

Two Extraordinary Flat Woven Carpets

by Zhanna Petruk and Karl-Michael Plötze

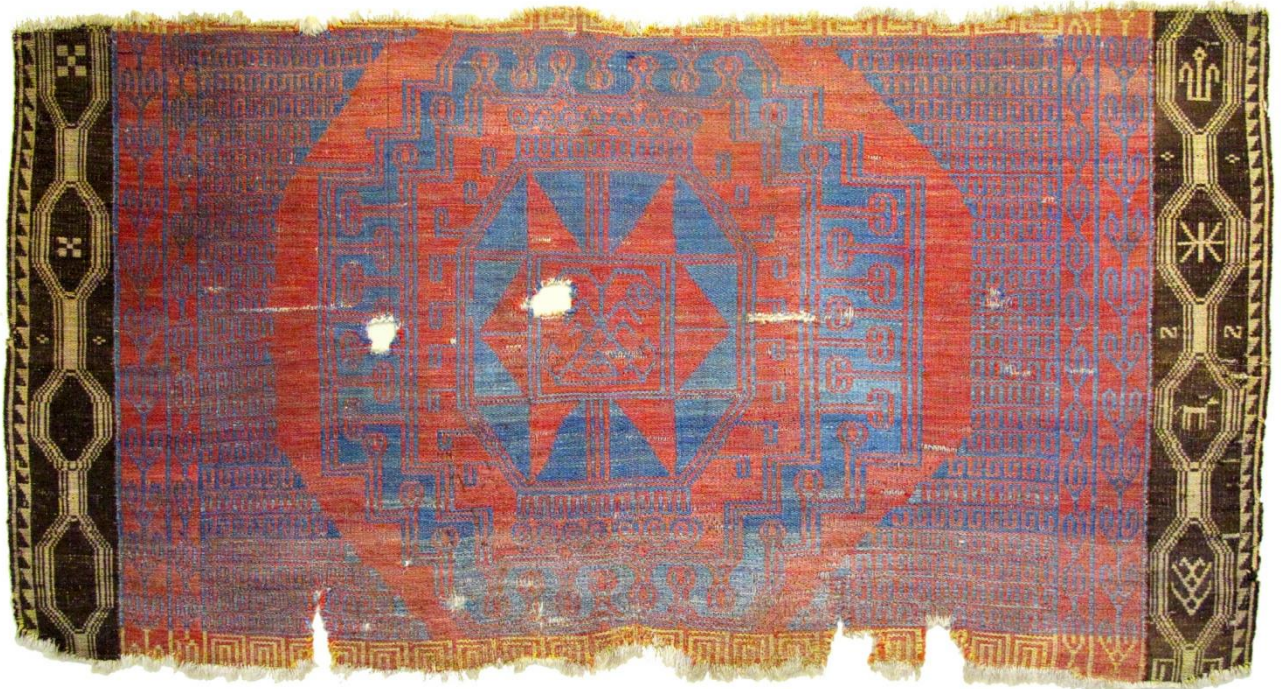
The scientific study and analysis of flatweaves and carpets is being carried out in Heidelberg at a branch of the Theodor Springmann Foundation (TSF). Particular emphasis is being placed on the research of kilims from Daghestan. Both authors are involved in this research.

In the collection of the Theodor Springmann Foundation there is an unusual flat woven carpet (1), which is also the subject of this paper and is currently being studied by the authors.



1 TSS Carpet

To date, the existence of only one other example of this type of carpet is known to the authors. It is part of the Orient Stars (OS) collection **(2)**. We would like to take the opportunity to express our gratitude to the Kirchheim family, to Klaus Kirchheim in particular, for their cooperation and support in making this piece available for research.



2 OS Carpet

In the OS collection, this flat weave has been categorized as “Mamluk”. This classification is based on similar patterns also found in Mamluk carpets. In a previous publication the piece was described as a “double weave fragment, 140 x 270 cm, North Africa”¹ The accuracy of this description will be discussed in this paper.

Format and Design

A brief glance at both carpets is all that is necessary to note the distinct similarities in design. The only exceptions are the colors used in the inner fields. These similarities, as well as the variations, will be discussed in this study.

In all probability, the formats of these pieces were similar. The TSS carpet is almost complete, with the exception of a few damages. Its measurements are 4.61 meters in length by 2.37 meters in width. The length of the OS carpet has been greatly reduced and is currently 1.37 x 2.72 meters. In comparison the calculated full length of the OS carpet would be approx. 529 cm. That this size must not necessarily be the original length will become evident when the designs are studied in detail.

In both examples, the inner field was divided into three parts, as seen in the TSS carpet **(1)**. Horizontal bands containing geometrical patterns were used to separate the fields. In the OS piece **(2)**, they are only rudimentary. In both examples, hexagonal cartouches connected by wide vertical bands have been used in the vertical side borders. A thick line has been used to outline these cartouches as is also the case for the bands. All of these design elements have been outlined with three or four vertical lines respectively.

The end borders are only complete in the TSS Carpet. They are decorated with short hexagonal

¹ Rageth, Jürg, ed.: 1999 Riehen (CH); Anatolian Kilims & Radiocarbon Dating, p. 28.

cartouches and framed with wide lines encased on both sides in two thinner lines. The connection between the cartouches has been created by using four or five lines respectively. A slender band made up of a vertical reciprocal sawtooth pattern has been used to form the outer border.

For the purpose of direct comparison, only a picture of the middle field of the TSS carpet was taken. The color copy was reduced to black and white for a clearer picture of the design (3). A black and white photo of the reverse side of the OS carpet was already available (4)².



3 TSS, Middle Field



4 OS, The Middle Field (a remnant)

² Rageth, Jürg, ed.: 1999 Riehen (CH); Anatolian Kilims & Radiocarbon Dating, p. 28, fig. 8.

The inner fields of both carpets are absolutely identical in design and differ only in minor details. For this reason, a detailed description would almost seem unnecessary.

Two contrasting colors have been used for the patterns in the inner fields (TSS = red / white, OS = red / blue). The plain background is divided diagonally in the right angled corners. Right angled hooks have been placed in six (TSS) and or seven (OS) horizontal rows in these corners and have been emphasized by the use of contrasting colors. The design has been carried out in the base color. The same type of hooks, in a contrasting color, have been placed vertically one on top of the other to decorate the outside borders of the inner fields.

The TSS carpet has only one row of these hooks, while the OS carpet has five consecutive rows arranged next to each other. Due to this, the OS piece has a greater width. If the four additional rows of hooks were left out, the width would be about 244 cm, which would be approximately the same for both pieces.

A plain field in the form of an octagon upon which concentrically arranged octagons are placed is evident. The outer octagon is delineated by a straight line, followed by notched horizontal and vertical lines as well as diagonal stepped borders. From these borders, cup like patterns have been arranged inwards, while the outer vertical borders contain double hooks on long horizontal connecting lines.

Within the octagon described above, a smaller octagon of the same type has been placed. The only difference is that the design elements have been arranged pointing outwards to the space created between the inner and outer octagon.

Following this, there is a straight edged octagon. Its borders are surrounded by right angled hooks. The empty space above and below the octagons has been filled with wavy horizontal lines.

