



Ruth Gilbert

Do you read my signal?

An attempt at the application of clear terminology in recording archaeological knitwork

Abstract

The lack of a conventional approach to the analysis of knitted fabrics has led to limited information being available for the study of early knitting. This paper discusses some reports of finds of knitwork and applies a newly developed terminology and a proposed protocol for reporting archaeological and historical knitted textiles to four previously published artefacts to demonstrate their clarity in use. It points out the pitfalls of assuming how items were knitted without appropriate evidence. It also proposes that some characteristics of knitted fabric such as gauge and yarn diameter are essential for the comprehensive understanding and comparability of early evidence for knitting as a technique.

Keywords: Archaeological, historical, textiles, knit, terminology

Introduction

Woven textiles are usually described and recorded accurately in archaeological reports but the same is not true for knitted fabrics. Handknitting itself lacks a precise vocabulary and the concern of this article is the description of knitted artefacts with clarity, using a consistent vocabulary that neither makes assumptions about methods of work nor depends on colloquial terms. The terms used here are those proposed after much discussion under the auspices of the *Knitting in Early Modern Europe* (KEME) project.

The structure of **knitted artefacts** or **knitted fabrics** or **knitwork** is what needs to be described, not 'knitting', which is the process. This article reviews some published examples and attempts a comprehensive description of the fabrics using the new protocol for describing knitwork proposed elsewhere in this issue (Malcolm-Davies et al. 2018).

In the following text, where preferred terms from the terminology, table 1 (Malcolm-Davies et al. 12-13, in this issue) or from the recording protocol, table 2 (Malcolm-Davies et al. 14-15, in this issue) are introduced, they are in **bold**. Most of these words are already used by hand knitters, by machine knitters or in industry and together they

enable accurate and unambiguous description of knitted fabrics.

Woven textiles are usually recorded using a clear and agreed system but knitted fabrics are referred to by obscure or ambiguous terms such as "garter stitch" and "brocade patterns" (Thomas 1945, 16 & 49). While these may be suitable for colloquial use, for technical recording it is necessary to describe what can be seen, not how the observer thinks the structure was produced. This is challenging for knitters who are accustomed to thinking in terms of instruction rather than description. One fundamental issue is the use of the word "stitch" for the action of making a new loop, for the loop thus formed, and for the configuration of loops within the fabric. It is proposed that the word "stitch" be reserved for the action, and that the fabric is described in terms of face and reverse loops. A **knit stitch** worked on the surface presumed to be the "right side" or technical face, the **recto**, of the fabric and a **purl stitch** worked on the other surface, the **verso**, produce the same result: a new loop that shows on the recto as a **face loop**, which appears as a flat "v", and on the verso as a **reverse loop**, which appears as a horizontal bar. They are not two different things but the two surfaces of the same thing (see figs 8 and 9 on page 19,



in this issue). Fabric structures can also be represented as charts for added clarity. The use of charts is not new, having been a feature of *Mary Thomas's Book of Knitting Patterns* first published in 1943, and there is increasing consensus on a system of symbols for more complex fabrics (Chartgen; Thomas 1945, 6 & 56). The deduction of **orientation** and of **working direction**, sometimes known as technical upright, requires care and may not be possible because some common structures are reversible (table 2).

An apparent lack of understanding of the potential variety of knitted fabric structures is almost universal in archaeological and historical reports, and indeed elsewhere. Simple knit is the commonest fabric structure found and frequently the only one in an archaeological assemblage but the same can be said for the common weave structures, for which diagrams are usually given, and it would be pleasing to see knit fabrics treated with the same consideration. Diagrams or charts of structures may be given to avoid ambiguity, but more importantly shaping should be illustrated either with diagrams or photographs. Some previous reports of knitwork come closer than others to providing adequate information even where ambiguous terms are used. The problem may be illustrated with reference to published descriptions of artefacts.

