

DRESS IN THE DESERT: ARCHAEOLOGICAL TEXTILES AS A SOURCE FOR WORK CLOTHES IN ROMAN EGYPT ¹

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Introduction

Our knowledge for dress in Roman Egypt has largely been based on so-called ‘Coptic textiles’, which were much sought after by private and public collections of the late 19th and early 20th century,² papyri and other textual sources, and mummy portraits. Although rich and valuable sources, this evidence often suffers from uncertain provenance, dating and context. Recent projects involving radiocarbon dating have helped; substantial groups of ‘Coptic textiles,’ for example, are now dated between the third and tenth centuries CE.³ All three types of sources are found in towns and villages in the Nile Valley. The ‘Coptic textiles’ are funeral attire and are thus likely to reflect the ‘Sunday best’ of town dwellers and villagers. The mummy portraits represent members of the same groups: sufficiently wealthy

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² Gulmini et al. 2017; Pritchard 2006; Rutschowscaya 1990

³ De Moor and Fluck 2007; De Moor and Fluck 2019; Pritchard 2006, 13-26 and 114-15

to afford the making of portraits. The textual sources shed light on the production of textiles in the form of letters, bills and receipts regarding textiles or the raw materials for making them, contracts of apprenticeship, and lists and inventories of garments ordered or supplied.⁴

In recent years, a series of excavations in the Eastern Desert of Egypt has recovered many thousands of textiles, providing further insight regarding the dress of different social categories during the Roman occupation.⁵ These excavations also illuminate our understanding of preferred materials for specific garments, and how various items of clothing were made. The recent finds are dated mostly to the first and second centuries CE but some from the fourth and fifth centuries CE (Fig. 1). They also derive from a range of secure contexts, including textual sources such as ostraca, papyri and epigraphy, which supply a wealth of information about the sites and their populations. The sites include imperial quarries, Red Sea ports, and a series of forts or *praesidia* that guarded the roads between the Red Sea and the Nile.⁶

Quarries

Quarrying at Mons Claudianus⁷ started during the reign of Nero, and had its heyday from 104-154 CE when it supplied columns, fountains and other materials for Trajan's Forum and Basilica Ulpia, Hadrian's Villa, the Pantheon, and the Temple of Venus and Rome. It continued in use into the third century CE. The Mons Claudianus stone is grey granodiorite that is especially well suited for long columns.

⁴ E.g. Guédon 2014; Sheridan 1998; Wipszycka 1965.

⁵ Bender Jørgensen 2018, Table 1

⁶ Bender Jørgensen 2018 with further references; Cardon 2003; Cardon, Granger-Taylor and Nowik 2011; Handley 2007, 2011; Wild and Wild 2018 with further reference.

⁷ Peacock and Maxfield 1997; Maxfield and Peacock 2001b

Mons Porphyrites⁸ was discovered in 18 CE and was used into the fifth century CE. It supplied two kinds of porphyry: black and purple. The latter was in high demand for imperial statues and sarcophagi, for basins and fountains, and for wall veneer and columns. Black porphyry appears mainly to have been used for columns. The quarries were run as a network, headed by a prefect, the *procurator metallorum*, who was an imperial freedman. The staff consisted of two main groups: *pagani* and *familia*. The *pagani* were free Egyptian stone masons and blacksmiths, while the *familia* were imperial slaves and freedmen. The sites were administered by soldiers.⁹ The rubbish heaps at both sites contained an abundance of textiles; those at Mons Claudianus were well preserved and a representative sample has been documented;¹⁰ at Porphyrites, conditions of preservation were less ideal and the number of extant textiles smaller.¹¹

Ports

Berenike¹² was a port on the Red Sea coast close to the current border with Sudan. Founded by Ptolemy II c. 275 BCE, it remained in use until the first half of the 6th century CE. Berenike was an important hub for long distance trade with India, Arabia and East Africa. Texts in twelve different languages reveal that the population was cosmopolitan and multi-ethnic, consisting of groups such as traders, custom officials, soldiers, transport

⁸ Maxfield and Peacock 2001a.

⁹ Cuvigny 2018 ch. 7-9.

¹⁰ Bender Jørgensen 2018.

¹¹ Handley 2007.

