Complex Weavers

Archaeological Textiles Study Group

2020 Contributions

Tx.2008 – Coptic Taqueté

Introduction

This paper is about my obsession with a taqueté fragment preserved in a museum in Belgium.

Figure 1 Coptic taqueté fragment, AD 500-700, ACO.Tx.2008 Musées royaux d'art et d'histoire[1]

This woven Coptic fragment, which is hundreds of years old and yet looks so contemporary, comes from a textile probably woven by someone like me, someone practicing weaving as home craft and looking for a way to accessorize her living room.

About taqueté

The story of taqueté goes back to the Roman Empire. Pliny the Elder himself had something to say about it. It is thought that taqueté was invented by tapestry weavers looking for a faster way to produce weft-faced fabric, the speed of weaving mechanically selvedge to selvedge trumping design flexibility.

Taqueté is a weft-faced textile woven with two or more wefts of different colour. Taqueté goes by many names. Pliny the Elder called it polymita and beginner weavers erroneously refer to it as

summer and winter without tabby. Purists use the term weft-faced compound tabby. Yet others call it weft-faced summer and winter, weft-backed plain weave, 2-block tied double weave, polychrome summer-and-winter weft-faced weave, or two-tie unit with four-end blocks. Atwater coined the term stuffer rug or two-warp weaving and Tidball changed that to double-faced stuffer weave or warp stuffer system. To Scandinavian weavers it is known as double-binding and to Persian rug weavers Zilu.

The earliest example of taqueté in existence in the world, a wool sample found in Masada, dates from the 1st century BC (Vogelsang-Eastwood, 2018; Pritchard, 2014; Verhecken-Lammens, 2007). A silk dress dated 1st century AD was found in Marseilles (Wild, 1987). Taqueté, born in the Middle East, perhaps in response to the warp-faced silk textiles coming from China, eventually became adopted in China itself and beyond. Today, taqueté is used mostly for rug weaving and lends itself to shaft-switching and pick-up techniques.

Taqueté structure

Technically, taqueté is "weft-faced compound tabby". It is threaded like summer and winter and woven on opposites with two contrasting colours on the same threading as summer and winter but unlike summer and winter it does not have a ground cloth. Inside of thinking of taqueté as summer and winter, it is best to think of taqueté as a weft-faced block weave that uses two warps and at least two wefts contrasting in value. One warp acts as the binding warp and the other warp creates the pattern. The binding warp weaves tabby. The pattern warp controls what weft colour appears on the surface of the fabric in a given block (the other weft appearing on the back of the cloth). The pattern warp does not show at all; it is an "inner" warp that does not interlace with the weft. When woven with two wefts, taqueté is completely reversible. Unlike summer and winter which has a tabby weft

and a supplementary weft, both wefts in taqueté are required to give the fabric its structure. These wefts are complementary.

Block A is threaded 1323 and Block B is threaded 1424. Four picks are required for each unit, that is, four picks are required to weave a solid multi-coloured line on both sides of the fabric:

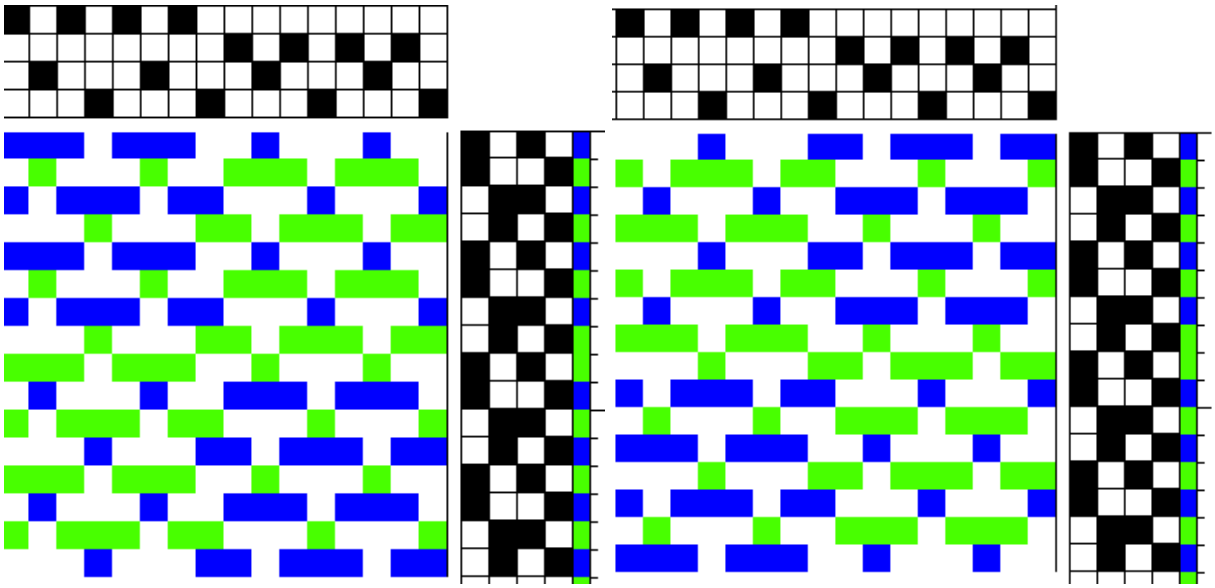


Figure 2 Taqueté draft (front and back)

The ratio of binding warp ends to pattern warp ends in the recovered Coptic textile fragments is usually 1 to 1. However, a few fragments have a 1:2 ratio (1 binding warp end to 2 pattern warp ends). These paired warp threads work together and act as a single thread. They behave exactly the same way as the four warp threads in Atwater's stuffer rugs. Some samples have been found where the proportion of pattern warp threads to binding warp threads varies within the cloth (Verhecken-Lammens, 2007).

The origin of taqueté

The theory is that the development of weft-faced Coptic taquetés was informed by the warp-faced silk fabric making its way from China to Egypt along the Silk Road. Since silk yarn was not yet readily available in Egypt, the local weavers in the 3rd century AD turned the draft as it were and used their

woolen yarn instead of silk. Therefore, the "turned" taqueté so popular today would in fact be the ancestor of the "real" taqueté. Later (7th to 10th centuries), Chinese weavers developed their own form of taqueté.

Egyptian explorations at the turn of the 20th century unearthed thousands of scraps, mostly wool, in rubbish heaps and cemeteries. Of those thousands of fragments, only a fraction is woven in taqueté. Moreover, simple textiles such as the Tx.2008 fragment are in fact rare. Most of the recovered taqueté textiles are highly decorated with plant motifs (e.g., palmettes), animals (e.g., lions), human figures, and geometric patterns such as rosettes, octagons and eight-pointed stars and would have been woven by highly skilled artisans toiling in the specialized weaving workshops of Alexandria and other such cities.

Uses in Coptic times

In Coptic times, taqueté fabrics were used mostly for mattress covers, cushions covers, and coverlets. These were not refined textiles: Chris Verhecken-Lammens (2007) refers to the Tx.2008 checked fragment as a heavy textile with thick warps. This fits the function of a mattress cover. One of the largest Coptic taqueté textiles to make its way to us (238.6 cm × 132.7 cm) is preserved in the Textile Museum in Washington DC. This highly decorated textile was probably a coverlet but could also have been a wall hanging. Cushion covers woven in taqueté were found in the graves of Antinoë. We know they were cushion covers because they were found under the heads of bodies buried in the cemetery and were still filled with feathers. The fact that one side of many Coptic taquetés is worn more than the other provides another clue that many of these textiles were used as covers.

Coptic taqueté looms

The looms required to weave taqueté are not complicated. And yet there is considerable debate on the type of loom that was used to weave taqueté during Coptic times. It is certain that some sort of

mechanization was employed but was the loom a foot-powered horizontal loom with treadles? A horizontal loom with heddle rods? A draw loom similar to the Akhmim loom still in used today? Or something similar to the vertical Zilu loom of Iran?

