

I.

EARLY TEXTILES FOUND IN SCOTLAND.

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PART I—LOCALLY MADE.

INTRODUCTION.

The textile remains preserved in the National Museum are rather diverse in character, varying in age, in material, technique and state of preservation. Those prior to 1700 were first considered as a whole in a temporary exhibition in 1951. In this paper it is proposed to deal with those fabrics from the Roman period to the 17th century which are likely to be of native production, leaving the more complex imported textiles to be treated in a similar manner later. A descriptive catalogue follows the introductory discussion; * the full description of many of the earliest materials in recent papers by Mrs G. M. Crowfoot and the present writer is not however repeated here.

These early cloths owe their *preservation* either to immersion in a bog, inclusion in a grave or tomb, or contact with a metal. The majority are bog finds and are the most perfectly preserved, but frequently they are unaccompanied by other relics, and the date of the cloth is only conjectural. The textiles from graves are few and very decayed, and mainly imported fabrics. Only the smallest fragments are preserved through impregnation with a metal oxide, and then the nature of the cloth has changed.

YARNS.—The great majority of the textiles are made from wool, whether in the woollen or worsted techniques. Many of the earliest cloths are *worsted*s. Their fine smooth yarns, necessary for the fine unshrunk cloth with clearly visible threads, result from spinning with all the fibres parallel. The preparation of wool for such spinning might have been by combing out or more simply by pulling out the fibres of the fleece by hand. The outer fleece was used for these worsted cloths; the staple is smooth and lustrous, 4–6 ins. long, and has probably less scales per inch than any modern staple. Remarkably fine hard worsted yarns are used in the diamond twill from Greenigoe (18, p. 17) and the embroidery and fringe of the Orkney hood (8, p. 9).

Yarns spun in the *woollen* technique were also used extensively, and the resulting cloths are a striking contrast to the worsteds. The wool is prepared

* My thanks are especially due to Miss Morfudd Roberts, who examined and discussed most of the items with me.

by carding, the yarn is fluffy, the cloths are shrunk and felted in varying degrees, and sometimes finished with a raised nap, as with the coat and breeches from Gunnister (p. 31, Pl. V, 1). The greatest contrast with the worsteds is the soft spongy texture of the brimless cap from Gunnister, which is probably made from the under fleece, certainly from a short stapled fleece.

Vegetable fibres are sometimes found. There is however a much greater tendency for vegetable fibre to decay, and the remaining fragments have mostly been in contact with metal. In the exotic silk fabrics from graves the linen foundation weft will almost or totally disappear. A cloth from the woollen bog-find from Birsay (28, p. 25) had two warp yarns used in stripes, one of which has entirely decayed, as has the weft from a cloth patching the plaid from Barrock (29, p. 25). The same thing happened in a cloth from a bog-find at Cambusnethan, Lanarks.,¹ and another at Thorsbjerg, Denmark.² These missing yarns presumably had been of vegetable material. It is conceivable that cloths entirely of vegetable fibre have disappeared completely in the bogs; there may have been linen underclothes or linings among the clothes from Barrock and Gunnister (30, p. 27), and certainly there were pockets of which the only indication now is the sewing.

NON-WOVEN TEXTILES.—In the long period under survey various techniques were employed for making textiles. There are a few examples of sprang and knitting, both of which produce an elastic and pliable fabric more suitable than cloth for stockings, gloves and caps. *Sprang* is a form of netting, threads strung on a vertical frame being interlaced by the fingers. The technique, which in Scandinavia flourished from the Bronze Age to last century, has been exhaustively described and discussed by Dr Hald.³ There are three or four examples in the Museum, all of which are Viking or earlier in date.

The earliest piece of *knitting*, which is silk and not included in the present catalogue, belongs to the early 16th century. In the 17th and 18th centuries knitting becomes the usual method of making caps and flat bonnets (Pl. IV). They are always exceedingly felted to produce a rainproof headwear, and must have been knitted about double the size of the finished article. This extreme felting can be seen on the inside and under the brim, but the outside is smooth and the knitting visible. It seems that, except for the pile cap from Gunnister, the difference is not due to wear but the outside matted surface has been deliberately shaved, probably to enable rain to run off. In the case of the Gunnister finds the knitting is very competent; there are stockings shaped down the back to fit the thigh, knee and calf, and gloves with separately knitted fingers. The use of different stitches is seen in the

¹ T. Glasgow, *A.S.*, IX, 52.

² *Ibid.*, 249-280, 456-7.

³ M. Hald, *Olddanske Tekstiler* (1950), 415.

moss-stitch clocks on the stockings and gloves, and an increase-and-decrease pattern on the cap brim. Colour is also introduced in the purse, where there are stripes of a simple "Fair Isle" type pattern in red and white. The stockings and cap from the Barrock clothes, though almost the same date, are both made from cloth. Except for unascertainable fragments all the knitting listed in this paper has been worked on four pins.

One unexpected item in the collection is an example of *naalebinding* or looped needle netting which it is desirable to record though outside the chronological limits of this paper. The *naalebinding* occurs on a pair of child's shoes made about 1780 (31, p. 27, and Pl. II, 3). This type of work has been described and discussed fully by Dr Hald¹: it is known from the Iron Age in Scandinavia where it was used for mittens and caps and, though rare, from the Middle Ages in other parts of Europe. These shoes are the only example of the work so far recognised in Great Britain. The fabric is worked with a needle, the stitches being a complex type of chain stitch which works into the former row as well as the current one. The general effect of the Scottish example, for which no exact parallel has been found, is of a fine, firm crochet. The embroidery on the Orkney hood seems to be a related work, though its purpose and the use of three needles is quite different (p. 13).

WEAVING.—The weaving varies considerably in quality. The majority of pieces are *twills*²—either 2/1 or 2/2. The 2/1 twill is always made up with the side with the warp predominating on the outside, the other side often having a considerable nap. Some are herring-bone, two are diamond twills, and a few plain weaves, though this does not occur as commonly as might be expected. Neither the quality nor the patterns seem to have any chronological significance, though both the diamond twills are probably early, one 1st century A.D. and the other probably Viking. However, two pieces, the Orkney hood (8, p. 9) and the Rogart shirt, temporarily lent by the Duke of Sutherland (24, p. 18), show primitive features indicating the use of the upright loom which may well have lasted to the early 18th century.

There is no reason to suppose that any piece was woven without *heddles*, indeed it is manifest that they were used for the earlier examples, the Orkney hood and Rogart shirt, as there are recurring shedding mistakes. Both these pieces also have *gores* due to the warp sagging and causing the weft to run in a curve and not at right angles to the warp, a tendency which has to be corrected by filling up the curve by a few weft threads in that area only. Gores are found in the prehistoric and early cloths from Scandinavia which were certainly woven on an upright loom, and they seem to be characteristic

¹ *Ibid.*, 291-318, 458-62.

² For explanation of weaves and draughts, see *P.P.S.*, N.S., XVI (1950), 137-8, fig. 1.

of this type of loom, though Dr Hald says cautiously "the presence of gores ought possibly not to be taken as the criterion of the use of a certain loom type, but should perhaps rather be regarded as the result of weaving on a primitive tool or a badly prepared warp in general."¹

In the case of the Rogart shirt the plain weave cloth is large enough to give a real indication as to the *loom type*. The overall dimensions of the piece are about 32 × 90 ins., which means there must have been provision for moving on the woven cloth and letting out more warp as the weaving was in progress. A feature which is seen also on the Orkney hood is the uneven spacing of the warp threads, indicating, as would be expected, that no reed was used. Further, on both the cloths used in the Rogart garment the beginning edge of the weaving is preserved. It consists of a row of warp loops about $\frac{1}{4}$ in. long, some interlocked, some simple, some overlapping, in no regular order (Pl. III, 3, and fig. 6). In the larger cloth it is almost certain that the looped end is indeed the beginning, for the opposite end, which is cut, accumulates an increasing number of gores, and is finished roughly by a weft of coarser yarn as if the proper weft were exhausted.

There seem to be two types of upright loom which would produce these various features. The first possibility is a loom producing a tubular cloth on which the warp is prepared by turning the threads at each end round the same transverse cord so that the warp forms a closed circle. By withdrawing the cord after weaving, the cloth can be opened out and there are closed short loops at either end of the work.² On purely negative grounds this arrangement seems unlikely: it is known in Denmark, but apparently only during the late Bronze Age and Early Iron Age; all the examples have entirely S spinning, they are all 2/2 twills, all the looped ends are twisted in the same regular pattern.

The alternative type of loom has stone warp weights, a beam at the top for rolling on the cloth, and it "is provided with a list or projecting edge, in which there are at regular intervals holes intended for the warp to be pulled through, or for a horizontal thick cord, which again carries the warp threads. At the top the warp threads make closed loops, generally quite short, only just long enough to go round the cord."³ The actual loom here described by Dr Hald is in Thorshavn Museum, Faroes, and probably belongs to the first quarter of the 18th century.

In later, or in less primitive pieces, the use of a 2/1 *twill*, which needs three heddles, suggests the continued use of the upright loom, for three heddles would not balance in the harness of the simple horizontal loom, which would need six heddles for the work. The 2/2 *twill*, needing four heddles, would be the natural produce of a horizontal loom, though it would be rash to take the 2/1 *twill* as a proof of the use of the vertical loom. It is curious that

¹ M. Hald., *op. cit.*, 448.

