory. Apparently, the significance of prehistoric textiles was predominantly associated with the traditional manufacturing techniques. Fabrics were not merely regarded as carriers of decoration, but were instead understood to be total objects. In regard to manufacturing techniques, it is often difficult to distinguish between embroidery and additional wrapping techniques. This contribution demonstrates that the majority of finds published thus far represent combinations of weaving and wrapping techniques.

It is not about proving that in prehistoric cultures there were no ornamental techniques in which a basic fabric was subsequently decorated. Instead, it should be rather understood that the production of prehistoric textiles is to be approached holistically, since the related manufacturing processes were just as important as the appearance of the finished fabric. That also means that the ground fabric was never reduced to the function of a mere decorative carrier. This understanding throws a completely new light on the social significance of textiles. In this context, the exchange or trade in textiles, and the transmission of old or the adoption of new production processes or pattern elements, have to be revisited from a new perspective.

Translation: Jörn Schuster  
(ARCHÆOLOGICALsmallFINDS)

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