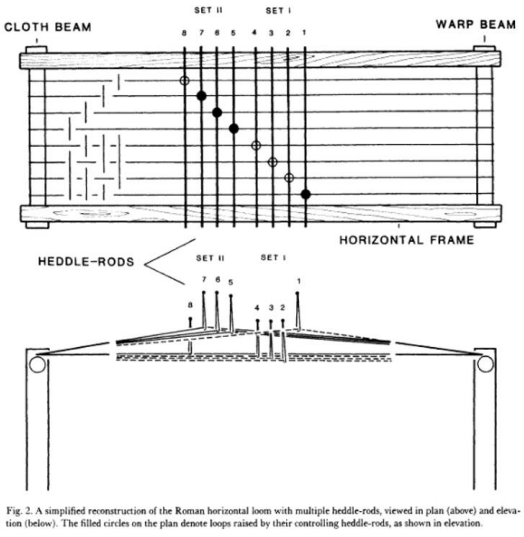


Fig. 2. A simplified reconstruction of the Roman horizontal loom with multiple heddle-rods, viewed in plan (above) and elevation (below). The filled circles on the plan denote loops raised by their controlling heddle-rods, as shown in elevation.

Figure 3 Roman horizontal loom (Wild, 1987)

Figure 4 Zilu loom (Saladrigas, 2015)

Tx.2008 description

The Brussels taqueté fragment Tx.2008 is 13.5 cm long by 12 cm wide. It features blue and green checks separated by red bands. The monochrome red bands are also woven in taqueté. The use of monochrome bands is typical of such textiles (Pritchard, 2014). The fragment has been radiocarbon-dated to AD 320–550 (Pritchard, 2014)[2]. The sample has been extensively documented by Chris Verhecken-Lammens (2007) and Daniël De Jonghe (2006). Both authors have even identified threading mistakes. What makes the Tx.2008 fabric so interesting is the mix of Z- and S-spun yarns, the selvedge treatment, and the number of picks per block.

The warp is S-spun brown wool with a sett of 10 ends/cm. The red and green wefts are Z-spun wool and the blue weft S-spun wool. The ppi count is 48 picks/cm (24 picks/cm per colour). The large checks are three times the size of the small ones.

The Tx.2008 fragment was donated to the Musées royaux d'art et d'histoire in 1887 by one Isabelle Errara [3], a Belgian art historian specializing in textiles. Fragments from what appears to be the same fabric are preserved in museums in Paris and New York City (Verhecken-Lammens, 2007). Also, by all appearances, V&A sample T899-1886 (Figure 5) belongs to the same fabric or a very similar one. This fragment of mattress or cushion cover was found at Akhmim and is dated 4th-7th century. The V&A notes that "the design and two-tone effect of this piece is in imitation of contemporary silks".

Figure 5 Taqueté sample V&A T899-1886[4]

Yarn twist

Unlike most taqueté samples, the Tx.2008 fragment features a mix of Z-spun and S-spun yarns. Most Coptic taquetés are made of 100% S-spun yarns (an indication that they were woven in Egypt), some are made of 100% Z-spun yarns, and very few contain both (Verhecken-Lammens, 2007).

Selvedge

The last three warp ends of the Tx.2008 fragment are doubled at the selvedge. Only one weft interlaces with the last two warp doubled threads. The other weft wraps around the third double warp

end. Moreover, the blocks in the selvedge are not aligned with the blocks in the body of the fabric. This suggests that the selvedge was manipulated by hand and not formed by the shafts.

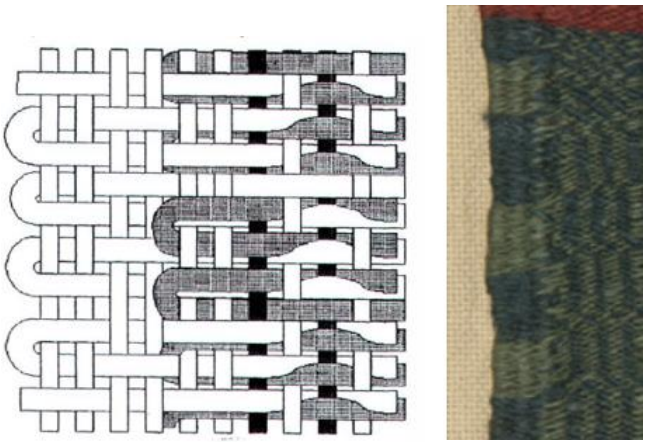


Figure 6 Selvedges of the Tx.2008 sample[5]

Block changes

The most interesting peculiarity of this fragment is that the number of picks per block is not a multiple of four. In fact, the blocks have an odd numbers of picks. The narrow blocks have 7 picks and the square ones 43 picks instead of 8 and 44 (De Jonghe, 2006; Verhecken-Lammens, 2007). The thinking is that skipping the last pick makes the weaving easier: the pattern shed remains open for the colour change. Compare Figure 2 to Figure 7. In Figure 7, shafts 2 and 3 should have been lifted for the seventh pick. Instead, shafts 2 and 4 are up: the pattern shaft 4 remains lifted and the tabby shaft changes. There is no eighth pick. The end result is that there is need to alter the colour order. De Jonghe argues that this intentional treadling "error" is a proof that this textile was woven on an horizontal loom equipped with heddle rods and operated by two weavers: one creating the sheds (and therefore in charge of the design) and one throwing the shuttles back and forth.

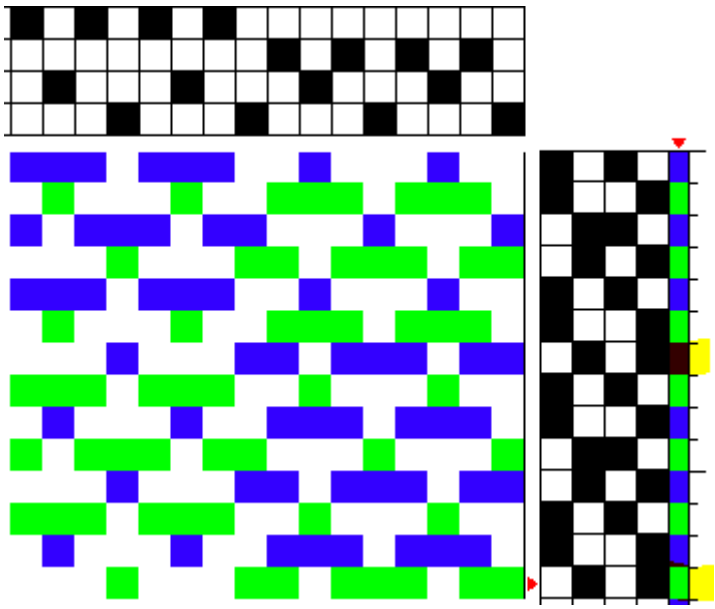


Figure 7 Threading Tx.2008

Related fragments

Other fragments featuring geometric designs are shown in Figure 8. According to De Jonghe's analysis, samples A, B, and C all have an odd number of picks per block.