² *Ibid.*, 430-4, 448-52.

³ H. C. Broholm and M. Hald, *Costumes of the Bronze Age in Denmark* (1940), 112-3.

gores occur in the clothes from Barrock, but none could be detected in the large plaid of 2/1 twill.

There are two examples of woven *textiles with piles*. The Viking cloth from Kildonan (9, p. 15) has been described by Mrs Crowfoot, who cited comparable cloths from Birka, Sweden, and possibly the Isle of Man.¹ The sleeves of the Rogart shirt also have a pile, and in this case the method of construction has not been elucidated. In both cases pieces of unspun fleece have been inserted into a plain cloth during weaving. The pile appears only on one side and is unknotted; it must more or less have imitated the appearance of a sheep-skin. The fabrics with piles from the Danish Early Bronze Age are sewn in after weaving and are not really comparable.² In literature it is not easy to distinguish between a woven pile and a deep nap brushed up. However, Irish mantles "generally made of stout woollen homespun or of a special shaggy cloth"³ seem to have a fleece pile. There are various references to and illustrations of these shaggy cloaks in the 16th and 17th centuries,⁴ and earlier vague references;⁵ they also seem to have been worn occasionally in Scotland.⁶ That the shaggy cloth was similar to that of the Rogart sleeve is borne out by two extant pieces of cloth, one, undated, from near Drumkeragh Mountain, Co. Down,⁷ and a more nearly comparable piece reputed to be Irish now preserved in the Cathedral of Bruges.⁸ This cloth is earlier than 1347, and traditionally belongs to the 11th or even the 6th century if the association with St Brigid is accepted. Like the Rogart cloth the exact method of construction was not proved, but the pile is evidently thicker and curly, and it was believed that the ends of the unspun tufts formed the only weft. In the Rogart piece, the tufts are worked in alongside the warp.

Tablet-weaving involves quite a different technique to the other methods of weaving. It is only suitable for making narrow bands, though a wide variety of patterns can be produced. Its history possibly starts in the Bronze Age and certainly by the Iron Age, and lasted down to modern times in northern Europe and the Near East.⁹ A collection of thin plates is used and the warp threads are each passed through a hole in a tablet. The pack of tablets, held together, forms a shed in the warp, and revolving the tablets will produce other sheds. By introducing a weft into these sheds the braid is woven. When the tablets are constantly turned in one direction the warp threads passing through one tablet will be corded together, a characteristic feature of tablet-weaving. Of the fabrics included in this

¹ *P.S.A.S.*, LXXXIII (1948-9), 24-8.

² H. C. Broholm and M. Hald, *op. cit.*, 137.

³ H. F. McClintock, *Old Irish and Highland Dress* (1943), 77.

⁴ *Ibid.*, 64, fig. 22.

⁵ *Ibid.*, 78, and *J.R.S.A.I.*, LXVI (1936), 39.

⁶ H. F. McClintock, *op. cit.*, 120.

⁷ *P.R.I.A.*, IX (1864-6), 101-4, fig. 6.

⁸ *J.R.S.A.I.*, LXVI (1936), 32-40.

⁹ M. Hald, *op. cit.*, 453; *Man*, I (1950), 115; *P.P.S.*, N.S. (1950), 148-51.

paper tablet-weaving only appears on the Orkney hood (8, p. 9, Pl. I, 2, and fig. 4), where the bands round the bottom of the hood and forming the top edge of the corded fringe are made in this way. These and the very similar band in Belfast Museum (described on p. 14) are unique; woollen bands, both simple and with colour and weaving patterns are found in Scandinavia and Saxon England,¹ but none of these have the ribbed effect. There is a great contrast between the Orkney bands and the other examples of tablet-weaving in the Museum designed for medieval vestments, which are fine silks with the pattern superimposed on the weaving by coloured brocading.

Colour in the fabrics is used sparingly as far as can be seen, though the long immersion in the bog has left a rich brown stain on a great many cloths, and may have induced fading in some colours. Contrast in tone is gained by the use of two shades of natural wool, as in a piece from Falkirk (6, p. 8) and the Rogart shirt. Green and red are the only dyes which have been detected. The most interesting collection of checks and stripes is in the Dava Moor find (26, p. 21). Colour in some cases seems to be used near the edges, sometimes in conjunction with a twill changing to a herring-bone. The use of herring-bone at the selvages of a twill piece is for the sake of "hang," and to counteract the tendency of the cloth (when hanging) to slope in the direction of the slant of the twill.

¹ *Ant. J.*, XXXII (1952), 189-91.

CATALOGUE.

In the following catalogue the count of the number of warp and weft threads is given in inches. Where it is uncertain which group of threads is the warp, a count followed by 2 letters is given. Unless specifically mentioned there are no selvages remaining. The direction of the spin or ply is represented by S and Z, the direction corresponding to the centre stroke of the two letters. The following abbreviations are used: wa. = warp, we. = weft, c. = about, st. = stitch.

PREHISTORIC.

1. *Stromness, Orkney.* (EQ 593.) *P.P.S.*, N.S., XVI (1950), 153. Moss fabric, cross-twisted technique. (Fig. 1.)

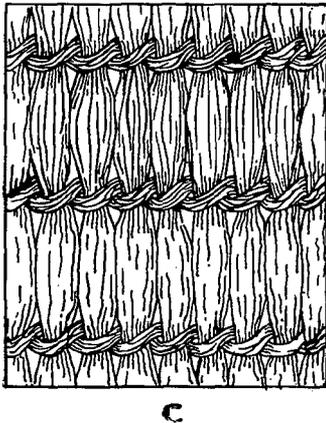


Fig. 1. Fabric from moss, Stromness, Orkney, showing cross-twisted technique.

[By courtesy of *Prehistoric Society*.

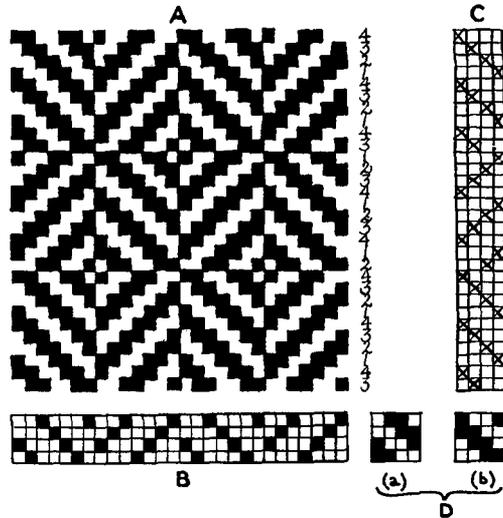


Fig. 2. The Balmaclellan diamond twill.

- Plan of weave.
- Entry.
- Order of pedalling or lifting plan (also shown by figures).
- Tie-up. (a) lower heddles (pedals); (b) raise heddles.

Black squares in plan of weave = weft, white = warp.

2. *Antabreck, Orkney.* (EQ 46.) *Ibid.* As above.
3. *Grantown, Morayshire.* (EQ 250.) *Ibid.*, 155. Woollen plait.

ROMANO-BRITISH.

4. *Balmaclellan, Dumfriesshire.* (FA 14.) *P.S.A.S.*, IV (1860-62), 293; LXXXII (1947-8), 225-31; *P.P.S.*, N.S., XVI (1950), 139. Wool, fine diamond twill, 1st-2nd century A.D. (Fig. 2.)

5. *Newstead, Roxburghshire.* (FRA 1180, 1183.) a. J. Curle, *A Roman Frontier Post* (1911), 289; *P.P.S.*, N.S., xvi (1950), 136. Wool, plain weave, second half 2nd century A.D. b. Curle, *op. cit.*, 108; *P.P.S.*, N.S., xvi (1950), 151-2. Basket of moss, late 1st century A.D.
6. *Falkirk, Stirlingshire.* (FR 483.) *P.S.A.S.*, LXVIII (1933-4), 32; *P.P.S.*, N.S., xvi (1950), 139. Wool, check herring-bone, mid-3rd century A.D. (Fig. 3.)

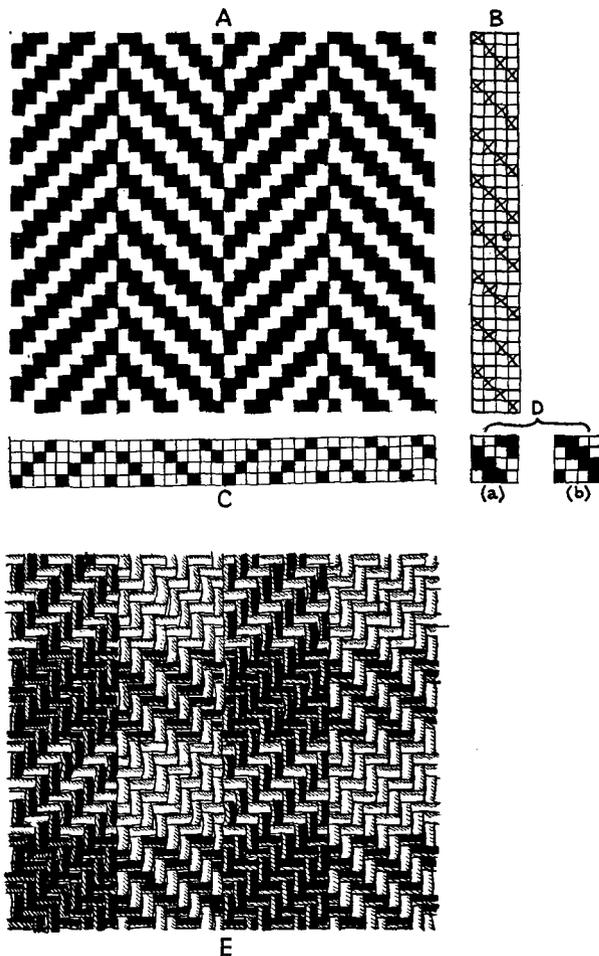


Fig. 3. The Falkirk tartan.

