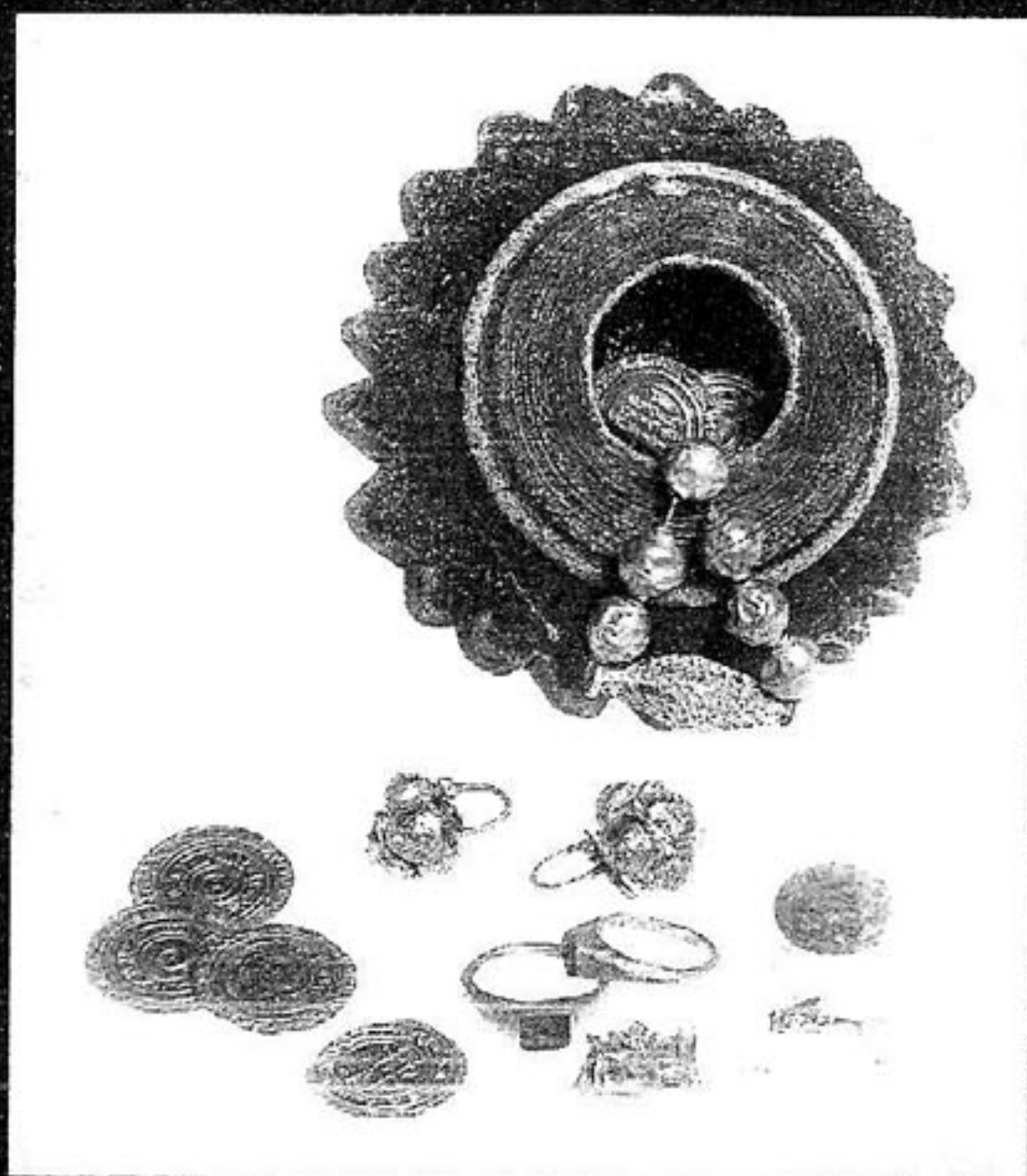


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TEXTILES, BASKETRY, AND CORDAGE FROM JAZIRAT FARA'UN (CORAL ISLAND)

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INTRODUCTION

From 1975 to 1981 excavations were carried out in the medieval fortress on Coral Island (Jeziret Fara'un) in the Red Sea, 14 km south of Eilat, by the Archaeological Staff Officer for the Civil Administration in Sinai, A. Goren. About 1500 textile fragments, 700 basketry fragments, and 700 pieces of cordage were discovered at the site. On the basis of the pottery (examined by J. Finkelstein) and radiocarbon testing (RT-1848: 1236–1285 cal. CE; see Segal and Carmi 1996:103, No. 63a) the material has been dated to the Late Ayyûbid and Early Mamlûk periods (late twelfth and thirteenth centuries CE).

The island, a solid granite rock, measures 300 m from north to south, and approximately 150 m from east to west at its widest point. It is of strategic importance—at the junction of the Red Sea route leading to Southern Arabia and East Africa, and the land routes leading to Syria and Egypt (Rothenberg 1961:185). On the west, facing the shore of the Gulf, lies a shallow lagoon which can be entered by boat at high tide: it was a sheltered harbor in the Middle Ages.

The fortress stands on the northern hill. A wall encloses a lower bailey on the north. On the south, it surrounds dwelling quarters divided into two wings separated by an upper bailey. The west wing is composed of a number of two-story buildings and contains a lofty keep-like tower which commands the surroundings; the jamb of one of the windows of this wing is a reused stone bearing an engraved cross. South of the east wing is a mosque containing a *mihrab*. Most of the fortress in its present form belongs

to the later periods (Mamlûk and Ottoman, with a recent Egyptian renovation), but its basic plan should be ascribed to the Crusader occupation. The Ayyûbid style of building is discernible in the cisterns (Benvenisti 1970:321–323).

Most of the textiles were discovered in the middens (L402), in contrast to the many basketry and cordage fragments recovered in the structures. As there are no signs of a sudden destruction of the buildings, it can be assumed that the inhabitants deserted the island, taking their garments and other valuable textiles with them and abandoning only used mats, baskets, and cordage fragments. A similar situation was observed at the Early Islamic site of Naḥal 'Omer in the 'Arava, where textile scraps were found in the middens, while the basketry and cordage were discovered in the ruins of the buildings (Baginski and Shamir 1995).

Selected for analysis were 236 textiles, 30 fragments of basketry and 40 pieces of cordage. One-hundred and sixty items are described in detail in the catalogue. These artifacts form a representative sample of the groups or types discovered at the site but not included in this report.¹

THE TEXTILES

The textiles display a large variety of materials, techniques, dyes, decorations, and patterns. No complete garments were discovered. Most fragments had been cut into strips, rectangles, or triangles. Many were stained, some were faded, and several had a foreign substance—some of it apparently asphalt—adhering to them.

Materials²

Cotton.— The largest group of textiles from Coral Island is made of Z-spun cotton. Most are items of undyed and undecorated cotton tabby, while a few fragments display assorted checked patterns (e.g., Nos. 9, 35). Some have stripes (Nos. 2, 13, and 29), others have both stripes and grids (No. 5). There are also cotton fragments decorated with selfbands (No. 3) or with colored bands (Nos. 1, 15).

Four fragments are woodblock printed on undyed cotton. Three are resist-dyed blue on an undyed ground: No. 16 (Color Pl. 1), No. 17, and No. 18 with unrecognizable motifs which might be vestiges of an Arabic inscription. The fourth (No. 19, Color Pl. 2) has red floral motifs on a beige ground which were probably mordant printed.³

Cotton was rare in Egypt and Israel up to the Umayyad period, contrary to Nubia, where it had been grown since antiquity. It was probably introduced into the region from South Arabia (Baldry 1982:6) and India as a luxury fiber during the Roman period. Many Z-spun cotton fragments were found in the Roman levels at Quseir al-Qadim, but in the Mamlûk period there were almost no cotton items, save raw cotton used for quilting and padding, and that found in middens (Eastwood 1980:286). In Israel, hardly any such Roman-period textiles have been discovered. A few such textiles of the Byzantine period were found at Nessana (Bellinger 1962). At Naḥal 'Omer, a site of the Early Islamic period, a great number of Z-spun cotton fragments were recovered, some of them *ikat* dyed, pointing to a Yemenite or Indian origin (Baginski and Shamir 1995). Cotton fragments were discovered at Qasr al-Yahud of the ninth century (Janaway and Shamir, in preparation). Many Z-spun cotton fragments were found in Qarantal Cave 38 (Baginski and Shamir 1995), carbon dated up to the thirteenth century CE. Similar fragments were found in Egypt at sites such as Quseir al-Qadim (Eastwood 1980) and Fustât (Mackie 1989), although the largest group at the latter is made of linen

(flax). Many Islamic-period cotton fragments were discovered in Upper Egypt, at Qasr Ibrim close to Nubia (E. Crowfoot, pers. comm. 1994; Eastwood 1980). Another site of the period with many textile items similar to those from Coral Island is Telem (Bolland 1991). Most items found there are cotton tabby with patterns resembling those of the Coral Island textiles.

Linen.— This was used almost as often as cotton. Some linen fragments are undyed and undecorated, while others display varied grids, checks, and plaids. Some patterns are similar to those of the cotton pieces, such as a blue grid on an undyed ground (No. 43). However, the patterns on the linen fabrics are often more varied than those on cotton, such as a single grid (No. 35), a double grid (No. 44), checks (No. 49, Color Pl. 4), a plaid (No. 32, Color Pl. 3), and a grid with a pair of bands crossing it (No. 42). Some linen fragments have bands (No. 37) or stripes of various widths (Nos. 40, 46 and 34). Linen was a very common yarn at that time throughout the region, which was noted for the excellent quality of its flax (Amar, this volume). The dominant twist was "S"; however, textiles which have both S- and Z-spun yarns are not uncommon at contemporary sites, e.g., Quseir al-Qadim (Eastwood 1980:286) and Fustât (Mackie 1989: 88–89), as well as at Coral Island, whereas in the Early Islamic period (e.g., Naḥal 'Omer) the linen remains are exclusively S-spun (Baginski and Shamir 1995).

Wool.— Only a few wool fragments suitable for clothing were discovered on the site. They are undyed and/or undecorated. Some are dyed in monochrome colors, such as a light blue tabby (No. 67). Twills, in red (No. 61) or green (No. 402/72, Fig. 1), or with a brushed nap (No. 63, which also has remains of a blue and black band parallel to the border) also appear. Some wool fragments have pigmented (undyed) bands (No. 59); others have colored (dyed) bands (Nos. 4, 64). No. 68, loosely woven with very fine wool threads, has a plaid pattern composed of pigmented beige and brown, as well as dyed



Fig. 1.

multicolored stripes and bands. There are two fragments, one of cotton (No. 14) and one of wool (No. 72), similarly decorated with bands of small blue "diamond"-shaped motifs, made in point twill (self-patterned with floats of different lengths).

Although the linen and wool in our region were S-spun, both S- and Z-spin directions are represented in the wool fragments from Coral Island, often in the same textile, the warp S-spun, the weft Z-spun. This parallels the textiles from Quseir al-Qadim (Eastwood 1980) and Fustât (Mackie 1989).

Silk.— Seven small fragment are all silk. Some are red tabbies (Nos. 96, 80, Fig. 56; No. 402/192; see Table 1). No. 97, which is sewn to a plain cotton fabric, has alternating multicolored stripes. The fragment illustrated in Fig. 2 is a compound twill with a red and golden-yellow pattern; No. 79 is a very small silk strip, a multi-colored compound tabby. One small fragment



Fig. 2.

(No. 82, Color Pl. 11) is of an embroidered silk damask. The small number of pure silk fragments found here also corresponds with finds from the aforementioned sites. The silk yarns are either slightly reeled in the Z direction or not at all (i.e., I; floss).

Mulham.— Twenty-two fragments have silk warps and hidden wefts made of other materials (*mulham*). In most of these the weft is of cotton. All the *mulham* fragments are warp-faced, the weft being almost invisible. The silk warp has colored stripes (No. 61), while the weft is either undyed (No. 83) or light blue (No. 85). In most cases the weft threads are paired. In No. 87 stripes of alternating colors with thick (triple) and single wefts form a pattern of small checkerboard squares and stripes. No. 97 has alternating silk and cotton wefts. One *mulham* fragment is also decorated with a very delicate, silk tapestry band of fine brown scrolls on a beige ground. The relatively large number of *mulham* fragments is unique at our site, with none discovered at Quseir al-Qadim (Eastwood 1980) and only 11 at Fustât (Mackie 1989:89). At Fustât, most are warp faced and striped, with undyed yellowish or light blue cotton wefts, although alternating silk and cotton wefts were used in one fragment (Mackie 1989). *Mulham*, familiar from dated *tiraz* fabrics (Golombeck 1977), is mentioned in literary sources of the ninth century CE in Iraq and Iran, whence it spread through the Islamic world.

Techniques

Weaving.— The fragments exhibit a great variety of weaving techniques.

As at the other sites of the region in this period, most are in various forms of tabby weave, though other techniques are also in evidence.

Tabby: simple	75	Twill	10
balanced	78	Compound weaves	7
warp faced	15	Satin weave	1
weft faced	21	Felt	2
extended	27		

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However, at Fustât (Mackie 1989) the only non-tabby fabrics were two compound weaves made of cotton and wool, probably used as floor coverings, and at Quseir al-Qadim (Eastwood 1980) there were only two—one weft-faced compound tabby and one twill. The compound weaves were woven on the drawloom, a device which had already been used by Coptic weavers in the fourth century CE in Egypt (Baginski and Tidhar 1980:9). Compound weaves are rare in the region although there is an item very similar to ours from Quseir al-Qadim. The textiles are made of wool and cotton with geometric patterns. One such fragment was also discovered at Naḥal 'Omer (Baginski and Shamir 1995).

Felt fragments similar to those from Coral Island were discovered at Fustât (Mackie 1989:26). In both sites only the upper layer was dyed.