A

V&A T-192-1976[6]. Multi-coloured fragment found in Egypt and dated 300-699. White warp with blue, red, and greenish yellow weft. S-spun warp at 10 ends/cm and Z-spun weft at 40 pick/cm. (Pritchard, 2014; Becker, 2009; Crowfoot, 1933; De Jonghe, 2006)

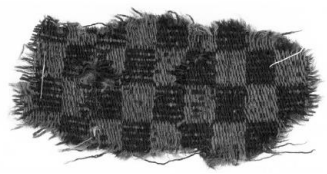
B

V&A T.239-1923[7]. Small checks found in Qar/Badari Egypt and dated 300-699. Excavation associated with William Flinders Petrie. (Pritchard, 2014; Becker, 2009)

C

New Zealand Te Papa Museum[8]. Alternating blue and white squares and blocks of different sizes with red, white and blue bands. 200-500; Egypt FE001731/13. Gift of the Egypt Exploration Fund, 1914. (De Jonghe, 2006; Pritchard, 2014)

D



Karanis 24–5016A[9], Kelsey Museum of Archaeology. Found with coins dated AD 277–450. Yellow and green wefts with wool warp. Squares are about ¾ inch. (Thomas, 2007; Pritchard, 2014)

Figure 8 Checked taquetés

Tx.2008 recreation

I attempted to recreate the Tx.2008 fragment but was not entirely a successful: weaving taqueté requires patience and practice. For the sample below, I used 10/2 mercerized cotton (4,200 yards/lb) for the warp at a sett of 14 epi and Blue Mountain 8/2 wool (2,100 yards/lb) at 45 ppi per color for the weft. In retrospect, I should have opened the sett a little bit and used a gentler beat.

Figure 9 Recreation of the Tx.2008 fragment

I can safely say that there is no rug weaving in my future but I do want to explore designing wall hangings in taqueté with fine threads.

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Planning a Recreation:
Weaving a Siksälä Shawl

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2020 Contribution

In February 2020, I settled on researching and weaving a reproduction of an ornate Estonian shawl from the late Iron Age and medieval cemetery at Siksälä, in southeastern Estonia near both Latvia and Russia (Valk and Laul, 2014; Valk et al., 2014). These shawls date mostly from the 13-14th centuries, and are tremendous feats of textile construction. Although the body of the shawl is plain blue wool twill, they are ornamented with woven-in metal decorations, and have colorful patterned tablet-woven borders, polychrome fringe, edgings of metal spirals: wonderfully complex productions. The abundant metal bits have acted to preserve the textile during centuries buried, so more complete and better-preserved examples are available than of many early Northern European textiles. The two-volume set of books on Siksälä cited above contains many photos to work from.

I started planning and organizing, and ordered the singles wool yarn for both the body of the shawl and the patterned borders. However, 2020 being as it was, before I even received the yarn I had to convert my weaving studio into a home office, and have managed to actually complete very little of the planned research and weaving. Instead, this will be a two-part contribution, with the 2020 paper here describing how I plan a major project, and the hopeful 2021 paper describing the result of this planning.

What is my starting point?

Something inspired this project. What is it? Is it someone else's recreation? A painting? A photo of an artifact? A painting? A museum trip? A mention in a book? All of these are great inspirations, but some give you more to work from than others.

Example: My original inspiration was this recreation of a metal-decorated Latvian shawl, from Zeire (2017).

The originals, which span the 11th-14th centuries, were even more complex. Look at these edges (Valk et al., 2014)! This is like catnip to me, and I've been thinking about researching and recreating one for several years.

What is my goal?

There are lots of reasons to make something. This worksheet is for those who want to use “making something” as a starting point for research.

Pro tip: It’s a whole lot more effective to do the research before you make something, rather than after.

Pro tip: It is absolutely okay to make something for the sheer joy of making it. Not everything must be researched exhaustively (or so I’ve heard).

Example: My goal for this project was to: a. Understand as much as I could about the original shawls, and b. Make the fanciest, most complicated version I could find.

What do I already know?

Often you have some context for the thing you want to make: you’ve made something similar, you’ve read a related book, or tried some of the techniques. That gives you something to build on, but beware of assuming that what you already know of other pieces is “of course” true of this piece.

Example: I know a lot about Northern European weaving and textiles, but very little about these Baltic shawls, and almost nothing about the metalwork.

What do other people know?

Now we get into the research. It’s important to try to figure out some things before you start to make an item. It can save a lot of pain later. (What do you mean I used entirely the wrong yarn?)

Collecting what other people have figured out is a good place to start. Searching the internet can give a great overview, but eventually you are going to want some academic sources. Academic publishing is complicated, and books and articles are often very expensive. There are ways around some of these barriers. Don’t be afraid to talk to librarians, including Special Collections librarians. Your local library may be a good starting point, and your state library may also have services available to residents.

- https://scholar.google.com - start here for searching academic literature.
- https://www.researchgate.net - more academic in focus, but also many uploaded papers. Indexed by Google Scholar.
- https://www.academia.edu - you need an account, but many scholars are uploading papers there, including independent and SCA authors. It's also a good place to share your own work.
- https://archive.org - scanned out-of-copyright books, including some archaeological works.
- Individual journal and society websites.
- http://www.archaeologicaltextiles.net/ - collects textile museum and society links; see Resources section.
- https://books.google.com - this is a good one! Google Books only provides full-text for out-of-copyright sources, but it allows you to search many other books. It's a great way to find out which books cover your subject. Often there is "snippet view," which allows you to see enough to decide if you want to look for the full book.
- Interlibrary loan.
- Friends, email lists, FB groups, etc.
- http://jurn.org - specialized google index for open access humanities, social sciences, science sources
- https://www.worldcat.org - useful to find libraries that have particular books
- https://unpaywall.org/products/extension - browser extension that finds legitimately available copies of articles.
- https://www.jstor.org - Currently has a COVID increase in accessibility.
- https://doaj.org - Directory of open access journals

Pro tip: neither random websites nor articles by academic authors are guaranteed to be correct.

Example: I don't read any Baltic languages, but there are archaeological site reports from Siksälä (Valk and Laul 2014; Valk et al. 2014). These gave me both a starting point and a focus: recreate a shawl based on finds from this Estonian cemetery.

Additional research tip: Book darts! (https://www.bookdarts.com) These let you mark pages and even specific lines in books, will not fall out, and will not leave a residue like post-its do.

What are the components of the project?

A “component” is any portion of the item or process that needs to be considered independently. Some projects are reasonably straightforward, and only have one component, but most have a few (or many) parts.

For each:

- What are the materials?
- What are the tools?
- What are the techniques?

How were the components combined?

Example: Shawl components include:

- Fabric
- Metal decoration
- Spirals
- Fringe
- Tablet-woven edges

Were the edges woven in or sewn on? Both approaches exist in archaeological material, and both historical precedent and my choice of materials and equipment may influence my decision, especially if I can’t figure out from the images what was actually done.

What can I figure out?

One of the things I enjoy the most is finding a photo of the thing and really digging into it, to find out everything I can about the item. (But why do they never provide photos of the BACK?) Sometimes diagrams of other analyses exist; sometimes you can make your own analysis; sometimes you have to guess. (And not all published diagrams are necessarily correct.)

ImageJ (https://imagej.nih.gov/ij/index.html) is a useful tool for extracting size information from photos. If there's a scale bar, you can get absolute sizes, but even without that you can get relative sizes (this thing is 0.7 times as wide as it is long, for instance).

Example: I used ImageJ to get estimates of the length and width of the metal ornaments, of the length, diameter, and wire size of the spirals, and of the number of threads per cm in warp and weft. This video (https://youtu.be/7wFSDPfMZ-Q) shows a brief demo of extracting information about the spirals in this image (from Valk et al., 2014).

What are my constraints?

- External: some things may be unavailable, or unaffordable.
- Internal: some things may be unachievable, or uninteresting.

Example: My constraints for the shawl were determined by a desire to actually finish, and lack of interest in learning how to do particular steps.

- Not spinning or dyeing my own yarn. (Time)

- Using a floor loom instead of a warp-weighted loom (Time, space, equipment)
- Not cutting my own strips or drawing my own wire (Time, interest)

What do I need to acquire?