- A. Plan of weave.
 B. Pedalling or order of lifting plan of weave.
 C. Entry or thread-up of weave.
 D. Tie-up or lifting plan. (a) lower heddle; (b) raise heddles.
 E. The check pattern.

Black squares in plan of weave = weft, white = warp.

7. *Micklegate, York.* (NB 1.) *Tr. York Phil. Soc.* (1951), 22. Sprang stocking.

VIKING.

8. *St Andrew's Parish, Orkney.* (NA 3.) *P.S.A.S.*, xiv (1879–80), 81.¹ The hood was found in the bog in 1867, and there is no direct evidence as to its date; it appears to be unique (Pl. I, 1).

Hoods with shoulder capes were used throughout the Middle Ages, as well as hoods attached to cloaks and tunics. There is little evidence for the use of hoods earlier, though hooded figures, not all ecclesiastics, appear on the Pictish stones.² The earlier medieval hoods were simple, but the extension of the back of the head to form a bag appears in the 13th century developing into the liripipe style of the 14th–15th centuries.³ The extreme fashion was largely an upper-class garment and the simple hood reappears; it lasted as late as the early 17th century in Ireland.⁴

Fringes are recorded in Ireland before the Norman Conquest when they were sometimes coloured,⁵ and continued as a popular decoration. Later they were made separately with a different wool to that of the garment.⁶ There is a fringe shown on the bottom of a garment on one of the figures on the Pictish stone from Birsay, Orkney.⁷

However, the techniques of the Orkney hood suggest an early date, Viking or even pre-Viking. The work is carefully designed with intricate detail; none of the extant woollen clothes of the medieval or later periods in Britain or Scandinavia display such workmanship. The use of tablet-weaving to make an edging and incorporating a fringe suggests the diverse and ingenious use of this technique in Scandinavia from the Iron Age to the Viking period. The corded fringe formed by an extended weft thread would seem to be related ultimately to the Danish Bronze Age corded skirts. The complex embroidery stitch, although not really comparable to the Scandinavian naalebinding, either in function or form, seems to be more nearly related to this work in its intricacy and development of the chain stitch than to any other needlework that can be cited. In the weaving the irregular spacing of the warp threads and the gores are primitive though not necessarily early features.

The hood is made up of three separate woven pieces—the hood itself, a band sewn along the bottom edge, and a band and fringe attached to

¹ Also J. Anderson, *Scotland in Pagan Times: The Iron Age* (1883), 104–6.

² E.g. *P.S.A.S.*, lxxiv (1939–40), Pl. xxxvi, a; lxxviii (1943–4), Pl. vi.

³ Discussion, see *Meddelelser om Grønland*, lxxvii (1924) P. Nörlund, *Buried Norsemen at Herjolfsnes*, 168–77.

⁴ E.g. Skjoldehamn, Norway, in *Viking*, II (1938), 27–73, pl. vii; and Holy Cross Abbey, Tipperary, in McClintock, *op. cit.*, 43.

⁵ *Ibid.*, 2–3.

⁶ *Ibid.*, 78.

⁷ *P.S.A.S.*, lxxiv (1939–40), Pl. xxi, b.

the lower edge of this again. The whole garment is woollen, now a warm brown colour varying in places with stains and the use of darker threads in the bands. The measurements of the hood are: middle forehead round to under chin 11 ins., point at crown to bottom of bands at back $19\frac{1}{2}$ ins., round shoulders $37\frac{1}{2}$ ins., length of fringe 11-12 ins.

The cloth of the hood is a 2/2 herring-bone. Wa. rather heavy, Z, 19-25, we. finer, Z, 22-24 double, *i.e.* 44-48 single threads. Weaving pattern of herring-bone stripes with 18-88 threads per stripe as indicated on plan (fig. 4).

All the yarn has been spun on the worsted principle, the threads are clearly visible and there is no felting; presumably this means there has been no shrinkage whilst in the bog. The unevenness of the spacing of the warp can be seen particularly in the 88 thread stripe, and means that, as would be expected, no reed was used on the loom. Although no selvedge remains there is no doubt which set of threads is the warp, for a gore occurs at A on the plan, an irregularity which can only be formed in the weft. The gore seems to stretch the whole width of the cloth, is 1 in. wide at the maximum and consists of 22 or 23 double threads.

Mistakes in the threading of the heddles can be seen; there is no displacement between the herring-bone stripes for 5 ins. between B-C on the plan. There are also instances where the shed has failed to open properly and the weft does not catch down some of the warp threads, as between D-E on the plan.

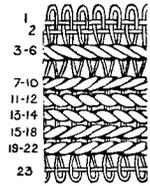
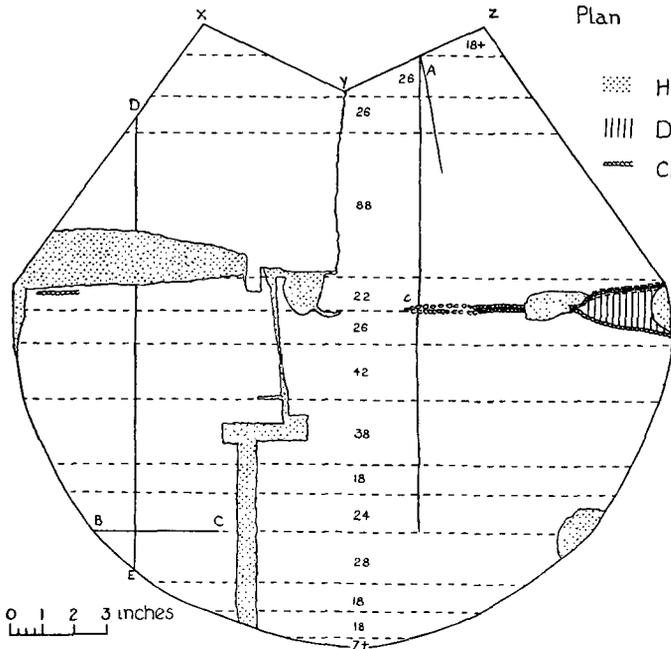
The lower part of the hood consists of two tablet-woven bands and the fringe. The upper band is $\frac{3}{4}$ in. wide. It is sewn to the hood, the bottom edge of which is sewn to the upper edge of the lower band; thus the back of the upper band is hidden by the cloth. The lower band is $2\frac{3}{4}$ ins. wide, and from it hangs the fringe which is an integral part of the lower band, not a subsequent attachment.

The bands are tablet woven using 2-hole and 4-hole tablets, both sets being turned for each shed, the 2-hole tablets turned $\frac{1}{2}$ round and the 4-hole tablets $\frac{1}{4}$ round. The ribs in the bands are due to three factors: different colour and weight of yarn, the use of 2- and 4-hole tablets, and the threading of the 4-hole tablets all from one side, the 2-hole tablets from alternate sides—a device which affects the direction of the twist of the warp threads. There is no reversal of the direction of the twisting of the tablets to untwist the warp. The two bands are worked in a similar pattern with similar yarns and both are very regularly woven (Pl. I, 2).

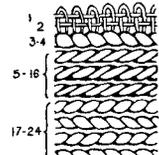
The upper band. Warp consists of 23 threads of various yarns:

1. (At upper edge.) 1 thread of 2-ply S, Z spun, a light and dark thread together.

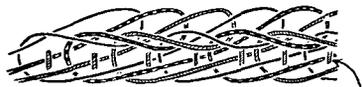
ORKNEY HOOD



Upper band

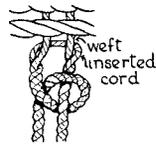


Lower band



Embroidery

thread joining top of upper band to hood



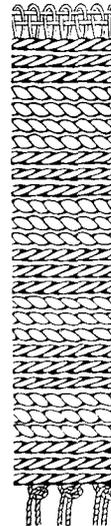
Knot at top of cord



Knot at bottom of cord

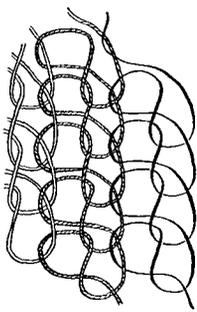


Thong

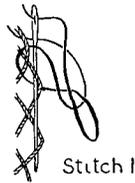


Band in Belfast Museum

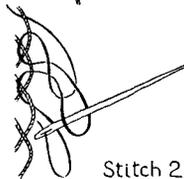
NAALEBINDING



Rounds 1, 2, 3



Stitch 1



Stitch 2

Fig. 4.

2. 1 thread, heavy, dark, Z.

3-6. 4 threads 2-ply lightly spun, fine, dark, threaded through a 4-hole tablet, yarn now mainly decayed.

7-10. 4 threads 2-ply S, fine, well-spun, medium brown, threaded through a 4-hole tablet.