In 1950, a major review of known prehistoric textiles in Britain was published (Henshall 1950). This was influential in establishing, for example, the use of S and Z to indicate spin direction, although since most of the information came from previous publications some of the descriptions are partial. Charts are given of most weaves mentioned (Henshall 1950, fig. 1) and diagrams of the more complex structures (Henshall 1950, fig. 2). There are no looped or knitted items in this report, but the following year *Early Textiles Found in Scotland* described items in the National Museum's collection "from the Roman period to the 17th century" (Henshall 1952, 1). Thanks to a collaboration with spinner and weaver Morfudd Roberts, the weave charts and terminology are more professional although some of the entries are extremely brief. The descriptions of knitted items is for its time exemplary, although they lack illustration. Assumptions have been made about production, as in "stocking stitch and four pins have been used" (Henshall 1952, 24), but this is also the case with the woven examples. The same year the Gunnister finds were published (Henshall & Maxwell 1952), which included a number of knitted items. These are described in sufficient detail for a knitter to reproduce, but without any form of chart or diagram of the fabrics for the benefit of non-knitters.

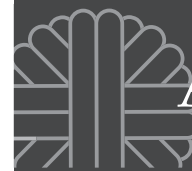
Photographs of the items are given, but they are not adequate to see detail. There are no diagrams of weave structures either, except an explanatory one of a warp-faced band (Henshall & Maxwell 1952, 35). No attempt was made to give yarn diameters, and the descriptions are subjective, but for its time Henshall's work was a beacon of good practice.

A commendable report (Walton 1981) details characteristics of 15 knitted textiles excavated at Black Gate, Newcastle (United Kingdom). Two assemblages of these fragments (T47 to T50 and T51 to T55) are the remains of knitted caps. Each fragment's dimensions, gauge per 5 cm, yarn spin, ply and twist, and colour are given (Walton 1981, catalogue II). No yarn diameters are provided but fibre diameters (range, mode and mean) and fleece types for two fragments are stated: T13 (early 15th century) is "true fine" and T47, which is part of a cap (early 16th century) is "shortwool" (Walton 1981, table 1). The finish of the fabric is also recorded with one of the caps described as "more felted than the other, perhaps from fulling; [on] the second ... there is no attempt to mat the surface" (Walton 1981, 200). All the fragments are said to be "worked in stocking stitch" which is problematic in that it is a description not of the fabric but of a presumed process. The caps are said to have been knitted "from the centre ... and at least one of them was worked on only two needles" but no evidence is cited for either of these assertions (Walton 1981, 200).

The following analyses and critiques are not intended to devalue the achievements of previous publications, but to demonstrate the application of the proposed terminology and protocol to improve the clarity of data presentation. The terminological shortcomings of publications will be briefly laid out followed by a section describing the same items using the proposed vocabulary from table 1 (Malcolm-Davies et al. 2018, 12-13, in this issue). These items have not been examined, and the new descriptions mostly rely on the information contained in the publication or more recent photographs of the artefacts reviewed.

Example 1: Published report (2001) on 14th century fragments of knitted fabric from London, UK (inventory numbers 316, 317 and 429)

Crowfoot, Pritchard and Staniland's exemplary catalogue of textile finds from medieval London includes descriptions of knitted fabric fragments (Crowfoot et al. 2001, 72-75). While the recording is good, the terminology relies to a considerable extent on familiarity with the technique, and with then current colloquial handknitting usage. The section is entitled



“knitting”, a verbal form, in contrast to other headings such as “three-shed twills” and “hairnets” which are descriptive of the artefacts (Crowfoot et al. 2001, 72, 27 & 145). Four finds are listed and photographs of three are given. Two groups of fragments (316 and 317) and one separate piece (inventory number 429) are described, the fourth (inventory number 438) is neither described nor illustrated, although a **gauge**, the count of loops in a given distance both horizontally and vertically, is provided. The total number of fragments is not stated.

The **yarn structure** (table 2, 1) is given, but no measurement of **yarn diameters**, which would permit the calculation of the **cover factors** (Malcolm-Davies et al. 2018, 18, in this issue). The importance of this information is for accurate comparison, as subjective

assessments can be misleading if used without supporting detail. The authors suggest, presumably by analogy with other surviving pieces, that the work was probably done **round** on all pieces. However the gauges refer to “rows” where **courses** would be unambiguous and the fabric is described as “stocking stitch”, which, however familiar, is a purely colloquial term and not universal even among Anglophone readers. The photographs are clear and include an indication of scale, but no measurements are given.