¹² Ast 2018; Sidebotham 2018, ch. 1, ch. 56.

workers and sailors. Textile finds from Berenike fall in two chronological groups: the first century CE and the late fourth to fifth centuries CE.¹³

The port of Myos Hormos¹⁴ was situated 8 km N of the modern town of Quseir on the Red Sea coast. It, too, was founded in the Ptolemaic period; it flourished during the Roman occupation of Egypt until the mid-third century CE. Like Berenike it served as a centre for commerce with India, Arabia and East Africa. The population was a similar multi-ethnic mix of merchants, administrators and mariners, military personnel and women and children. The site was re-occupied in the late 11th and 12th centuries. An abundance of textile remains from both periods have been recovered.¹⁵

Praesidia

The fort of Didymoi¹⁶ was located on the caravan road between Berenike and the city of Coptos (modern Qift). It was founded 76-77 CE, and was intermittently in use until the middle of the third century CE. Middens at the site proved to contain a large number of textiles.¹⁷ Krokodilô and Maximianon¹⁸ were situated on the road between Myos Hormos and Coptos. Krokodilô was established c. 100 CE and appears only to have been used for about 20 years; Maximianon is more broadly dated, to the first and second centuries CE.

¹³ Wild and Wild 2018.

¹⁴ Blue 2018 with further references.

¹⁵ Handley 2011; Vogelsang-Eastwood 2006.

¹⁶ Cuvigny 2011, 2012

¹⁷ Cardon, Granger-Taylor and Nowik 2011.

¹⁸ Cuvigny 2003

The population at the *praesidia* consisted of 15-22 soldiers, their servants, the occasional prostitute, and some civilians providing supplies.¹⁹ Rubbish dumps again contained numerous textiles.²⁰

A number of further *praesidia* have been excavated by a team directed by H el ene Cuvigny.²¹ At two sites, both on the road between Berenike and Coptos, extensive textile finds were recovered.²² As little information is yet available, they are not discussed here. A fort at ‘Abu Sha’ar, north of modern Hurghada and founded 310-311 CE, then abandoned before 400 CE, housed a garrison of approximately 200 cavalry. The trash left by the soldiers also contained many textile scraps.²³

Textiles from the Desert

The textile finds from the quarries, ports, and *praesidia* of the Eastern Desert primarily derive from rubbish dumps. Such a location means that they are rags, worn-out garments, and torn or cut off scraps. The few recognisable items are worn almost to shreds. Work in the quarries was hard labour. They, as well as the *praesidia* were situated far into the desert where food and especially water was in scarce supply, and where everybody dreamt of getting back to the Nile Valley as quickly as possible.²⁴ Transporting goods across desert or sea was perilous. In such conditions, few people would choose to wear their Sunday best; consequently, we do not find anything that matches the beautiful garments from the burials

¹⁹ Cuvigny 2003; 2011; 2012.

²⁰ Cardon 2003.

²¹ <http://www.ifao.egnet.net/recherche/archeologie/praesidia/> accessed January 30, 2019.

²² Cardon, B ulow-Jacobsen and Cuvigny 2010.

²³ Bender J orgensen 2018 with further references.

²⁴ Bingen 1998.

along the Nile Valley. What the rags and heavily repaired items from the quarries, ports, and forts of the Eastern Desert lack in splendour they do, however, make up for in numbers: currently more than 12,000 dated and provenanced fragments have been processed and recorded.²⁵

Roman Garments

The Roman male citizen wore the tunic and toga for formal occasions; for less formal ones he donned the Greek-style *pallium* instead of the toga.²⁶ The *sagum* and *paludamentum* were distinctive military cloaks.²⁷ Roman soldiers and civilians occupied with outdoor activities preferred the *paenula* and other hooded cloaks as daily outerwear.²⁸ Women wore a longer tunic along with a mantle.²⁹ Scarves, loincloths, wrappings, socks and various types of headgear were also part of the Roman wardrobe.³⁰ To these can be added various dress items from the provinces specific to the area or to certain ethnicities.³¹

While these items of dress are well known from Roman art and literature, the materiality of these garments is more difficult to identify. We need archaeological remains in

²⁵ Bender Jørgensen 2018 with further references; Cardon, Granger-Taylor and Nowik 2011; Handley 2007, 2011; Vogelsang-Eastwood 2006; Wild and Wild 2018.