The inner space has been decorated with an eight sided star (eight points at 45°). The unusual thing about this design is that the points at the side of the star are arranged pointing toward one another. Further, the octagon has been divided by vertical and horizontal lines. At the center of the star, there is a rectangle surrounded by a border of two lines. A figure has been placed at the center of this rectangle. This design has been used in both carpets with only slight variations. It may be a stylized "tree of life" placed on a small hill and flanked on both sides by an animal (see below **14**). The double hook at the top of the tree in the OS carpet reminds one of an inner design used in some medallions found in Mamluk carpets (see below **13**).

The main field is flanked on both sides by vertical lines reminiscent of links of chain. A further adjacent row has been decorated with double hooks.

The upper and lower ends of the main field are bordered by wider horizontal bands woven in contrasting colors. These bands extend over the side borders which are adorned with the chain and double hook motifs. In the TSS piece these bands are decorated with convoluted double hooks, placed above and below small diamond shaped lozenges. In the case of the OS carpet, this pattern is no longer clear and is most likely the remnant of a meandering rectangular design.

Similar designs and for the most part the same motifs have been used for the cartouches in the borders.

In the OS example, not all cartouches are decorated with motifs. However, the existing ones are of a purely geometric nature. This includes two stylized floral designs and one zoomorphic ornament (**2+4**). A slight variation of three of these motifs can be found in the vertical border of the TSS carpet. In this case, several additional motifs such as human figures and water jugs are evident (**1+3**). There are also small geometric figures on both sides of the connecting lines between the cartouches. The variety of small motifs used as fillers only in the octagons and stars of the TSS carpet can be considered a small but important difference in the two pieces.

Based on the study of both carpets, only slight variations in the designs of these pieces were found. Therefore, it is safe to say that both were woven using a similar design layout which could be slightly varied by the weaver.

Up until now, only the middle fields of both weavings have been discussed. However, since the TSS carpet is complete and its size is original, the entire piece has been studied in detail. Both additional fields are very similar to the middle field, with the exception of a lighter shade of red used in these areas. In this case, there are only slight variations in the design.

The upper and lower borders of these fields have each been decorated with a row of coiled wavy lines as well as a row of vertical lines with double hooks reminiscent of arrows. These are identical to the motifs adjacent to the inner fields. This repetitive motif has been placed vertically and used to frame the entire inner field.

In the upper inner field, there is a panel above the large octagon containing four small octagons decorated with hooks. This design is also found at the center of the large octagons. The centers of the small octagons are decorated with a five-point motif. In addition, two small rosettes have been placed between each octagon.

Based on the size of this panel, the calculated length of the TSS piece could be increased by 32 cm. If this panel were not included in the OS piece, presumably the total length would be 5.00 meters.

Comparisons

What is meant when a piece is referred to as “Mamluk”³, North African⁴? Is there really a relationship between the carpets described in this study and so-called Mamluk carpets? A comparison of the designs and motifs found in both examples with those in Mamluk carpets may help to answer this question.

It is important to note that the techniques used in the production of these flat weaves did not facilitate the degree of variation in designs such as those found in Mamluk knotted carpets. In flatweaves the motifs tend to be stylized. In other words, they can only be represented in a limited and or adapted form.



5 TSS, Design Concept



6 MAK, cat. no. 1

³ Carpets which were produced during the Mamluk sultanate are classified as Mamluk carpets (presumably the second half of the fifteenth century until the middle of the sixteenth century). Today, the provenance of Mamluk carpets is thought to be Cairo, Egypt and or North Africa.

⁴ Housego, Jenny: 1986 London; Mamluk Carpets and North Africa, in *Oriental Carpets and Textile Studies II*. Jenny Housego attributes a specific group to the Maghreb, North Africa, pp. 221-241.

After a brief comparison of the TSS flatweave (5) and the Mamluk carpet from the Museum of Applied Arts (Museum für angewandte Kunst, MAK) in Vienna (6)⁵, it is evident that both pieces are identical where their basic design and concept are concerned. Unfortunately, the Mamluk piece is not complete. To what extent this is also true for the details found in these pieces becomes obvious when the following examples are considered:

1. Concentric octagons and or eight sided, lobed medallions on a patterned⁶ or plain background (7)⁷.



7 TSS



7a MAK, cat. no. 5



7b MAK, cat. no. 1



7c Bardini

2. Horizontal bands used to divide the inner field (8)⁸.



8 TSS



8a MAK, cat. nr. 1

3. Cartouche in the borders (9)⁹.



9 TSS



9a MAK, cat. nr. 4

4. Repetitive motifs (used to frame the inner field) (10)¹⁰.



10 TSS



10a MAK, cat. nr. 1

⁵ Völker, Angela: 2001 Wien; Die Orientalischen Knüpftteppiche des MAK, pp. 36-41, cat. no. 1; inv. no. T 8348+8383+8732/1922 KB.

⁶ Völker, Angela: 2001 Wien; Die Orientalischen Knüpftteppiche des MAK, pp. 50-51, cat. no. 5; inv. no. T 8346/1922 KB; pp. 36, cat. no. 1, inv. no. T 8348+8383+8732/1922 KB.

⁷ Suriano, Carlo Maria: 2004 London; A Mamluk Landscape, Carpet Weaving in Egypt and Syria under Sultan Qaitbay, in HALI Magazine 134, p. 103, fig. 15; Eredita Bardini, Florence, inv. no. 3/358.

⁸ Völker, Angela: 2001 Wien; Die Orientalischen Knüpftteppiche des MAK, pp. 36-41, cat. no. 1; inv. no. T 8348+8383+8732/1922 KB.

⁹ Völker, Angela: 2001 Wien; Die Orientalischen Knüpftteppiche des MAK, pp. 48-49, cat. no. 4; inv. no. T 8345/1922 KB.

¹⁰ Völker, Angela: 2001 Wien; Die Orientalischen Knüpftteppiche des MAK, pp. 36-41, cat. no. 1; inv. no. T8348+8383+8732/1922 KB.

5. Additional panels containing consecutive motifs as a finish at one or both ends of a field **(11)**¹¹.



11 TSS



11a Textile Museum, Washington DC

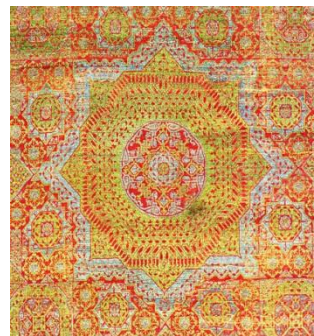
The overall layout and five significant design features found in both carpets are proof, that beyond a shadow of a doubt, the design elements of both flat weaves are directly related to those found in Mamluk carpets.

The reduced color scheme is a further indication of the adaptation of characteristics found in Mamluk carpets, which were woven using a limited color pallet. This color scheme included red, blue and green with small accents of yellow and white. The inner field of the TSS carpet has been woven using two shades of red in addition to white. Dark brown and yellow were used in the borders. The same colors can be found in the borders of the OS carpet, while the inner field has been done in two shades of red, combined with blue and yellow.

It is interesting to compare the color pallet in the OS carpet to that of some Mamluk carpets. Due to the lack of strong contrasting colors, the clarity of the patterns is greatly reduced (12)¹².