There is no diagram to show the fabric structure or the placing of the features mentioned, the orientations of the fabrics are unclear and the presumed working directions are not indicated. The irregular decreases are described by means of a line of code of the kind used in published knitting instructions: “k8 (or more),

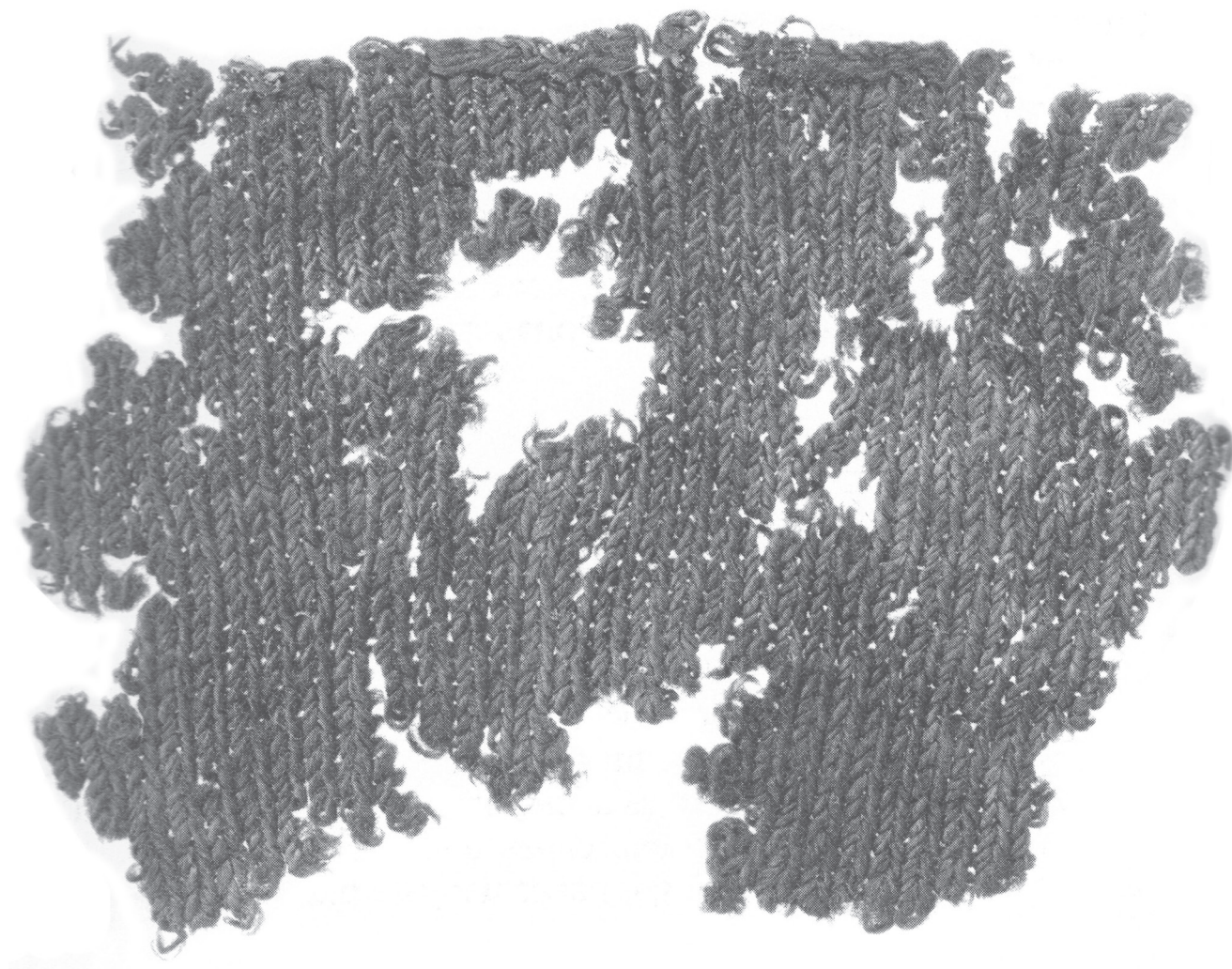


Fig. 1: Fragment of knitwork (inventory number 429) from a 14th century deposit. Scale 3:4 (Crowfoot et al. 2001, fig. 49, 74) (Image: Museum of London)



k2 tog, k2, k2 tog, k5, k2 tog, k3, k2 tog, k8, k2 tog, k2 (and probably more)". This is not explained for non-knitters. On the following page, a mention is made of a "decrease ... accomplished by knitting two stitches together" but no evidence to explain how this has been deduced is given. Edges are described as **cast on** and **cast off** without clarification as to why they can be so designated. Two red fragments of the same fabric (inventory number 316) are stated to have been dyed with madder, although no evidence is cited (Crowfoot et al. 2001, 72).