²⁶ Cleland, Davies and Llewelyn-Jones 2007, 137, 190-197, 200-202; Croom 2000, 30-54; Granger-Taylor 1987; Sebesta and Bonfante 1994, 13-45; Wilson 1938.

²⁷ Cleland, Davies and Llewelyn-Jones 2007, 137-138, 164; Croom 2000, 51.

²⁸ Cardon, Granger-Taylor and Nowik 2011, 319-323; Croom 2000, 51-54; Cleland, Davies and Llewelyn-Jones 2007, 135-136.

²⁹ Croom 2000, 73-91; Sebesta and Bonfante 1994, 46-64.

³⁰ Croom 2000, 56-60; Cardon, Granger-Taylor and Nowik 2011, 341-352.

³¹ See Croom 2000, 123-143 for an overview.

order to understand what the textiles really looked like, their drape, handle, colours and materials, and how they were constructed. Yigael Yadin made an important step towards this when he compared descriptions in literature of the Roman tunic with *clavi* with a large group of rectangular sheets of cloth with two parallel bands in contrasting colours recovered from the Cave of Letters in Israel.³² He also identified a group of rectangular mantles decorated with symmetrically placed motifs such as *gammas* and notched bars from the same site as the Roman *pallium*.³³ Hero Granger-Taylor has added significantly to this discussion, examining how details in depictions of dress in Roman art are mirrored in archaeological finds. Her work has demonstrated that most Roman dress items were woven to shape.³⁴ This applies to major garments such as tunics, mantles and cloaks as well as smaller items like scarves and wrappings. Techniques such as sprang and ‘Coptic knitting’ were used for socks and some types of caps.³⁵ Tailored Roman garments, however, are few.

Dress in the Desert

Although most of the textiles from the rubbish deposits in the Eastern Desert are fragments, it has been possible to ascertain a number of garments from Mons Claudianus and the *praesidia*. The sleeveless Roman tunic is the most common, as it is easily identifiable by the purple bands or *clavi*; in many cases just a fragment of a *clavus* is preserved but is sufficient to classify it as the remains of a tunic. Most tunics were off-white/undyed, and a few were green or red. The *clavi* are normally purple, but colours such as blue, green, red or

³² Yadin 1963; Katie Turner’s essay in this volume discusses this work of Yadin extensively.

³³ Yadin 1963, 204-40.

³⁴ Cardon, Granger-Taylor and Nowik 2011; Granger-Taylor 1982, 2000, 2007, 2009.

³⁵ Burnham 1972; Cardon, Granger-Taylor and Nowik 2011, 349-352; Pritchard 2006, 129-145.

even black appear as well.³⁶ The sleeveless tunics were square in outline and a belt adjusted their length. This type of tunic appears in many mummy portraits. Men's tunics are usually white, while women's are of various bright colours.³⁷

Sleeveless tunics from the Eastern Desert were made of wool, and woven in tabby with a variety of textures. In many cases the fabrics appear of good quality – or were when they were new. Most were repeatedly patched and repaired. One almost complete tunic from Mons Claudianus was so heavily mended that patches replaced most of the original material. The purple *clavi*, however, appeared to have been meticulously preserved throughout the garment's existence.³⁸

Sleeveless tunics of this type were constructed horizontally.³⁹ They were made as two sheets of cloth sewn together at the top and down the sides, leaving openings for armholes and neck. The top seam joins the selvages of the two sheets, while side seams connect the fabric's transverse borders (Fig. 2). The characteristic reinforced selvages and cord-like closing borders are easily recognisable in preserved textiles and garments as well as in art. The *clavi* are created while weaving the tunic sheets. This involved rearranging the warp to accommodate the bands that are much more densely woven than the ground weave. Two different ways of doing this have been noted: one is termed *croisage*, as warp threads were rearranged by crossing; in the other, part of the threads were dropped, i.e. left unused during

³⁶ Bender Jørgensen 2011; 2018; Cardon 2003; Cardon, Granger-Taylor and Nowik 2011, 282-3.

³⁷ See Lorelei Corcoran's essay in this book.

³⁸ Mannering 2000, 2006.