12 OS



12a MAK, cat. no. 4



12b MAK, cat. no. 5

Possibly, a further common feature may be found in the two flatweaves and Mamluk carpets. Within the stars in the middle fields of both flat weaves there is one motif which could be attributed to a stylized floral design **(13)**.

Floral motifs, of a mirrored four cornered nature, placed at the center of octagons are common design elements in Mamluk carpets **(13a)**¹³. The adaptation of floral motifs based on arabesque design elements seen in mosque architecture and found in Mamluk carpets has been described in an article by Robert Pinner and Michael Franses¹⁴. Marion Bösch describes band ornaments decorated with arabesque motifs **(13b)**, as characteristic of Mamluk carpets¹⁵.

¹¹ Suriano, Carlo Maria: 2004 London; A Mamluk Landscape, Carpet Weaving in Egypt and Syria under Sultan Qaitbay, in HALI Magazine 134, p. 104, fig. 17; Eredita Bardini, Florence, inv. no. R16.1.2.

¹² Völker, Angela: 2001 Wien; Die orientalischen Knüpftteppiche des MAK, pp. 48-49, cat. no. 4; inv. no. T 8345/1922 KB; pp. 50, cat. no. .5., inv. no. T 8346/1922

¹³ Völker, Angela: 2001 Wien; Die Orientalischen Knüpftteppiche des MAK, p. 39, cat. no. 4a; inv. no. T 83486+8383+8732/1922 KB.

¹⁴ Pinner, Robert & Franses, Michael: 1981 London; The East Mediterranean Carpet Collection, in HALI Magazine, vol. 4, no. 1, pp. 42-43.

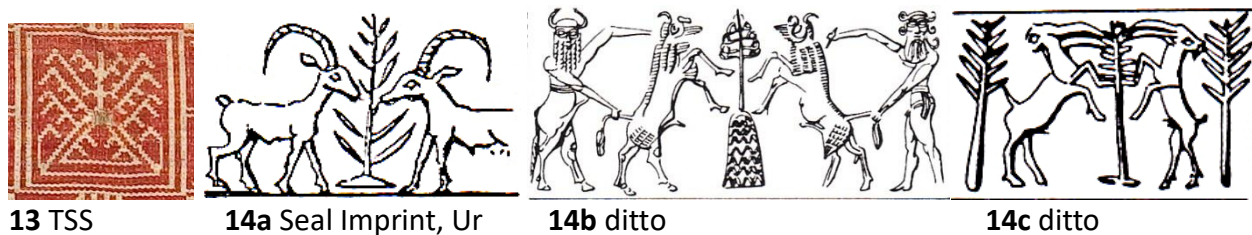
¹⁵ Bösch, Marion: 1996 Düsseldorf; Mamluk Carpets - Typology and Dating, in 7th ICOC Hamburg-Berlin 1993, Paper Presentations, pp. 81, 89, fig. 6a.

A comparison of these arabesque designs with the center motifs found in the flatweaves seems feasible, particularly where the description of the OS piece with its convoluted double hooks is concerned (13).

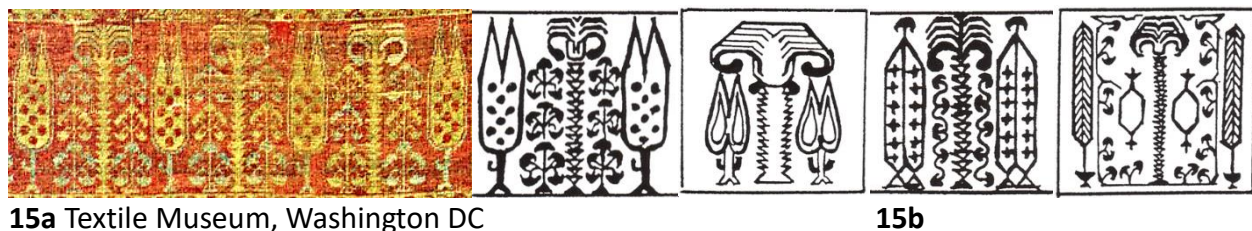


Perhaps, this comparison is not entirely satisfactory. However, there is a further common feature, which should not be ignored.

It is more rewarding, to compare the archaic motifs found in both flatweaves (13) and the representations of tree of life motifs, as described in literature on prehistoric history (14)¹⁶. These tree of life motifs are placed on top of hills and flanked by two animals respectively. The animals are frequently accompanied by gods and or mythical creatures. Occasionally, these figures are replaced by tree motifs.



In the end panels of the Mamluk carpets, several examples of consecutive groups of trees can be found (15a)¹⁷. Sometimes, these are arranged as single groups alternated with secondary medallions. Marion Bösch presents four examples in her article, which definitely remind us of prehistoric tree of life symbols (15b)¹⁸. If no motifs with human forms are found, it should be mentioned that these types of representations were not acceptable to Sunni Muslims such as the Mamluks.



As previously mentioned, the similarities in both types of carpets are exceedingly prominent. There is no doubt, that the inspiration for the designs and motifs of both flatweaves discussed in this paper can be found in Mamluk carpets.

It is a different story for the following three groups of motifs, in which case the plausibility of the context is obvious. At the same time however, there is still room for interpretation and speculation.

¹⁶ Müller-Karpe, Hermann: 1974 München; Handbuch der Vorgeschichte III, Kupferzeit, plates 180/9, 181/6, 239/22, Königfriedhof Ur, Siegelabdrücke, 3.Jt.v. Chr.

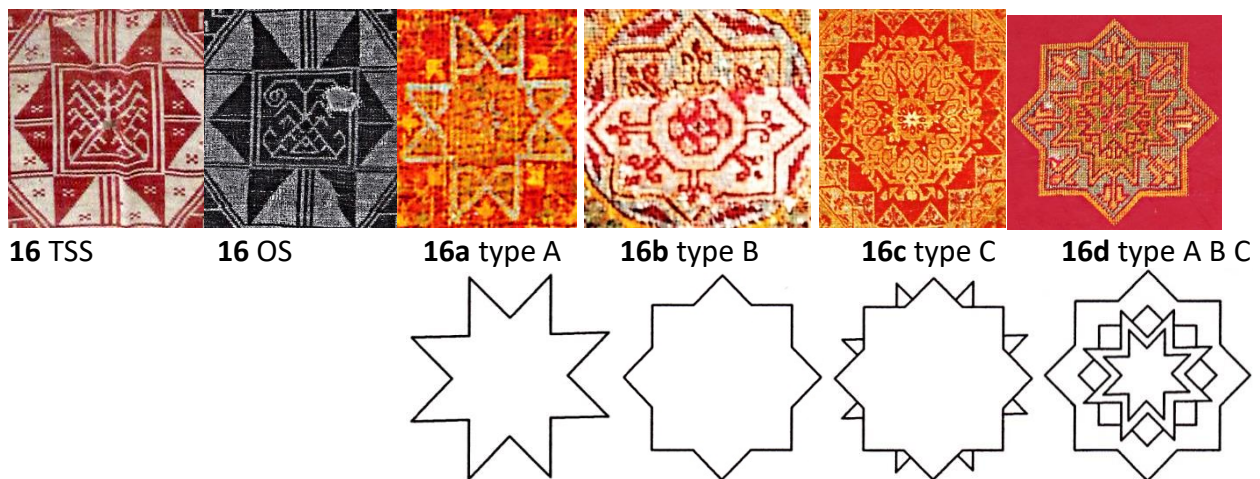
¹⁷ Suriano, Carlo Maria: 2004 London; A Mamluk Landscape, Carpet Weaving in Egypt and Syria under Sultan Qaitbay, in HALI Magazine 134, p. 100, fig. 9; The textile Museum, Washington DC, inv. no. R7.13.

