

# Case Study 4

## Reassembling a weft-faced compound tabby with birds in octagons

### ARCHAEOLOGICAL PUZZLES IN A MUSEUM

Egyptian Fabrics from the 1st Millennium AD  
at the National Museum of Denmark  
(Online Exhibition)



#### Case study 4 Reassembling a weft-faced compound tabby with birds in octagons

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In 1890-1891 the National Museum of Denmark made an acquisition of a piece of wool fabric from Robert Forrer that has an overall pattern of birds in octagons (Fig. 1: NMD Inv. 3670\_1537, see also **Catalogue No. 8**). A detailed analysis of technique and a comparison with pieces in other collections have helped to set the piece in its Late Roman context. With a very close look it is even possible to reassemble the original textile and to see what it was used for.

#### A special patterning technique: *taqueté*

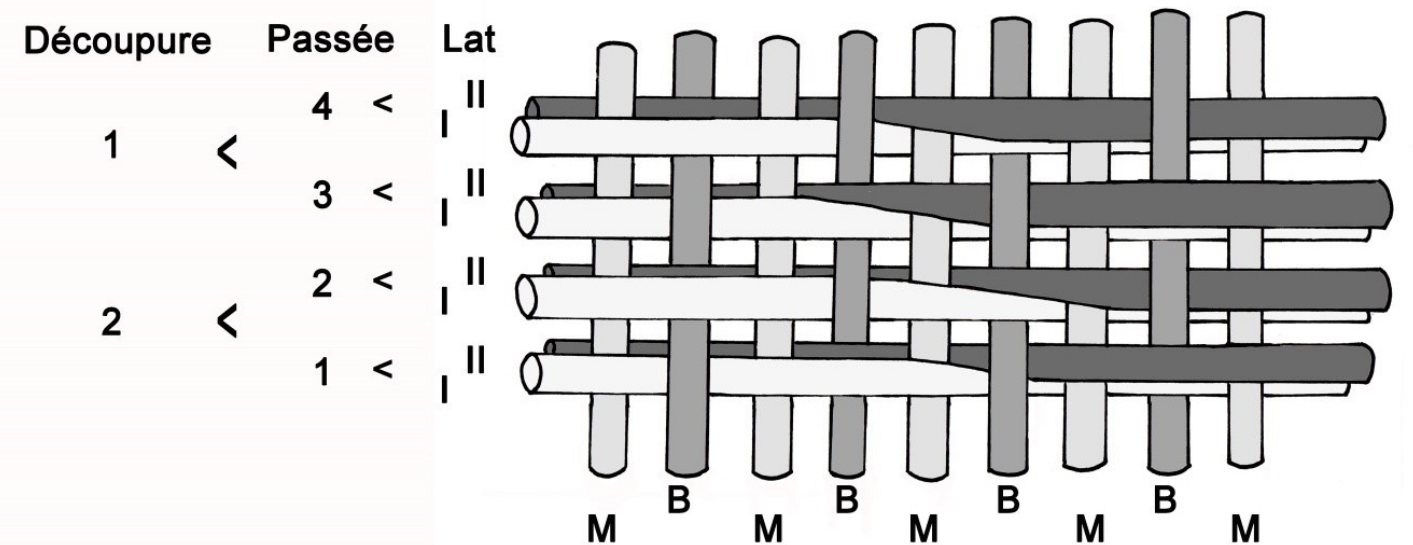
The pattern of the fragment is bichrome in cream and dark brown, depicting small birds in octagons surrounded by tendrils that are enclosed by a larger octagon. A small rosette sits between the octagons. A monochrome blue stripe is woven into the textile on one edge.

This fabric is special, as it is produced in a technique that allows a mechanical repeat of the pattern all over the width of the cloth. It is woven in weft-faced compound tabby, also called *taqueté*. The weft dominates the look of the textile. The binding of the fabric is in tabby and two wefts in contrasting colours are inserted in every binding shed. An additional set of warp threads (main warp) is manipulated to push the one or the other colour of weft to the surface of the fabric (Fig. 2). In a bichrome *taqueté* the rear side of the fabric shows the same pattern, but is inversed in colours.