- Tools
- Materials

Example: Given that I wanted to purchase yarn, and given the measurements of ends per cm in warp and weft that I made on the images as described above, what commercial yarn would be most suitable, and what colors would best match my experience with natural dyes used in northern Europe during this time period? After some time wandering the internet, I settled on 6/1 wool singles, the Fårö line, which I purchased from Vavstuga (https://store.vavstuga.com/product/yarn-borg-woo-faro.html).

What do I need to learn?

What skills do I already have? What do I need to learn?

Example: I'm a good tablet weaver and I can weave twill on a floor loom. I needed to figure out how best to make the metal decorations work using the supplies and equipment I have available.

Experiment, experiment, experiment.

After working through as much as I can learn and figure out from written sources, it's time to begin. On a project of this size and complexity, clearly I needed to sample first. Not only to ensure that my sett was correct for the yarn and exemplar, but to see if sizing improved the weaving (and if so, whether flaxseed or gelatin was better), and to figure out how best to shape and insert the metal decorations.

The fabric is about right, and the yarn I chose is pleasing to weave with, but I'm not yet happy with the metal inserts. Continued experimentation is needed. My attempts at making the spirals were more successful, but it will take me a long time to produce enough for the finish I desire.

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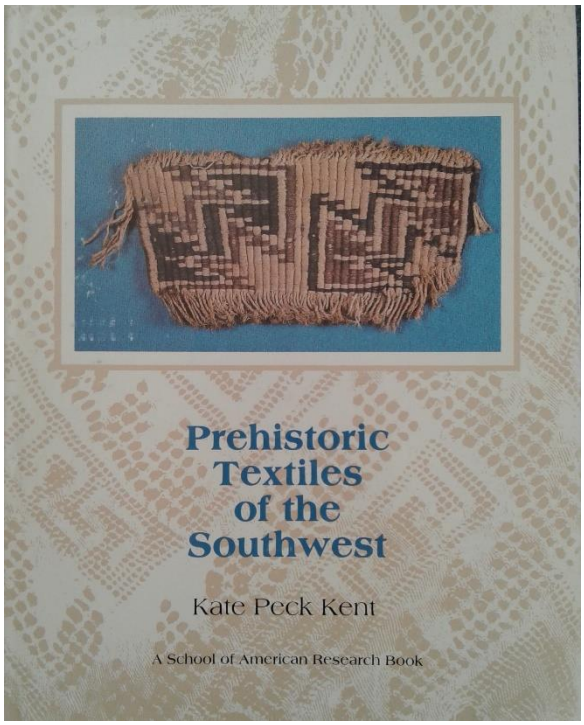
Treasures in the Desert:
The exploration of textiles in the American Southwest

A review of *Prehistoric Textiles of the Southwest* by Kate Peck Kent New Mexico: School of American Research Press, 1983

Lin Bentley Keeling
Contribution to Complex Weavers Archaeological Textiles Studies Group
January 2021 (contribution for 2020)



What we now call the American Southwest, which encompasses the states of Arizona, New Mexico, Colorado, Utah and parts of Nevada and Texas, was once home to vibrant, sophisticated societies with rich fiber traditions that also encompassed the northern frontiers of Mexico for more than a thousand years, between 300 BC and AD 1400, before the arrival of the Spanish and other Europeans around AD 1500. In her groundbreaking text, *Prehistoric Textiles of the Southwest*, Kate Peck Kent has cataloged and analyzed approximately 3000 examples of textiles found in museum collections and other institutions and described in published archaeological reports (xix) representing the wealth of weaving in this region, home to four major cultural traditions, the Hohokam, Mogollon, Anasazi[i] and Casas Grandes, as well as the Sinagua and Sinaloa. Peck's research covered materials found in 182 archaeological sites in this region, shown on maps, pages 4 and 6, and her text is illustrated by 161 figures (photographs of the artifacts, drawings of their designs and cloth construction, and proposed heddle configurations for loom woven artifacts) and 18 color plates of the more spectacular textile examples.

Peck begins by discussing the contexts in which the textile artifacts were found, their geographic distribution, the analytical techniques she brought to the study, including ethnographic comparisons, examination of other fiber artifacts and studies of textile representations in murals, and a brief discussion of what has been lost because of careless excavation and the fragility of textiles in comparison with pottery, stone, and architectural features. In chapter 2, Kent discusses the yarns and dyes used in the textiles she examined. Both bast and leaf fibers were used including yucca and agave leaves and to a lesser extent, sotol and bear grass. Bast fibers found included

milkweed and dogbane (also known as apocynum). Fur and feather yarns are also discussed as yarns from animal hair from dogs, wool from bighorn sheep, and human hair, and the introduction of cotton to the region. Spinning and other processing techniques are covered and an extensive discussion of the use of color in the prehistoric Southwest follows, beginning with the use of color in non-cotton yarns followed by an examination of the use of eight distinct colors found in roughly one quarter of the two thousand examples of cotton fabrics (39) covered in her text.

Chapters 3 and 4 examine number of nonloom textiles and their production, geographic distribution, and occurrences through time, including looping, knotted looping, netting, braiding and plaiting, and a discussion of whether sprang existed in the prehistoric Southwest. Articles created using these techniques with a single element are discussed in chapter 3 include looped bags and sacks from yucca and cotton yarns, shoe-socks, belts and sashes, carrying and hunting nets and an interlinked cotton shirt (figure 34, page 71). Two element, warp-weave woven articles created without the use of a loom follow in chapter 4 including narrow bands used on cradle boards, fringed aprons, tumplines and sashes. Weft-twined wide fabric bags, fur and feather robes and blankets are also discussed.

Chapter 5 covers cotton loom-woven fabrics, dated between AD 1000 and 1400 after the introduction of cotton to the region. Kent begins the chapter by discussing the three types of looms utilized in the region, vertical, back-strap and horizontal, staked-out, along with other weaving implements based on indirect and ethnographic evidence. She then discusses fabrics within five categories: plain weave; openwork weaves; float weaves; compound weaves and fabrics with decorative elements applied after weaving, postulating heddle rigs for a number of the examples along with diagrams of the woven cloth illustrating its structure. Of the cotton woven artifacts examined by Kent, 85 percent are white, undecorated plain weave (125,128). This still leaves us with many tantalizing examples to study and attempt to replicate.

There is an "eccentric plain weave" fragment (134-35; figure 67) which measures only ca. 4 cm. square, a white cloth from Tonto National Monument created by alternating picks of tabby with twining. There are color-and-weave effect plain weaves including checks and plaids and an example of log-cabin color patterning (130-31, Figure C2). Weft-wrap openwork in which lace-like pattern is created in sophisticated and complex patterning and gauze weave (what we would call leno weave) (143-53; figures 76-86) follow.

Weft-float and warp-float pattern weaves, creating by interspersing plain weave picks with float picks, are discussed early in the next section of chapter 5, followed by a discussion of weft-dominant and weft-faced twill weaves. Kent separates the twills, discussed on pages 155-175, into regular and irregular examples, including four examples of irregular twills with continuous wefts (162) and ten examples of irregular twill tapestry[ii] (166-67). The distinction she makes here are that irregular twills are created by "purposely breaking the regular heddle order, or by shifting from twill to plain weave within a single pick of weft (162). She returns to the discussion of weft-float patterning in the section on compound weaves (175-182), including examples of plain weave with extra-weft float patterning also known as brocade weave in the archaeological literature, and twills with extra-weft float patterning, double- or two-faced twills and warp-float weaves. These are

followed by a section on applied decorative techniques (183-98) including embroidery, couching, stamping, tie-dyeing, and painting.

Chapter 6 analyzes the different styles of textile design using comparative studies of basketry and mural depictions of woven textiles in order to place loom woven textiles within the larger context of Southwestern graphic design, separating woven design into two classes: self patterning, created by the weave structure and discrete motifs or geometric elements. She connects both to pre-loom fiber technologies including basketry, matting, weft-twining, and interlacing (201) and discusses the influence textile processes had on Southwestern design (220).