¹⁸ Bösch, Marion: 1996 Düsseldorf; Mamluk Carpets-Typology and Dating, in 7th ICOC Hamburg-Berlin 1993, Paper Presentations, p. 91, fig. 65. The motifs are labeled as various types of trees.

Up until now, only the similarities in the flatweaves and Mamluk carpets have been discussed. However, the differences and variations should also be considered.

In both flatweaves, octagons with eight sided stars have been placed within the medallions. This form of star is very unusual and not found in Mamluk carpets. The unusual feature is the arrangement of the triangular cut-outs at the end of each arm. The vertical triangles are placed pointing away from each other, while the horizontal sections are placed back to back (16).

This type of octagram seems to be a combination of two styles. In this case the vertical placement of type A and the horizontal placement of type B have been adapted from other sources. As far as we know, type A (16a)¹⁹ is rarely found in Mamluk Carpets at the center of a large primary medallion. If at all, this motif usually appears in secondary medallions and or designs. On the other hand, type B is frequent in Mamluk carpets and can be found particularly in the centers of primary medallions (16b)²⁰. It is interesting to note, that the combination of type A+B=C was used occasionally in the medallions of Mamluk carpets (16c)²¹. The placement of all three designs concentrically within a medallion would be considered a rare occurrence (16d)²². The following depictions should serve to illustrate this point.



A further divergence in motifs can be found in the cartouches. While the designs in the cartouches of the flatweaves are limited to single motifs of various types (1,2,3,4,9), detailed filigree floral designs are evident in the cartouches of Mamluk carpets (9a). There are perhaps two important reasons for this. Where knotted carpets of a fine quality are concerned, it is possible to create designs in more detail as opposed to these flat weaves which were produced using a relatively imprecise technique. For the same reason, the inner fields of the flat weaves are limited to geometric designs. In addition, the mode of production was subject to an entirely different process. For the most part, the design of a Mamluk carpet was thoroughly planned, down to the smallest details and is the result of a well organized manufacture. At first glance the flatweaves appear to be well balanced in design. However, upon closer scrutiny various inconsistencies become apparent. This leads to the conclusion that they were perhaps produced under less rigorous conditions.

¹⁹ Okumura, Sumiyo: 2007 Istanbul; The Influence of Turkic Culture on Mamluk Carpets, pp. 104-105, cat. no. 9; The Textile Museum, Washington DC, inv. no. R16.2.5.

²⁰ Okumura, Sumiyo: 2007 Istanbul; The Influence of Turkic Culture on Mamluk Carpets, pp. 182-184, cat. no. 48; The Textile Museum, Washington DC, inv. no. R16.2.8.

²¹ Hali Magazine, 1981 London; vol. 4, no. 1: The Simonetti Mamluk, p. 35; The Metropolitan Museum of Art, New York, inv. no. 1970.105.

²² Okumura, Sumiyo: 2007 Istanbul; The Influence of Turkic Culture on Mamluk Carpets, pp. 160-161, cat. no. 37; Victoria & Albert Museum, London, inv. no. T26-1943.

It is possible that the origin of both flat weaves is the Near East. To be precise, East of Egypt. The TSS-flat weave, found in Azerbaijan, could be further evidence of this. The following structural analysis should be a source of more information.

Structure and Technique

The structure of the OS-flatweave is described as “double-weave” by Rageth²³. Which leads to the conclusion that we are dealing with a weave with two different sides.

In reality, both carpets have two opposite sides with the same design in reciprocal colors. Because of this, both sides are equally important. A front or back is determined by the viewers preference and arrangement of a piece **(17a+17b)**.



17a TSS – side A



17b TSS – side B

²³ Rageth, Jürg, ed.: 1999 Riehen (CH); Anatolian Kilims & Radiocarbon Dating, p. 28.

The OS-carpet fragment has been fixed on a backing to stabilize the fabric. For this reason, the piece can only be studied from one side (side A) (**18a**). On the reverse side or face (side B) two “windows” have been left in the material to allow for a glimpse of the weaving (**18b**). The complete side B (**18c**) as well as a larger section of side A (**18d**)²⁴ are shown in an earlier color photograph by Jourdan. In the chapter “Flachgewebe aus dem Kaukasus und Nordwestpersien”, the author states that the origin and age of this flatweave are unknown.



18a OS – side A

18b OS – side B



18c OS – side B

18d OS – side A

Based on the structural analysis of both flat weaves, it is evident that the label “double weave” is incorrect. In both cases, we are dealing with double faced weaves or two-faced weaves. The difference between a double-faced weave (weft-faced) and double weave lies in the number of warps used. While only one set of warps is needed for a double-faced weave, a double weave requires two sets of warps. Both types of weaves have two sets of wefts.

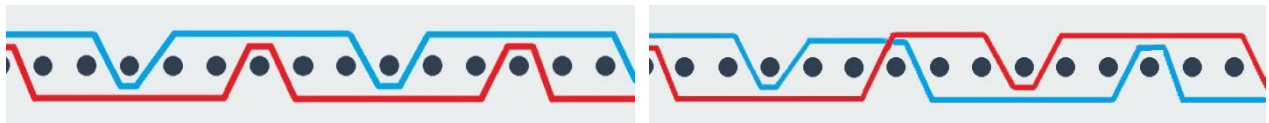
²⁴ Jourdan, Uwe: 1996 Augsburg; Orientteppiche-Anatolien, Kaukasien, Persien, Tibet, und andere Länder, p. 203, no. 82.

Typical for a double-faced weave is that two opposite sides can be woven simultaneously on the same warp²⁵. This is in contrast to a “double weave” where two fabric layers held together by calculated connections. In a double-faced weave two sides of one fabric are connected by the use of every weft. The resulting connecting points should be covered by the wefts from the reverse side. Thus producing two opposite faces. This results, when after every first and or second use of the weft, the yarn from the opposite side is handled in the same manner. The wefts are woven into the warps in such a way that both sides slide behind each other, see graph (19a). Normally the connecting points are almost completely covered by the wefts.

In the case of the weavings under discussion, the connecting points are in part clearly visible. The reason for this may be the nature of the material, relatively strong and unevenly spun yarn, as well as a lighter treatment of the wefts (20a+20b).

It should be mentioned that in both flat weaves a certain degree of carelessness in the execution of the work is evident. This in turn leads to the conclusion that these pieces were produced in smaller workshops, where restrictive controls were not enforced.

Both sides of the flatweaves have the same design in reciprocal colors (21). This is the result of the exchange of the yarn²⁶, which means the weft in use on side A is switched to side B, while the weft from side B is switched at the same point to side A (19b, 22a+b).