Example 1: Proposed report on 14th century fragments of knitted fabric from London, UK (inventory numbers 316, 317 and 429)

The finds of knitted fabric consist of fragmentary pieces from 14th century contexts on the Thames embankment in London. The total number of fragments is not stated in the original report. The pieces are all **planes** (that is, pieces with one continuous edge and two distinct faces) made from wool yarn, Z plied from two S spun components, which can be abbreviated to S2Z (tables 1 and 2). Both **yarn diameter** and **spin angle** can be estimated from the photographs, but this is not really satisfactory. The fabrics are all **simple knit fabric**, often called "stocking stitch", "stockinet[te]", "plain" or "jersey"; that is, one surface consists entirely of face loops and consequently the other surface of reverse loops (it is essential to remember that a face loop on the recto appears as a reverse loop on the verso). There is no way of determining the recto or the method of working, but all could have been made by knitting round without the use of purl stitches, or by knitting alternate courses back and forth of knit stitches and purl stitches, turning the work. None of these fragments have a matted surface. The pieces are small, none apparently much over 10 cm in any direction, so the measurement of gauges can only be approximate (Malcolm-Davies et al. 2018, 18, in this issue).

No information is given about the single piece (inventory number 438, not illustrated) except the gauge of 20 **wales** (columns of loops) and 30 **courses** (rows or rounds of loops) per 10 cm, giving a **density** of 600 loops per 10 cm² and a **course-to-wale ratio** of 1.33:1. These data, the density (calculated by multiplying the wale and course counts) and the ratio (calculated by dividing the course count by the wale count), can be useful in matching pieces of the same fabric and may help to identify particular techniques. The gauge of the other single piece (inventory number 429; fig. 1) is given as 50 × 40 per 10 cm (the first figure is the wale count and the second the course, following the convention for woven fabrics of warp × weft) but



Fig. 2: Fragment of knitwork (inventory number 316) from a 14th century deposit worked in a two-ply yarn with a maximum width of 110 mm (Crowfoot et al. 2001, plate 13A, between 174 & 175) (Image: Museum of London)

measurement of the illustration gives 30 × 50, or 22.5 × 37.5 per 10 cm when adjusted for the stated 3:4 scale of the photograph. Certainly, the given proportion is wrong. Using the figures from the photograph, the density is 844 per 10 cm² and the ratio is 1.66:1. This piece has several **shapings** and an edge that appears to be cast off, a simple chain of laterally interlinked loops. If this is the case, then the shapings must be **increases** to be consistent with the working direction. However, this edge structure can be produced by some methods of casting on (Stanley 2001, 74 & 75) in which case the appearance of the shapings is consistent with decreasing by working two loops together. Although the authors state that neither dye nor natural pigment was found in the analysis of this piece, one course is darker than the rest.

Two fragments of the same red fabric (inventory number 316 – one shown in colour in plate 13A; fig. 2) are in simple knit, the gauge stated as 20 wales and 40 courses per 10 cm, giving a density of 800 per 10 cm² and a ratio of 2:1. The illustrated piece has no surviving edges or shaping and looks looser and fluffier than the others illustrated. Two of the unspecified number of fragments inventory number 317 (figs 3A and 3B) appear denser than the others. They are also in simple knit and the gauge is stated to be 30-40 × 40-50 per 10 cm. Using the median for the calculations gives a density of 1575 per 10 cm² and a ratio of approximately 1.3:1. The density, almost twice that of the red pieces described above, is consistent with the appearance of solidity. One fragment has a finished edge described as cast-on and the other illustrated piece has a number of shapings that appear to include increases and decreases. The shapings are not in any discernible pattern. The results of the dye analysis are not given