In chapter 7, Kent summarizes the forms and functions of the Southwestern textile examples within her book used as clothing, utilitarian objects and later in ceremonial contexts, and their roles within the different cultural contexts, again using comparative examples from other Southwestern creative traditions. In chapter 8, Kent describes the regional and temporal distributions of the textiles she has been discussing, suggesting the interplay between the cultural groups through the changes, similarities and differences in textile processes and products. This is followed by a detailed appendix which cycles back to the maps in the opening chapter, providing information about the fiber artifacts found at each site, the cultural period(s) and dates for the site and the sources she used to study these artifacts, found in museum collections and other institutions, and written reports. A list of the abbreviations used in the text, figures and appendix for institutions can be found on page xv and a comprehensive bibliography and index complete the book.

Peck limited her studies to artifacts of "flexible or pliable fabric constructed from spun plant or animal fibers by various weaving, looping, netting, plaiting, … or braiding … processes." (7) She did not include basketry artifacts except as technological references when examining structure or design elements. Though I believe it is long past time to eliminate this delineation between basketry and other woven textiles, this book is nonetheless comprehensive in its examination of the textiles as artifacts, the materials and techniques used to create them, their designs, forms and functions and a comparison of the styles which developed within this extensive cultural region over time.

Archaeologists working in the Southwest still do not incorporate textiles into their larger view of cultures and traditions as readily as they do pottery, architecture, and other 'hard' artifacts. Kate Peck Kent's text gives a window into this fascinating arena which we can use as a guide to study the individual textiles as well as their place within their cultural contexts, the ways textiles worked as symbols and texts, their use in ceremonies and rituals and as tradegoods across the region. While this book is necessarily a broad strokes view of prehistoric textiles in the Southwestern United States, Kent provides a wealth of information and many tantalizing glimpses into the world of weaving in this region. The technical skill and artistry of these examples shows the importance of cloth and weaving to the peoples living here before the arrival of Europeans and they provide us with so many avenues for study as contemporary weavers interested in archaeological textiles. I highly recommend Kate Peck Kent's book to the members of this group and to the Complex Weavers community as a rich source for study and inspiration.

[i] In 1983, "Anasazi" was the common name given to the peoples who lived in northern Arizona and New Mexico and southern Utah and Colorado as well as a small area within Nevada. Currently, these peoples are referred to as Ancestral Puebloan. I will continue to use Anasazi within this report to remain consistent with Peck's text.

[ii] In chapters 4 and 5, Kent uses the term 'tapestry' in discussions of discontinuous weft patterned fabrics, and we would more likely use the latter term since the designs of these artifacts in geometric rather than pictorial. However, the use of the term 'tapestry' for any weft-dominant or weft-faced fabric or design whether plain weave or twill seems to be fairly common within archaeological and anthropological literature.

CHIMAYO WEAVING by Helen R. Lucero and Suzanne Baizerman
ISBN 9780826319760 by Linda P. Laffler
2/3/2021

Weaving is an ancient craft, highly valued and vital to human life. Cultures through time have imprinted their norms and values in cloth as a form of expression and for everyday utility. These fabrics of our lives have intricate and deep historic roots, and Chimayo weaving has endured through the centuries by becoming a mix of (Moorish) Middle Eastern, Spanish and (Navaho) Native American cultures.

In 1519 Hernan Cortes landed in Vera Cruz, Mexico, and began the conquest of the Aztec empire. Mexico was subsequently claimed as a Spanish colony. In 1540 Francisco Vasquez de Coronado led an expedition north into New Spain and also claimed that area for Spain. This included what is now the state of New Mexico. It was opened to further exploration and settlement, including weavers among the Spanish settlers, who settled in small colonies in the valleys. In 1610 Santa Fe became the first capital of New Mexico under a Spanish governor, and it has remained the oldest continuously occupied capital city in the U.S. American Indian trade routes provided sales opportunities for Hispanic weavers and missions (built by the Catholic church to convert heathen native peoples.) Supply caravans in 1631 included local hand woven Chimayo blankets and cloth. The authors cite a 1638 trade invoice listing a treadle loom and textiles exported to Mexico. Thus began the Hispanic weaving tradition in the southwestern United States. Influenced by nearly 800 years of invasion by Moors and Islamic Arabs, exclusive access to fine Spanish merino wool, and demand for Judeo-Christian religious garments and fabrics, the Hispanic weavers had a rich history of design and utility to draw on when making goods to market in the new world. Cloth was a vital staple and had an ongoing demand because otherwise it had to be brought from Europe or the Far East.

According to Wikipedia, Chimayo is a census designated place in Rio Arriba and Santa Fe counties, New Mexico. The name is derived from a Tewa Indian name for the hill of Tsi Mayoh, one of four hills sacred to the Pueblo. Elevation is over 6000 feet, where the climate is more temperate. Chimayo was a village in New Spain in 1598 where the Pueblo Indians had a pueblo structure and camp, cultivated food and medicines, and did weaving and pottery for community needs. There was easy access to established trade routes. Today the ruins of neighboring Quarai, NM, mark some of the Native American area ravaged by famine and epidemics inflicted on the Indians before they revolted. Spanish settlers imposed an imperialistic domination on Native Americans.

One form of Spanish control, the authors explain, was enslaving natives, including Spanish colonial weavers, to prohibit free trade. Caught in a “Repartimiento” system, they were compelled to pay tribute to their Spanish conquerors. Payments consisted of a valued garment which was woven for that purpose: a Manta, which was a white cotton rectangular cloth wrapped around the shoulders. Manta cloths were woven on upright fixed tension looms and on wooden treadle looms, whose design had come from Spain.

In 1680 the Pueblo Indians revolted, ending Spanish domination, according to Wikipedia. A 9/27/2020 New York Times article by Simon Romero states that the 1680 Pueblo uprising handed Spain one of its bloodiest defeats anywhere in its vast colonial empire. Romero refers to long simmering tension between Native Americans and Hispanics over Spain's conquest of New Mexico. Two statues of despotic conquistador Juan de Onate, a 16th century governor, were recently removed in Albuquerque due to their historical infamy. After the revolt captive Native American children became weavers. The 1600s were an era of misery for weavers, who made valued cloth but were themselves considered a lower class.

Spanish colonists thrived and the 1700s saw recolonization. Sheep ranches grew large and wool became plentiful due to commercial demand for their products in a growing population. Spanish weavers produced utilitarian products such as blankets which were woven from local wool colored by natural dyes, in two long strips, on narrow looms, then sewn together. The blankets could augment their farming income by weaving in the winter. The Ortega website says that along with other necessities, weavers even made mattresses.

The Navaho are skilled weavers who have woven forever. They create dense, water tight, originally striped, rectangular wool blankets of various sizes that have always been highly prized by the rest of the world. Chimayo weavers copied the Navaho designs but never achieved the level of weaving quality. Chimayo weaving was by necessity economic and opportunistic, while Navaho weaving is deeply cultural and integral to their lives.

Saltillo designs, intricate colorful stripes of various widths and geometric designs, influenced by the Moors and indigenous weaving, were popular. Named for Mexico City but actually woven in New Mexico, fine tapestry serapes were made by the most skilled weavers, from 1830. As weaving spread and changed, Saltillo designs became details in later weavings, less elegant, but with markets expanding to meet demand, production had to become faster and easier. Saltillo was an ornate Chimayo style featured in serapes and blankets.

New Mexico government officially encouraged weaving as a form of income in the 1800s. The Bazan brothers introduced cotton into traditionally all wool blankets, used new ikat dyes, tapestry patterns, and home workshops. Chimayo weavers embraced efficiency and innovation to increase production and sales. Serapes and frazadas became main trade items in all geographic directions. When in 1848 New Mexico was annexed by the United States, trade changed to fit the capitalism of the new country instead of the rigid Spanish structure.