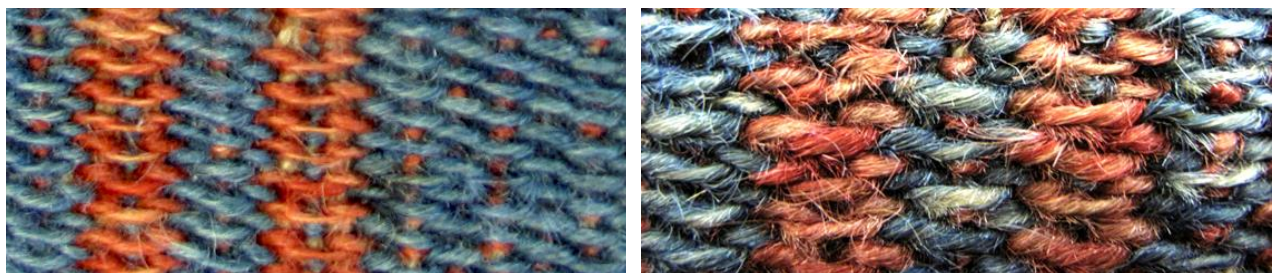


19a Wefts one on top of another with 5/1 warps 19b ditto, with exchange



20a TSS + 20b OS – detail: the connecting points of the opposite side are more or less visible

21 TSS – both sides identical pattern, however reciprocal colors



22a+b OS – detail: exchange of yarns and connecting points clearly visible

²⁵ Alderman, Sharon: 2004 Loveland USA; Mastering Weave Structures, pp. 42-43, pp. 63-65.

Arndt, Erika: 1984 Ravensburg; Ravensburger Webbuch, pp. 152-153.

Collingwood, Peter: 1968 London; The Techniques of Rug Weaving, pp. 264-265.

Emery, Irene: 1980 Washington, D.C. USA; The Primary Structures of Fabrics, pp. 150-153, 164-166.

Kirchner, Ursula: 1979 Marburg; Am Webstuhl mit 4 Schäften – Arbeitsweise und Mustermöglichkeiten, p. 178.

Burnham, Dorothy K.: 1981 London; A Textile Terminologie – Warp & Weft, p. 38.

²⁶ The alternation of yarns is also defined as exchange or substitution.

Double-faced weaves are not unusual; however, it appears that this technique was rarely used in carpet production. The Navajo Indians, native to the American South West, are known for the use of this technique in their weavings. However, these textiles were originally used as cloaks or blankets. The use as a carpet developed when these pieces began to be merchandized²⁷.

This type of carpet production is not common in the Near East and Maghreb. No further examples of this type of weaving are known to the authors. If anyone is familiar with examples of double-faced weaves from this area, this information would be much appreciated.

Those textiles known under the Persian name “Zilu”²⁸ are similar in appearance. However, they have a different structure with two sets of warps and therefore should not be mistaken for the textiles under study.

For those readers particularly interested in the special technique of double-faced weave, a detail copy of the OS flatweave was woven (**22a**). For the purpose of clarity, the structure was made visible through the use of thin warps and thick wefts. Both methods of production are clearly illustrated in the following graphs (**23a-25d**).

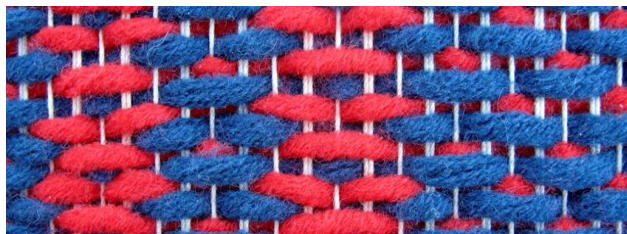
In compacted form, both methods (one or two wefts) result in the same type of weave since the wefts slide behind each other. The connecting points are barely visible (**23a+b**).



23a Reproduction, side A



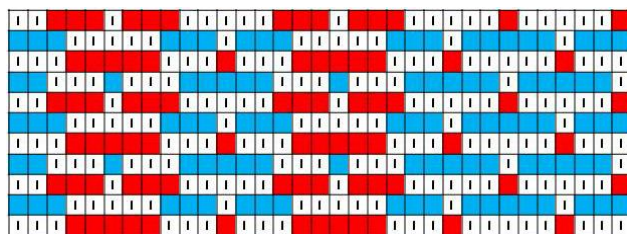
23b ditto, side B



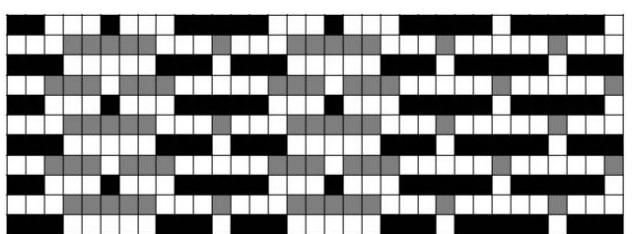
24a Reproduction, open structure, side A
color change after every exchange of yarn



24b ditto, side B



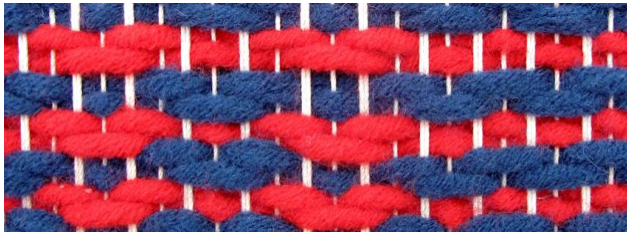
24c Graph of reproduction 24a
 □ Warp ■ Weft 1,3,5,7,9,11 ■ Weft 2,4,6,8,10



24d Pattern for the weaver
 ■ Warp lifts

²⁷ Wheat, John Ben: 2003 Tucson (AZ), Blanket Weaving in the Southwest, p.127.

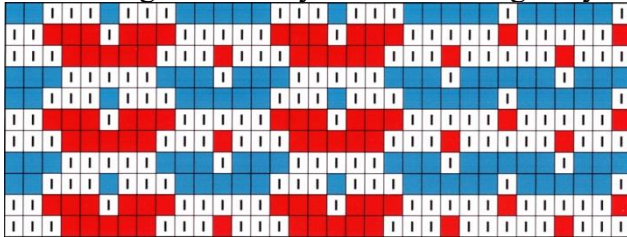
²⁸ Thompson, Jon: 2003 Portland (OR); Looms, Carpets and Talims – Zilu weaving, chapter 11, pp. 207-209, in Tapper, Richard and McLachlan, Keith (eds.): Technology, Tradition and Survival. Beattie, May H.: 1981 Washington DC.: A Note on Zilu, pp. 169-174, in Cathrin Cootner: The Arthur D. Jenkins Collection, Vol. I, Flat Woven Textiles, Tanavoli, Parviz: 2002 Woodbridge, Suffolk (GB); Persian Flatweaves, pp. 258-269.



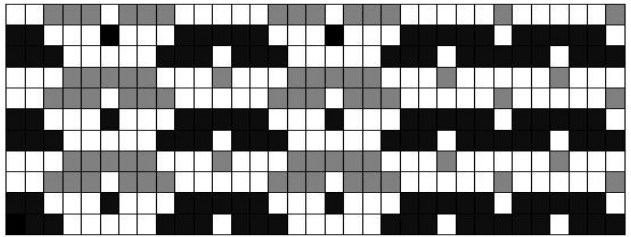
25a Reproduction, open structure, side A
color change after every second exchange of yarn



25b ditto, side B



25c Graph of reproduction from 25a
 □ 1 Warp ■ Weft 1,2,5,6,9,10 ■ Weft 3,4,7,8,11



25d Pattern for the weaver
 ■ Warp lifts

A basic sateen structure is shown in these graphs. The sequence is 5/1 (over 5 warps, under 1 warp) (19a). Variations in the weave result from the exchange of wefts, for example: 5/3, 3/1 (19b).