11-12, 13-14. 4 threads 2-ply S, fine, hard-spun, light brown, threaded through two 2-hole tablets.

15-18, 19-22. 8 threads same yarn as 7-10, threaded through two 4-hole tablets.

23. 1 thread not identified around which the weft turns.

The weft is a 2-ply S, loosely spun and plied yarn, rather heavy. It is used singly when passing over warps 1, 2 and 23 but double through the tablet weave where there are 12-14 sheds per inch. The pairs of weft threads divide and change partners between warp threads 6 and 7, thus the threads of the upper tablet (nos. 3-6) are divided from the other tablet threads which lie close together and hide the weft. At both edges of the band the weft appears and hides the 2 outside warp threads at the top and the outside thread at the bottom. There is now no sign of the beginning or end of the weaving of this band; the join probably came where the hood is torn down the back and where the ends of the weaving are now rather frayed.

The lower band. Warp consists of 150 threads:

1 and 2. 2 threads 2-ply S, hard-spun and twisted, light brown. They are widely spaced and pass in and out of the weft as a plain weave. The rest of the band is tablet woven.

3-4. 2 threads 2-ply S, hard-spun, dark, heavier yarn than the other dark warps, threaded through a 2-hole tablet. These threads disappear for the last 13 ins. of the band.

5-16. 12 threads of 2-ply S, fine, dark, threaded through three 4-hole tablets.

17-24. 8 threads 2-ply S, heavier, lighter colour, threaded through four 2-hole tablets.

In all there are 8 ribs of the dark yarn as 5-16, though the lower two are of a rather lighter shade, and 7 ribs of the lighter coloured yarn as 17-24, though 3 ribs consist of 6 threads instead of 8 (fig. 4). Twenty-six 2-hole and twenty-four 4-hole weaving tablets were used. The direction of the twist of the 2 upper light coloured ribs is reversed about half-way along the band, but this seems to be a mistake due to turning over the tablets sideways.

The weft is the same yarn as the first two warp threads. As in the former band, it is used double through the tablet-weaving and single at the top edge. There are 11 sheds per inch. On the bottom edge the weft does not turn back into the next shed but continues below the weaving to form the fringe.

The two ends of the lower band are complete. They are sewn along the actual edge, but enough can be seen to suggest that the beginning lies underneath on the left of the back, for here, where the sewing is broken, it can be seen that the weft is beaten against the very end of the warp which is uncut. It is not possible to see how the other end

was worked, but the finishing is very neat and obscured by sewing. However, some of the warp threads appear to have been worked into the last cord which is rather thick at the top.

The upper band goes once round the shoulder of the hood, but the lower band starts at the back to the left side and reaches almost twice round the shoulder. The width of the weaving is $2\frac{1}{4}$ ins. and the total length is 68 ins.

The fringe is corded by twisting two 2-ply threads together. At the bottom edge of the band the wefts issue from each shed and are corded and knotted together in pairs immediately under the weaving. Over most of the length of the band a pair of cords appears to come from each shed, and as there are only two 2-ply weft threads in each shed and two cords would need four 2-ply threads, the weft threads must have been supplemented. A long thread of the same yarn has been inserted doubled, the loop hidden in the knot under the weaving, and twisted in with the weft threads to make the double cord (fig. 4). The lower ends of the cords are knotted individually with the ends cut immediately below.

The constructional sewing is simple. A seam runs from the crown to the front of the hood (X and Z-Y on fig. 4). The edges have been whipped together after the raw edges have been turned over twice and hemmed down on the outside. The edges framing the face have also been turned over twice on to the outside making a hem $\frac{1}{2}$ in. wide. The lower edge of the cloth has been turned outwards and hemmed to the upper edge of the lower band, while the upper band is also whipped to the upper edge of the lower band and is so applied to the hood that it covers the raw edge of the cloth.

The top of the upper band is sewn to the hood with regular stitches of 2-ply wool, but this is completely obscured by a line of decorative sewing. It is carried out in the same fine dark yarn as the dark ribs in the tablet-weaving. The work is very fine, only $\frac{1}{10}$ in. wide and 12 stitches per inch, is very regular and looks like three rows of diagonal stitching very close together: it may be an imitation of the tablet-weave bands. The stitch is actually very intricate, using three threads simultaneously, and is only attached to the hood by catching the thread sewing the band to the hood cloth (fig. 4). As has been mentioned the ends of the bands are covered with sewing, being whipped with deep stitches, and on the very edge a similar embroidery is applied.

There are two areas on the hood where there have been tears and extensive mending in antiquity. Both are at the junction of the hem down the side of the face and the bands. This is where most strain and friction would occur in wear. In a darn on the right side an attempt has been made to imitate the cloth, for the twill weave is copied, the

warp is similar to that of the cloth but the weft, which is used double like the original, is a heavier and darker yarn. Under the chin is another piece of twill in a 2-ply thread, now almost detached, which is probably another such darn. At these places of weakness there are lines of chain stitching in double thread averaging 5 stitches per inch, the purpose of which is difficult to understand. On the right-hand side a double row of chain stitches begins at the face edge, continuing to almost the middle of the back of the hood. These stitches are worked on the inside, and there are traces of similar work on the left side, while chain stitching worked on the right side of the cloth frames the darn.

A curious feature is the knotted leather thongs which lie between the double layer of the lower band at the front of the hood and pass through the underneath band. No special holes have been made for them. There are now five thongs but the holes of a sixth can be seen. The middle thongs are about half-way down the band and 3 ins. apart, while the outer thongs are nearly at the top of the band and $1\frac{3}{4}$ ins. apart. One end of these narrow thongs was wider and slit; the other, after passing twice through the band, was passed through the slit and knotted. Two intact thongs are 2 ins. long (fig. 4).

In *Belfast Museum* there is a piece of a band of tablet-weaving with a fringe, very similar to the lower band of the Orkney hood.* The Irish band, which was found in 1893 between Moyarget and Ballintoy, Co. Antrim, has been examined through the kindness of the Director of the Belfast Museum, Mr J. A. S. Stendall. It measures 6 ins. in length and $1\frac{1}{4}$ ins. wide.

The points of resemblance between the two bands are striking. They both have a pattern of warp ribs formed by contrasting yarns and the use of 2-hole tablets for the light colour and 4-hole tablets for the dark. The fringe is formed in the same way by extending the weft at one edge. It is supplemented by inserted threads to thicken it, and is knotted under the weaving and again at the end where precisely the same knot is used. In both cases a technique is employed which allows the first weft to be beaten to the very end of the warp. The Belfast band is however much narrower, and the light coloured warp threads are all threaded through the tablets from the same side.

The warp consists of 108 threads:

1. 2 threads of 2-ply Z, S spun, through which single weft threads pass under and over alternately.
2. 12 threads of 2-ply S, Z spun, fine, dark, threaded through three 4-hole tablets.
3. 8 threads of 2-ply S, Z spun, threaded through four 2-hole tablets.

* Mr Stuart Maxwell drew my attention to this band in Belfast Museum.

The band consists of 5 ribs of dark yarn and 4 ribs of lighter colour, the lower three of these consisting of 6 threads, the upper of 8 (fig. 4). Fifteen 4-hole tablets and thirteen 2-hole tablets were used. The weft is similar to the thicker, lighter coloured warp yarn—through each shed of the tablet weave there are 2 weft threads but it passes singly through the top 2 warp threads. There are 11–13 sheds per inch. The weft threads continue into the fringe, where they are supplemented by independent threads introduced at the upper knot; 15 weft threads could be traced through the fringe and in only four cases were there no supplementary threads. One end of the band is intact and shows a beginning edge like that on the Orkney band, though there are two extra weft threads through the lower half of the warp before the first thread passing the full width. The first cord of the fringe is only 1 inch long with knots at both ends, and contains at least seven 2-ply threads, probably representing these extra wefts besides the first normal one.

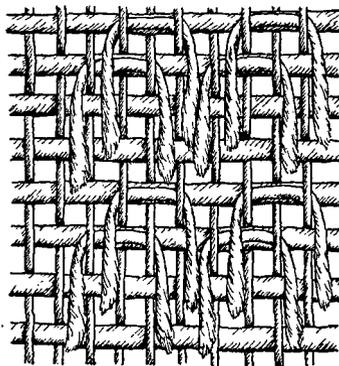


Fig. 5. Sample from Kildonan, Isle of Eigg. Diagram showing a possible reconstruction of the pile weave. It repeats on two rows of weft with two empty rows in between.

9. *Kildonan, Isle of Eigg*. (IL 164, a, b, c, d.) *P.S.A.S.*, XII (1876–8), 589–91, fig. 10; LXXXIII (1948–9), 24–8; J. Anderson, *Scotland in Pagan Times: Iron Age* (1883), 55. Includes an interesting woollen plain weave with pile (see p. 5, and fig. 5) and 2/2 twills and plain weave of both linen and wool.

[10–15.] A number of bronze oval bowl-shaped “tortoise” brooches bear traces of textiles on them. In some cases there is a positive cast over the entire inside of the brooch, a phenomenon probably due to the method of casting. In other cases the remains of the cloth to which the brooch was pinned have survived round both ends of the iron pin where it has been preserved by the corrosion of the metal. All these fabrics are probably of vegetable fibre, and are all plain weave unless otherwise stated. (Brooches listed with bibliography in *Viking Antiquities in Great Britain and Ireland*, ed. Shetelig (1940), Part II.)