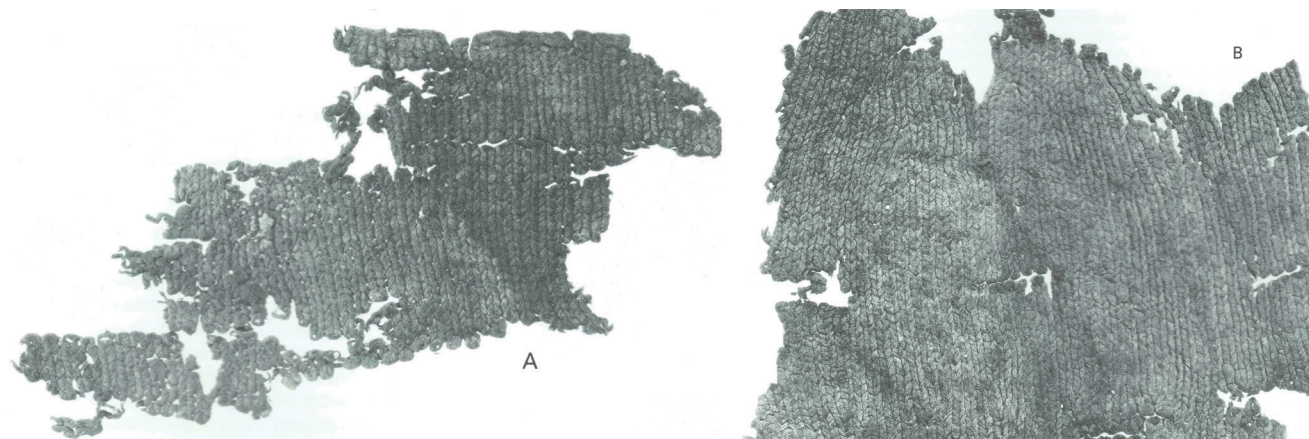


Fig. 3: Fragments of knitwork (inventory number 317) from a 14th century deposit. A is labelled “cast-on edge”, scale 3:4 and B “detail of shaping”, scale 1:1 (Crowfoot et al. 2001, fig. 47, 73) (Image: Museum of London)

but the colour is said to be “almost black” (Crowfoot et al. 2001, 73).

Example 2: Published reports (1987 and 2005) on a knitted tube from the *Mary Rose*, Portsmouth, UK (inventory number 981A1936)

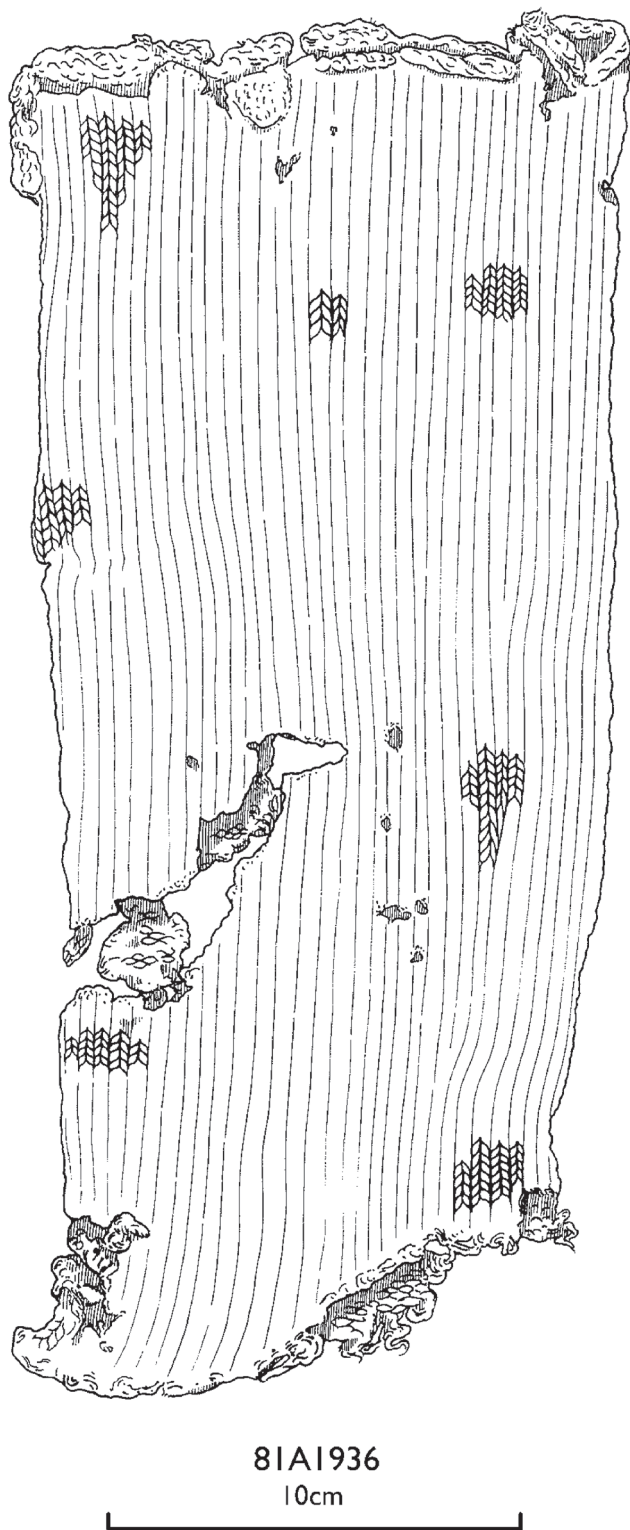
There are two published descriptions of a knitted artefact from the *Mary Rose* shipwreck, a tube of simple knit fabric (981A1936). This is unusual in being reliably dated, as the ship sank in 1545 and the clothing aboard was presumably in use at the time. Richard Rutt’s *History of Hand Knitting* includes a photograph and gives dimensions and gauge (Rutt 1987, 63-65) but