When the reproductions are studied in detail, it becomes apparent that the warps adjacent to the connecting points are pressed together (26a). In the case of the two original weavings, where substantially thicker material was used for the warp, the result are two compacted warps. These “double warps” often appear to be a thick single thread. (26b+20b). Most likely this somewhat unusual type of construction was chosen for the sake of strengthening the weave²⁹.



26a Warps pressed together, reproduction



26b ditto, TSS – original



27 TSS – occasional wefts of two threads

In the examples presented up until now only one thread was used for every weft. However, in the case of the TSS flatweave two threads were used for the weft in some sections of the weaving. These threads were not twisted together, but are single and lie one on top of the other. Presumably the wefts were separately woven into the same shed one after the other (27).

This method was also used for larger areas. At first glance, the purpose is not apparent. Most likely this technique served as a compensation for irregularities which occurred during the weaving process.

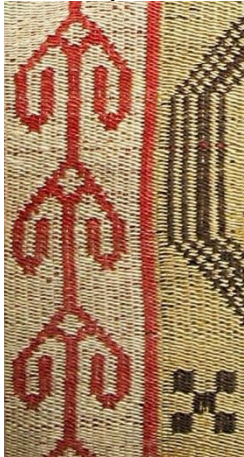
²⁹ Twill weave 3/1 is normally used.

It is apparent that this method was not used in the OS flatweave. However, in this case only a third of the original length still exists.

The side borders of both flatweaves were woven in different colors as opposed to those used in the inner fields. Therefore, the wefts must have been woven back and forth within these borders. In order to avoid creating small slits in the weaving, the wefts of the inner field and the borders were dovetailed.

On the one side of the weaving this technique is perfectly executed (**28a+b**), while on the opposite side these transitions appear to be somewhat poorly carried out (**28c+d**). This is due to the fact that four different wefts (yellow and brown from the border as well as white and red from the inner field) are joined in this section of the weaving.

The fact that the transitions between the inner fields and the borders were done in the same way in both carpets is a further indication that these two pieces were produced in the same workshop.



28a TSS – side A



28b OS – side B



28c TSS – side B



28d TSS – side B

A further reverse of the wefts in the selvages was necessary. In pictures (**29a+b**) it is apparent that 2 wefts of the same color were woven one after the other in a staggered or oblique manner. Following this, 2 wefts of the other color were woven in the same way (see also **25a-d**). The different colored wefts are crossed over each other at the outer edges of the selvages. This applies to both flatweaves. However, several variations can also be found in certain areas of these pieces.



29a OS – side A



29b TSS – side B

The final finishes at the beginning and end of the TSS piece should also be mentioned. Several warps were bundled in groups and obliquely interlaced³⁰. This could only be carried out after the piece was finished and removed from the loom. On side B the interlacing appears to be diagonal and on side A horizontal to the weaving (**30a+b**). The warp ends were also interlaced with the rest.



30a TSS – side B, diagonal



30b TSS – side A, horizontal

The two flatweaves differ primarily in the color schemes used in the inner fields. The field of the OS carpet was done in reds and blues. Two shades of both colors were used and one of the colors is slightly faded. The fields of the TSS carpet were woven in red and white. The white was not dyed and is the natural color. Red was obtained by using madder. Two shades of this color are evident, one of which is slightly faded.

The borders of both flatweaves, as well as the stripes used to separate sections of the TSS carpet, were woven in two shades of undyed brown wool. Most likely the yellow in these pieces was produced using the same natural dye (see below).

The colors in the TSS flatweave were analyzed. Accordingly, the red was obtained from madder and the yellow from a natural dye containing hydroxylflavon³¹.

³⁰ Mallet, Marla: 1998 Atlanta GA; Woven Structures, A Guide to Oriental Rug and Textile Analysis, p. 121.

³¹ Color analysis: Dieter Weber, Hassloch, 2004.04.01.

Compared Structural Analyses

Collection Abbreviation	Theodor Springmann Stiftung TSS	Orient Stars OS
Format Length x Width in m	4.61 x 2.37	1.37 x 2.72
Kind of weave	double-faced weave	double-faced weave
Warps Material Colors Spin / Ply Threads / dm	1 set wool Wt-nat, Wt-nat mix Br2-nat S2Z 2-3ply 65	1 set wool, possibly mixed with goat hair Wt-nat, Wt-nat mix, Br2-nat, Br2-nat S2Z 2-3ply 65
Wefts Material Spin / Ply Threads / dm Colors Technique	2 sets wool S1 + S2 2-3sp 64 6 / Rd2, Rd1=fadRd2, Wt-nat, Ye1=fadYe2 Br2-nat, Br3-nat 5/1 3/1, 3/2, 3/5 +reciprocal alternation several variations*	2 sets wool S1 1-3sp 69 7/ Rd2, Rd1=fadRd2, Bl2, Bl1=fadBl2, Ye1=fadYe2, Br2-nat, Br3-nat 5/1 3/1, 3/2, 3/5 +reciprocal alternation several variations*
Contours	woven as in narrow areas	woven as in narrow areas
End Finishes Top / bottom Characteristics Technique	Identical warps bundles of warps, diagonally interlaced oblique interlacing	no longer exist
Selvedge Finishes Right / left Technique	identical wefts wefts reversed over 2/3 warps** wefts crossed at selvedge	identical wefts wefts reversed over 2/3 warps** wefts crossed at selvedge
Texture	thick, heavy, flexible	thick, heavy, flexible to limp
Condition	several holes apparent (some crocheted repairs) ends and sides partly damaged	only a fragment, greatly damaged and worn down, several holes; mounted on a textile backing and wooden frame
Special Characteristics Other	*variations in the very narrow vertical and diagonal areas ** variation: the outer 2 warps are completely wrapped	*variations in the very narrow vertical and diagonal areas ** variations non-registered

Abbreviations:

Spin and ply

S = spin or ply to the right

Z = spin or ply to the left

S2Z = 2 threads S (right) spun, Z (left) plied together

sp = spun, ply = plied, 1 = slight, 2 = middle, 3 = strong

Colors

Bl = blue, Br = brown, Ye = yellow, Rd = red, Wt = white

-mix = mixed with, -nat = natural, not dyed, -fad = faded

1 = light, 2 = medium, 3 = dark

When the structural analyses are compared, it is evident that both carpets are very similar. The variations in the thickness of the yarns used for the wefts and warps as well as the colors of the inner fields are important features. On this basis it can be safely said that despite several deviations, both flatweaves are of the same provenance.