1. *Taqueté* fabric NMD Inv. 3670\_1537. The warp is horizontal in the picture. Photo: Søren Greve © NMD

2. Structure of the *Taqueté* fabric NMD Inv. 3670\_1537. M = Main warp thread, B = Binding warp thread, Lat = individual weft thread, Passée = pass, consisting of two threads in contrasting colour, Découpure (trame) = weft step, consisting of several passes © Barbara Thomas



### Details of the Copenhagen *taqueté*

In NMD Inv. 3670\_1537 the binding warp threads and main warp threads are alternating in a proportion of 1:1. There are 14-16 warp threads (7-8 binding warp, 7-8 main warp) per centimetre. All warp threads are single yarns in white wool, spun in s-direction. In the *taqueté* section brown and white single wool threads, also spun with an s-twist, are used as wefts. The weft count is quite dense: up to 44 passes (= 44 white plus 44 brown threads) are woven in 1 centimetre. There are always several passes of the same pattern selection per weft step, forming small blocks in the pattern. The count of passes per weft step is usually six, but in some steps it can be just five or even up to eight passes, leaving a slightly thinner or noticeable thicker “block” or line visible in the fabric (Fig. 3).

One bird in an octagon is one pattern repeat. Each pattern repeat is 35 main warp threads wide. The pattern step is one main warp thread, meaning that the 35 main warp threads per pattern repeat can be selected individually. The selection of main warp threads for a pattern shed repeats mechanically in the width of the fabric. This is done by a special loom setup that enabled weavers to produce overall-patterned fabrics in this technique in an economic way. Irregularities in the selection of the pattern shed, of course, also repeat weft-wise.

When the pattern repeat in warp direction is studied, we see that Repeat 1 and Repeat 2 are not exactly alike. Small irregularities among the pattern repeats in warp direction show that the pattern was not stored by any device, but selected anew for the next repeat, causing small but visible alterations (Fig. 4). Just to point out

one example, we can see that the birds in the first pattern repeat above the blue stripe have upward-pointing tail feathers, while the birds in the second repeat show straight tail feathers (cf. Fig. 1).

At the lower end of the fragment, the weaver decided to interrupt the pattern of birds for a densely woven monochrome blue stripe. Here the warp threads are paired, and a single blue s-twisted wool yarn is woven in with 80 threads per centimetre to form a unicoloured stripe in extended tabby.

### Connected examples in other museum collections

The example in the National Museum of Denmark does not stand alone. Currently we know of 38 other fragments with this special pattern, having the same features in technique and material. They are dispersed across 29 collections all over the world. Many of them were purchased in the late 19th century, like the Copenhagen piece. Some of them were acquired directly via Robert Forrer, others, for example, via Stanislas Baron or Reverend Greville John Chester.