Hispanos supplied blankets to the US government, which were given to Native Americans from 1848 to 1880, probably as part of Reservation agreements. These infamous gift blankets were exploited by unscrupulous traders and government agents, some blankets containing smallpox for genocide. The weaving trade relationships between Hispanics and Native Americans that had existed since the 1600s took an evil turn. Many tribes had to rely on these blankets for winter warmth and utility.

Looms for Hispanic weavers became easier to build and buy as milled lumber was shipped by railroad, also metal for reeds, new dye stuffs and some commercial yarns for weaving, in the 1850s and 1860s. Production was enhanced along with demand, so trade blossomed in the

weaving craft among Chimayo weavers. Crude wooden looms, hand made reeds, natural dyes and handspun wool were things of the past in this rail transportation era. Chimayo weavers had better tools, faster production methods and a growing demand.

Chimayo blankets evolved 1870-1900 due to available commercial yarns and easily manageable dyes. Dyeing wool or cloth is often dangerous due to poisons in the dye materials and can be hazardous or fatal, yet today. Using cotton warp, which is cheaper, easier to manage, and faster as a result, accelerated production, however, the "wool" blankets were not as warm or durable and certainly not water tight like Navaho's. Wool does not burn but cotton does. Chimayo weavers wove Vallero blankets, dazzling colorful pieces made in the mountains south of Taos, according to the authors. Bright colors sold well, and coincided with the Pueblo and Navaho making multi colored fine quality star design blankets that were highly desirable for tourists.

By the 1880s the Pendleton Company manufactured blankets to appeal to the Native American market. Hispanic weavers began making rag rugs, which had cotton warp and pieces of cloth as weft - inexpensive materials, and woven in plain weave with perhaps a tapestry design area - a very economical and useful product. Trading post sellers have long sought to keep prices elevated for Navaho blankets and rugs, to compensate weavers for the slow meticulous labor intensive creation of their products that begin with a sheep. Chimayo weavers focused on rapid production of easily affordable pieces, and branched into clothing and other items. Navaho weaving was very popular and Chimayo weaving evolved to fill gaps in Navaho products, so blanket and clothing designs followed the Navaho originals. Many Chimayo weavings were styled after and even sold as Navaho pieces, cheaply. They became Navaho knock-offs for a valid reason – to boost sales. However, weavers around the world tend to copy designs from others. It is part of the creative process, so Chimayo copies of Navaho designs were not unusual. The Navaho had been shown Middle Eastern designs by trading post sellers probably a generation ago, so their weaving had an expanded awareness of style and design. Mexican weavers also copied the Chimayo. Pendleton Home Collection catalogs today offer Chimayo designs.

Chimayo weavers typically wove smaller pieces on narrow looms standing on foot treadles, now known as Rio Grand looms. They could wind a long cotton warp onto the back beam and weave many small pieces to sell to tourists. Navaho weaving is incredibly labor intensive by comparison. They raise and shear their sheep, clean, comb and card the wool, spin it one or more times to make yarn, color the wool with natural dyes from flowers or vegetation they gathered and stored, then construct their looms from wood found or gathered, warp the loom for a single piece, tightly and systematically weave geometric and free style designs of their own creation, remove the piece from the loom and take it to market. This makes one weaving, which can be any size. Consequently pricing and quality of Navaho weaving reflect weavers' intense and lengthy labor, as the Navaho remain faithful to their traditional weaving technique.

When Navaho weavers switched from making blankets to rugs, due to encouragement from traders in trading posts, that gap was filled by Chimayo weavers. They made blankets loose and soft, from yarns not tightly spun for strength and durability and also less dense in the weave. These soft creations were much cheaper and filled gaps when Navaho blankets were unavailable. But customers complained about the shoddy weavings that could be easily pulled apart.

Chimayo weavers had to develop better quality products and in time they did improve, featuring bright colors and eye catching designs, which varied among individual weavers. Pieces were commissioned through trading posts, J.S. Candalario being one of the popular brokers for Chimayo weavers.

1870-1920 was a period of this change for Hispanic weavers responding to new commercial demand by trading posts which evolved into tourist and curio shops selling higher quality affordable by arriving tourists. New Mexico, like much of the southwest, is geographically unique and breathtaking, featuring landscapes never before seen by Eastern and Midwestern Americans. Trading posts offered food, interesting indigenous goods, guides, and atmosphere for adventure hungry travelers, and they profited accordingly. Gentrification brought curio shops and more luxurious woven goods for sale. Blankets, rugs, clothing and souvenirs acquired color, dazzle, intricate designs and romance for tourists. Chimayo blankets sold well. Also, adjacent Santa Fe had a huge Exposition in 1883, geared to tourists, and the coming Victorian era demanded curiosities for home decoration. Indigenous and exotic weaving became very fashionable.

National industrial growth had an unexpected consequence, however, for the toiling weavers. As whites had greater disposable income and could acquire luxuries, social awareness of wealth grew, and Hispanics and Native Americans fell to the bottom of the social ladder. Under this pretext they were economically vulnerable and lost much of their lands and grazing areas, which were seized by the government or swindled from lawful owners. So while industry flourished, weavers fell on hard times and turned to migratory work for survival. Large sheep ranches raised down breeds for meat instead of wool. Suitable wool for spinning and weaving became scarce.

An agricultural state lacking industry, New Mexico poverty drove weavers to sell primarily to tourists, but a philanthropic group of writers, anthropologists, artists, architects and cultural celebrities formed to develop more socially elevated Hispanic art and crafts in the southwestern area. Anglo artists had been attracted to northern New Mexico and resulting art colonies emerged in nearby Taos and neighboring Santa Fe, spearheading an arts and crafts revival movement championed by acclaimed writers of the era. The Pueblo Pottery Fund was created in 1922 on behalf of the rights of Native Americans, and involved Hispanos. The group sought to establish fine art from indigenous artists. They worked with local employers to further their cause, and became tourist attractions themselves as they sold their books and art work to travelers. In 1925 group leaders and their supporters established the Society for the Revival of Spanish Colonial Arts, and the following year their art and crafts were part of the new Fine Arts Museum located in Santa Fe. They stimulated tourism and developed a national stage for native arts and crafts in Santa Fe that flourishes today. Chimayo weavers, along with other local artists, finally climbed the social ladder in the southwest.

In 1929 the Great Depression took a toll on the national economy, including weavers, but government plans aided Hispanic weavers producing “modern Chimayo blankets”. Vocational schools, community programs and small production shops made blankets to sell to tourists. Hispanic weavers were unable to sell nationally in the finer arts market because their materials were commercial yarns and dyes, considered inferior quality. Their thrifty materials kept their

products at a lower aesthetic level. So they developed other household and apparel products: ties, vests, coats, jackets, home furnishings, etc.

By 1930 automobiles allowed easy access to Chimayo weavers' home shops and their individual businesses expanded. Formerly, horseback was the only mode of transportation to reach the outlying small weaving communities in northern New Mexico.