no detail of yarn twist or diameter. His explanation of how the tube is constructed is clear to anyone familiar with the process of knitting a sock: “it has fairly regular decreases made by knitting two stitches together at the ends of three needles in a single round, the decrease rounds being set at regular intervals down the tube” (Rutt 1987, 63). The need here is for a diagram, for the benefit of those who do not knit.

The same artefact is published in *Before the Mast* (Richards & Green 2005, 58-59) with a drawing including scale (fig. 5), but this does not indicate the working direction or the positions of the shapings. The yarn is described and gauge given, but a method



Fig. 4: Knitted tube (inventory number 81A1936) from the *Mary Rose*, which sank in 1545 (Richards & Green 2005, fig. 2.31, 58) (Image: © The Mary Rose Trust)



81A1936
10cm

Fig. 5: Knitted tube (inventory number 81A1936) from the *Mary Rose*, which sank in 1545 (Image: © The Mary Rose Trust)

of casting on is stated that cannot be deduced from the object. After a description of the presumed decreases it is stated that “some garter stitch can be seen”. Since the piece is described as a tube worked round, the term “garter stitch” is anomalous, referring to a method of working in rows.

These descriptions lack detail and neither states their presumed direction of work. Both give subjective assessments of the fabric, “heavy, black” (Rutt 1987, 63) and “coarse black woollen” (Richards & Green 2005, 58) but there is no indication of whether the colour is “archaeological brown” due to burial, naturally pigmented wool or dye colour.

Example 2: Proposed report on a knitted tube from the *Mary Rose*, Portsmouth, UK (inventory number 981A1936)

The photograph supplied by the museum (fig. 5) may be referred to here, although it appears in neither of the published accounts. This is a tube, the maximum length 34.5 cm and the width decreasing from 14 to 12 cm across, i.e. 28 to 24 cm round. It is of coarse wool yarn, S2Z, with no yarn diameter given. It is largely of simple knit fabric, the gauge stated as 24 wales × 38 courses per 10 cm, so the density is 912 per 10 cm² and the course-to-wale ratio is 1.58:1. These measurements are consistent with the majority of surviving stockings and sleeves of similar date in the Museum of London (for example, stockings inventory numbers A26851 and 39.188.5 and sleeve inventory number 22449). The number of wales is decreased from 72 to 56, all the decreases made by knitting two loops together if the working direction is as presumed, from the top down. The decreases are spaced at three points around the tube, suggesting the use of four needles, three holding the loops and one working. There are some reverse loops at the narrower end, just visible on the left in the photograph (fig. 4) that may be the remains of heel shaping similar to that of coarse stockings in the Museum of London that are presumed to be of a similar date. Some of these have heels turned with flaps made by knitting back and forth to form **single**