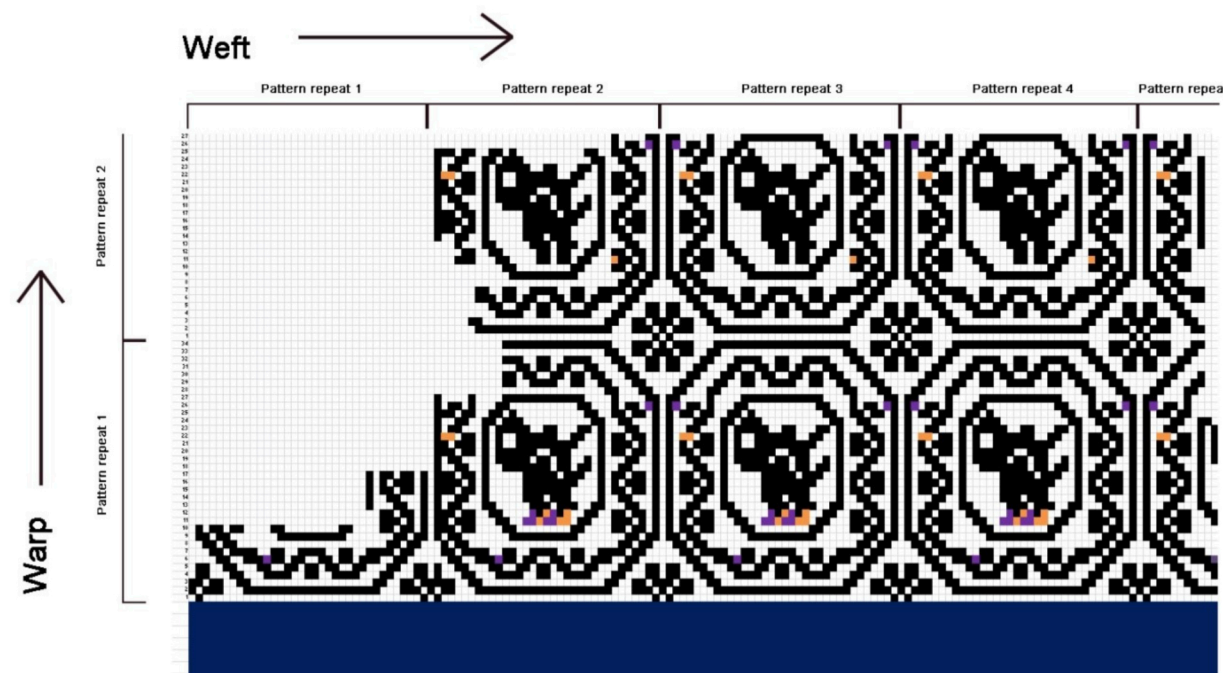
The provenance of some of these fragments is given as Akhmim-Panopolis. Robert Forrer also depicted one piece in his 1891 volume on textiles from Akhmim. Chris Verhecken-Lammens suggests that due to the technical features these *taquetés* were possibly manufactured in Egypt.

Two of the fragments with birds in octagons have been 14C dated to the early 4th-early 6th century AD (Phoebus Foundation Antwerp, KN Inv. 654-02, and Abegg-Stiftung



3. Detail of one pattern repeat of the *taqueté* NMD Inv. 3670\_1537. Warp is vertical. Photo: Søren Greve © NMD

4. Drawing of the patterning of NMD Inv. 3670\_1537. The blocks are always one warp step wide (= one main warp thread) and one weft step high (six passes). Orange and violet blocks show irregularities in the pattern that are repeated in weft direction due to the mechanical pattern repeat © Barbara Thomas



Riggisberg, AS Inv. 906).

But how are the pieces connected? When we look closely at the parallels we can observe individual features in the pattern selection of the *taqueté* and the general design of the fabric. One example: the “standard bird” has straight tail feathers, while the NMD fragment shows the birds next to the blue stripe with upward-pointing tail feathers. This feature is also found in a small piece from Berlin (Fig. 5, Berlin MBK Inv. 11527), indicating that the two pieces have a strong connection. Also other “markers”, such as the count of passes per weft step, match between the two fragments. We can thus conclude that these two pieces were woven at the same time in the same cloth, aligned in weft direction. As in the case of the NMD and the Berlin (MBK) fragments, more of the pieces in the collections can be matched in warp and weft direction, giving us insights into the overall design of this special piece of Late Roman compound fabric.

### Clues as to the original use of the fabric

Two fragments of this bird-patterned *taqueté* are preserved as complete objects and they have so far been identified as cushion covers (London, Victoria and Albert Museum, Inv. 243-1890 and Inv. 780-1893). While early scholars like Otto von Falke thought that the other fragments in this technique and pattern were also used as household textiles for upholstery, Sabine Schrenk did not exclude their interpretation as fragments of garments with *clavi*.