Parts of selvages were preserved on 46 fragments. Twenty-five are plain selvages, 14 are crowded, and 8 are reinforced. Of the reinforced selvages six are composed of three to ten pairs of warp threads and one is made of six groups, with four warp threads in each group (No. 66). Some pink silk warps are located near the selvedge on a linen fragment (No. 33). One item (No. 8) is a four-centimeter wide strip with both plain selvages preserved. Two fragments have simple closing borders (Nos. 63 and 26), and two (Fig. 3 and No. 91) have a starting border. The selvages and borders preserved on the textiles from Coral Island are similar to those

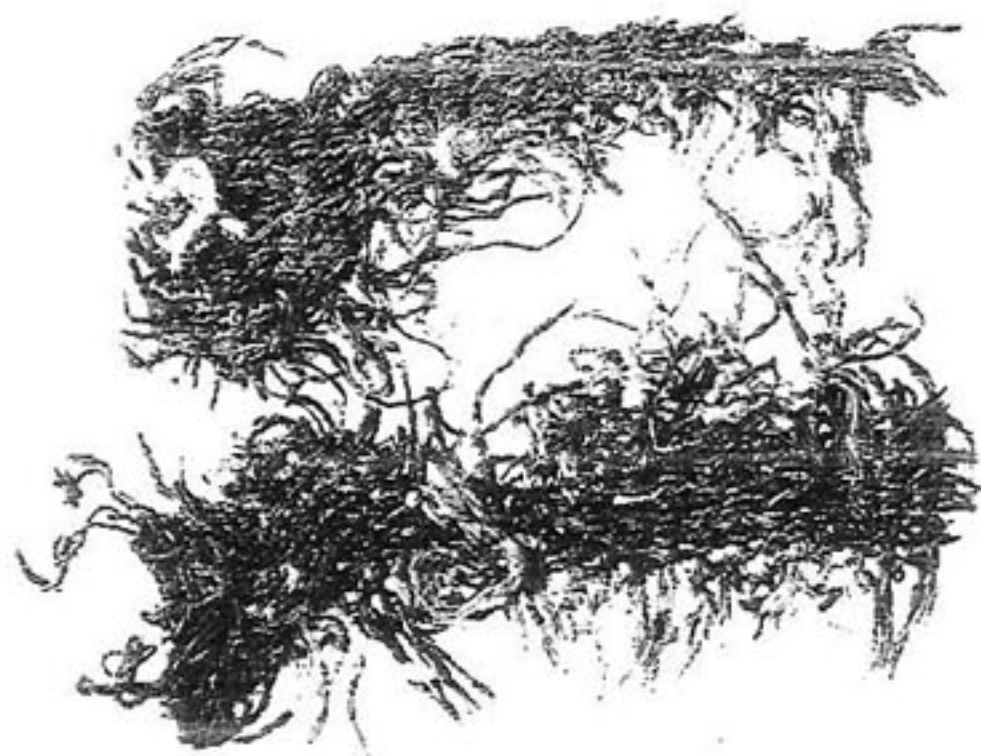


Fig. 3.

known from the Roman, Byzantine, and Early Islamic periods.

Decoration.— Of 236 fragments, 106 are dyed or decorated with dyed threads. Fifty-eight samples were analyzed by Z. Koren, all dyes being of plant origin (see Koren, this volume). Madder (with one exception) was used to produce red dyes, and indigo the blue, green, or greenish-blue. Unidentified plant sources were used for yellow; indigo + tannins for brown dyes. Three yellow or beige silk samples are undyed (Koren, this volume).

Patterns and Motifs: A great number of the fabrics have blue and white checks and may be of cotton, linen, or both materials in the same textile. As at Quseir al-Qadim and Fustât, there are also a large number of textiles with bands and stripes.

Checks	6	Tapestry	3
Plaids	6	Brocading	1
Grids	14	Selfbands	1
Stripes	38	Embroidery	10
Bands	25	Printed	4

Brocading and Embroidery: It is not always easy to distinguish between the brocaded and the embroidered decorations on Mamlûk textiles (Thompson 1985:39). Our three undyed linen fragments, Z-spun balanced tabby 20/cm, brocaded and/or embroidered with multicolored floss silk threads (Nos. 52–53, Color Pls. 5, 6; No. 55), are similar to those of the Ayyûbid and Mamlûk eras discovered at Fustât (Mackie 1989:90), Quseir al-Qadim (Vogelsang-Eastwood 1993:88), and Qumran (Jull et al. 1996:90). There are similar textiles in private and museum collections (see e.g., Thompson 1985; Curnu and Martiniani-Reber 1993). The brocaded and/or embroidered motifs in all these textiles may be stylized geometric bands, as well as candelabrum trees with outstretched branches. They were apparently parts of garments (Thompson 1985:138) such as turbans, scarfs, and robes (Martiniani-Reber 1985). The Coral Island frag-

ments are very small; it is therefore difficult to determine their use.

No. 82 (Color Pl. 11), an all-silk fragment, is embroidered with multicolored silk floss threads on an old-gold silk damask ground. Some of the embroidery threads have disintegrated, but the painted contours are preserved. The motifs are a foliated split arabesque (split palmette) and other stylized plant motifs, which show a very high quality of design and craftsmanship. An embroidered split palmette also appears on a garment of double weave in the Kunstgewerbemuseum, Berlin (No. 04.27a, Mackie 1984:134), as well as in other Mamlûk forms of art such as metal work, glass, ceramics, woodwork, illuminated manuscripts, and architectural decorations (Atil 1981:240–234).

Textiles Used in Clothing

Many fragments of assorted materials were originally parts of clothing. Some had been tailored as evidenced by seams, hems, and remains of sewing threads, and some simply cut to shape. The fabrics may be undyed and undecorated, dyed, decorated with embroidery or brocading wefts, or woven with colored threads in various patterns. Sometimes different fabrics were joined in order to make a garment or to decorate it. Some fragments were evidently of garments such as coifs (Nos. 20, and No. 25) or parts of sleeves, some with cuffs (No. 47). Varied materials were occasionally joined together to form the sleeve or to decorate it (Nos. 12, 100, and 101). Other items include the neck opening of a child's garment (No. 48), a decorated front opening (No. 55), and the lower parts of trousers (No. 95). Some triangular fragments, which may or may not have remains of stitches, are gores or gussets, which were sewn into a garment in order to shape it (Nos. 21, 24, 27, 95, and 99, Color Pl. 13), as in the tunic of the Bishop Timotheos from Qasr Ibrim (Crowfoot 1977:45) and in fragments found at Telem (Bolland 1991:59–64). Many items, though made of materials suitable for clothing, and evidently garments, are unidentifiable. As with similar

textiles found in Egypt (Vogelsang-Eastwood 1990b), they preserved no remains of sewing threads or other indications of tailoring.

Garments made of delicate fabrics were sometimes lined, such as No. 101, which is a sleeve of a *mulham* garment lined with an undyed cotton fabric. It is similar to the linen tunic of Bishop Timotheos (Crowfoot 1977:46).

Textiles made for clothing were at times re-used for other purposes. For example, No. 56 is probably a fragment of a purse; No. 31 is a piece of a bag made of several layers of varied cotton fragments. Parts of the attached bast fiber handle are preserved on it. Originally it was probably a blue bag, framed with an undyed fabric, lined, and embellished with attached pieces of leather, cord and goat hair. Several other fragments were cut and rolled as wicks; others were unraveled and most wefts removed, leaving scant woven material (No. 28). Textiles may also have been re-used as cords, such as No. 26, which was cut into strips, folded in two and twisted. One scrap was cut into a strip, folded in three, cut, and plaited (Reg. No. 402/127). Others were cut into strips and knotted together, such as No. 30. Most of these fragments are of cotton, but some are of linen or wool.

Sewing Threads.— Remains of sewing threads appear on 118 fabrics. They are not necessarily of the same material as their fabrics. Most are of undyed linen S2Z, some are of cotton Z2S, and a few are of wool.

The sewing threads were used for joining parts of garments or bags, for hemming, for mending, and for inserting patches. Run and fell (Morrel 1990:16) seams and rolled hems are common. Most of the sewing was carefully executed, using small and regular running, overcast, and hemming stitches. In one cotton fragment (No. 10) a rolled hem is terminated by knotted, two-centimeter long finials on each side, one filled with goat hair and the other made of cotton. Colored silk (floss) threads were used for decoration and embroidery in the form of stem, satin, and filling stitches.

Crude, Heavy Textiles

Fragments of various materials and techniques, not suitable for clothing, were discovered at the site. They are made of thick threads with a low thread density. Some are plain weaves (tabby)—undyed and undecorated textiles made of wool (No. 69), goat hair (No. 78), or linen (Nos. 89, 90, 92, and 93). It is difficult to determine their use because they are small and fragmentary, but they are probably fragments of sheets, floor coverings, bags, sacks, linings for baskets, or sails.

Two fragments are made of undyed beige wool decorated with pigmented brown bands (Nos. 69 and 71). Several remnants of a large floor covering (No. 102), made of wool, cotton, and goat hair, are decorated with dyed colored bands.

A rectangular piece of wool tabby weave (No. 70) has a cotton tape threaded around its four sides, three of which are cut. Parallel to its selvedge is an embroidered decoration. It was probably used as a purse.

One thick cotton fragment is a diamond twill with dark blue warps and cream (undyed) wefts (No. 4). No. 65 is a small, thick wool weft-faced compound weave, with undyed (beige) warps and blue and red wefts. Two other warp-faced compound twills with geometric patterns were probably floor coverings.

Felt.— Two fragments are made of felted wool (No. 75, Color Pl. 9; No. 76). Both are composed of two layers, the lower one undyed beige and the upper layer red. One has remnants of leather sewn onto it, suggesting that these felt fragments may have been parts of saddles.

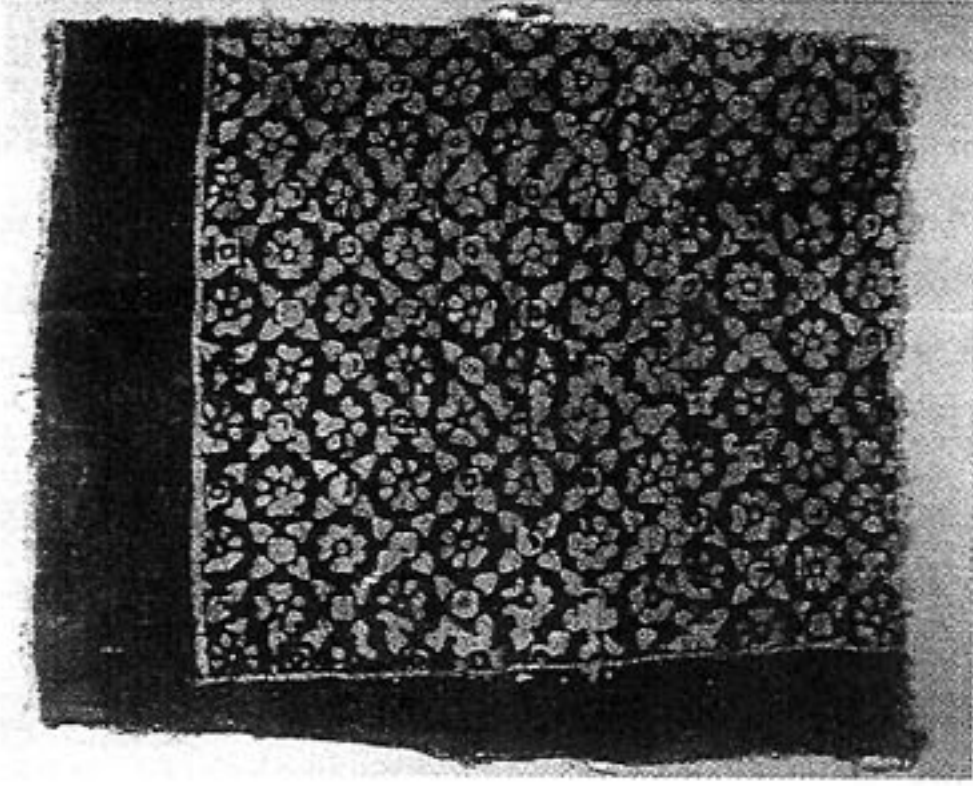
Origin

The textile fragments are of diverse origin. Similarly to Quseir al-Qadim (Vogelsang-Eastwood, 1993:85) there is no evidence that textiles were produced on the site. It can be assumed that the wool and goat-hair tabby fabrics were woven nearby on the mainland, where the local nomads herded sheep and goats, while all the other textiles were imported.

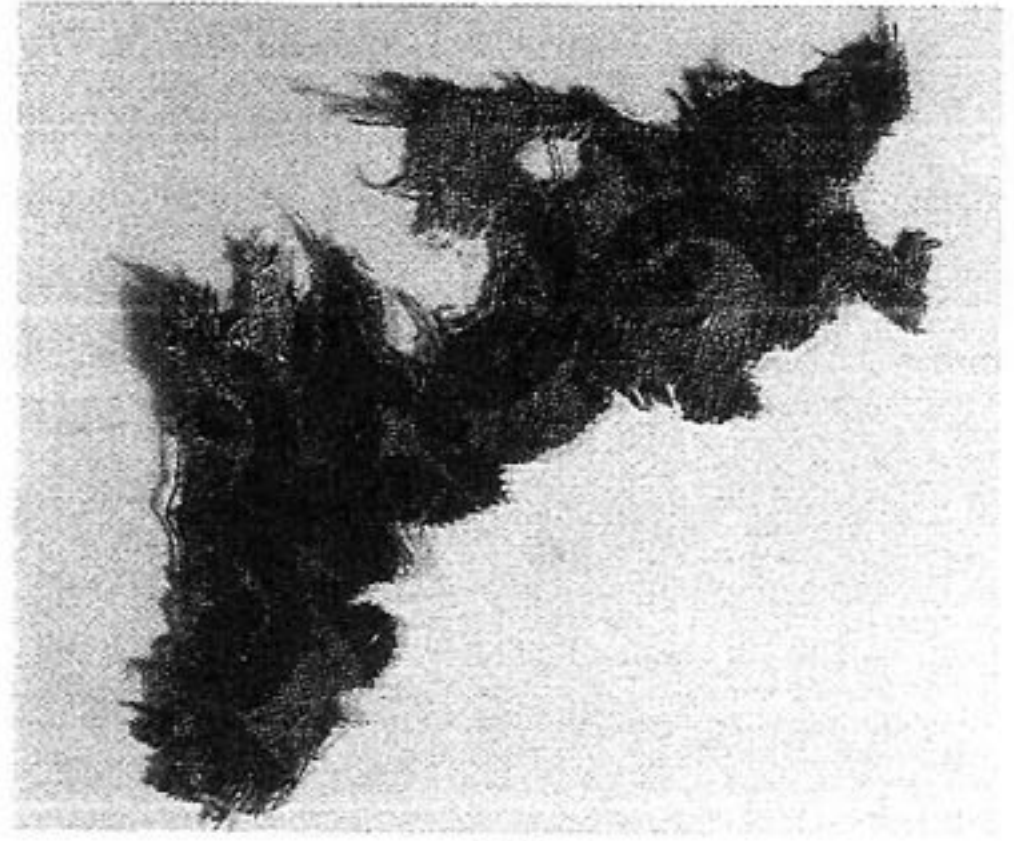
The non-woven wool felt fragments, similar to those found at Fustât (Mackie 1985:33), were among the most commonly traded goods coming from North Africa and the East. Thick wool and cotton compound weaves with geometric patterns were also discovered in Egypt (Quseir al-Qadim, Vogelsang-Eastwood 1993:85; Fustât: Mackie 1985:33, 86) and defined as *zilu*, which originated in Iran (Wilber 1981:309; Afshar 1992:31; Thompson and Granger-Taylor 1995–96). The woolen twills 2:1 are very similar to contemporary fragments from Europe (Bender-Jorgenson 1993). They were probably brought to the Near East by sailors or merchants.