³⁹ Cardon, Granger-Taylor and Nowik 2011, Fig. 306; Granger-Taylor 1982.

the weaving of the band.⁴⁰ This opens up a possibility of identifying the loom type, as the crossing of warp threads cannot be done on a warp-weighted loom. Tunics with this kind of *clavi* are therefore likely to have been made on a two-beam loom, while the method of dropped threads probably was used for the warp-weighted loom (see fig. 8).⁴¹ Both types of bands appear at the sites in the Eastern Desert but *clavi* made with *croisage* are much more frequent than those where threads have been dropped.⁴²

Sleeved tunics are rare the first and second centuries CE, but become common from the third century CE.⁴³ They appear on some mummy portraits⁴⁴ contemporary to Mons Claudianus and the *praesidia* and are well-known from later sites, e.g. in Syria there are indications of them at desert sites. Decorative motifs associated with this type of tunic appear only in a few cases, such as a pyramid shaped form (or ‘Delta’) connected to double bands dated to the second half of the second century CE found at Mons Claudianus.

The sleeved tunics were usually made in one piece, starting at one sleeve.⁴⁵ When sufficiently long, warp threads were added on both sides to create the body part of the tunic. A split was made for a neck opening. When the desired width of the garment had been reached, the main parts were finished by a closing border, leaving a reduced number of warp

⁴⁰ Cardon, Granger-Taylor and Nowik 2011, Figs. 308-309; Ciszuk and Hammarlund 2008, 127-31; Granger-Taylor 1992.

⁴¹ Ciszuk and Hammarlund 2008, 127-31.

⁴² Ciszuk and Hammarlund 2008, 128.

⁴³ Cardon, Granger-Taylor and Nowik 2011, 283; Pritchard 2006, 45—115.

⁴⁴ See Lorelei Corcoran’s essay on mummy portraits in this volume.

⁴⁵ Cardon, Granger-Taylor and Nowik 2011, Fig. 307; for decorative motifs: Figs. 310, 312, 316.

threads for the second sleeve. Decorations in the form of *clavi*, bands on sleeves and decorative motifs were made along with the ground weave like the *clavi* of sleeveless tunics.

Mantles and Cloaks

In modern English, ‘mantle’ and ‘cloak’ are synonymous, but here, following terminology introduced by Alexandra Croom, ‘mantle’ is used of draped garments worn over a tunic, while ‘cloak’ refers to male outer garments that are fastened by a brooch rather than draped.⁴⁶ Mantles and cloaks are frequently depicted in Roman art. Roman literature mentions many specific types such as the *abolla*,⁴⁷ the *cucullus*,⁴⁸ the *lacerna*,⁴⁹ the *laena*⁵⁰ the *paenula*,⁵¹ the *paludamentum*,⁵² the *pallium*,⁵³ the *sagum*,⁵⁴ and of course the *toga*.⁵⁵ But except for a few instances it has proved difficult to describe each garment and explain how the items of dress were distinctive from one another. In some cases, however, it has been

⁴⁶ Cardon, Granger-Taylor and Nowik 2011, 308-10, 319-23; Croom 2000, 50-1.

⁴⁷ Cleland, Davies and Llewellyn-Jones 2007, 1; Suetonius, Caligula, 35.1.

⁴⁸ Cleland, Davies and Llewellyn-Jones 2007, 44; Wilson 1938, 92-95; Martial 5.14.6.

⁴⁹ Cleland, Davies and Llewellyn-Jones 2007, 108; Croom 2000, 51; Wilson 1938, 117-124; Pliny, NH 18.60.225

⁵⁰ Cleland, Davies and Llewellyn-Jones 2007, 108-109; Croom 2000, 51; Cicero, Brutus 15.56

⁵¹ Cleland, Davies and Llewellyn-Jones 2007, 135-36; Pliny NH 8.73.190;

⁵² Cleland, Davies and Llewellyn-Jones 2007, 137-138; Pliny NH 22.3.3; Livy 41.10.5, 45.39.11.

⁵³ Cleland, Davies and Llewellyn-Jones 2007, 137; Suetonius, Augustus 98.3, Tiberius 13.1.

⁵⁴ Cleland, Davies and Llewellyn-Jones 2007, 164; Diodorus, 5.30.1; Tacitus, Histories 2.20.