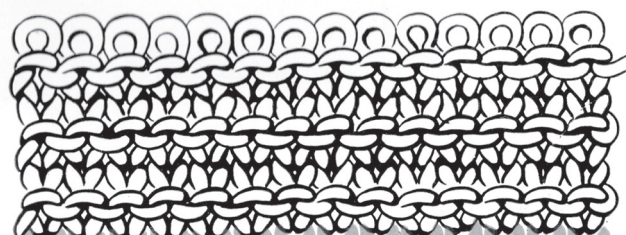


Fig. 6: Structure diagram of single ridge fabric (Image: No current copyright holder identified)



ridge fabric (fig. 6), a ridged fabric with the same recto and verso appearance commonly known as “garter stitch”. (Hemmons Hiatt 2012, 103; Thomas 1938, 217-221). Some images, detail and discussion of the London stockings have been published (Staniland 1997, 246-247) and now further information is available (O’Connell Edwards 2018, 42-50, in this issue). There is no nap or matting visible on the Mary Rose fabric and although the colour is described as “black” (Rutt 1987, 63; Richards & Green 2005, 58) it might be better understood as the discolouration referred to as “archaeological brown”.

Example 3: Published report (2007) on a fragment of knitted fabric from a 17th century latrine in Lüneburg, Germany (no inventory number)

This brief report is not really about the knitted piece so much as about the crystalline deposit on it but it does give some information (fig. 7). The article is in German and the translations have been made for this article. The yarn is inadequately described, no gauge is given and the explanation of the technique is not enlightening: “Gestrickte rechte Maschen, auch glatte Maschen genannt. ... Die Kehrseite zeigt das entsprechende rückseitige Maschenbild”. “Knitted in knit stitches, called stocking stitch ... The other side shows the corresponding appearance of the reverse loops.” Both the photographs show the fragment with the wales aligned horizontally.

Example 3: Proposed report on a fragment of knitted fabric from a 17th century latrine in Lüneburg, Germany (no inventory number)

One of an unspecified number of fragments of knitted fabric is described in some detail. They were excavated in October 2006 from a location recorded as



Fig. 7: Fragment of knitwork measuring 11.5 cm × 8 cm from a 17th century latrine in Lüneburg, Germany (Haase & Weißgraf 2007, 76) (Image: Lüneburger Stadtarchäologie)



Fig. 8: The recto and verso of a piece of knitwork measuring 19.5 cm long, 2 cm wide in the narrower part, and 2.5 cm in the wider part (Image: Museum of London, inventory number NN18752)

Baumstraße, Kloake 1, in Lüneburg, Germany, and are dated to the first half of the 17th century. The piece described is stated to be 8 cm wide and 11.5 cm long. It is of wool yarn described as “lightly Z twisted”, which appears from the photograph to be made of two elements. The fabric is simple knit and the gauge estimated from the photograph is approximately 26 wales × 40 courses to 10 cm, giving a density of 1040



per 10 cm² and ratio of 1.54:1. It has no undamaged edges. There may be one or two shapings, apparently decreases, but the size of the scrap does not allow any interpretation. The surface shows no nap or matting. The wool fibres are described as brown and black, which could be natural pigmentation or staining from burial.

Example 4: Published description (1997) of a knitted strip in the Museum of London (inventory number NN18752)

Kay Staniland included some of the knitted items in the Museum of London's collection in an article largely devoted to changes in tailoring practice. One of these is an odd fragment described as a garter from imprecisely dated deposits said to be circa 1540 to 1560 (Staniland 1997, 247-248). The article includes a poor photograph (fig. 16.6, 248) with no scale and no description other than "This is a knitted garter ... This must be the origin of the term 'garter stitch', the most basic knitting stitch" (Staniland 1997, 247). The piece has been more recently examined in detail and the unpublished description made available for this article (O'Connell Edwards 2018) along with close scrutiny of new photographs (Malcolm-Davies 2018).

Example 4: Proposed description of a knitted strip in the Museum of London (inventory number NN18752)

This fragment comes from the same 16th century deposits as caps, stockings and other knitwork. It is 19.5 cm long, 2 cm wide in the narrower part, and 2.5 cm in the wider part. It is unclear from the photograph whether the ends are complete or damaged, and further examination of the artefact is needed to settle this. It is worked back and forth, as indicated by the selvedge on both sides, and, at the narrow end, there are seven wales. Every course was worked the same, either knit or purl, to produce single ridge fabric until the point where the strip widens. Here, there are three courses with the loops facing the same way, implying one course was worked differently (the same effect could be achieved by working in the same way and in the same direction with a second yarn, but there is no suggestion of yarn ends). At this point, a wale is added to one edge, another being added to the same edge on the next course. The measurement of the nine-wale section is 2.5 cm, giving a wale count of 28 per 10 cm. The course count is 54 per 10 cm, making the course-to-wale ratio 1.93, showing the contraction of ridge fabric. The yarn appears to be consistent throughout and its colour is "archaeological brown". As it stands, this fragment is clearly not a garter, being nowhere

near long enough but it could be part of one if one or other end is incomplete.