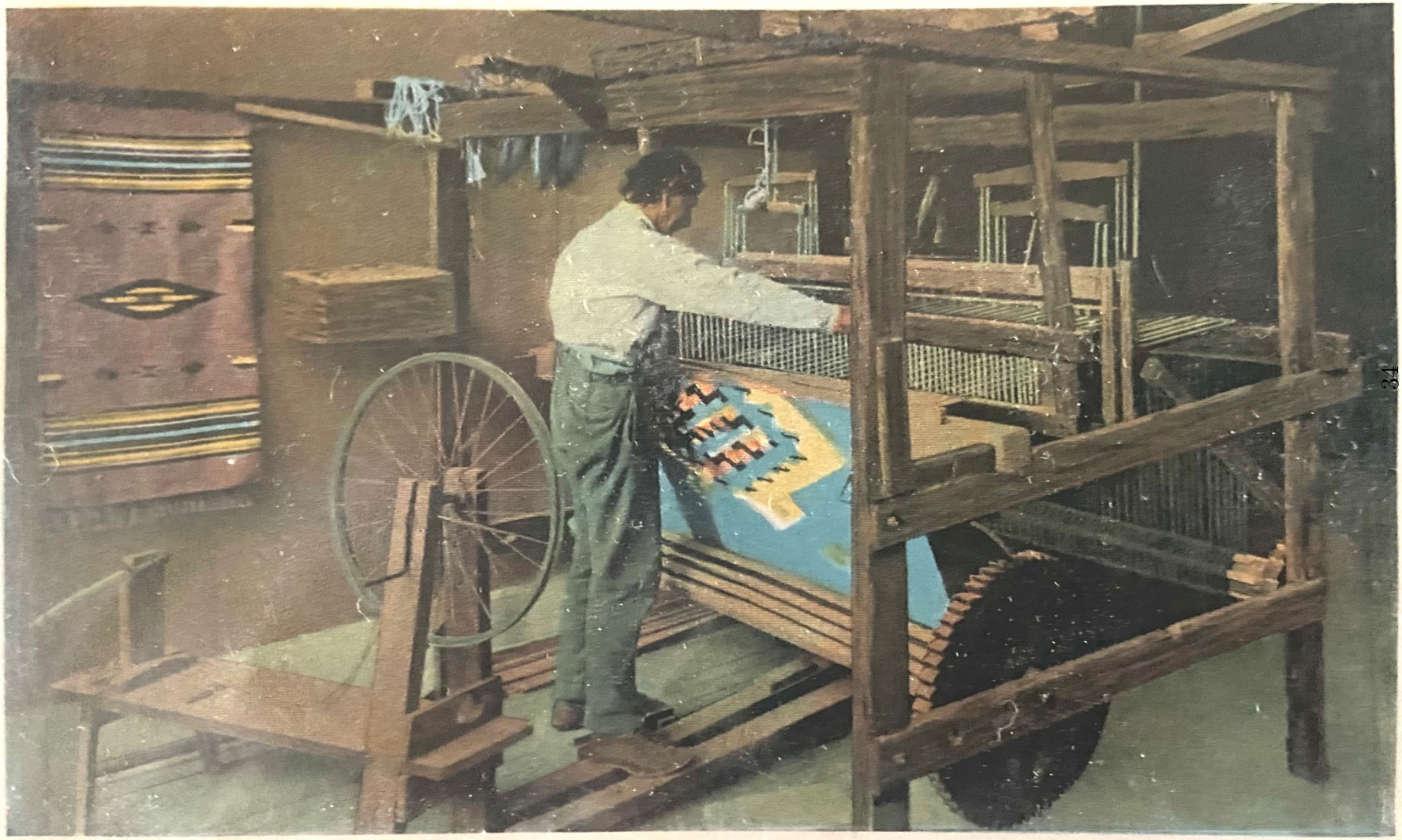
With World War II Hispanic weavers' numbers declined in New Mexico due to military enlistment and war casualties. Development of Los Alamos followed the war. Government subsidies became the new economic face in New Mexico, changing the population mix and culture. Weavers declined until the 50's and 60's when arts movements became interested in native goods again. Museums grew popular, and women in greater numbers became weavers of blankets to supply shops. Long standing weaving families of Hispanic origin grew more prominent and many have continued their businesses through generations, now advertising and selling via their web sites. Traditionally most weavers were affiliated with dealers who paid them by the piece, according to size and complexity of design. Today customers can place specific design and color orders online to order woven pieces from the weaving families.

Federal programs continued to aid weavers, providing means for young people to learn the craft. In 1965 the HELP program focused on teaching young weavers all the facets of weaving, important steps to become skilled in the craft.

For the rest of the 20th century acclaimed Chimayo weavers in New Mexico have received recognition and acclaim in newspapers, magazine articles and have exhibited in shows internationally. They continue to be advocates for Hispanic arts and culture, carrying forward tradition from their families and communities who struggled for hundreds of years to preserve their heritage and economic livelihood. Contemporary prominent Chimayo weaving families include the Ortega, Trujillo and Martinez, as well as individuals. Their weaving is stylized and is very beautiful. The book gives an in-depth account of their accomplishments and weaving lifestyles. The Ortega and Trujillo family weavers have websites in addition to shops in the Chimayo area. They continue to weave on looms they inherited, which have woven countless yards of fabric.

Finally, the authors explain the technology of this weaving structure in fine detail: historic loom construction, wool and yarn treatments, designs layouts, tapestry weaving instructions, and individual weaving styles. Chimayo weaving structures include plain weave and tapestry techniques.

This article is both a loose summary as book review and a commentary on the survival methods of a cohesive immigrant group of weavers. Heirs to a rich historic Spanish textile culture, they were able to geographically spread their trade and maintain it for centuries in a new world. Ancient cultures tended to live and market their trade goods nomadically on one continent. Although they initially capitalized on Indian markets in New Mexico, Chimayo weavers have endured tremendous social change and in the process built fine products that are luxuries today. Darwin was correct – the strong survive.



2264 A CHIMAYO WEAVER AT HIS LOOM

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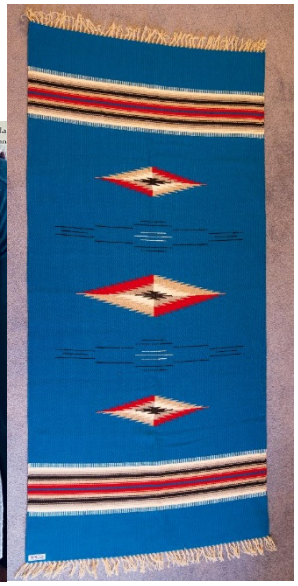

The gray Chimayo blanket is from 1960s, very fine and tightly woven. White runner and Ortega vest date from the 1970s, and the thicker wool Ortega purple blanket is from 1980s. Aqua runner is also from Ortega, purchased online 2013. The large pieces show classic Chimayo design: stripes at both ends with a center tapestry motif, all wool. The black/white striped is a Mexican copy of Chimayo. Photos are courtesy of S. White, A. Boerup and T. Laffler. Thanks to Estela Klink for background chronology of weavings information.

Experimental Archaeology: Complex Weavers
Archaeological Textiles Study Group Project, January 2021
Sue Walsh, Portland OR

Introduction and Inspiration:

Nancy Arthur Hoskins gave a presentation on ancient Egyptian textiles, "Ephemeral Textiles," to the Portland Handweavers Guild in May 2019. Her hypothesis is that the fitted pattern dress worn by goddess was most likely woven, not beaded, as suggested by some Egyptologists. The dress is essentially a shift or sheath dress from just below the bust (or about where a bra band would be, exposing the breast) to the ankle. The dress has shoulder straps set at slight angles and appears to have little wearing ease.

Figure 1. Isis and Nefertari, mural from the tomb of Nefertari, New Kingdom (mural), Egyptian 19th Dynasty.

Nancy Hoskins had not woven the dress but, to support her theory that these were woven textiles, she had woven samples of many of the designs associated with these dresses which are seen in murals in Egyptian tombs. I decided to try to weave the dress for my 2020 Complex Weavers Archaeological Textiles Study Group project using her specifications, her book on weft-faced pattern weaving, and several of her articles in *Complex Weavers Journal*. I am very appreciative of her help and support in this effort.