The large number of cotton fragments of various types demonstrates commercial relations with India, South Arabia, Syria, Egypt, and perhaps also Nubia (Al-Hassan and Hill 1988:181). Cotton from India, South Arabia, Iran, Iraq, and Syria was generally Z-spun, while Nubian cotton was mostly S-spun (Mackie 1989:88–89). Most of our cotton fragments are Z-spun; only nine are Z-spun in one direction and S-spun in the other. Two are S-spun in both directions. The use of Z- and S-spun yarns in the same textile was found in twenty of our linen fragments. This is paralleled at Fustât, where many such textiles were found (Mackie 1989:83). The block-printed fabrics probably originated in India (Barnes 1996). All are Z-spun, as are those from Quseir al-Qadim (Vogelsang-Eastwood 1990a:15) and Fustât (Mackie 1989:88). A large group of *mulham* fragments probably came from Iran and/or Iraq, where such textiles are known to have been made (Mackie 1989:89). As at Fustât, all their wefts are Z-spun.

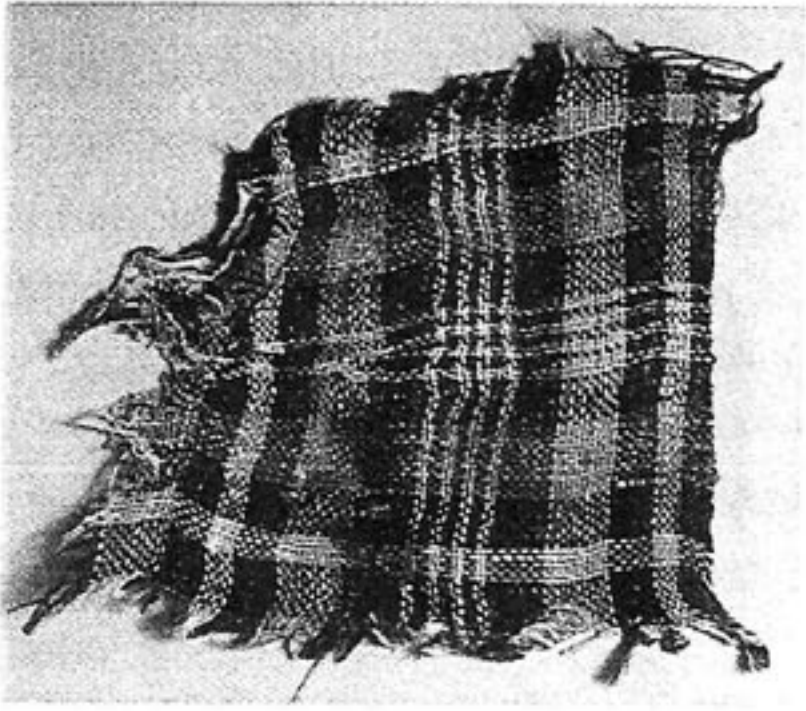
In contrast to the Egyptian sites of Quseir al-Qadim and Fustât, fewer linen than cotton fragments were found at Coral Island. All the linen fabrics are tabby, their yarns spun in the S- and the Z-directions, sometimes both in the same fabric. As flax has been grown in the Nile Valley since antiquity, most of our linen fragments, including those brocaded and embroidered with silk threads, probably originated there. Some textiles with *tiraz* inscriptions giv-