⁵⁵ Cleland, Davies and Llewellyn-Jones 2007, 190-194; Pliny NH 34.11.23

possible to compare images and texts with archaeological finds. Rectangular mantles decorated with symmetrically placed motifs such as *gammas* and notched bars are now identified as *pallia* (Greek: *himation*), and semi-circular hooded cloaks with similarly specific decoration are recognised as *paenulae* with the shorter version classified as the *cucullus*.⁵⁶ Both of the latter appear regularly in the Eastern Desert as do remains of the *sagum*.⁵⁷ The *sagum* was a Celtic garment adopted by the Roman army; it is rectangular, but specifics of the Roman version of this cloak have as yet received little analysis. Identifications are based on the weave that corresponds to a group of well-preserved cloaks found in Northern Europe and identified as *saga*.⁵⁸

The characteristic feature of the *pallium/palla/himation* in Roman Egypt is the four motifs, ‘*gammas*’ or notched bars in tapestry weave in a contrasting colour, placed symmetrically near the corners of the fabric (Fig. 3). More than forty *gammas* and five notched bars were recorded at Mons Claudianus; ten were found at Maximianon, one at Krokodilô.⁵⁹ Numbers are not supplied for Didymoi, but several examples are described in detail.⁶⁰ The fabrics are usually undyed, woven in tabby and of the same medium quality as the tunics. The *gammas* and notched bars are mostly purple. Mummy portraits show that both motifs also appear on tunics and headscarves, so they cannot be used unequivocally as

⁵⁶Cardon, Granger-Taylor and Nowik 2011, 309; Granger-Taylor 2000, Fig. 12; Mannering 2000; 2006; Yadin 1963, 219-32.

⁵⁷ Didymoi D98.14431.6, cf. Cardon, Granger-Taylor and Nowik 2011, 322-323; Bender Jørgensen 2004, 97.

⁵⁸ Cardon, Granger-Taylor and Nowik 2011, 322-3.

⁵⁹ Cardon 2003, 621; Mannering 2000, 286-7.

⁶⁰ Cardon, Granger-Taylor and Nowik 2011, 310-14.

evidence for mantles. Three of the Mons Claudianus *gammās* were in fact found on a partly preserved tailored tunic; it had obviously been manufactured by cutting up a mantle and re-fashioning it. This feature demonstrates that the number of textile fragments with a gamma decoration cannot be used as evidence for a specific number of *pallia*; but we may infer that some of the people living at the site owned such a mantle.

Semi-circular cloaks comprise a variety of items including everyday wear such as the *paenula* or *cucullus* that were well suited to outdoor physical activities. Two well-preserved specimens of semi-circular cloaks found at Lahun and a fragmented specimen from Ballana in Nubia offer valuable information regarding how these cloaks were constructed.⁶¹ This has made it possible to establish diagnostic features that allow us to identify remains of semi-circular cloaks among fragmented items from the Eastern Desert.⁶²

One of these features is the form of the cloaks (fig. 4). They were woven to shape.⁶³ The hood was made first, and then, as in the case of sleeved tunics, warp threads were added. In order to strengthen the corners between hood and main cloak, one or two rows of twining were made. Along the hood and the upper part of the cloak a band in a contrasting colour ran from edge to edge, turning upwards at right angles to include the hood.⁶⁴ The semi-circular shape was then created by gradually reducing the warp threads. At the end of the curve, another decorative band was inserted, usually in the form of a notched band. Cast-off threads were worked back into the web as weft to some degree and then joined to further threads

⁶¹ Granger-Taylor 1982, 2007, 2009.

⁶² Bender Jørgensen 2018, ch. 22-23; Cardon, Granger-Taylor and Nowik 2011, 308-41.

⁶³ Cardon, Granger-Taylor and Nowik 2011, 319-23; Granger-Taylor 2009.

⁶⁴ Granger-Taylor 2009, Fig. 1, 2 and 6.

directly from the curved edge to form a closing cord; or, they could be worked into a fringe.⁶⁵ These cloaks were often in very densely woven 2/1 or 2/2 twill (See Fig. 7), but other weaves appear too.⁶⁶ Colours range from off-white, brown, red and blue; bands are purple, blue, green or red. The rows of twining combined with a band close to the starting border, turning 90°, are among the diagnostic features that makes it possible to identify textile fragments as remains of cloaks. Another diagnostic is secondary: namely, curved cutaway pieces from cloaks. When worn, the cloak's edges were cut away, and replaced by a sewn edge or hem⁶⁷.