Conclusion

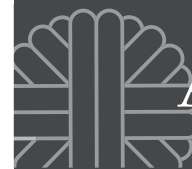
Archaeological finds of non-woven fabrics have usually been assumed to be of interest only to specialists and have consequently tended to be marginalised. Assuming that those interested in knitting are knitters themselves is not helpful. Good practice in analysing and describing fabrics makes them more accessible, as has been demonstrated by the recording of woven fabrics. It is to be hoped that agreement on terminology and necessary information for reporting knitwork finds can help to create records of similar quality that are clear and comparable so as to be of real value to researchers.

Acknowledgements

I am grateful to all of those who have shared the unravelling of the mysteries of knitting, including Lesley O'Connell Edwards, and the nit-picking of words and things, including Sandy Black, Geeske Kruseman, Susanne Lervad, and Jane Malcolm-Davies. Thanks are due to Dorothee Wortelboer, who translated the German text.

Bibliography

- Crowfoot, E., Pritchard, F. & Staniland, K. (2001) *Textiles and Clothing c.1150-c.1450: Medieval Finds from Excavations in London 4*. Woodbridge: Boydell.
- Haase, W. & Weißgraf, T. (2007) Ausblühungen an Gestricken des 17. Jahrhunderts aus einer Kloake in Lüneburg. In *Denkmalpflege in Lüneburg*, Lüneburg: Lüneburger Stadtarchäologie, 75-79.
- Henshall, A. (1950) Textiles and weaving appliances in prehistoric Britain. In *Proceedings of the Prehistoric Society*, 10, 130-162.
- Henshall, A. (1952) Early textiles found in Scotland: Part 1 – locally made. In *Proceedings of the Society of Antiquaries of Scotland*, 86, 1-29.
- Henshall, A. & Maxwell, S. (1952) Clothing and other articles from a late 17th-century grave at Gunnister, Shetland. In *Proceedings of the Society of Antiquaries of Scotland*, 86, 30-42.
- Malcolm-Davies, J., Gilbert, R. & Lervad, S. (2018) Unravelling the confusions: Defining concepts to record archaeological and historical evidence for knitting. In *Archaeological Textiles Review*, 60, 10-24.
- Malcolm-Davies, J. (2018) "Sitting next to Nelly: knitting 16th century garters" paper presented at *Knitting in Early Modern Europe* seminar, Copenhagen, 7 July
- O'Connell Edwards, L. (2018a) A study of the construction



- of wool stockings dating from the 16th century in the Museum of London. In *Archaeological Textiles Review*, 60, 42-50.
- O'Connell Edwards, L. (2018b) personal communication, April.
- Richards, M. & Green, E. (2005) Sock or "scogger". In Gardiner, J. (ed.), *Before the Mast: Life and Death Aboard the Mary Rose*. Portsmouth: Mary Rose Trust, 58-59.
- Rutt, R. (1987) *A history of hand knitting*. London: Batsford.
- Staniland, K. (1997) Getting there, got it. In Gaimster, D. and Stamper, P. (eds), *The Age of Transition: The Archaeology of English Culture, 1400-1600*. Oxford: Oxbow, 239-249.
- Stanley, M. (2001) *The Knitter's Handbook*. Newton Abbot: David and Charles.
- Thomas, M. (1938) *Mary Thomas's Knitting Book*. London: Hodder and Stoughton.
- Thomas, M. (1945) *Mary Thomas's Book of Knitting Patterns*. London: Hodder and Stoughton.
- Walton, P. (1981) The textiles. In Harbottle, B. & Ellison, M., An excavation in the castle ditch, Newcastle upon Tyne, 1974-76. In *Archaeologia Aeliana*, 5th series, 9, 190-228 & 248-249.

Internet sources

ChartGen available at <http://chartgen.orangellous.com/> (last accessed 14 August 2017)

Author:
plainweave879@btinternet.com