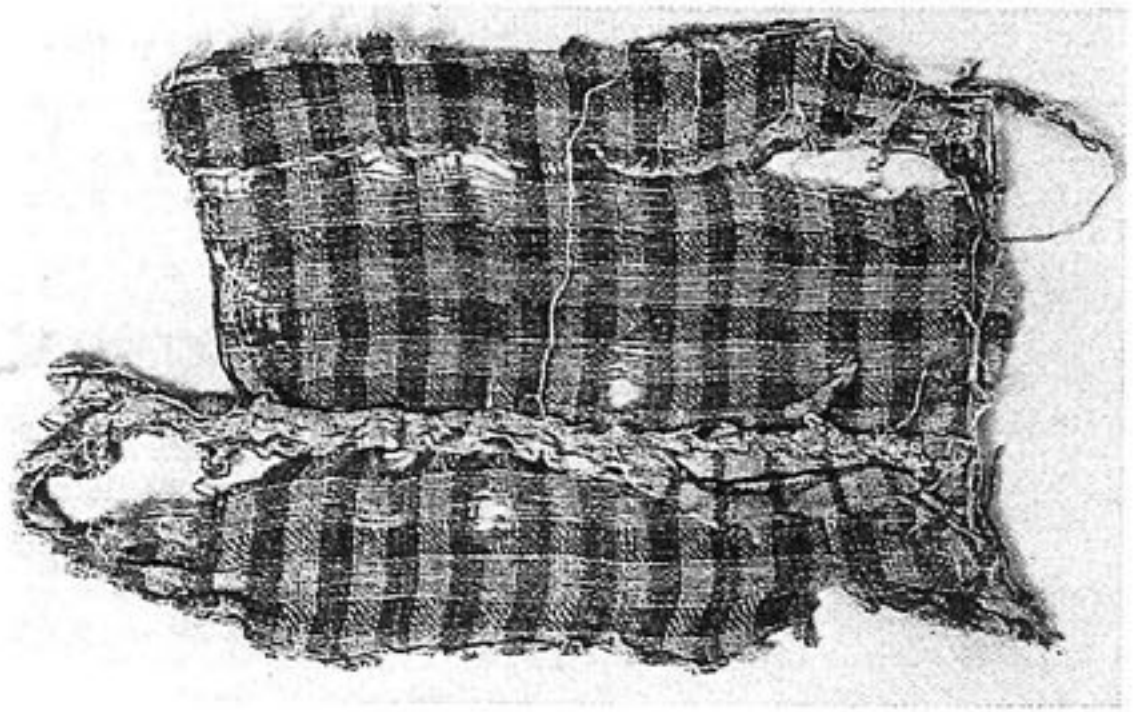
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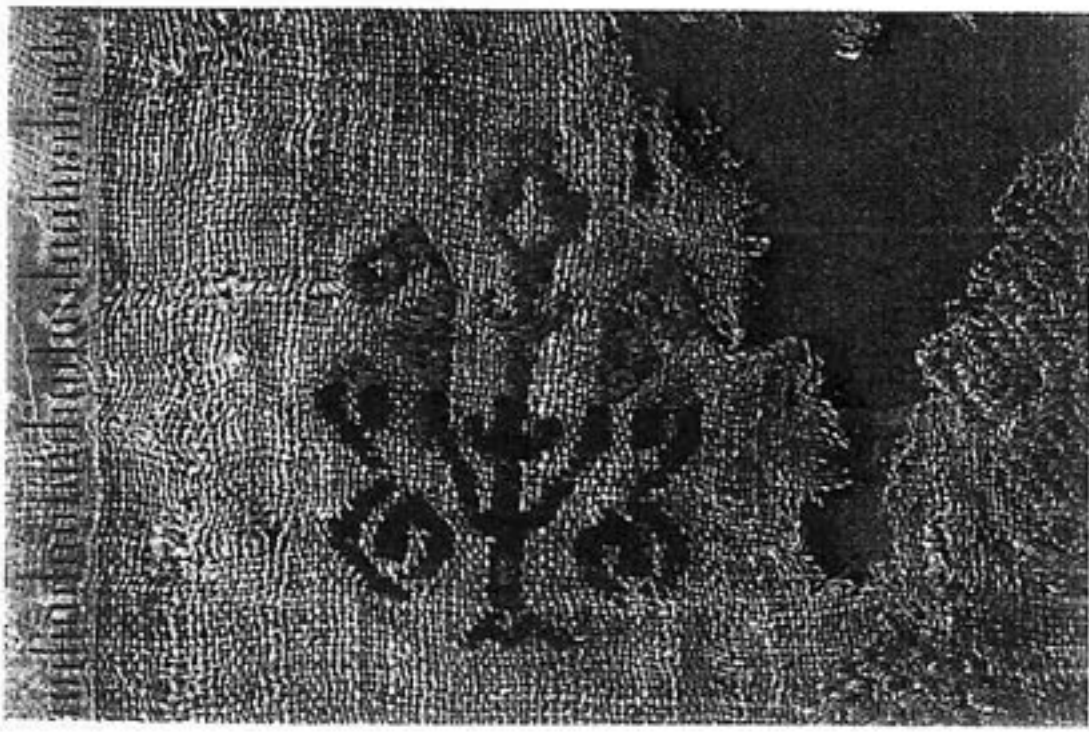
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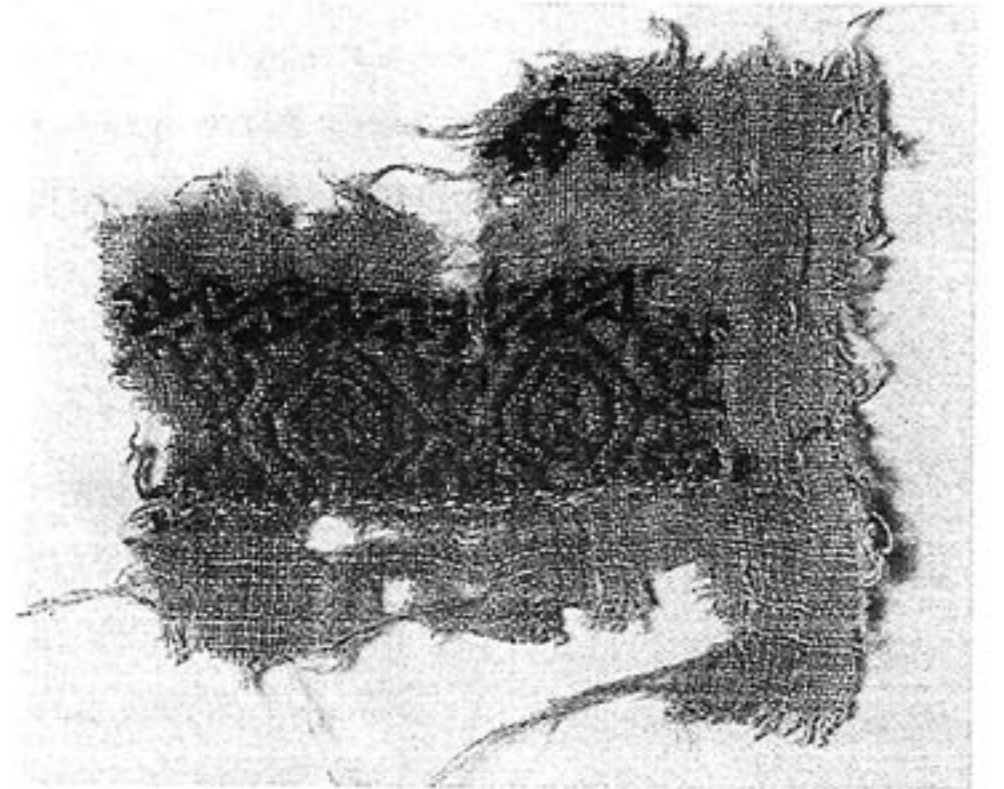
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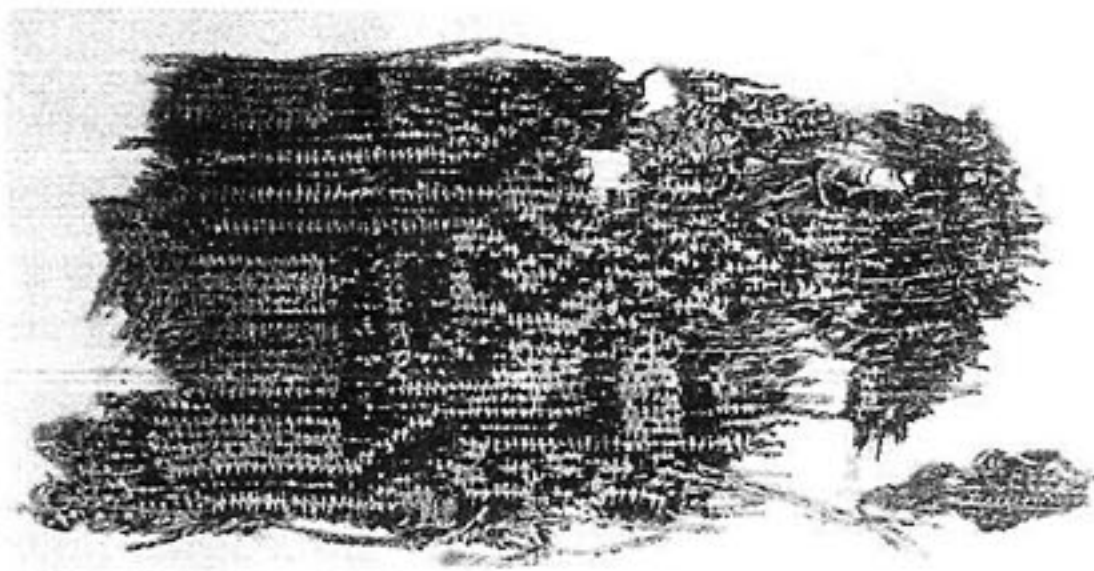
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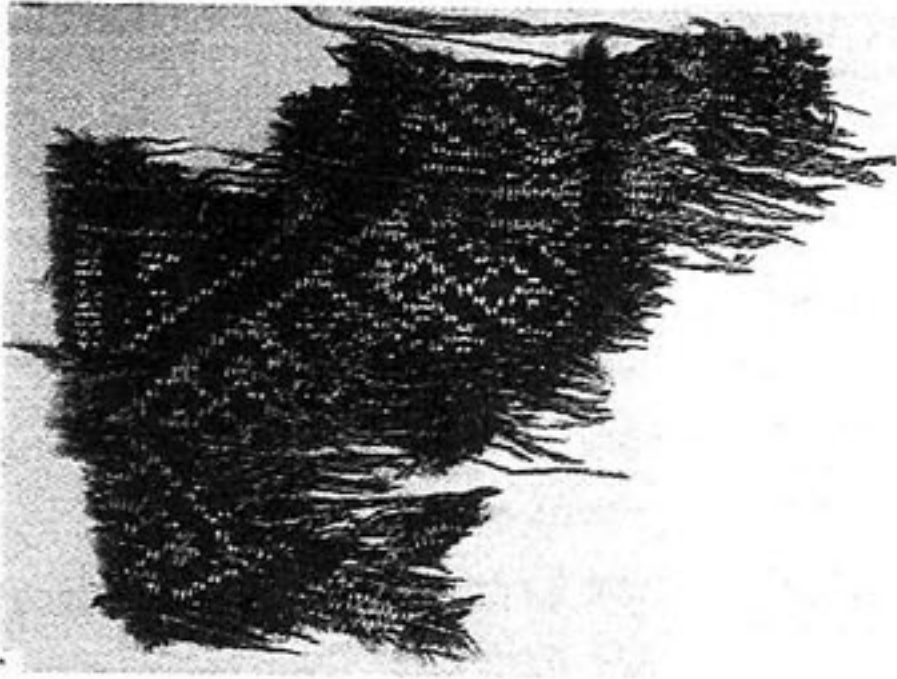
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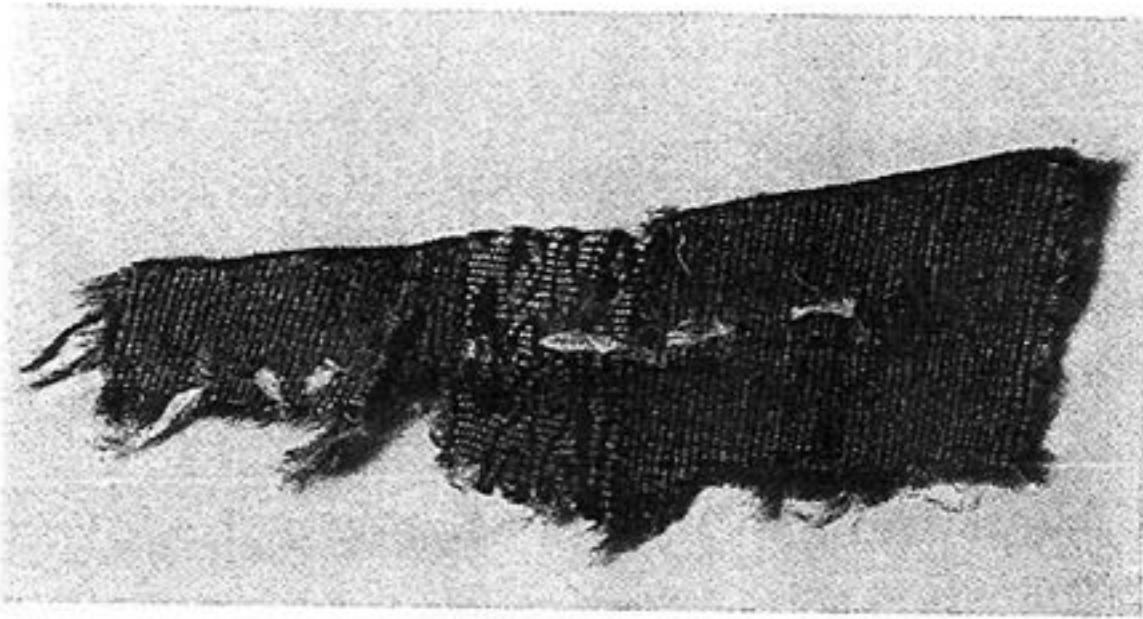
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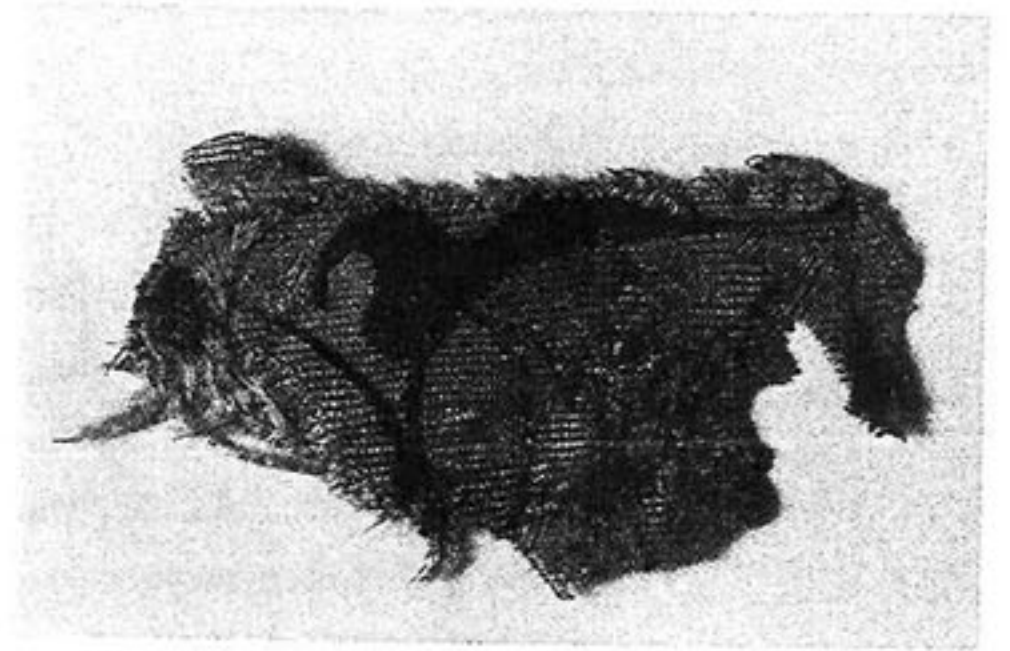
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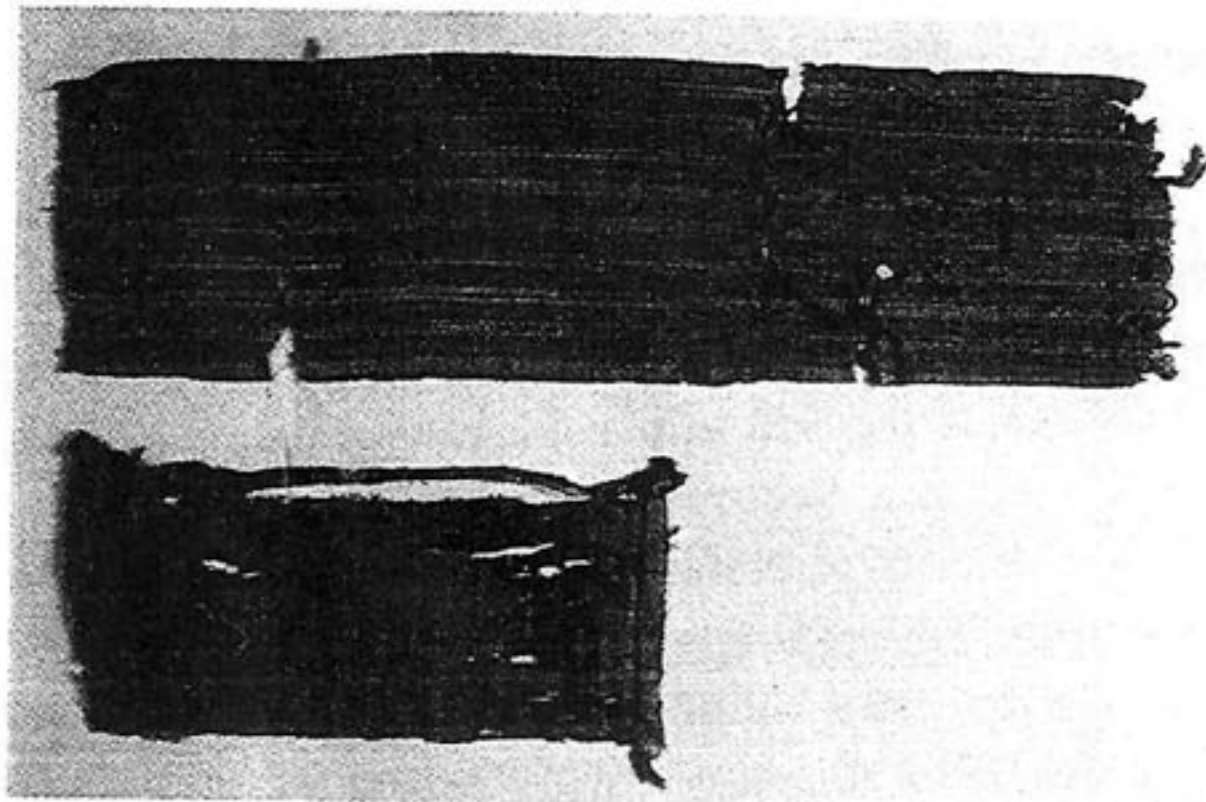
9 (75)



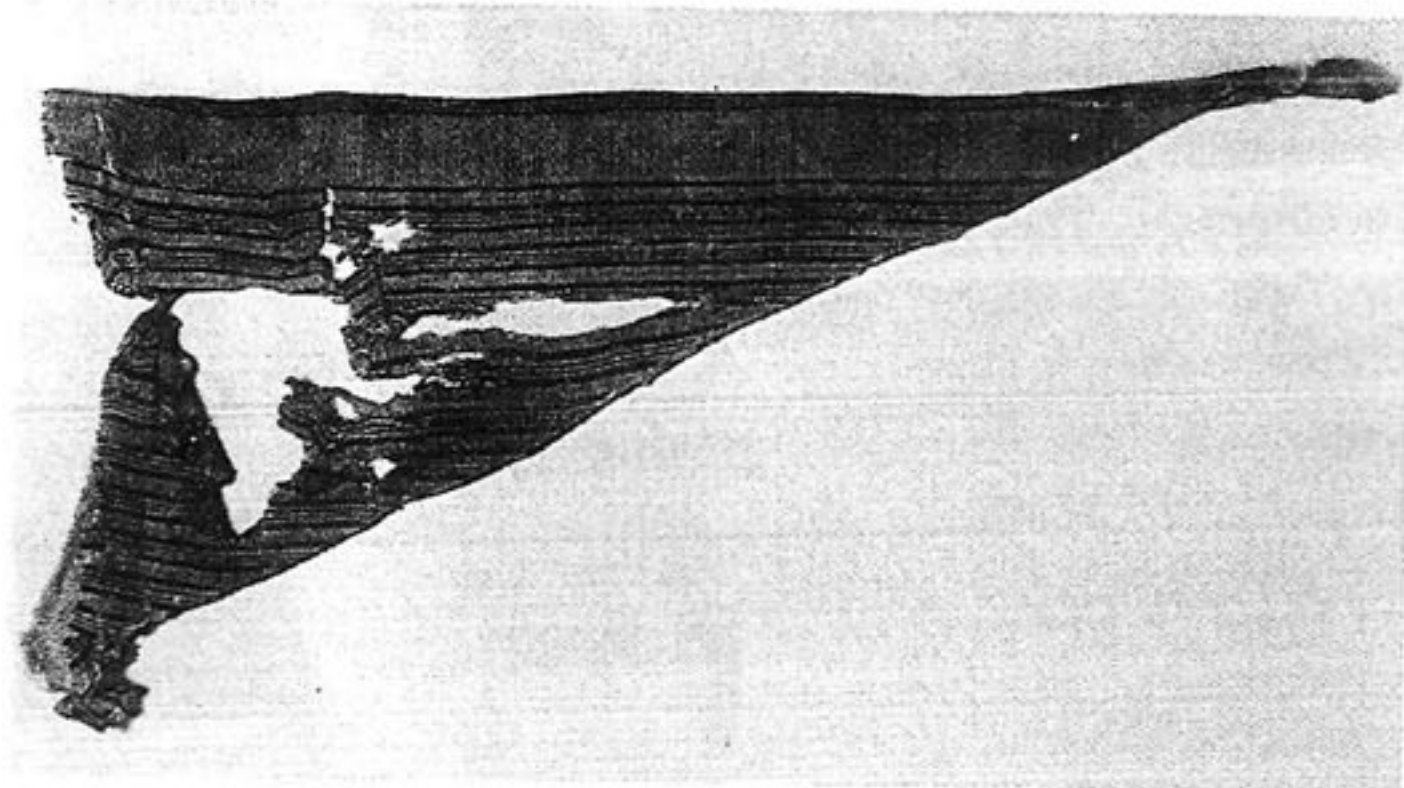
10 (81)



11 (82)



12 (86)



13 (99)

ing the place of manufacture as "Misr" were discovered at Quseir al-Qadim and Fustât (Mackie 1989:85).