The presence of these cutaway pieces indicates that semi-circular cloaks were prized possessions in the Eastern Desert and kept in good repair. In several ostraca found at Mons Claudianus the writer asks about items of clothing; one is to be fulled and sent, another to be sold, and one is to be hemmed.⁶⁸ The climate is harsh in the desert, with temperatures in the winter varying between zero and 30 C. A weatherproof cloak of densely packed twill must have provided excellent protection against the cold of the winter nights, the wind, and the ever moving fine sand.

Headwear

Headwear is one of the best-preserved types of clothing in the Eastern Desert. A pillbox hat in green felt dated 100-120 CE was found at Mons Claudianus (Fig. 5.a),⁶⁹ while a cap shaped like a helmet and interpreted as an under-helmet ended up in the rubbish dump at

⁶⁵ Granger-Taylor 2007, 30-1.

⁶⁶ For definition of barred damask, see Ciszuk 2004.

⁶⁷ Granger-Taylor 2008

⁶⁸ Bülow-Jacobsen 2014.

⁶⁹ Mannering 2000, 2006; Bender Jørgensen 2018, ch. 21.

Didymoi c. 96 CE.⁷⁰ At both of these sites, and at Krokodilô, caps made of triangular segments of cloth (*centi*) have been found (Fig. 5b). The *centi* are tailored garments, but irregular features such as a *clavus* across one of the triangles indicate that they were made from scraps. One of the Mons Claudianus *centi* was composed of block damask in three different colours (red, yellow and green) and had red cheek pieces and a green neck guard. It was dumped between 100 and 140 CE.⁷¹ This item has also been interpreted as an under-helmet.⁷² A second *cento*, dated 100-120, was apparently made from undyed fabric but had a red button at the top. A *cento* from Didymoi deposited c. 96 CE also had several colours and a red top button.⁷³ The *cento* from Krokodilô was brown with a red top button surrounded by embroidery.⁷⁴

Scarves, Sashes and Wrappings

Scarves were square or rectangular pieces without diagnostic features and are difficult to identify; there is no reason to doubt that they too were woven to shape, probably with simple selvages and finished with fringes. Scarves were worn in many contexts, e.g. with *paenulae*, wrapped around the neck⁷⁵. No scarves have yet been identified among well-preserved textiles from the Roman East; consequently, they are difficult to identify among the fragmented textiles from the Eastern Desert. Nonetheless, a number of brightly coloured

⁷⁰ Cardon, Granger-Taylor and Nowik 2011, 345-7, Pl. 29a-b and 30a.

⁷¹ Bender Jørgensen 2018, Fig. 8.

⁷² Mannering 2006, 159.

⁷³ Bender Jørgensen 2018, ch. 21, Fig. 8; Cardon, Granger-Taylor and Nowik 2011, 344-9, Pl. 30c-d; Mannering 2000, 2006.

⁷⁴ Cardon 2003, 647, 668 Pl. Vc.

⁷⁵ Cardon, Granger-Taylor and Nowik 2011, 341.

checked fabrics found at Didymoi are interpreted as scarves;⁷⁶ similar pieces appear at Mons Claudianus, and at Berenike.⁷⁷

Sashes (belts⁷⁸) are identifiable too among the textiles from the Eastern Desert.⁷⁹ Sashes were worn with tunics, tied around the waist. They were long narrow woven bands. They may, however, be difficult to distinguish from wrappings for legs, arms, or parts of the torso, or from loincloths. These also consisted of long narrow bands. According to Hero Granger-Taylor, loincloths have been recorded at Didymoi.⁸⁰

Socks

Socks are well-known from ‘Coptic textiles’. They are usually made by cross-knit looping, also called ‘Coptic knitting’.⁸¹ Several such items have been found in the Eastern Desert. Parts of five were recovered from Mons Claudianus, dating between 135 and 160 CE. One sock is virtually complete. At least three were found at Didymoi; one is dated to between 88 and 96 CE, the others to the late second and third centuries CE⁸². All are made of undyed wool.

Materials, Yarns, and Weaves

Wool is the most common material among the textiles from the Eastern Desert. This is especially true for the inland sites, where up to 90 percent of the finds are wool. Bast fibres

⁷⁶ Cardon, Granger-Taylor and Nowik 2011, 341-4.

⁷⁷ Wild and Wild 2018, Fig. 7.