Project Goal:

A garment for an ancient Egyptian might be about a petite size 2, or to fit a female about 5' tall with hips and bust of about 32-33". I opted for two panels to be seamed up the sides, and additional warp to weave the straps sideways.

Materials and Project Set-up:

Warp: 40/2 linen, doubled; threaded as a five-shaft point twill
Weft: 20/2 wool (Mora), tripled in red, yellow, and blue
Total Ends: 282 working ends (564 total ends) plus floating selvedges
Sett: 8epi, 1 working end per dent (2 ends) in an 8-dent reed
Width in Reed: 35.25"; Warp Length: 4yds (3yds for dress plus 1yd waste)

Weaving:

The header was woven as plain weave with the doubled 40/2 linen. The main cloth was woven as a "five-picks-equals-one-pass" multi-color weft-faced cloth as described in (1). Red was the dominant color, with yellow and blue being secondary colors.

Finishing and Construction:

1. Each panel was cut from the loom and the warp ends were tied off with half-Damascus knots and the ends threaded through the weft "tunnels" with a tapestry needle to secure and protect the wefts.
2. Next, the two panels were steamed and allowed to completely dry on a flat surface.
3. The panels were abutted and seamed at the selvedges with the 40/2 linen thrums.
4. The straps were similarly finished with half-Damascus knots and the warp ends pulled through the weft "tunnels" and then steamed and allowed to dry flat. Each was sewn onto the top edges of the dress at a slight angle as seen in the pictures of the ancient paintings.
5. Stress points were reinforced with a couple of whip stitches. Once the dress was completely sewn together, the entire piece was steam pressed again.

Lessons Learned and Ideas for Future Work:

1. The proportions of the breast and ankle bands to the body diamond motif seemed about right based on the picture of ancient painting of Nefertiri and Hathor. However, the straps could have been slightly wider.
2. Initially, I expected to finish the tops and bottoms of the panels and straps with hems woven in plain weave linen. But after noting the huge difference in the two weave structures, it became clear that the hems may not lay flat. I'd just finished a krokbragd rug with Damascus knots and burying the warp ends in the weft "tunnels" and thought that the edge created was neat and secure. Also, the long floats on the reverse of the dress fabric appeared to be too loose and fragile to support sewing a hem onto it (See Figure 3). Damascus knots seemed a bit big for this purpose, but the half-Damascus worked fine and was less obvious (See Figure 4).
3. The finished material using wool was quite heavy, but still wearable. I'd really like to see the difference using all linen (although linen tends not to dye well to get the

bright colors of the dress as seen in the murals), or research what other fiber(s) might have been used that could be lighter and/or more flexible.

4. The panels lined up pretty well, with very little variation so that the motifs weren't distorted much along the side seam lines, but there were some places that required more work to coax the designs into alignment (See Figures 5a and 5b). Since the dress is a straight shift, weaving one wide panel with a single seam up the back would simultaneously assure the motifs would line up and eliminate the extra work associated with aligning and sewing two side seams.
5. Although the work was time-consuming, it was actually pretty easy and could be accomplished with rudimentary equipment. One could use a ground or upright loom using pickup for weaving the cloth, and just scissors and a large tapestry needle for hiding the warp ends and sewing the seams. However, I did use a temple to avoid draw-in at the selvedges.
6. Initially, the straps using the same weave structure seemed too heavy. Finishing both sides of such a narrow textile using the half-Damascus knots and "tunneling" technique to bury the warp ends was tedious and made the straps a bit stiffer. As an alternative, I wove a strap sample on a band loom using the same 40/2 linen and 20/2 wool, but the warp peeked through just enough to change the saturated color, and the weight of the final strap was slightly lighter. Another option for further study might be to explore more deeply a warp-faced band weave for the straps to both get a sturdier strap with the strength along the linen warp over the shoulders while also avoiding the extra effort and bulk of finishing the sides of the straps. A "warpier" band could also deepen the color by completely covering the weft. The sample of the band on the loom is in Figure 6.
7. Due to the pandemic, I had no model to try the dress on for fit. However, the finished dimensions – dress internal circumference of about 33" and length from under-bust to ankle of 34" – corresponds roughly to a Ladies' Petite size 2.
8. The dress would have to be pulled over the head or up over the hips. The wearer would benefit from having help to put it on because the fabric is fairly stiff, but a lady of the Egyptian court would have had such assistance. It is unlikely that the dress was as fitted as depicted; to achieve such a form, the wearer would need to be sewn into the garment. It's very possible that line drawings of the figures were drawn first and then the colors and designs of the clothing filled in later.
9. The final weight of the garment is about 3#, similar to a typical Northwest winter coat. The interior of the garment next to the skin is comfortable since the long floats are soft to the touch. If the garment were beaded, it would likely weigh more and need something like a lining between the beads and skin to feel more comfortable.
10. If this dress really was woven in ancient Egypt, it would have been a garment worn for ritualistic rather than daily wear. Compared to plain weave linen, it uses up an extraordinary amount of fiber and would therefore be quite costly. It is heavier and therefore warmer, and doesn't seem to allow for much physical flexibility and freedom of movement through the hips and upper thigh for sitting or squatting. That said, there are paintings that show women in these dresses doing exactly that [see Figures 2 and 3 in reference (5)]. Although there doesn't appear to be any evidence

of a vent to facilitate movement, such a vent would not be visible if it were located in the back of the dress since all paintings seem to be front or side views. Again, a single panel seamed up the back might be a good solution.

References:

(1) Hoskins, Nancy Arthur. Weft-Faced Pattern Weaves: Tabby to Taquete. Seattle: Skein Publications, in association with the University of Washington Press. 1992.

(2) Hoskins, Nancy Arthur. "Fabric Patterns Found in Royal New Kingdom Tomb Paintings from Egypt: The Tomb of Tuthmosis IV." *Complex Weavers Journal*. June 2016. Number 111, pp. 17-26.

(3) Hoskins, Nancy Arthur. "Fabric Patterns Found in Royal New Kingdom Tomb Paintings from the Eighteenth and Nineteenth Dynasties of Egypt." *Complex Weavers Journal*. October 2016. Number 112, pp. 17-27.

(4) Hoskins, Nancy Arthur. "Fabric Patterns Found in Paintings from Egypt: The Tomb of Amenhotep III." *Complex Weavers Journal*. June 2017. Number 114, pp. 17-26.

(5) Hoskins, Nancy Arthur. "Fabric Patterns Found in Royal New Kingdom Tomb Paintings from Egypt: The Tomb of Seti I." *Complex Weavers Journal*. October 2019. Number 115, pp. 33-38.

(6) Hoskins, Nancy Arthur. "Fabric Patterns Found in Royal New Kingdom Paintings from Egypt: The Last Pharaohs of the Nineteenth Dynasty." *Complex Weavers Journal*. February 2019. Number 119, pp. 33-43.

Figures 2a and 2b: Design being woven on the loom

Figure 3: Back-side of design

Figure 4: Half Damascus knots

Figure 5a and 5b: Side seams to join panels

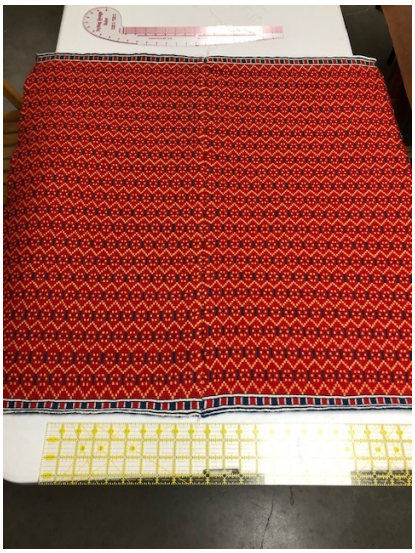

Figure 6: Sample of band-woven for strap

Figure 7. Completed dress