Only seven small, all-silk fragments were found on Coral Island. In the twelfth century the silk industry was established in most Islamic lands, as well as in Sicily, where it flourished. After the Crusader conquest of this country (1091 CE) silk continued to be produced and woven, and the products were exported to Egypt and other Islamic countries. We can assume that they also reached 'Aqaba and Coral Island (Al-Hassan and Hill 1988:182).

Discussion

Textiles were of great significance in Mamlûk Egypt and were its major industry, ranking high in international trade relations. There were special rules regarding the costumes of the Chalifa and the Mamlûks of his court (Mayer 1952). Robes of honor were a customary gift which the state officials considered their due; in fact, textiles were counted among the valuables of the ruling class. Textiles from many countries even reached the small fort on Coral Island guarding the harbor of 'Aqaba.

An "international fashion" in that period is evidenced in the blue and white checked and striped textiles, as well as garments made up of several fabrics, composed of panels, gores, and gussets. These were discovered in excavations in the Near East, Egypt, Nubia, and West Africa and were depicted in European paintings (e.g., Simone Martini, Italy 1320) and miniatures (e.g., the Sarajevo Haggada, Spain, thirteenth century) of the period.

Garments composed of narrow panels and gores made of yard goods woven on narrow looms with repeat patterns (if any) were a new development. They differed completely from the "woven to shape" garments of antiquity, which survived in Coptic Egypt up to the twelfth century CE. This new, basic garment pattern—the *galabiye*—is still a garment worn by men in Egypt and other Arab countries.

BASKETRY

About 700 fragments of basketry, most of them made of date palm, were found on Coral Island. Various techniques were used: checker plaiting 1/1, twill braid plaiting 2/2 (Table 2), twill plaiting 2/2, simple plaiting, and twining. Thirty items which represent the various techniques of the Coral Island basketry fragments were chosen for analysis. Twenty-four of them appear in the catalogue, where they are listed according to Adovasio 1977 and Wendrich 1991.

Checker Plaiting 1/1 on a Bias

Five pieces of checker plaiting 1/1 are representative of the fragments of this type. The dimensions of the largest piece are 65 × 50 cm (No. 104). All five are made of date-palm leaflet elements woven with four to seven elements per 10 cm into five to eight elements per braid. The cord which connects the braids is made of date-palm fibers, Z2S, diam. 0.4 cm, twisted 13 times per 10 cm. Two fragments (Reg. No. 406/19; Cat. No. 104) have complete handles Z2S3Z with reinforced cords made of date-palm fibers. The handle is attached to a rim-self selvedge with connecting cord. The cordage used in the checker plaiting is also made of date-palm fibers.

It seems that Nos. 103, 104, and 406/19 are parts of baskets. No. 402/182 is apparently a flat basket, 52 cm in diameter with walls 6 cm high. The braids of these baskets are very narrow, 4–5.8 cm, compared to the braids of the two others, Nos. 303/7 and 402/183, which are 11.8 cm and 9.8 cm wide respectively. The latter two were probably parts of mats.

Twill Braid Plaiting 2/2

Eleven pieces of twill braid plaiting 2/2 are representative of the fragments of this type.

The largest piece is 24 × 140 cm (No. 112) with a complete circular rim. All are made of date-palm leaflet elements woven from 5 to 15 elements per 10 cm into 5 to 18 elements per braid. The braids are 3–16.5 cm wide. The cord connecting the braids is made of date-palm fibers, Z2S, 0.4 cm in diameter, twisted 12 times

per 10 cm. Five fragments have handles (Nos. 108, 109 No. 111 and 112). Four are complete, measuring 18–20 cm, and two have no reinforced cords (Nos. 111, 112). The handles are made of date-palm fibers except for one handle, which is of date-palm leaflets (No. 109). The diameter of the handles is 1.5–2 cm, 5–6 twists per 10 cm. The twist direction is Z2S3Z except for No. 109, which is Z2S4Z. Two fragments (Nos. 108, 109) have two handles, one above the other. Three have Z2S reinforced cords (Nos. 108, 110). There are five preserved rims, made of date-palm leaflets or fibers. The rim selvages are triple wrapped.

Only in one fragment (No. 111) is the base preserved, its starting braid 6 cm long. All the fragments were apparently parts of baskets except for No. 106, which is very flat, made of very wide braids (16.5 cm), with 18 elements per braid and is probably part of a mat.

A textile was sewn onto No. 105 (see Table 1) to mend it. There are no reinforced cords in Nos. 111 and 112. They are probably fragments of small, flat baskets. No. 303/7 (Table 2) could have been part of a mat because its braid is very wide (12 cm).

Twill Plaiting 2/2 Connected by Sewing

Only two fragments of twill plaiting 2/2 without a connecting cord were found. In one of them (No. 114) the braids are connected by a sewing string Z2S, 0.4 cm in diameter. The other (No. 115) is a continuous element self selvedge (Bernick 1994: Fig. 18, Type 1).

Twining

Three examples of twining were observed on the site: countered weft twining, close twining consisting of cords, and open twining. All appear in the catalogue.

Two (Nos. 117 and 118) could have been part of floor coverings. The function of No. 116 remains enigmatic.

Simple Plaiting

Six pieces of simple plaiting (Adovasio 1977: 104) were examined. They differ in material,

number, and diameter of elements, as well in other parameters. All the fragments are parts of mats except No. 124, which is too fine to be defined as a mat. Its use remains unknown.

Discussion

Though over 700 items of basketry were found, there was no complete basket among them. Many fragments were discovered in the ruins of the buildings (in contrast to the textiles, which were mostly recovered in the middens). Presumably, when leaving the site the inhabitants carried their goods in baskets, leaving behind only those which were in very poor condition.

Similarly to Fustât (Driskell 1989) none of the basketry fragments are dyed or decorated. In contrast, dyed and decorated basketry fragments were common at Qasr Ibrim in Egyptian Nubia (Driskell 1989).

Many techniques were used, e.g., checker plaiting 1/1 and twill braid plaiting 2/2. The handles, rims, and reinforced and connecting cords are similar in their twist direction and dimensions.

The twining technique was known in the Neolithic period at Naḥal Hemar (Schick 1988) and in the Late Bronze Age at Timna (Shamir and Baginski, forthcoming), as opposed to the Roman period when it was fairly uncommon. This technique was used at Fustât and Qasr Ibrim (Driskell 1989).

Simple plaiting, known since the Chalcolithic period (Bar-Adon 1971), was rare in the Roman period.

There is no coiling as at Fustât and Qasr Ibrim in the twelfth century (Driskell 1989), or as in the Early Islamic period at Naḥal 'Omer (Baginski and Shamir 1995:32).

NETTING

Three pieces of different linen nets (identified by C. Shimony) were found in the waste dump (L402: see, e.g., Cat. Nos. 125, 126). Such nets were usually made with a netting needle (Wendrich 1991:64) and are suitable for fishing.

CORDAGE

About 700 cordage fragments were found on Coral Island. Thirty-four representative types were catalogued and described in detail.

The term "cordage" as used here subsumes items which may be characterized either as threads, cords, strings, ropes, or cables. The longest fragment is 150 cm. The diameter of threads is smaller than or equal to 0.2 cm; that of the cords, strings, ropes, and cables varies from 0.3 to 6.7 cm.

The threads are made of cotton, linen, silk, wool, or goat hair. Only a few of them are dyed blue or red. The cords, ropes, and cables are composed of various kinds of plants.

There are many variations of twist direction: Z2S, S2Z, Z3S, Z2S2Z, Z2S3Z, Z3S3Z, Z2S6S.

The thin threads were probably used for sewing, as they are similar to the sewing threads on the textiles. There were no skeins that could have been used for weaving.

Most of the ropes are short sections which had been tied or knotted. They contain many broken fibers, showing that they had been utilized. They were well made: tightly twisted in a uniform width, having been produced by professional rope makers and not on an *ad hoc* basis.

The large number of remains indicates that the site was subject to considerable traffic and trade. Moreover, the construction stones of the fort would have been shipped from the mainland, with ropes having been used in their transportation. Several ropes have overhand knots, and might have been utilized to bind bundles.

Thick cables such as Nos. 133, No. 140, and No. 141 could have been used to tie up a boat or an anchor. Such cables were discovered in the Dead Sea near 'En Gedi and were identified as anchor ropes (Shimony, Yucha, and Werker 1992).

Some of the cordage fragments are similar to those from Roman sites such as 'En Raḥel, Mo'a, and Sha'ar Ramon (Shamir, in preparation) and from Early Islamic sites such as Naḥal 'Omer (Baginski and Shamir 1995:33-34). However the Coral Island fragments present

many more variations of twist directions and materials compared to those mentioned above. Cordage fragments discovered at sites contemporary with Coral Island, such as Quseir al-Qadim and Qasr Ibrim, have not yet been published.

SUMMARY

The artifacts from Jazirat Fara'un (Coral Island), though largely consisting of discarded objects, stand out in their great variety of materials, techniques, and dyes. They parallel the finds at sites of the period in Egypt, such as Quseir al-Qadim (Eastwood 1980), Abu Sha'r (Bender-Jorgensen and Vogelsand-Eastwood 1990), Gebel Adda (Vogelsand-Eastwood 1993), and Fustât (Mackie 1989).

There are no indications that weaving took place at the site. The artifacts were evidently imported. The nature of the textile finds is consistent with the site's situation as a fortress guarding the entrance to the port of 'Aqaba, which served the sea route to Egyptian ports in the Red Sea such as Quseir al-Qadim, where similar textiles were discovered.

The small number of silk fragments indicates that the textile assemblage represents commonly used objects belonging to the inhabitants of the fort, namely the soldiers and their families. It can be assumed that only the damaged or fragmentary textiles were discarded, while the others were carried away by the inhabitants when leaving the fort. Nevertheless, a great deal can be learnt from these discarded fragments about the textiles of the Late Ayyûbid and Early Mamlûk periods.

The basketry and cordage, also a collection of worn and unusable discards, attest to an assemblage of objects of every-day use. The cordage, and in particular the nets, the thick cables, and the black substance (asphalt?) which sometimes adheres, are compatible with this island site, approachable only by boat.

As in most of the above-mentioned sites, the majority of textile, basketry, and cordage fragments was discovered in middens. They might

have been collected to serve as raw material for paper production, which was introduced by the Arabs from China in the eighth century (Hunter 1978; Newman 1990).

ACKNOWLEDGEMENTS

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CATALOGUE

The items in the catalogue are arranged by major groups: textiles, basketry, and cordage. The textiles are presented according to their warp material, then their function.

Several textile items consist of a number of fragments which may have been stitched together or have similar technical features. They appear under the same catalogue number, with each fragment marked by a letter. When the fragments have identical features, and it can be assumed that they originated from the same piece of material, then only the largest one is described in detail. When they are made of different fabrics sewn or tied together, each fragment is described separately.

Cream, beige, and yellowish colors are always undyed, unless stated otherwise.

The spin tightness is mentioned only when significant to the character of the textile.

The basketry fragments are arranged according to their technique; the cordage according to the raw material.

TEXTILES

No. 1 (303/2).
29.5 × 5.0 cm. Tabby.
Warp: Cotton; cream and dark blue (0.7 cm near selvedge); Z-spun, 16/cm.
Weft: Cotton; cream, light and dark blue; S-spun medium 12/cm.
Patt.: Colored bands, 1 cream, 4 light blue, 1 cream, and 4 light blue wefts on cream warp.

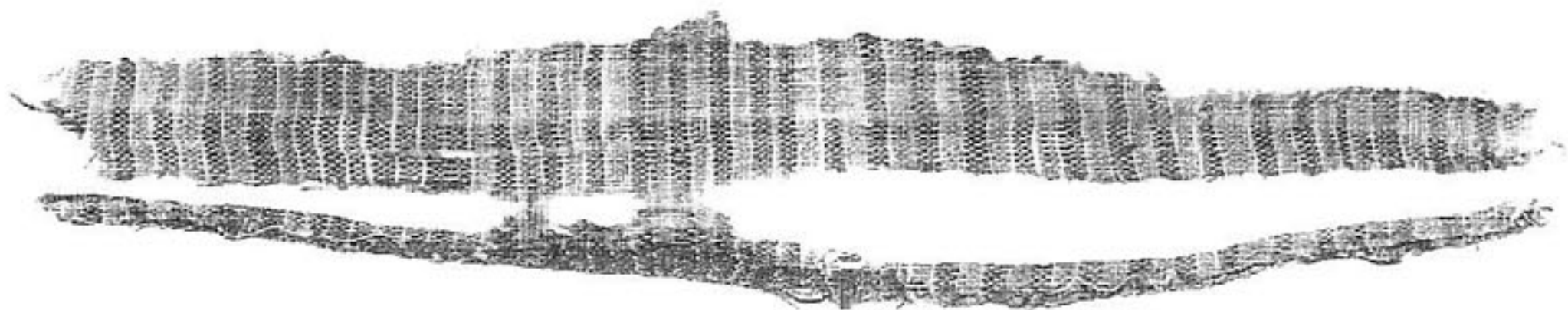
Comm.: Crude weave. Partly preserved selvedge, reinforced with dark blue threads S3Z. Folded near the selvedge; part of selvedge was cut out.