10. *Westray, Orkney.* (IL 197.) *P.S.A.S.*, xiv (1879-80), 87. Positive cast of fine cloth inside brooch. Count c. 24 × 30.
11. *Castletown, Caithness.* (IL 221.) *P.S.A.S.*, XLVIII (1913-4), 314. As above, but more distinct. Count c. 32 × 32.
12. *Unst, Shetland.* (IL 313.) *P.S.A.S.*, XLVIII (1913-4), 310. As above, very fine and regular. Count c. 38 × 40.
13. *Carn nan Bharraich, Oransay, Argyll.* *P.S.A.S.*, XLVIII (1913-4), 272-3.
- a. (IL 329.) There are no signs of a cloth impression but quite a large piece of cloth is preserved at one end of the pin. The spin seems to be Z and S, c. 40 × 32.
- b. (IL 330.) As above, with fragment of cloth at either end of the pin.
14. *Sanday, Orkney.* (IL 343.) *P.S.A.S.*, XLIX (1914-5), 15. Cast of a cloth on inside, apparently a fine twill.
15. *Clibberswick, Unst, Shetland.* *P.S.A.S.*, xvii (1882-3), 17; XLVIII (1913-4), 299; *Tr. York Phil. Soc.* (1950), 23.
- a. (IL 223.) The inside of the brooch bears the positive cast of a fabric composed of threads in the form of slender diamond shapes. A plain, fine sprang is the only technique which seems likely to have left such an impression. The fabric has 12 twists of intersections of the diamond per inch and 7 twists in the measurement at right angles to the former count (Pl. II, 2).
- b. (IL 222.) The impression inside this brooch is indistinct, and might be due either to a finer sprang or to a twill cloth. There are traces of a plain weave cloth round the hinge.
- The following brooches also show indistinct impressions inside: Ballinaby, Islay (IL 138), *P.S.A.S.*, xiv (1879-80), 51; Islay, Argyll (IL 215), *P.S.A.S.*, x (1872-4), 554; Tiree, Argyll (IL 219), also with a coarser cloth on the hinge, *P.S.A.S.*, ix (1870-2), 532; Reay, Caithness (IL 335), *P.S.A.S.*, XLVIII (1913-4), 17, 295; Opisdale, Sutherland (IL 377), *P.S.A.S.*, x (1872-4), 554; Northallerton, Yorks (IM 1); Oslo, Norway (IM 2), also with cloth on the hinge; Hankadal, near Oslo, Norway (IM 4), also with cloth on the pin.
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16. *Kiloran Bay, Colonsay, Argyll.* (L. 1924. 5.) *P.S.A.S.*, xli (1906-7), 443; *Viking Antiquities*, op. cit., fig. 29. The iron shield boss has been wrapped in cloth which has been preserved by the rust. The cloth is fairly closely woven and unfelted; it might be either wool or linen. Weave, plain.
17. *Oronsay, Argyll.* (FC 185-8.) *P.S.A.S.*, xxv (1890-1), 434. A fragment of cloth preserved by metal oxide. When found it was under the hinge

of an oblong brooch which is one of a number of items (FC 183-189) from a ship burial. Probably linen. Weave, plain. Count, Z. c. 18×30 .

18. *Greenigoe, Orphir, Orkney.* (NA 307.) *P.S.A.S.*, xxiii (1888-9), 123. Cloth fragments were found in a cist about 1889, with two beads, now lost. All the cloths are quite unfelted, a rich dark brown with an almost silky sheen. The find may be tentatively assigned to the Viking period by comparisons, especially with piece *e*.

a. Cloth measuring $3 \times 4\frac{1}{2}$ ins. Weave, 2/2 twill. Probable wa. Z, 30, we. Z, 16.

b. Sewn to *a*. Weave, plain. Probable wa. Z, 30, we. Z, 16. Fairly firm cloth, both spinning and weaving uneven, almost a rep.

c. 2 pieces, one $4\frac{3}{4} \times 2\frac{1}{2}$ ins. Weave, 2/2 twill. Probable wa. Z, 23, we. 14, much thicker and softer spun. The cloth is loosely woven and the difference between the wa. and we. yarns is very marked.

d. Sewn to *c*. Weave, 2/2 twill. Probable wa. Z, 30, we. Z, 30-32, softer and thicker. The yarns are fine and the cloth loosely woven. Spinning and weaving very regular.

e. Sewn to *c*, measuring 5×3 ins. Weave, 2/2 diamond twill (Pl. II, 1, and fig. 6). Probable wa. Z, 45, we. Z, c. 30, thicker and softer. If this is the case, the warp is set up with a reversal of the order of threading every 10 threads and the order of the heddlings is changed every 5 sheds.

The cloth is very regular and firm. This last piece is very distinctive, with so small a repeat of the pattern closely set and very fine. Similar cloths of Viking date were found at Birka, Sweden, and although there are many variations on the 2/2 diamond twill there is one piece with exactly the same analysis.¹ There is also illustrated a twill similar in character to piece *c*.²

MEDIEVAL.

19. *Closeburn, Dumfriesshire.* *P.S.A.S.*, xxxv (1900-1), 639. The piece of cloth measuring $1\frac{3}{4} \times 1\frac{1}{4}$ ins. was found with a pot and coin hoard of the mid-14th century. It is made of dark brown wool. Weave, 2/1 twill. Probable warp Z, c. 44, weft S, c. 28. Closely woven and felted.
20. *Kelso, Roxburghshire.* (NA 1.) *P.S.A.S.*, vi (1864-6), 247. The piece of fabric was found near the Abbey in a long cist shaped for the head, and is probably medieval in date. It is a rich brown colour and probably made of a vegetable material. Weave, plain. Count, 6×7 . The yarn is 2-ply S, heavy hard-spun and rather uneven, fairly closely woven. The cloth has a heavy rough appearance, quite unlike any other in the Museum.

¹ A. Geijer, *Birka, III*, Die Textilfunde (1938), fig. p. 24, pl. 4, no. 3.

² *Ibid.*, pl. 7, no. 6.

21. *Iona, Argyll.* (HX 37.) *P.S.A.S.*, LVIII (1923-4), 20, 102. Four fragments of linen cloth were found adhering to the outside of one of the silver spoons found, in 1922, under the Nunnery Church. The spoons were probably deposited in the 13th century. The largest fragment measures $1\frac{1}{4} \times 1$ in. It is a light grey colour with green stains from the silver. Weave, plain. Probable wa. Z, c. 52, we. Z, c. 34. The yarn is quite well spun and the cloth fairly regular.
22. *Loch Treig, Inverness-shire.* (HT 170.) *P.S.A.S.*, LXXVI (1941-2), 64. Twill cloth with rib. This seems to be a 6-heddle pattern and not a 4-heddle as published. The site may go back as early as the 10th century.
23. *Kilmichael Glassary, Argyll.* (KA 4.) *P.S.A.S.*, LX (1925-6), 415. There are traces of woollen cloth on the iron bell within the bronze bell-shrine, but very little remains. It looks rather unevenly woven. One set of threads is spun S and the other Z. The cloth is probably medieval, and may have wrapped the bell when it was placed in the reliquary in the early 12th century.
24. *Springhill, Rogart, Sutherland.* *Scottish Exhibition Catalogue, Glasgow* (1911), II, 865. The shirt was found in a grave and is now preserved in the Museum at Dunrobin Castle, Golspie, and was examined through the kindness of His Grace The Duke of Sutherland. The shirt is a primitive and careless piece of work, but has many interesting features. However none of these serve to date it, and the suggestion that it is medieval is tentative; a somewhat similar garment belonging to the 14th century was found in Sweden.¹

The body of the shirt consists of one piece of cloth, with a horizontal slit for the head in the middle, and the selvages sewn together except for the armholes. The sleeves are shaped and made from a different cloth (Pl. III, 1).

The main piece of cloth varies in width, being $29\frac{1}{2}$ ins. at the front hem, the same at the shoulder, and 32 ins. at the back hem. The length of the whole cloth is about 90 ins.; the hem at the back is not cut straight.

Weave, plain. Wa. Z, 17-22, we. S, 15-22. Selvedge, double threads in the outside place. The spinning and weaving are both rather irregular, the yarn is hard-spun and unfelted. The weft count from shoulder to hem at the back is 15, 17, 16, 22, 19, 22, 15, 14. The last two figures refer to the coarser piece of weaving at the end of the cloth (the back hem), where a much heavier weft is used for the last $4\frac{1}{2}$ - $6\frac{1}{2}$ ins. The warp threads here are also more widely spaced at 16-19. There is a less conspicuous change in the weft about 2 ins. below the shoulder in front; the unevenness of the yarn may be partly due to spinning unsorted wool.

¹ *Acta Ethnologica*, II (1937), 1-64.

There is a curious colour arrangement in the warp. The dominant shade of the garment is ginger brown, but for $11\frac{1}{4}$ ins. from the left-hand selvedge the use of a darker yarn makes an irregular pattern of narrow stripes. The number of threads in each stripe varies from 1 to 4, and there is no apparent order or repeat in the pattern. The stripes run the whole length of the cloth and seem to be an intentional feature.