Origins

The origin of both flatweaves should also be taken into consideration. On the basis of the patterns and motifs found in these pieces, the place of origin could be Egypt or North Africa. The “S” yarn spin is also an indication, since the “S” spin direction was common in Egypt. By contrast the “Z” yarn spin was used in the Maghreb and several areas of North Africa. The final finishes at the end of the TSS flatweave, a type of diagonal oblique interlacing of the warps, has already been described in this paper. This characteristic is an indication that the piece may have originated east of Egypt, since this type of finish is common in both Eastern Anatolia and the Caucasus.

Early Anatolian and Mamluk rugs³² contain similar motifs and designs which are definite indications of cross-cultural influences³³ This is also true for patterns found in Caucasian Carpets³⁴ as well as in weavings from Dagestan³⁵.



30 Anatolian, Philadelphia, Museum of Art
Inv.Nr. 43.4



31 Dagestan, Private Collection

³² Balpınar, Belkis & Hirsch, Udo: 1988 Wesel; Carpets of the Vakıflar-Museums Istanbul, pp. 66+70, plate 2, inv. no. A-217; plate 11, inv. no. A-119; plate 14, inv. no. A-150.

Gantzhorn, Volkmar: Köln 1998; Orientalische Teppiche, pp. 172-182, fig. 250-260.

³³ Okumura, Sumiyo: 2007 Istanbul; The Influence of Turkic Culture of Mamluk Carpets, pp. 73-83.

³⁴ Eder, Doris: München 1979; Kaukasische Teppiche, p. 89, fig. 21; pp. 94-99, fig. 28-33.

³⁵ Dagestan Museum of Fine Arts, Makhachkala, Dagestan: Dagestan carpet, Private Collection.

Moreover, the place in Northern Azerbaijan where the TSS flatweave was found would be an additional indication of Caucasian origin. According to Ziya Bozoglu this piece originally came from Dagestan³⁶.

Further proof that these pieces were woven in the North Caucasus is a photograph found in a publication from the "Dagestan Museum of Fine Arts" (32)³⁷. Thanks to the generosity of the author, Ajschat Magomedova, the original photograph has been made available for our use.



32 Caucasian carpet workshop, Akhty, Kustarnj Committee. Photo by A. Taho-Godi, inv. no. 16249

The photo above is of a carpet workshop in Akhty, Dagestan. It was taken for and exhibited at "The First Dagestan Farming and Kraft Fair 1912" held in Temir-Chan-Schura (Buinassk) from the 15th to 30th of April 1912.

Many thanks to the historian Gabib Ismailow, Makhachkala, for providing the copies from the state archives of the city of Tbilisi, Georgia³⁸.

The photograph in question is a picture of five weavers working on various pieces of equipment used in the production of carpets.

The incomplete carpet mounted on the vertical loom could be attributed to either Northern Azerbaijan or Dagestan. Three carpets can be seen on the wall in the background. The one on the right is a felt. A soumak is hanging at the bottom to the left of the felt. Immediately above the soumak there is an example of exactly the same type of weaving discussed in this paper. While felts and soumaks from Dagestan are well known, this is not true for the third type of carpet.

³⁶ Bozoglu, Ziya: He found the TSS-flatweave and transferred it to the foundation.

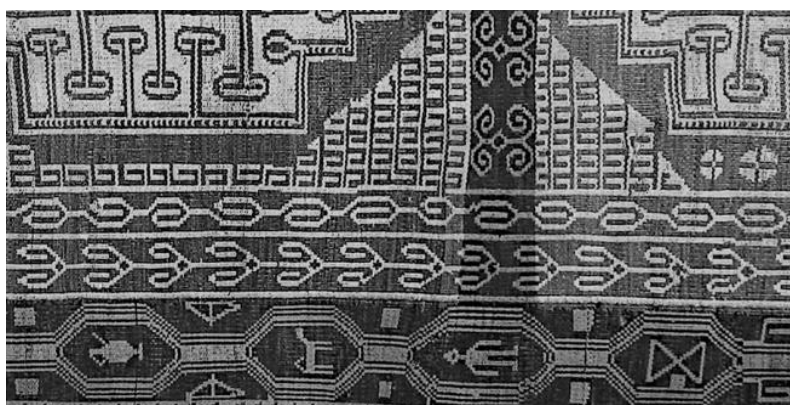
³⁷ Magomedova, Ajschat: 2009 + 2017 Makhachkala; Dagestan Carpet Collection of P. S. Gamsatova, p. 8.

³⁸ City of Temir-Khan-Shura, ed.: 1913; Retrospect of 1st Dagestan Agricultural and Craft Fair 1912 (archive no. of copy not recognizable).

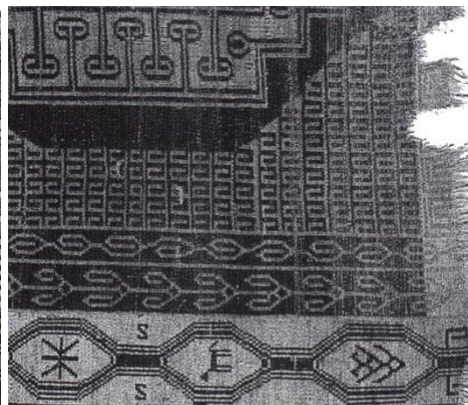
Based on the picture of the Akhty workshop this type of weaving most likely also originates from Dagestan. Therefore, it is safe to conclude that both flatweaves under study also originate from this area.



33a Detail of picture 32



33b TSS – detail



33c OS – detail

The similarities found in the carpet in the photograph above and the researched weavings are obvious.

The three detailed photos (**33a+b+c**) are illustrations of this. In all three, stepped octagons containing identical hooks and cups attached to lines can be seen. The spaces between these lines and the octagons are decorated with reciprocal hooks. On the carpet in the photo and the OS piece these motifs are arranged in rows of five. In comparison, the TSS carpet has only one row of this pattern. In the photo a human figure and a dog can be found in the empty space below the left octagon. The same types of figures are present in the cartouches placed in the borders of the TSS and OS flatweaves.

There is a noticeable deviation in the layout of the designs of the inner fields. While stripes between the octagons have been used in both carpets under study, this type of design element cannot be found in the carpet seen in photographs (**32, 33a**).

Determination of Age

The time frame for the production of both flatweaves is very difficult to determine without the use of technical methods. The overall impression of a piece can be very misleading since one may be easily impressed by its condition. Subjectively speaking, the OS fragment would appear to be older than the relatively well preserved TSS carpet. In both cases, the colors were obtained using natural dyes. However, this does not bring us one step further in determining the age of these pieces.

A popular method, radiocarbon dating (^{14}C)³⁹, is also being used on textiles made of organic material.

At the end of the last century this method was used to analyze the OS flatweave. The following are the results of these tests⁴⁰.

1. University of Oxford:	radiocarbon dates	160+-50 yrs. (prior to 1950 AD)
2. ETH – Zürich:	radiocarbon dates	160+-35 yrs. (prior to 1950 AD)
Calculated averages for both tests:	radiocarbon dates	160+-30 yrs. (prior to 1950 AD)

Calibrated ages (95% confidence limit)	1668-1787 AD (54.9 % probability)
	1792-1823 AD (13.9 % probability)
	1831-1884 AD (12.9 % probability)

The fourth plausible period of time, the 20th century, was not taken into consideration.

The span of time referred to is 216 years, from 1668 to 1884 AD. This period is interrupted by two short gaps totaling only 13 years.