No. 2 (303/3). Two fragments.
(a) 4.5 × 11.5 cm; (b) 4.5 × 5.0 cm. Tabby.
Warp: Cotton; brown and dark blue; S-spun tight 15/cm.
Weft: Cotton; brown; S-spun tight 10/cm.
Patt.: Brown and dark blue alternating stripes.
Ref.: Baldry 1982:7

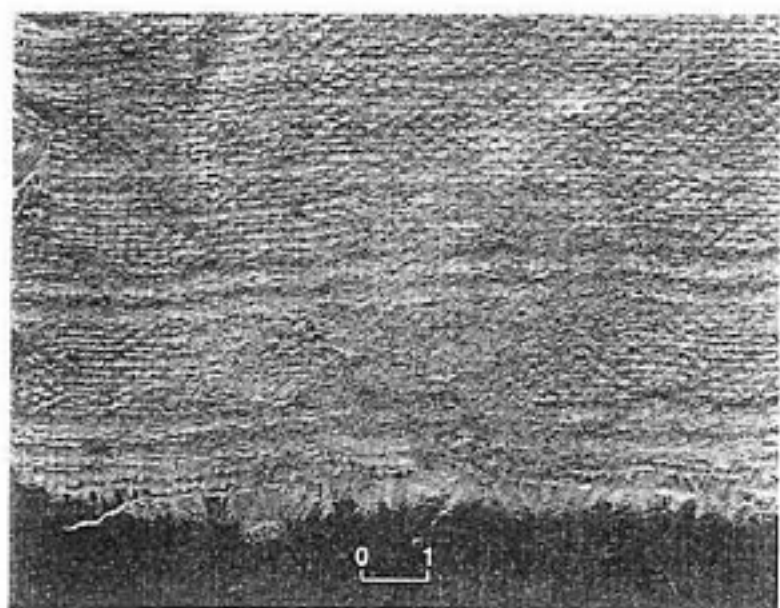
No. 3 (304/1).
22.0 × 28.0 cm. Tabby.
Warp: Cotton; undyed (white); Z-spun 12/cm.
Weft: Cotton; undyed (white); Z-spun 14/cm.
Dec.: 2 self-bands, each of 2 groups of five threads; 1 cm tabby between the self-bands.
Comm.: One partly preserved crowded selvedge.

No. 4 (402/178).
20.0 × 10.0 cm. Diamond twill.
Warp: Cotton; dark blue; Z-spun 13/cm.
Weft: Cotton; cream; Z-spun 14/cm.
Patt.: Light diamonds on dark ground.
Comm.: The weft yarns are somewhat finer than those of the warp. The fabric is thick, unsuitable for clothing; probably a fragment of a hanging or cover.

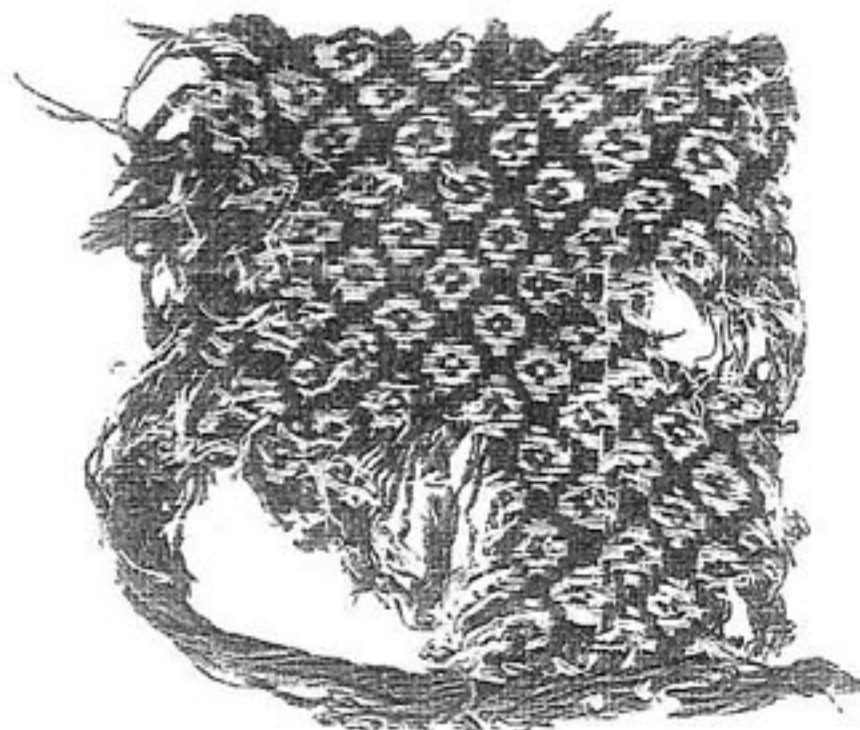
No. 5 (308/1). Three fragments.
(a) 8.0 × 22.0 cm; (b) 3.0 × 6.0 cm; (c) 3.0 × 7.0 cm. Tabby.
Warp: Cotton; cream, blue; and pink; Z-spun 13/cm.
Weft: Cotton; cream, and blue; Z-spun 21/cm.
Patt.: Stripes and a grid: 2 blue stripes divided by 2 cream, 2 blue and 2 cream warp ends—total width of the stripes, 2.3 cm. Then 5.0 cm blue grid on cream



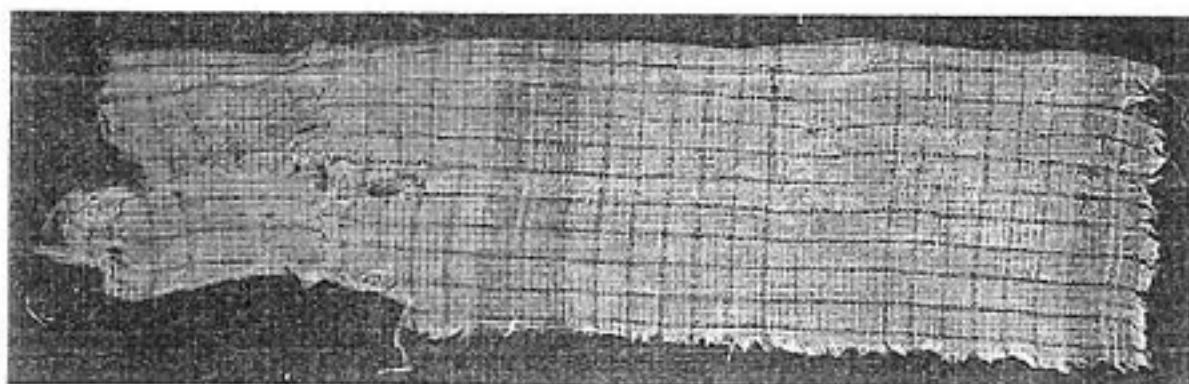
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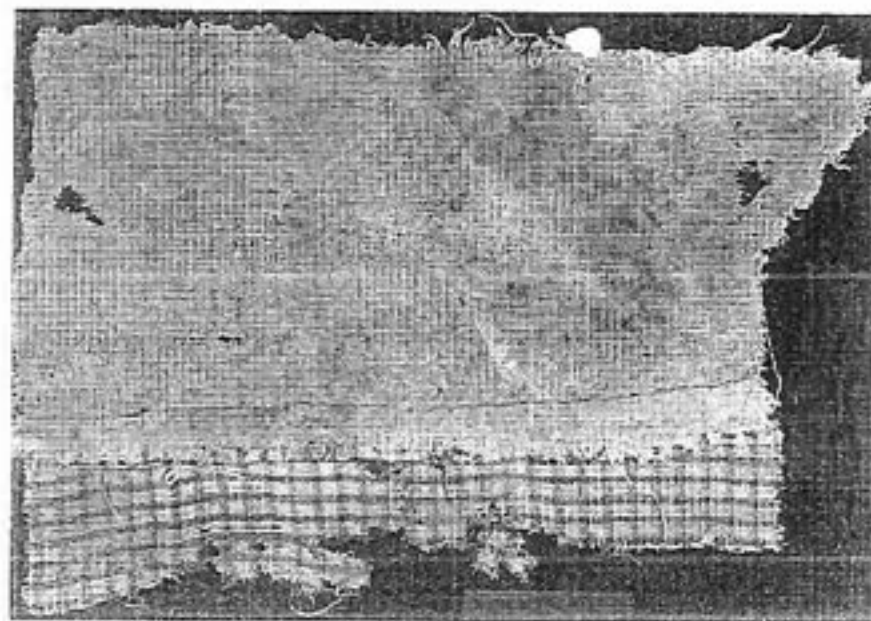
4



5



6



7

ground (0.7 × 0.7 cm); the grid consists of 2 blue threads in each direction; then 2.3 cm wide pink stripes.

Comm.: The three pieces are joined by single-stitched seams. There is a slip hem in the weft direction. Sewing thread linen S2Z. Some warps are torn.

No. 6 (308/2). Three fragments.

(a) 17.0 × 5.0 cm; (b & c) 5.0 × 9.0 cm (tied with a knot). Warp-faced tabby.

Warp: Cotton; blue, cream, and pink; Z-spun 42/cm, very fine threads.

Weft: Cotton; blue, and cream; Z-spun 11/cm.

Patt: The wide blue stripe is cut; its width cannot be determined.

Comm.: Fragments (b) and (c) are of the same material as (a). They are tied together. One rolled hem with remains of linen Z2S sewing threads is partly preserved.

No. 7 (308/4). Two pieces sewn together.

(a) 17.0 × 9.0 cm. Balanced tabby.

Warp: Cotton; cream; Z-spun loose 16/cm.

Weft: As warp.

(b) 17.0 × 4.0 cm. Balanced tabby.

Warp: Cotton cream; S-spun: blue. Z2S 18/cm.

Weft: Cotton; cream and blue; Z-spun 18/cm.

Patt.: Grid of 3 blue threads and 6 cream threads in each direction.

Comm.: Probably part of a garment, the colored part being an inserted gore or gusset; the two pieces are joined with cotton sewing threads Z2S and a run and fell (flat) seam. Cut.

Cf.: A fragment from Qasr Ibrim in the British Museum.

No. 8 (402/2).

18.0 × 4.0 cm. Warp-faced tabby.

Warp: Cotton; cream; Z3S tight 10/cm.

Weft: Cotton; cream; 5Z loose 3/cm.

Comm.: Fragment of a strip with both plain selvages preserved. Very crude weave.

Cf.: As No. 7.

No. 9 (402/6). Two fragments.

(a) 10.0 × 2.5 cm; (b) 12.0 × 20.0 cm. Tabby.

Warp: Cotton; cream and blue; Z-spun 32/cm.

Weft: Cotton; cream and blue; Z-spun 28/cm.

Patt.: Checks 1.2 × 1.2 cm made of two blue threads in each direction.

Comm.: Both fragments were cut on all sides.

No. 10 (402/13). Two pieces sewn together.

(a) 43.0 × 3.0 cm. Tabby.

Warp: Cotton; beige; Z-spun 13/cm.

Weft: Cotton; beige; Z- and S-spun 16/cm.

(b) 14.0 × 6.0 cm. Balanced tabby.

Warp: Cotton; beige; Z-spun 11/cm.

Weft: As warp.

Comm.: The pieces are sewn together with cotton sewing thread S2Z. The hem of (a) is terminated by 2 cm long knotted finials on each side. One is filled with goat hair, the other is of cotton.

No. 11 (402/32).

2.5 × 7.5 cm. Warp-faced tabby.

Warp: Cotton; tan, and blue; S-spun 32/cm.

Weft: Cotton; light blue; S-spun 8/cm.

Patt.: Stripes, alternating tan and blue.

Comm.: Cut on all sides.

No. 12 (402/68).

Five joined plain and striped cotton fragments.

(a) 9.0 × 30.0 cm; (b) 8.5 × 2.5 cm; (c) 5.0 × 4.0 cm.

Warp-faced tabby.

Warp: Cotton; cream, two shades of blue; Z-spun 32/cm.

Weft: Cotton; blue; Z-spun 20/cm.

Patt.: Stripes of 6 cream, 3 dark blue, 3 light blue, 3 dark blue, and 3 light blue warps.

Comm.: On (a), cream crowded selvedge.

(d) 25.0 × 8.0 cm; (e) 9.5 × 9.0 cm. Tabby.

Dir. I: Cotton; cream; Z-spun 14/cm.

Dir. II: Cotton; cream; Z-spun 18/cm.

Comm.: Probably remains of a sleeve from a cream cotton garment with a cream and blue striped cuff. The sleeve is composed of two pieces of plain cream cotton joined with simple seams, carefully sewn with running stitches and cotton sewing threads Z2S. The cuff also consists of two pieces joined with running stitches of cream linen sewing thread S2Z, and is attached to the sleeve with a false hem sewn with blue linen sewing threads Z2S. Part of the cuff was cut out.

No. 13 (402/69).

1.7 × 9.0 cm. Warp-faced tabby.

Warp: Cotton; blue, light red, and brown; Z-spun 22/cm.

Weft: Cotton; blue; Z-spun 11/cm.

Patt.: Large repeat of colored stripes of various widths.

Comm.: Cut into a triangle.

No. 14 (402/70).

11.0 × 1.3 cm. Tabby and point twill decorated stripes.

Warp: Cotton; cream and blue; Z-spun 36/cm.

Weft: Cotton; cream and blue; Z-spun 28/cm. Very fine threads.

Patt.: Self-patterned stripes. On one side, double warps: cream, 2 blue strips (this might have been near a selvedge which was cut away); 2 blue wefts every 1.40 cm, terminating at the double warps. One weft band of 8 picks, also terminating at the double warps, followed by a pair of decorative bands.

Dec.: Two bands with thick blue threads, self-patterned with floats of different lengths (point twill) forming small lozenges with a dot in the center.

Cf.: Table 1:402/152.

No. 15 (402/73). Three fragments.

a) 2.5 × 10.0 cm; (b) 3.0 × 7.0 cm; (c) 2.0 × 2.7 cm.

Weft-faced tabby.

Warp: Cotton; cream; Z-spun 14/cm.

Weft: Cotton; cream, faded red, and blue; Z-spun 48/cm. Some wefts are double (two in one pick) in an inconsistent manner.

Patt.: Cream and blue bands on red ground.

Dec.: Large running stitches (embroidery?) with cream cotton threads Z2S.

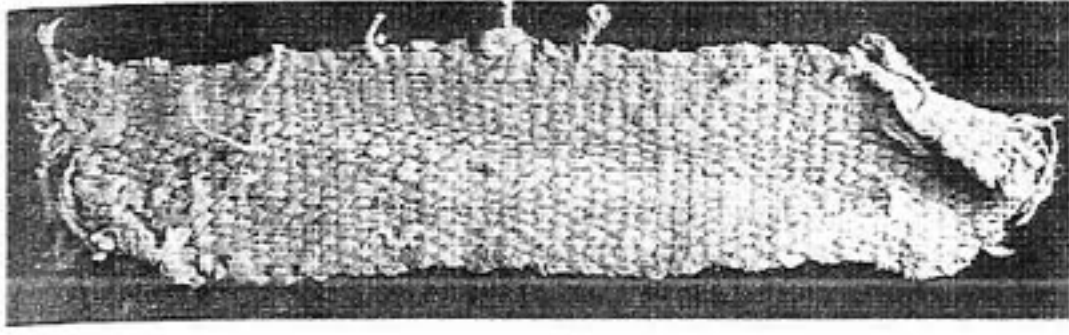
Comm.: Rolled hems on all three fragments sewn with tight Z-spun linen sewing threads. All the fragments were cut.