The side of the garment with the coarse weft has been called the back, and it has been assumed that this was woven last. The coarse yarn would probably be used to finish the weaving to the required length when the weaver had run out of the original weft. There are also weaving flaws towards the end of the warp, the lower part of the front being almost innocent of errors, especially gores. The sewing of the front hem is broken for a short distance and two loops at the end of the warp can be seen, similar to those on the sleeves. They are only $\frac{1}{4}$ in. long and look like the beginning edge of the cloth.

There are numerous knots mending broken threads in both the warp and the weft. In places the weft is overspun and results in loops either woven in or left on the surface of the cloth, or the weft may jump over 3, 5, 7 or 9 warp threads, the result of a slack warp. Gores of 2-8 extra threads are found a number of times on the shirt; there are none until nearly half the cloth has been woven, but wear and tear on the warp means increasing unevenness, and especially the left side of the warp has caused trouble.

The underarm seams of the sleeves are cut on the cross, the straight of the material being attached to the selvedge of the main cloth at the armholes, with the cuff also on the straight. The left sleeve is made of three pieces of cloth, the right of two. The left sleeve is 3 ins. longer than the right (fig. 6).

Weave, plain. Wa. Z, 20-23, we. S, 12-16. There is a tufted pile on the outside of the cloth though the underside shows nothing unusual. The tufts have disappeared in places owing to wear. They are in a very matted condition and appear to be quite thick. In fact each tuft consists of a number of small tufts worked into one by wear, the individual tufts consisting of only a few unspun fibres. The tufts examined were seen to be worked in with the warp, and even seemed to be attached to the actual warp thread in one case. In another the tuft could be seen to come over two and under two weft threads beside a warp thread, and then emerge as a tuft at the end away from the starting edge of the cloth. Though many tufts appear to lie in the opposite direction, on examination they were all seen to lie with their free ends away from the starting edge. There are very few loops to be seen on the outside of the cloth; they are very short and seem to be where the tufts were inserted. It is almost impossible to see if there were any regularity

in the placing of the tufts, but in one small area they did seem to be in rows with 2 or 3 wefts between. The tufts average about $\frac{1}{2}$ in. and the

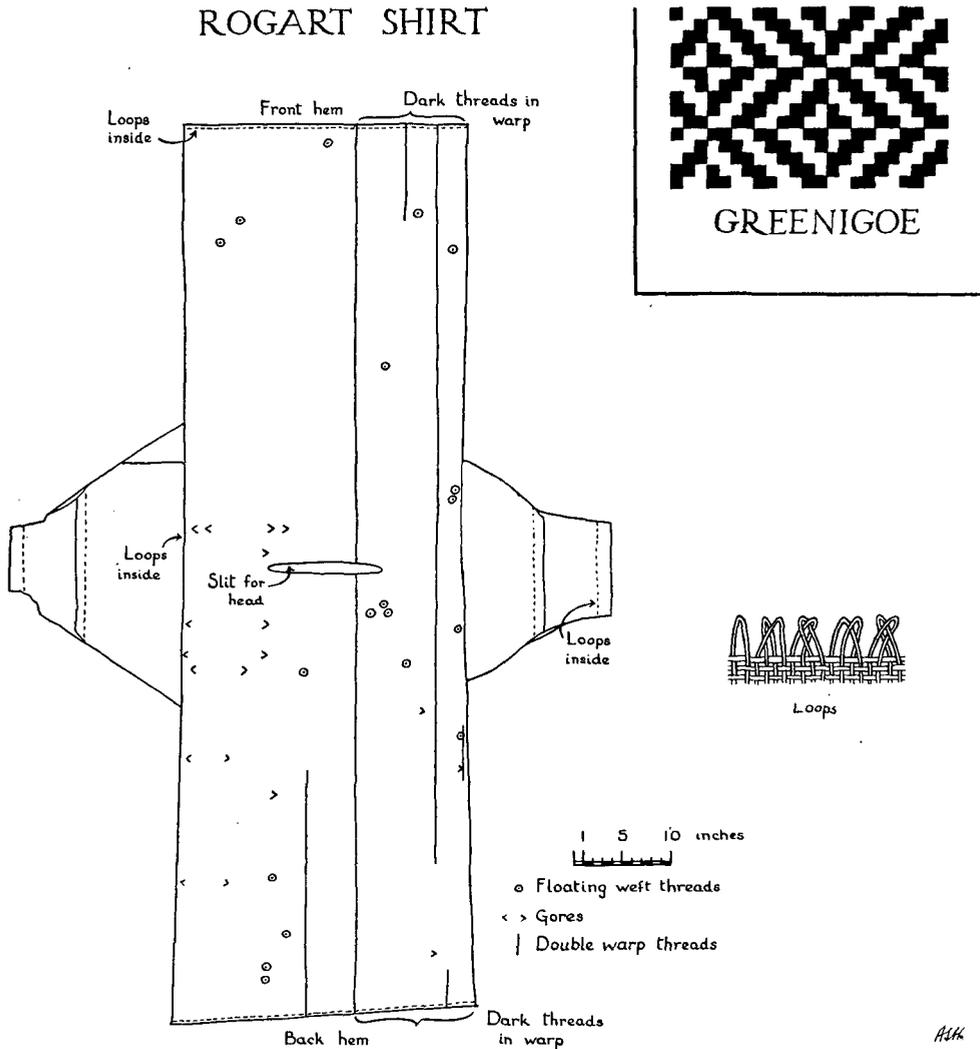


Fig. 6.

longest measured $2\frac{3}{4}$ ins. The construction of this cloth seems quite different from the Viking tufted cloth from Kildonan (9).

A row of loops was found at the top of the left sleeve sewn to the armhole, and also inside the cuff of the right sleeve. These loops must

be the beginning edge of a cloth, as they are very similar to the loops at the front hem of the shirt. They vary in length from barely $\frac{1}{4}$ in. to $\frac{3}{4}$ in. Most of the loops are simple, the two threads forming the loop being adjacent warp threads. But in some cases the loop is formed by two warp threads separated in the weaving by two other warp threads, or sometimes the loops are interlocked (fig. 6). There does not seem to be any regularity in the occurrence of these various types. The twisting of some of the loops was probably to hold the first weft as near the top of the loom as possible.

Most of the seams are joined by oversewing, and where there is a raw edge this is turned over twice on to the wrong side and hemmed down first. Only on the sleeves are there joins with the edges turned in and each hemmed to the other. The neck opening is hemmed on the long sides and blanket stitched at the corners.

17TH CENTURY.

25. *Fisherrow, Musselburgh, Midlothian.* P.S.A.S., LXXXV (1950-1), 177. On five coins from a hoard, the latest of which was dated 1646, were slight traces of cloth.

a. On three coins. Weave, 2/2 twill, about 22 per inch, apparently wool.

b. On two coins. Weave, plain. Both yarns Z, c. 40 × 48. Linen. Fine and regular.

26. *Dava Moor, Cromdale, Morayshire.* (NA 477, 478.) P.S.A.S., LXIII (1928-9), 22. The relics were found, in July 1927, on a skeleton in the moss with a birch stick laid across the body. Professor T. H. Bryce examined the skeleton and reported in a letter of August 5th, 1927, that it represented a short, poorly developed person somewhat over 20 years old. The long bones were very short and fragile, the length of the thigh bone indicating a height of under 4 ft. 10 ins. The sex is doubtful. There was some dark hair still adhering to the bones.

The cap is the most intact item. In general shape it is similar to those from Barrock and Tarvie, having a brim of double fabric and a flat crown (Pl. IV, 1-3). In the knitted cap from Dava the crown barely overlaps the edge of the brim, which has two pieces of cloth knotted through it. The fabric, the general shape and the side strings are comparable to the caps of the 16th century in the London Museum, though similar caps would probably last longer in the north. The cap from Barrock, which belongs to the end of the 17th century, is of cloth. The crown is not much larger than that from Dava but the brim is hardly more than a roll of cloth: the knitted cap from Tarvie has an exaggerated crown protruding well beyond the brim, though

not so enlarged as that of the "Kilmarnock" bonnet of the late 18th and early 19th centuries. The clothes are ragged in the extreme, patched and repatched and now quite formless, though the wool is in good condition. In all there are pieces of at least 29 different cloths, and a piece of knitting as well as the cap; an analysis of the more important pieces follows.

The commonest weave is twill; there are 15 examples of 2/1, 2 of which are check, and 7 examples of 2/2, 3 of which are check. Of the 5 pieces of herring-bone, 2 are check; and in 1 piece the heddling order is reversed, which makes a row of diamonds in the woven pattern. There is only 1 small piece of plain weave. A very heavy rep cloth does not have the appearance of having been woven for clothing at all (Pl. IV, 4).

The greatest interest of the remains is the diverse use of colour, though it seems to be confined to shades of brown, green and red, brown being the background or the only colour, red and green being used sparingly in narrow stripes except for one piece with a green warp. There are 7 pieces bearing check patterns; these can be divided into three groups. There are 3 examples of line checks (26 *b*, *c* and *g*). 26 *b* has a green line on brown with a repeat of $1\frac{1}{2}$ - $1\frac{7}{8}$ ins. sq. Small solid checks, in the case of 26 *a*, consist of 6 light and 6 dark threads, while another example has 8 threads per stripe. Of the large checks there are no pieces big enough to show if they had any formal repeat, but 26 *d* and *e* show a complex arrangement, and 26 *a* and *f* may belong to this class (Pl. IV, 5, 6).