⁷⁸ The term ‘belt’ is here used of items of leather, ‘sash’ of woven ones.

⁷⁹ Cardon, Granger-Taylor and Nowik 2011, 306-8.

⁸⁰ Granger-Taylor 2007, 26.

⁸¹ Burnham 1972.

⁸² Cardon, Granger-Taylor and Nowik 2011, 349-352.

are rare in the desert, but more common at the coastal sites; the proportion of goat hair varies between 4 and 16 percent.⁸³ At the Red Sea ports, cotton is common, especially at Berenike where between 18 and 28 percent of the early and about 50 percent of the late textiles are cotton.⁸⁴

Yarns can be twisted two ways, usually described as 's' and 'z' (Fig. 6). Yarns from Roman Egypt are primarily s-twisted, in warp as well as weft; z-twisted yarns do, however, appear in a number of textiles, and in some cases both yarn types appear in the same textile. In Egypt, the tradition of s-twisted yarns goes back to Pharaonic times and appears in flax as well as wool.⁸⁵ When cotton was introduced to Egypt at the beginning of the first millennium CE, the habit of making s-twisted yarn is transferred to this fibre too.⁸⁶ The preference for s-twisted yarn is also discernible in Syria and Palestine, while in other areas such as India and Iran, parts of North Africa, and the European parts of the Roman world, z-twist was the rule.⁸⁷ Yarn twist is thus a pointer as to whether a textile is locally produced or not. *Fabby* is the most common weave regardless of the fibre.⁸⁸ It appears in a range of different qualities depending on the type of yarns and whether it is balanced or weft-faced, densely or open woven.⁸⁹ Half-basket and basket weave where the threads of one or both systems are paired

⁸³ Bender Jørgensen 2018, Fig. 43.

⁸⁴ Wild and Wild 2018, ch. 12 and ch. 27-30.

⁸⁵ Hall 1986, 12; Kemp and Vogelsang-Eastwood 2001, 57-82.

⁸⁶ Wild et al. 2008.

⁸⁷ Bender Jørgensen 2017, 238.

⁸⁸ Bender Jørgensen 2018, Fig. 44.

⁸⁹ Hammarlund 2005.

are also variations of tabby.⁹⁰ *Twill* is less common; at Mons Claudianus 6 percent of the textiles are twills; at military installations such as Krokodilô and Maximianon, however, 19 percent of the textiles are twills (Fig. 7). Varieties of twill occur too.⁹¹ Other techniques such as taqueté, ‘coptic knitting’, and felt also appear.⁹² Hand weaver Lena Hammarlund has examined the wool tabbies and twills from Mons Claudianus and defined seven different varieties of tabby and five of twill.⁹³ Each of these may be perceived as a specific type of fabric. Hammarlund’s categories are recognisable in other assemblages of archaeological textiles, including some made of cotton or flax.⁹⁴

Textile Tools

Textile tools are rarely found in the Eastern Desert. At most of the sites, just a few spindle whorls have been recorded.⁹⁵ It has been suggested that a group of pierced sherds labelled ‘labels’ from Mons Claudianus are loom weights,⁹⁶ but as they do not resemble this type of object at all, it is unlikely. Still, the warp-weighted loom was far from the only loom known in antiquity,⁹⁷ and as loom weights are scarce in Roman Egypt, other looms such as

⁹⁰ Bender Jørgensen 2018, Table 5.

⁹¹ Bender Jørgensen 2018, Fig 2 and Table 6.

⁹² Bender Jørgensen 2018, Ch. 10.

⁹³ Hammarlund 2005.

⁹⁴ Bender Jørgensen 2019.

⁹⁵ Maxfield and Peacock 2001b, 376-7, ‘wooden roundels’; Maxfield and Peacock 2006, 297, two sherds reworked into ‘?spindle whorls’; Peacock and Maxfield 2007, 313-14, ‘spindle whorls’, and 315, ‘labels’.

⁹⁶ Bülow-Jacobsen 2014; Maxfield and Peacock 2006, 294.