No. 16 (402/67), Color Pl. 1.

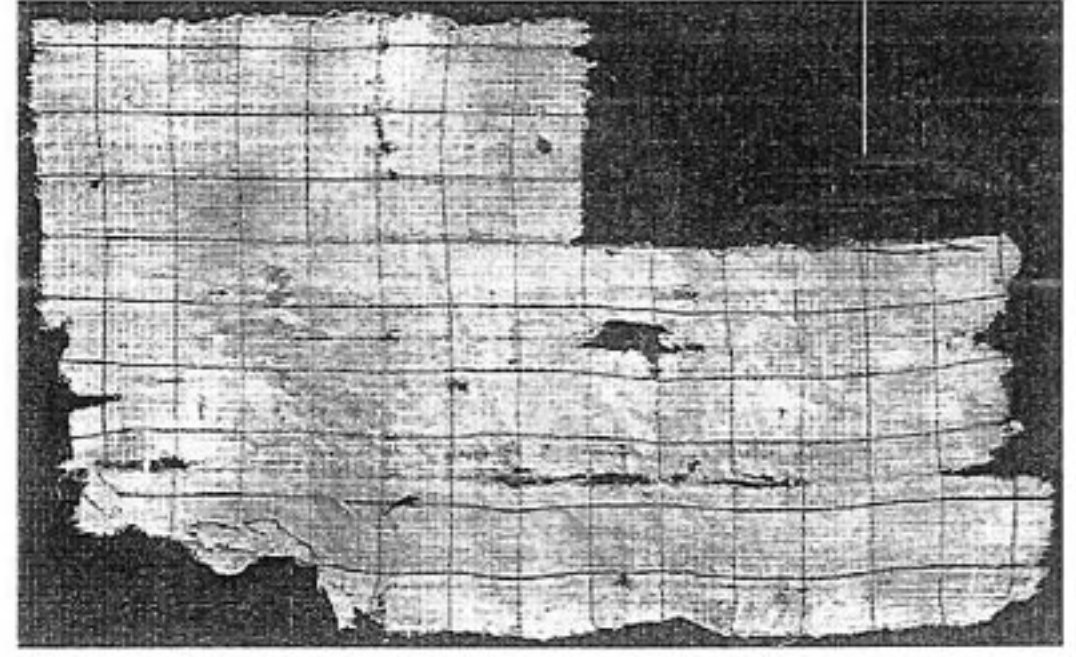
34.5 × 27.0 cm. Balanced tabby.

Warp: Cotton; Z-spun 13/cm.

Weft: As warp.



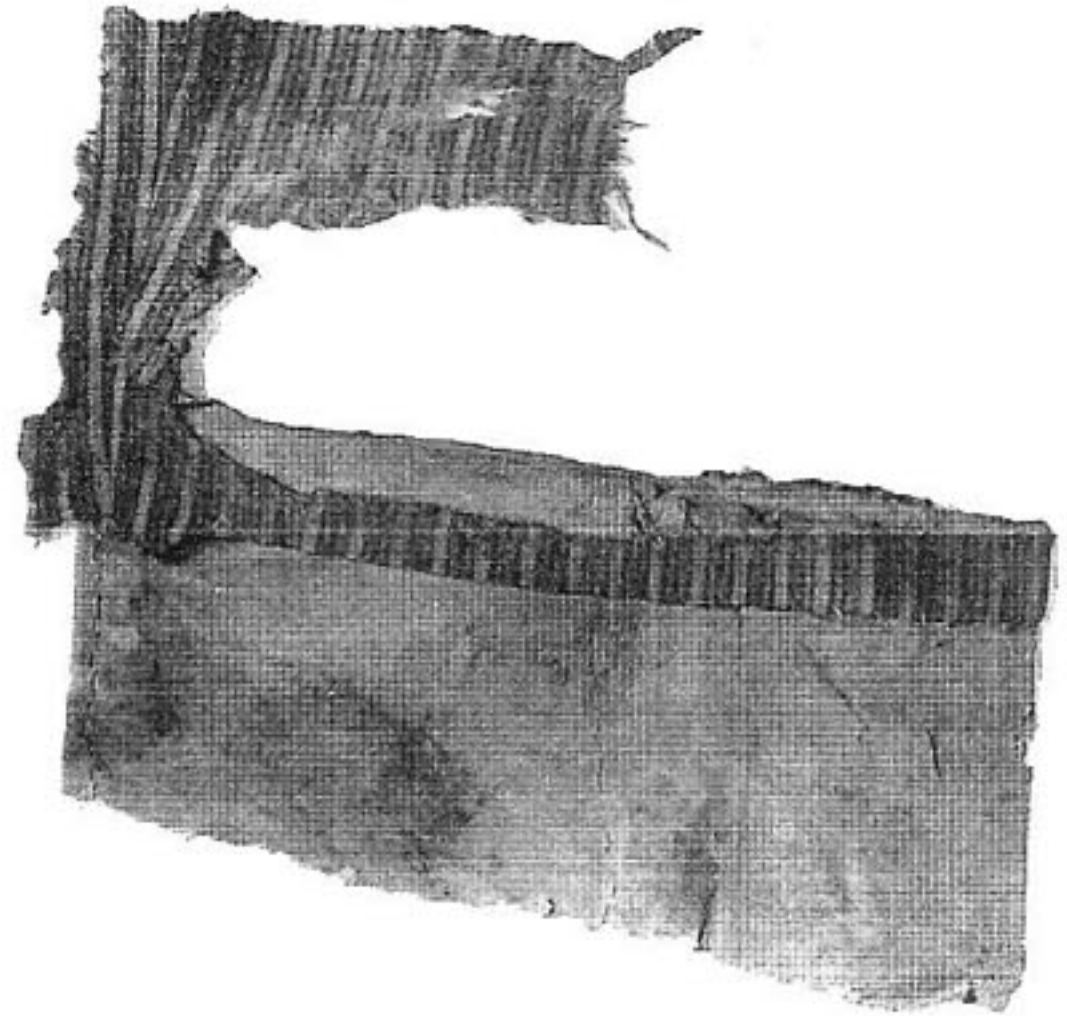
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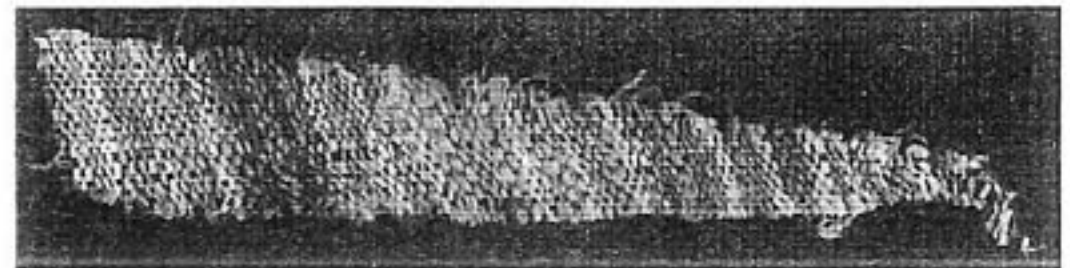
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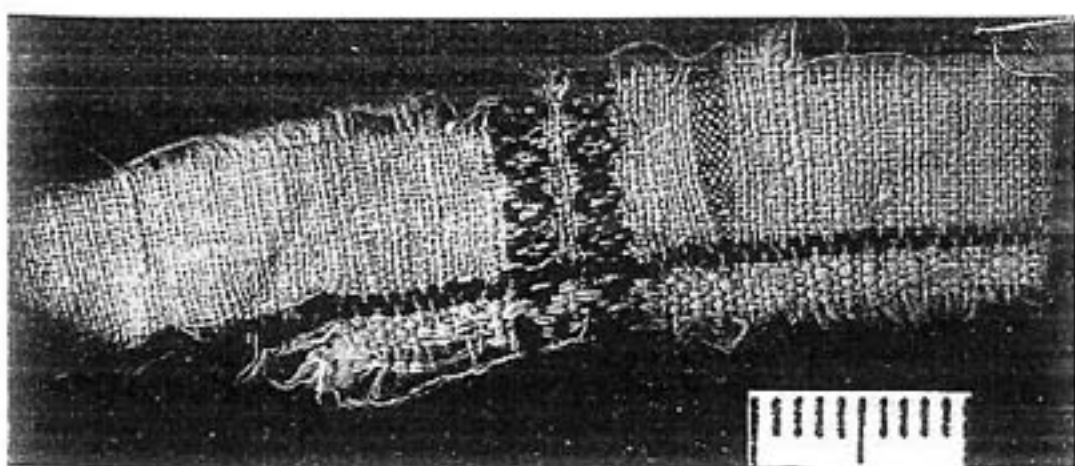
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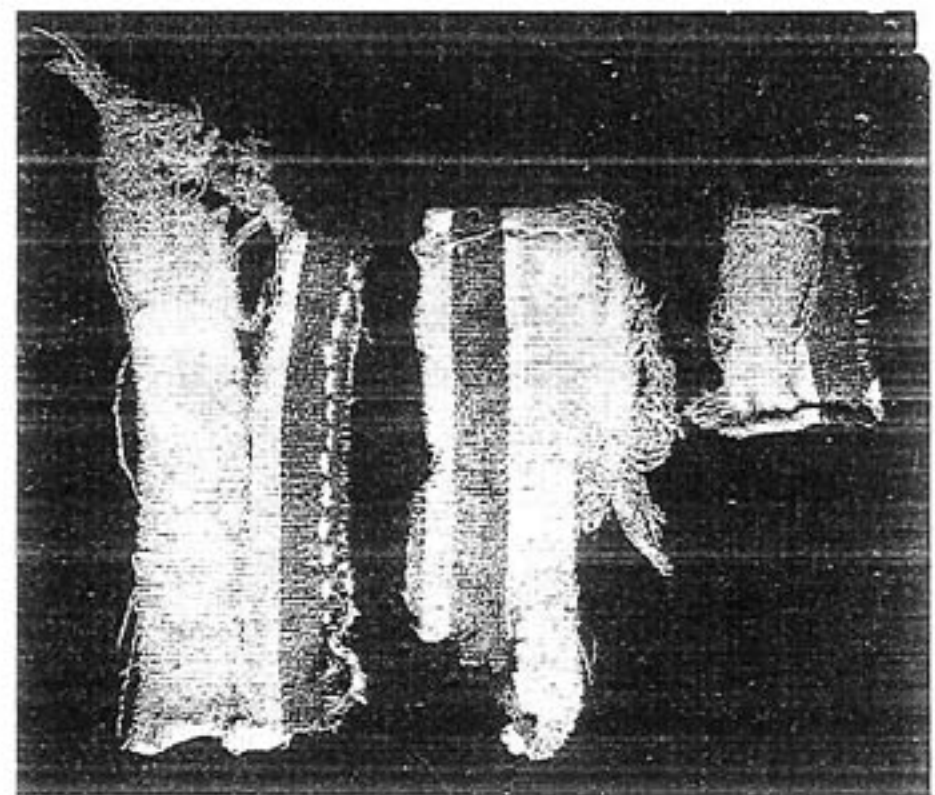
11



13



14



15

Dec.: Block-printed resist dye, dark blue on beige ground.

Patt.: Repeat of small rosettes in the center of a lozenge grid. Wide monochrome dark blue border.

Cf.: R. Barnes, pers. comm. 1993: textiles in the Newberry Collection, Ashmolean, Oxford.

Ref.: Vogelsang-Eastwood 1990a.

No. 17 (402/82). Two strips sewn together.

(a) 28.0 × 1.5 cm. (b) 26.0 × 1.5 cm. Tabby.

Warp: Cotton; Z-spun 13/cm.

Weft: As warp.

Dec.: Resist dyed, dark blue on beige ground. The fragments are too small to identify.

Comm.: One reinforced selvedge with pair of 8 warp threads partly preserved.

No. 18 (402/83).

11.5 × 17.5 cm. Balanced tabby.

Warp: Cotton; Z-spun 13/cm.

Weft: As warp.

Dec.: Resist dyed, blue on beige ground.

Patt.: Possible remains of an Arabic inscription.

Cf.: No. 17.

No. 19 (402/172), Color Pl. 2.

9.5 × 9.5 cm. Balanced tabby.

Warp: Cotton; Z-spun 15/cm.

Weft: As warp.

Dec.: Mordant-dyed, block-printed cotton, red on beige ground. Large floral motifs: four-petaled rosettes, stems, and leaves. Due to the fragmentary condition of the textile the pattern was unidentifiable.

No. 20 (402/88). Four fragments.

11.5 × 28.0 cm overall measurement.

(a) 20.5 × 11.5 cm. Balanced tabby.

Warp: Cotton; S-spun 12/cm.

Weft: Cotton; Z-spun 12/cm.

Comm.: Piece dyed; now faded blue. One plain selvedge.

(b) 11.5 × 6.0 cm. As (a).

Dec.: 2 dark blue bands of 3 wefts each with 2 light blue wefts between them.

(c) 13.0 × 9.5 cm. As (a).

(d) 16.0 × 2.0 cm (allover). Balanced tabby.

Warp: Cotton; cream; S-spun 14/cm.

Weft: Cotton; cream; Z-spun 14/cm.

Comm.: Made of two pieces of the same material sewn together.

Comm.: Probably part of a coif. Two single layers of piece-dyed, faded blue fabric were joined by a run and fell seam with cotton sewing threads S2Z. Remains of a 2 cm wide facing, made of double layers of

cream cotton which were joined by a run and fell seam with linen sewing thread S2Z, were sewn to the main part of the coif with three Z-spun cotton threads in overcast stitches. The coif was dyed after being finished; the facing was added later.

Ref.: Bolland 1991:113, 150.

No. 21 (402/89). Five fragments.

Overall measurement: 44.0 × 25.0 cm. Balanced tabby.