There are also some coloured stripes. One of the 2/1 twills has two heavy warp stripes $\frac{2}{5}$ in. wide divided by a stripe of the ground colour. Another 2/1 twill has an irregular warp stripe, single dark threads are divided by 2-9 threads of the ground colour. Again there may be single threads of red and green in groups on a brown cloth. 26 *h* has a group in the warp, and another 2/2 twill has a group in both the warp and the weft consisting of R B B G B B R, and although there is a considerable area of cloth remaining there is no repeat, nor does the colour occur at the edges. These colour stripes are similar to those on 28 *g* in the Birsay find. The colour pattern in the rep cloth 26 *j* (Pl. IV, 4) consists of weft stripes in four colours. In the twills there are three instances with the warp and weft of different shades, and in the single colour pieces there is a variation from ginger to black in individual cloths.

There is only one certain example of a patterned edge, where there are narrow herring-bone stripes and a dark coloured stripe against the selvedge. Selvedges occur on 4 cloths, and are made of: double threads in the 2 outside places, double threads in the 4 outside places, thick

2-ply threads in the 2 outside places, no special arrangement. There are no signs of beginning or finishing edges. In only five instances is it certain which threads are the warp, but in each case they are set closer than the weft. In 26 *i* it shows the pattern is a true herring-bone and not a wave.

The weaving mistakes are all unremarkable, commonly 2 warp threads running together, or loose warp threads caught down only occasionally.

All the yarns are Z spun except one twill using S, and in the rep cloth there is a mixture of S and Z. The counts vary from 32–18 warp threads per inch, the weft from 24–11, the average being about 20. The felting varies from one extreme to the other.

(“Repeated” refers only to the last two colours mentioned.)

a. Check. 2/2 herring-bone. Wa. Z, 25–28, we. Z, 21–24. Three shades of brown; wa. 6 light, 6 dark alternately, in places 3 or 5 instead of 6; we. 6 light, 6 dark; in one part the dark we. are a lighter colour. Weaving pattern, herring-bone stripes do not follow the stripes of the colour pattern, no. of wa. in each herring-bone vary from 17–2.

b. Check. 2/1 twill. Wa. Z, 30, we. Z, 23. Brown and green; 4 green, c. 34 brown, repeat $1\frac{1}{2}$ – $1\frac{1}{8}$ ins. sq. Cloth rather felted on one side, hard and firm.

c. Check. 2/2 twill. Wa. Z, c. 25, we. Z, 16–20. Two shades of brown; wa. 16 dark, 48 light; we. 14 dark, 48 light; wa. repeats pattern at $3\frac{1}{4}$ ins. Cloth delicate, lightly spun and open, dark threads heavier than light.

d. Check. 2/2 twill. Wa. Z, 24–27, we. Z, 20–23. Two shades of brown and green; wa. 6 dark, 6 light repeated 5 times, 18 green, 6 light, 18 green, 6 light, 6 dark repeated 7 times; we. 6 dark, 6 light repeated 6 times, 11 green, 5 light, 10 green, 6 light, 6 dark repeated 6 times. Not enough cloth to see a repeat. Unfelted.

e. Check. 2/2 herring-bone. Wa. Z, c. 26, we. Z, 21. Dark brown, light brown, khaki-brown and red-brown; wa. 4 R, 6 LB, 5 DB, 6 LB, 6 DB, 6 LB, 5 DB, 6 LB, 6 DB, 6 LB, 5 DB, 6 LB, 6 DB, 6 LB, ? DB, 6 LB, 4 R, 15 KB, 4 R, 13 + KB . . . ; we. 6 LB, 6 DB repeated 3 times, 3 LB, 4 R, 16 LB, 4 R, 13 LB, 4 R, 4 LB, 6 DB, 6 LB repeated 8 times. Weaving pattern, herring-bone stripes with c. 12 threads in each do not follow colour pattern. Cloth lightly spun, not enough to see repeat. Very fragmentary.

f. Check. 2/2 twill. Wa. Z, 30, we. Z, 23. Green and brown; wa. 4 G at selvedge, $1\frac{3}{8}$ ins. brown, 6 G, 6 B, 6 G, $2\frac{3}{10}$ ins. brown, 6 G, 6 B, 6 G, 56 B, 6 G, 4 + B; we. 4 ins. + brown, 6 G, 6 B, 6 G., $2\frac{1}{2}$ ins. + B. Selvedge has double threads in the 2 outside places. Cloth is firm with a softer thread in the we.

g. Check. 2/1 twill. Wa. Z, 20–25, we. c. 18. Two shades of green and brown; wa. 28–30 brown, 6 dark green repeating, we. 30–32 brown, 5 khaki-green repeating, we. green stripe faint due to 2/1 twill, wa. repeat $1\frac{3}{8}$ ins., we. repeat 2 ins. Hard, felted on inside.

h. Stripes. 2/2 herring-bone. Wa. Z, c. 27, we. Z, c. 24. Mid-brown cloth with single threads of green and red at one side arranged R B G B R B G B R. Weaving pattern, herring-bone stripes do not coincide with colour stripes; herring-bone stripes of 9 or 5 threads between pieces of twill over $2\frac{1}{4}$ ins. wide. Fine and unfelted.

i. 2/2 herring-bone. Wa. Z, c. 30-32, we. Z, 18-20. Green and brown, wa. green, we. brown. Weaving pattern, herring-bone stripes consist of 11-8 threads, between two there is no displacement. Selvedge of light coloured threads, double in the outside 4 places. Cloth is $1\frac{1}{2}$ ins. wide, 5 ft. 7 ins. long, with selvedge the whole length of one side. Fine and firm.

j. Rep. Wa. Z, 6-7, 3 threads together, we. 2-ply, Z twist, S spun, 16-20. Black, 3 shades of brown, red-brown, no regular repeat of the stripe pattern though a number of narrow stripes are reversed in order to make a definite pattern within a broad stripe. The wool is particularly long stapled and lustrous (Pl. IV, 4).

k. Knitting. A strip over 2 ft. long, very felted. Stocking stitch, decrease every 8th st. 5 sts. per inch. Might have been the brim of a cap similar to *l*.

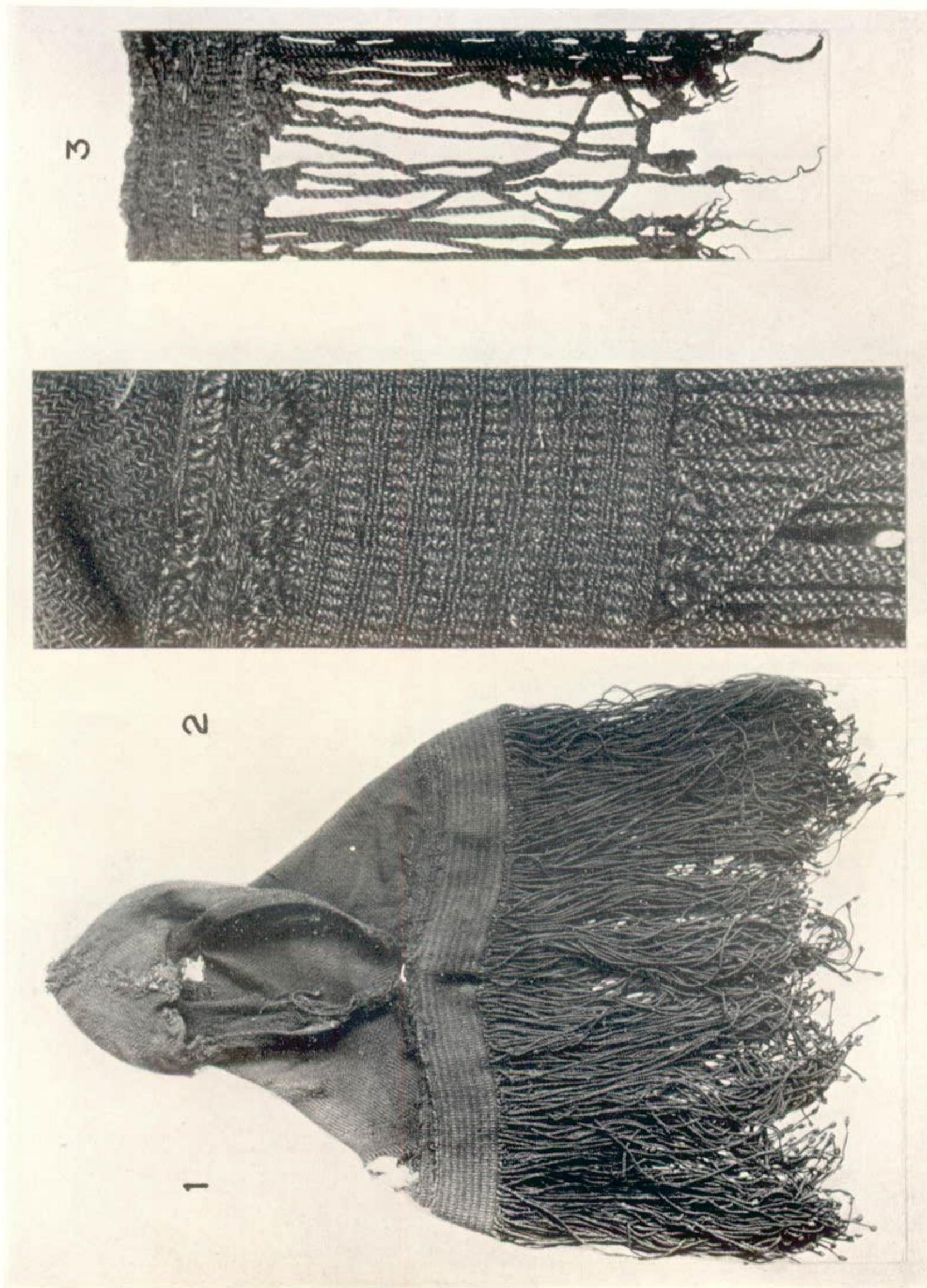
l. Knitted cap (Pl. IV, 1), internal circumference 21 ins., brim 1 in. wide, circumference of crown 28 ins. Brown, 2-ply, Z spun, S twisted. $5\frac{1}{2}$ sts. on brim and $6\frac{1}{2}$ sts. on crown per inch, 10 rows per inch. Worked on 4 pins in stocking stitch. Knitting starts at the inside under edge of the brim with 118 sts., increases in the 4th row to 129 sts., decreases in c. 17th row to 116 sts. There are 20 or 21 rows in brim. Upper edge is fastened back to beginning row. The junction of brim and crown is obscured by felting. Crown must start with c. 118 sts., increases soon after beginning and again in 14th or 15th row making 171 sts., the maximum number. After 12 plain rows there are decreases in every 3rd st. to make 130 sts. After 10 rows decreases to 92 sts. Decreases in the 7th, 5th, 5th, 3rd, 3rd, 3rd rows ending with 5 sts.