⁹⁷ Ciszuk and Hammarlund 2008.

the two-beam loom or the ground loom are alternatives that easily could have been brought to the desert (Fig. 8). An ostrakon from Barud, a smaller quarry site near Mons Claudianus, asks Kalokairos to send his wife so that she can help with the weaving, and papyrologist Adam Bülow-Jacobsen suggests that the eight pieces of wood one Heracleides is sending to his sister was a loom.⁹⁸

Second-hand Dealers

As we have seen, a partly preserved tunic from Mons Claudianus was found to have been pieced together by pieces of an old mantle, and the two *centi* found at the same site and at Didymoi had obviously been made from scraps of cloaks. Many other textiles from the sites in the Eastern Desert were obviously also put together from recycled items of dress.⁹⁹ At Didymoi, a complete pillow was recovered that proved to be filled with rags.¹⁰⁰ These items are likely to be the work of the *centonarii*, dealers in rags and second-hand clothing.¹⁰¹ Guilds of *centonarii* are known to have existed in Italy and Roman Gaul; the multitude of recycled objects among the textiles from the Eastern Desert makes it likely that a similar guild existed in Roman Egypt.

Where Were the Textiles Made?

As mentioned above, yarn twist may serve as a pointer to where textiles were made as most of the Roman east preferred s-twisted yarns, while z-twisted yarns were the norm in

⁹⁸ Bülow-Jacobsen 2014, 5-6.

⁹⁹ E.g. Bender Jørgensen 2018, Fig. 13 and Wild and Wild 2018, Fig. 9.

¹⁰⁰ Cardon, Granger-Taylor and Nowik 2011, 276-81.

¹⁰¹ Cardon, Granger-Taylor and Nowik 2011, 276; Larsson Lovén 1998, 17; Mannering 2006, 153.

southern Europe, India and Iran.¹⁰² Garments made of z-twisted yarns are therefore likely to be intrusive. At Berenike and Myos Hormos, cotton textiles are often made of z-twisted yarns and are likely to derive from India.¹⁰³ At Mons Claudianus, 22 percent of the diagonal wool 2/2 twills are also made of z-twisted yarns; among the balanced diamond twills, 12 percent have z-twisted warp and s-twisted weft. These fabrics may well derive from the European part of the Roman Empire. Similar textiles are frequently found at sites along the northern border of the Roman Empire, and in bogs in Denmark and northern Germany.¹⁰⁴

Another clue could be the yarns for *clavi*. Yarn twist for ground weave and *clavus* has been recorded for 149 bands from Mons Claudianus. The great majority were made entirely of s-twisted yarns, and only two entirely of z-twisted yarns. In nine pieces the ground weave had s-twisted yarns in both systems, but z-twisted yarn in the *clavus*. This may suggest that most tunics were produced in Egypt or other parts of the Roman East, and the few made entirely of z-twisted yarns might derive from Europe where such a twist was common.

Technology is a further pointer. Several different loom types are known from antiquity.¹⁰⁵ The ground loom was used in Egypt since early Pharaonic times and is still used. A two-beam loom was introduced during the New Kingdom,¹⁰⁶ and similar looms are also still in use. The warp-weighted loom was used in Italy, Greece, Anatolia, and the southern

¹⁰² Bender Jørgensen 2018, ch. 8-9 with further references.

¹⁰³ Handley 2011; Wild and Wild 2018 with further references.

¹⁰⁴ Bender Jørgensen 2004.

¹⁰⁵ Ciszuk and Hammarlund 2008.

¹⁰⁶ Kemp and Vogelsang-Eastwood 2001, 335-338.

Levant since the Neolithic period¹⁰⁷ but its characteristic loom weights are missing from Pharaonic Egypt. Although some weights are now turning up from the Roman period, the presence of such weights appears to be connected to the introduction of cotton from Nubia. As we have seen, the method of rearranging the warp threads in order to make the *clavi* can serve to argue whether a tunic was made on a two-beam loom or a warp-weighted loom.

Conclusion

Work clothes in Roman Egypt were basically ordinary Roman tunics and other items of clothing that may be recognized in mummy portraits and other sources. Mantles and cloaks, headwear, scarves, sashes, wrappings and footwear such as socks are all in evidence in the Egyptian desert. Most were heavily worn and repeatedly mended, and are likely the products of second-hand dealers, the *centonarii*, supplying clothing to the poorer levels of Roman society.

¹⁰⁷ Barber 1991, 127-132, 300-301; but see Rast-Eicher and Bender Jørgensen 2018, 102-103; Schoop 2014, 429-434; Shamir 2015, 19.