(a) 44.0 × 9.5 cm; (b) 11.0 × 42.0 cm; (c) 18.5 × 5.0 cm; (d) 26.0 × 14.0 cm; (e) 23.0 × 14.0 cm.

Warp: Cotton; cream; Z-spun 13/cm.

Weft: As warp.

Comm.: Fragment of a garment. Plain selvedges preserved on (a), (b), and (d). Fragments (a), (b), and (c) are joined with linen (white) sewing threads Z2S in running stitches forming a gore which was cut and reused. Originally it had been sewn to the garment with a run and fell seam. Fragment (d) is an additional piece of the same fabric, cut into a triangle, hemmed on one side with remains of stitches along its selvedge. Fragment (e) is of the same fabric hemmed on one side with remains of sewing threads on the other.

No. 22 (402/94). Two fragments.

(a) 7.0 × 23.0 cm; (b) 7.0 × 3.0 cm. Circumference 26.0 cm. Tabby.

Warp: Cotton; cream; S-spun 12/cm.

Weft: Cotton; cream; Z-spun 14/cm.

Comm.: Part of a sleeve with the cuff; two pieces sewn together by a run and fell seam. Rolled hem. Sewing threads: linen S2Z.

No. 23 (402/96).

12.0 × 12.0 cm, circumference 12.0 cm. Balanced tabby

Warp: Cotton; beige; Z-spun 12/cm.

Weft: As warp.

Comm.: Part of a sleeve of a baby's garment made of a single piece of cotton sewn together at the sides. Run and fell seam with linen sewing threads S2Z; rolled hem around the cuff.

No. 24 (402/110).

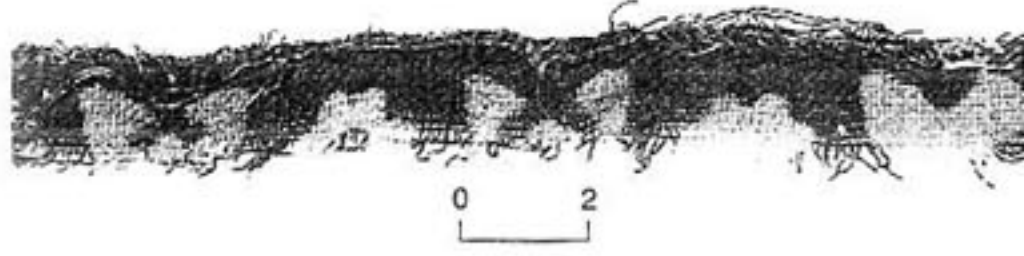
Three joined pieces of the same material.

Overall measurement: 20.0 × 7.0 cm. (a) 13.0 × 4.0 cm; (b) 12.0 × 1.4 cm; (c) 8.5 × 1.5 cm. Balanced tabby.

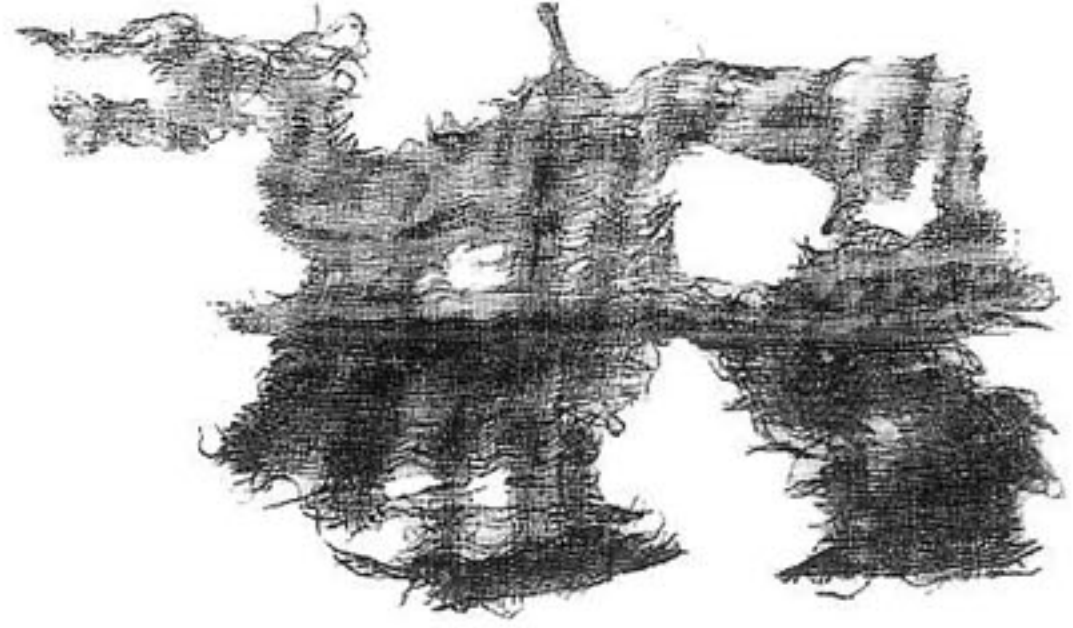
Warp: Cotton; cream; Z-spun 16/cm.

Weft: As warp.

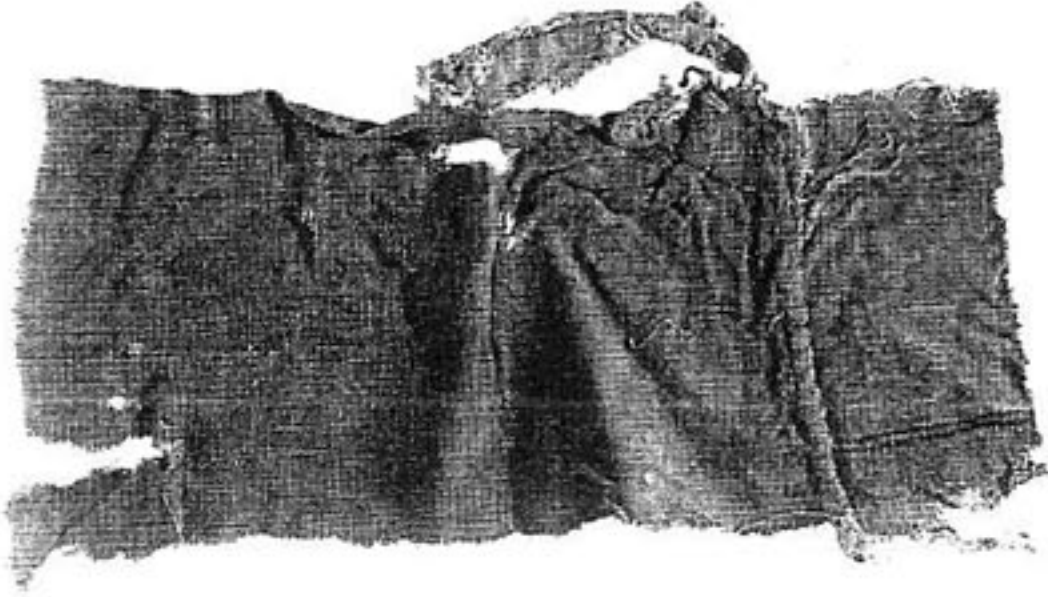
Comm.: Fragment of a garment, probably a gore (triangular pieces from the side skirt panels), sewn to a



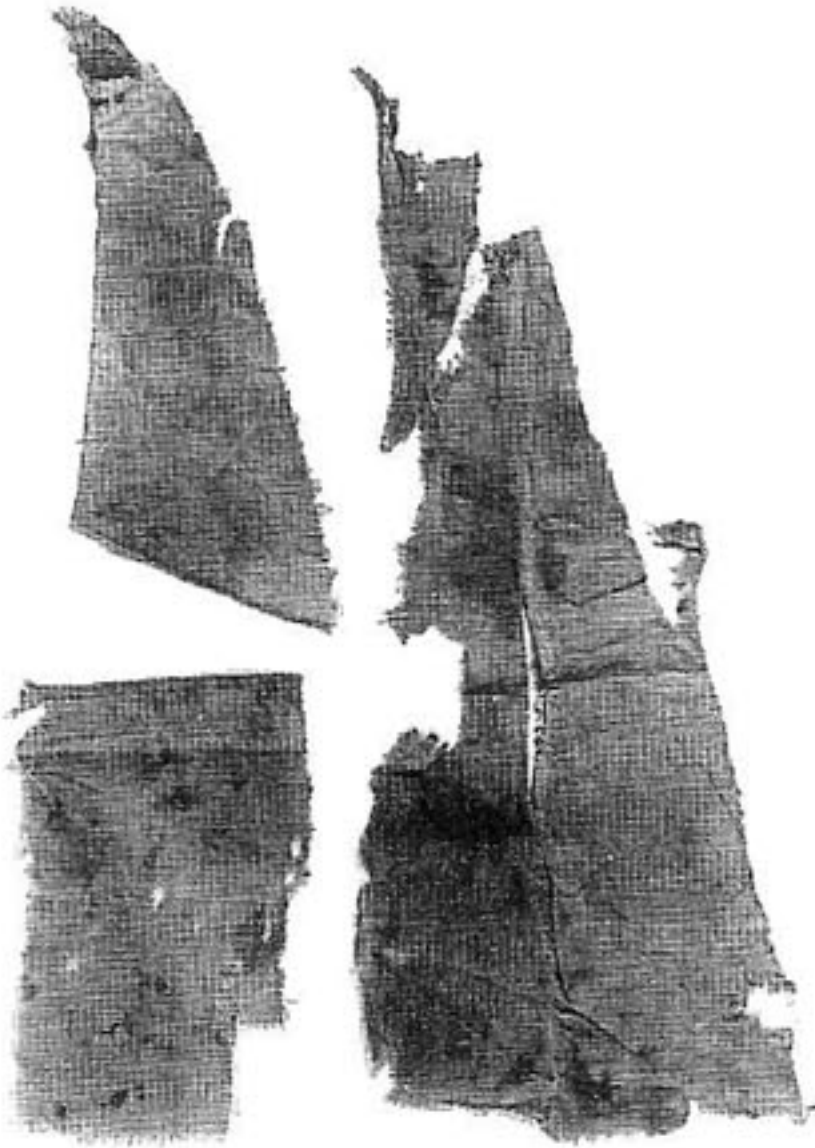
17



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20



21

blue garment with a simple seam on one side and overcast stitches on the other. Some blue threads are still attached to it.

No. 25 (402/116).

21.5 x 28.0 cm. Tabby.

Dir. I: Cotton; cream; Z-spun medium 22/cm.

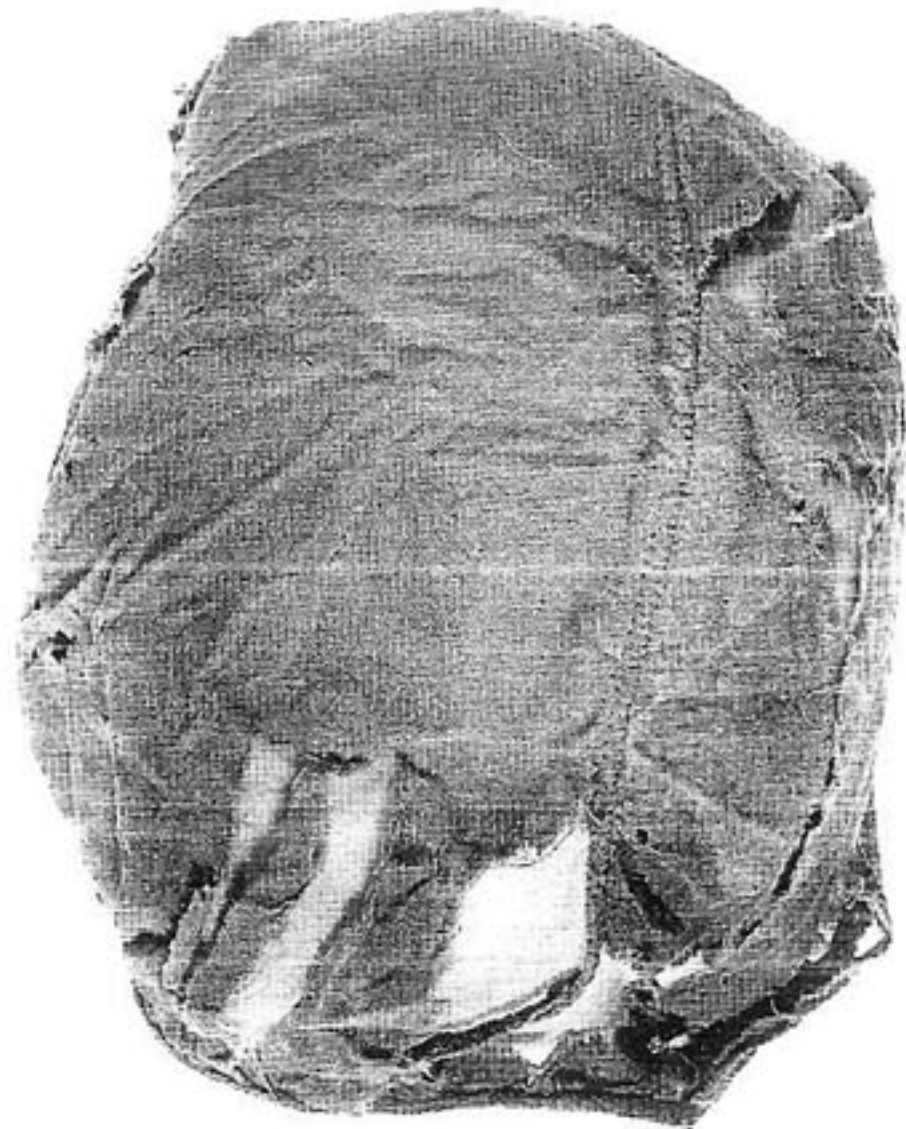
Dir. II: Cotton; cream; Z-spun medium 20/cm.

Comm.: A coif made of two pieces of the same fabric sewn together at the back by a double seam with overcast stitches. The bottom is slightly gathered, terminating in a rolled hem also sewn with overcast stitches. Very well executed, careful sewing with sewing threads Z2S. Torn in several places.

Ref.: Mayer 1952: Pl. 8.



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25