A ^{14}C - analysis was carried out on the TSS flatweave at the ETH-Zürich on 06.08.2004. The results cover 3 periods over a span of 280 years.

ETH- Zürich:	radiocarbon dates	135+-40yrs. (prior to 1950 AD)
Calibrated ages (95% confidence limit)	1671-1779 AD (42.3% probability)	
	1798-1899 AD (40.0% probability)	
	1905-1951 AD (17.7% probability)	

If the last probability range from the 20th century is also neglected, as in the instance of the OS piece, a time span of 228 years with a short interruption of 19 years is covered.

The first period is almost completely identical with data from the OS piece. The beginning of the second period is also approximately the same. Since this time span is not interrupted, its final date is much later. It is practically the same and correlates to the later dates of the OS flatweave. In conclusion, it can be said that both flatweaves are approximately the same age, with one or two short interruptions in time.

The time spans in the 20th century, ignored for both flatweaves, cannot be compared since they were only recorded for the TSS piece. However, they should be included in the discussion of age.

It is important to keep in mind that the shorter periods with a lower rate of probability should not be neglected in favor of longer periods with a higher rate. The date of production could lie within any one of these time frames.

³⁹ Bonani, Georges in Rageth, Jürg, ed.:1999 Riehen (CH); Anatolian Kilims & Radiocarbon Dating, pp.15-22.
This subject is extremely complex. Therefore, it is feasible to simplify as much as possible.

⁴⁰ Rageth, Jürg, ed.:1999 Riehen (CH); Anatolian Kilims & Radiocarbon Dating, p.28.

ETH-Zürich: “Unfortunately this period of time is too short for detailed information on the true age.”

If the production date of relatively young artifacts made of organic materials is to be determined, the advantages gained by the use of the radiocarbon method are limited. The data begins to be more reliable for organic material older than 1650 AD.

The exact date of production for the flatweaves discussed in this article cannot be determined on the basis of the available test results.

Can conclusions be drawn on the basis of the photo **(32)** and the circumstances under which it was taken? The photograph mentioned above in the chapter Origins was taken in 1912 for a regional fair. Primarily new products were exhibited at that time. This was also true for carpets which among others were occasionally copies of older patterns or pieces. A photograph of a famous old carpet from Achty was also exhibited. In addition, 3 antique carpets were on display, one of which was already 137 years old at the time⁴¹.

The following should be taken into consideration as possible conclusions:

1. The flatweave in the photo taken in 1912 may have been new. Therefore, both OS+TSS flatweaves could have been woven at the beginning of the 20th century.

2. The flatweave in the photo was one of the three antique pieces.
Then the OS+TSS flatweaves could have already been antique in 1912.

3. The flatweave in the photo was one of the copies of older carpets.
Therefore, the OS+TSS flatweaves could already have been old in 1912.

4. The flatweave shown in the photo was woven on the basis of a long tradition. The pattern used have remained the same over an entire span of time. Therefore, all dates of production from the second half of the 17th century to the first half of the 20th century are possible.

On this basis, it can be said that it is not possible to determine the exact date of production for these flatweaves.

Therefore, the authors are forced to rely on their own expertise and subjective observations. It is possible that both flatweaves were produced either during the second half of the 18th or the first half of the 19th century.

⁴¹ City of Temir-Khan-Shura, ed.: 1913; Retrospect of 1st Dagestan Agricultural and Craft Fair 1912 (archive no. of copy not recognizable).

Conclusions

At this point a summary of the test results from both flatweaves is called for.

It is important to note, that the authors were not able to find satisfactory answers to all the questions under discussion.

1. Format and Pattern

The formats (calculated on the basis of complete pieces) vary. They are however, fairly similar. With a few exceptions, the patterns found in the inner fields are practically identical.

Variations are the additional vertical hooked rows in the OS flatweave, the central motif in the stars and eventually the horizontal panel found only in the TSS flatweave. The borders are the same in both pieces.

2. Comparisons

When both flatweaves are compared with the Mamluk pieces it is evident that they are very similar. This is true despite the different methods of production.

3. Structure and Technique

Contrary to the classification by Rageth, the OS weave is not a double weave but a double-faced weave, produced by the alternation of the wefts. This is also true for the TSS piece. In addition, the unusual application of sateen weave 5/1 also supports this premise. The compactness of the warps and wefts is in both cases relatively loose and differs only slightly in the two pieces.

The selvages of both weavings have been finished in the same manner. It should be noted that the diagonal interlaced warp still exists only in the TSS carpet.

Based on the research completed, the nature of the S-spun material is identical.

The use of two colors in the inner fields varies (red/blue and or red/white). However, the borders are the same color in both carpets (brown/yellow).

Undyed brown and white is evident. The other colors were produced with natural dyes. The color analysis of the TSS flatweave brought to light that madder was used for red and a hydroxiflavon dye for yellow⁴².

4. Method and Location of Production

With a few exceptions, the overall design, format, technique, structure, material and colors are the same in both flatweaves. This is also true where the ¹⁴C-data is concerned. Therefore, it can be concluded that the origin of these pieces is the same.

The following may give additional credence to this conclusion:

a. Certain Anatolian and some Caucasian carpets have similar characteristics also found in Mamluk carpets.

b. The material in both weavings is S-spun as is common in Egypt. This could be an indication of production in North Africa.

The attribution of origin on the basis of the colors used was not feasible since this evidence is not reliable enough.

c. The final finishes of this type of carpet are frequently found in pieces from Eastern Anatolia and adjacent regions such as the Caucasus.

⁴² Color analysis: Dieter Weber, Hassloch, 01.04.2004.

- d. The TSS carpet found in Northern Azerbaijan was evidently imported from Dagestan.
- e. The photograph from the “Dagestan Museum of Fine Arts” and the mention of the regional fair in Dagestan can be a clear indication production in the Caucasus region. On this basis, it can be safe to say that these flatweaves originate from the Northern Caucasus and not from North Africa.

Regardless of the region of production, both flatweaves were produced in the same place. An indication of this is the large number of common characteristics found in these pieces. Although both have been created according to a specific pattern, there are still some mistakes and variations. Therefore, it is safe to say that they were both produced in a smaller workshop where less attention was paid to a precise result.

The photograph taken in Dagestan for exhibition purposes is of a small workshop in Akhty. However, no definite conclusions can be made on this basis where the origin of the flatweaves under study is concerned. There is possibility that these pieces are part of the production of a cottage industry.

It is hard to tell if they were produced on a horizontal or vertical loom.

The use of a horizontal loom with shafts would have facilitated a quicker result. The prevalence of mistakes in both flatweaves is an indication that the wefts were lifted by hand. This is a method commonly used on a vertical loom. Presumably, several weavers worked on these pieces simultaneously. This factor could also account for some of the errors and variations in these pieces.

5. Calculation of Age (Time Frame)

The majority of data acquired through the use of the radiocarbon method is the same for both weavings (TSS and OS). However, it was not sufficient for the calculation of a time frame of production.

On the basis of the current research, it is clear that both flatwoven carpets are very unusual. In reference to the photo taken in Dagestan, it is safe to assume that other examples of this type of weaving may have existed. It should be mentioned that any additional information on other examples in existence would be gratefully received.

Translated by Jane Hobler
2017