A key piece for the identification of the use of fragment NMD Inv. 3670\_1537 is a fragment now in London (Fig. 6, Victoria and Albert Museum, Inv. 304-

1891). This object features a blue unicolour stripe next to the patterned area just as in the Copenhagen and Berlin examples. Two thin decorations in weft twining with red thread have been added parallel to the blue stripe (Fig. 7). At the left side of the fabric, a selvedge is visible, formed by several warp threads that were bundled together. On top of this selvedge sits a narrow band in red and green wool. It follows the outline of the selvedge and then turns around 90 degrees. The red weft of the band is stitched into the tunic to fix the decoration to the fabric. Another portion of this band runs parallel to the blue stripe. The selvedge is typical of a woven-in neck slit of a tunic, identifying the blue stripe indeed as the *clavus* of a tunic. The red weft twining parallel to the *clavus* is also a usual decoration scheme for the chest and upper back of a tunic. The red and green band supports this identification, as it is the decoration of the neck slit. It also tells us that the side where the birds are seen as dark on a light background is the original outer side of the fabric, as the ends of such decorations were usually draped around the neck slit on the outer side.

When we look closely at the birds in the first pattern repeat next to the blue *clavus* in V&A Inv. 304-1891 (Fig. 6), we can again observe the same pattern irregularity as in the Copenhagen and Berlin pieces with the tail feathers of the birds pointing upwards. Other irregularities and the count of passes per weft step also match perfectly, proving that the three pieces once belonged to the same cloth.

### The reassembled garment

The tunic in *taqueté* technique was woven in one piece with a woven-in neck slit. This is a common feature of



5. Fragment with remnants of the blue stripe and birds with upward-pointing tail feathers in the pattern repeat next to it. The piece is shown from the reverse, hence the colour scheme is inversed. In the lower right corner a second layer of textile (later addition) hides the original pattern (Berlin, Museum für Byzantinische Kunst Inv. 11527). Warp is vertical. Photo: Antje Voigt © MBK.



6. Fragment of a tunic with blue *clavus*, red stripes in weft twining, woven-in selvedge for the neck slit and decoration of the neck slit with a green and red band in tabby (London, V&A Inv. 304-1891). Warp is vertical. Photo: Barbara Thomas © taken courtesy of the Victoria and Albert Museum London.

7. Detail of the neck slit-selvedge and decoration of the tunic with blue *clavi* (London, V&A Inv. 304-1891). Warp is vertical. Photo: Barbara Thomas © taken courtesy of the Victoria and Albert Museum London.

Late Roman tunics. From the weaving to the wearing the fabric was turned 90°, so when worn, the birds would be in a perfect upright position. At the shoulder of the tunic the pattern is mirrored, so when folded for wearing, the birds are still in upright position on the back of the tunic. The sides of this sleeveless garment would then have been stitched, leaving openings for the arms at the top. The lower hem of the tunic features fringes in brown and white.

A first reconstruction attempt of a possible tunic in this pattern was sketched by Petra Linscheid in 2016, but thanks to technical analysis and the matching of irregularities it is now possible to say that the many fragments in the museums belong to at least two tunics. We even can place many of the pieces back in their original position in the cloth.

The original tunic with blue *clavi* was in total *circa* 120 cm wide (warp direction). We can so far reconstruct the length (weft direction) to *circa* 200 cm, which finds a parallel in size in a fully preserved wool damask tunic in Riggisberg (Abegg-Stiftung Riggisberg, AS Inv. 4219).

Regarding the bird-patterned *taqueté* tunic with blue stripes, there are currently nine, maybe ten pieces that can be allocated to this garment (Fig. 8). Most interestingly, at least four other pieces of this tunic came to the collections in the years 1890 (Stuttgart, LMW, GT Inv. 4728) and 1891 (Oxford, Ashmolean Museum Inv. 1891.287; London, V&A Inv. 304-1981; Oslo, Nasjonalmuseet Inv. OK 03598).

A further 11 fragments can be assigned to a second tunic which features purple coloured *clavi*. Surely a detailed study of the remaining

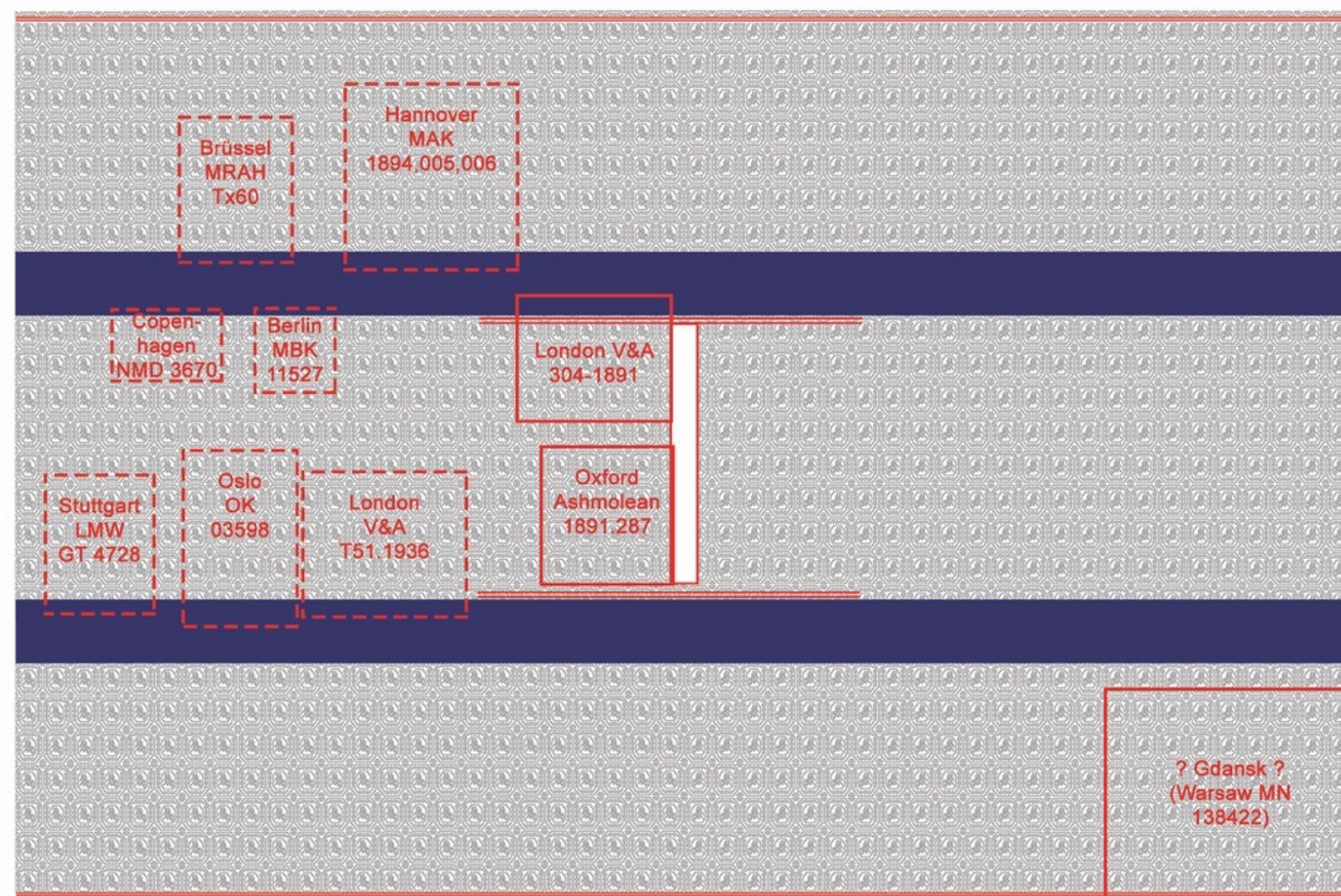
fragments will help to find more matches.

### Conclusion

The detailed study of technique and pattern of the fragment NMD Inv. 3670\_1537 not only led to similar objects, it also helped to identify adjacent pieces from the same cloth and to put them back in their original position in the cloth. Thanks to key fragments, it is possible to reconstruct the original use of the fabric as a tunic with an all-over pattern with birds in octagons, featuring broad blue *clavi*. This garment must truly have been magnificent when worn.

For more on identification of scattered fragments from the same fabric or from similar textiles, see a section about **“Dublicated fabrics” and multiple production of textiles** in the **Introduction**.

**8.** Reconstruction of the *taqueté* tunic with birds in octagons and blue *clavi* as woven in the loom (warp vertical in the picture). Continuous lines: exact position in cloth is known. Dotted lines: position may differ in weft direction  
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