It is extremely felted inside and on the outside where the crown is hidden by the brim.

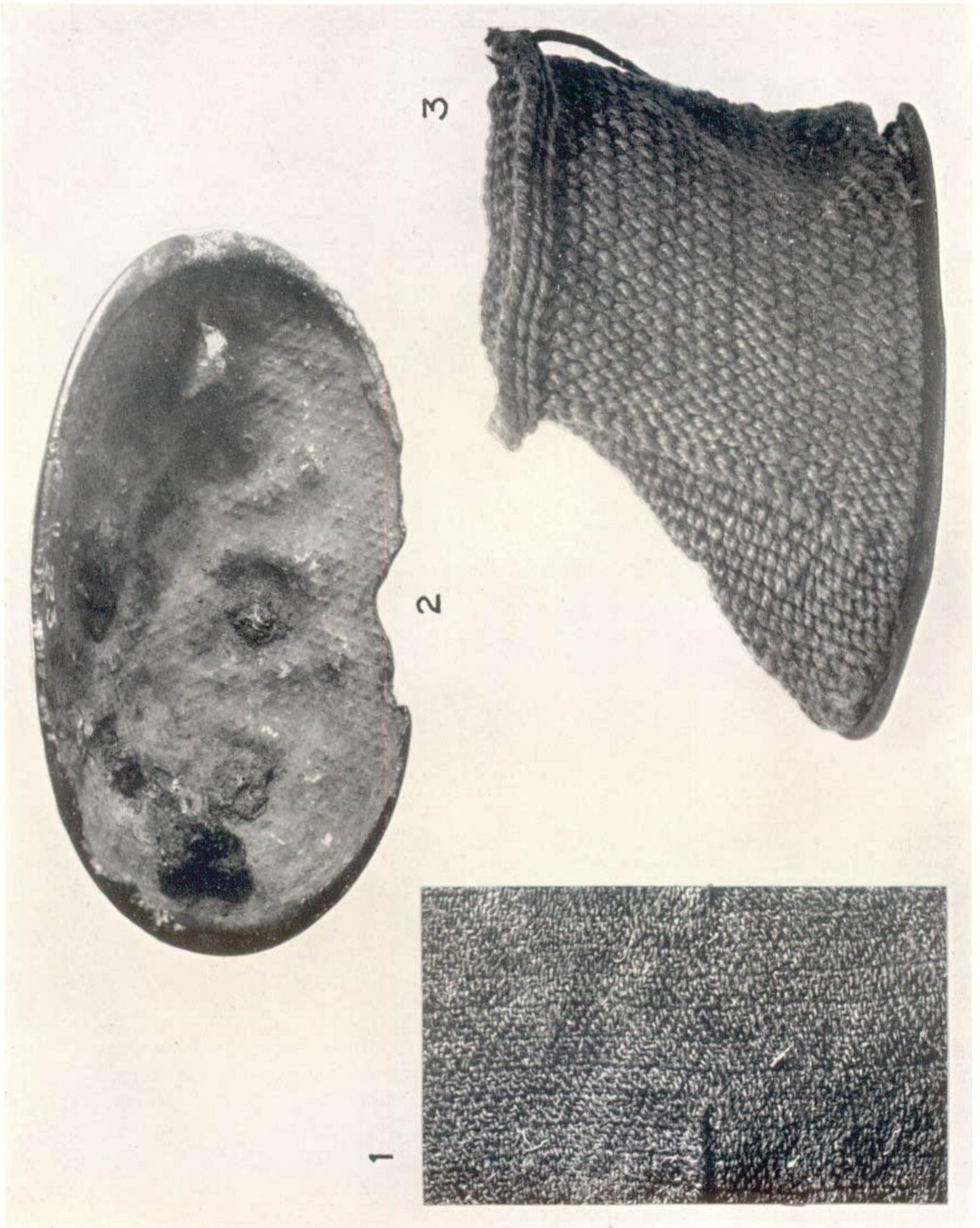
27. *Tarvie, Garve, Ross-shire.* (1935. 208.) A green woollen knitted cap on loan from the Scottish United Services Museum, Edinburgh Castle. It was found with another not now known, in 1935, 3 ft. below the surface of the peat bog (see p. 21, and Pl. IV, 2).

The cap is slightly oval in shape, the circumference inside the brim is 21 ins., of the crown when flat $33\frac{1}{4}$ ins. There are two cut slits under the edge of the crown just above the brim, probably the position of a brooch or badge. The cap is very felted; the stitches on the inside are indistinguishable. The outside appears to have been shaved. Stocking stitch and four pins have been used.

There are 7 stitches and 10 rows per inch. The knitting seems to have started at the lower inside edge of the brim with about 103 stitches. The width of the brim is only $\frac{1}{2}$ in., and on its outside edge the number of stitches has increased to 125. On this edge where the brim folds back on itself there seems to be a row of garter stitch. The inner edge



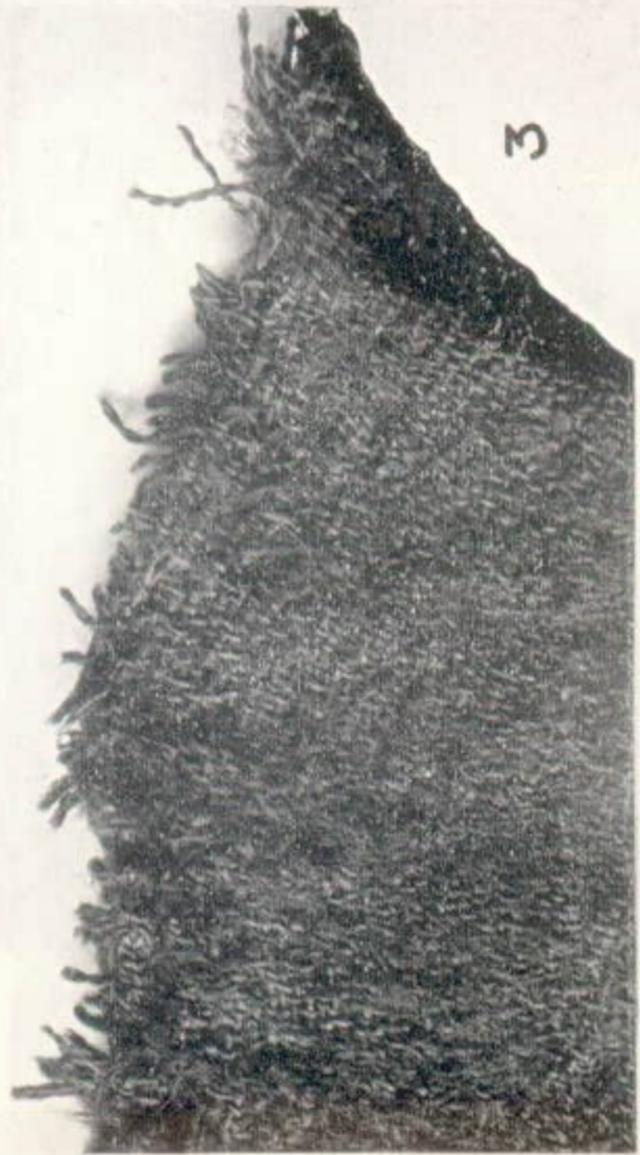
1. Hood from St Andrew's Parish, Orkney. No. 8. ($\frac{1}{2}$.) 2. Detail of the tablet-woven bands. ($\frac{1}{3}$.)
3. Band in Belfast Museum. ($\frac{2}{3}$.) By permission of Belfast Museum and Art Gallery.



1. Cloth from Greenigoe, Orkney. No. 18, e. ($\frac{1}{2}$.)
2. Inside of brooch from Clibberswick, Shetland, No. 15. ($\frac{1}{2}$.)
3. Bootee in naalebinding. No. 31. ($\frac{3}{8}$.)



2

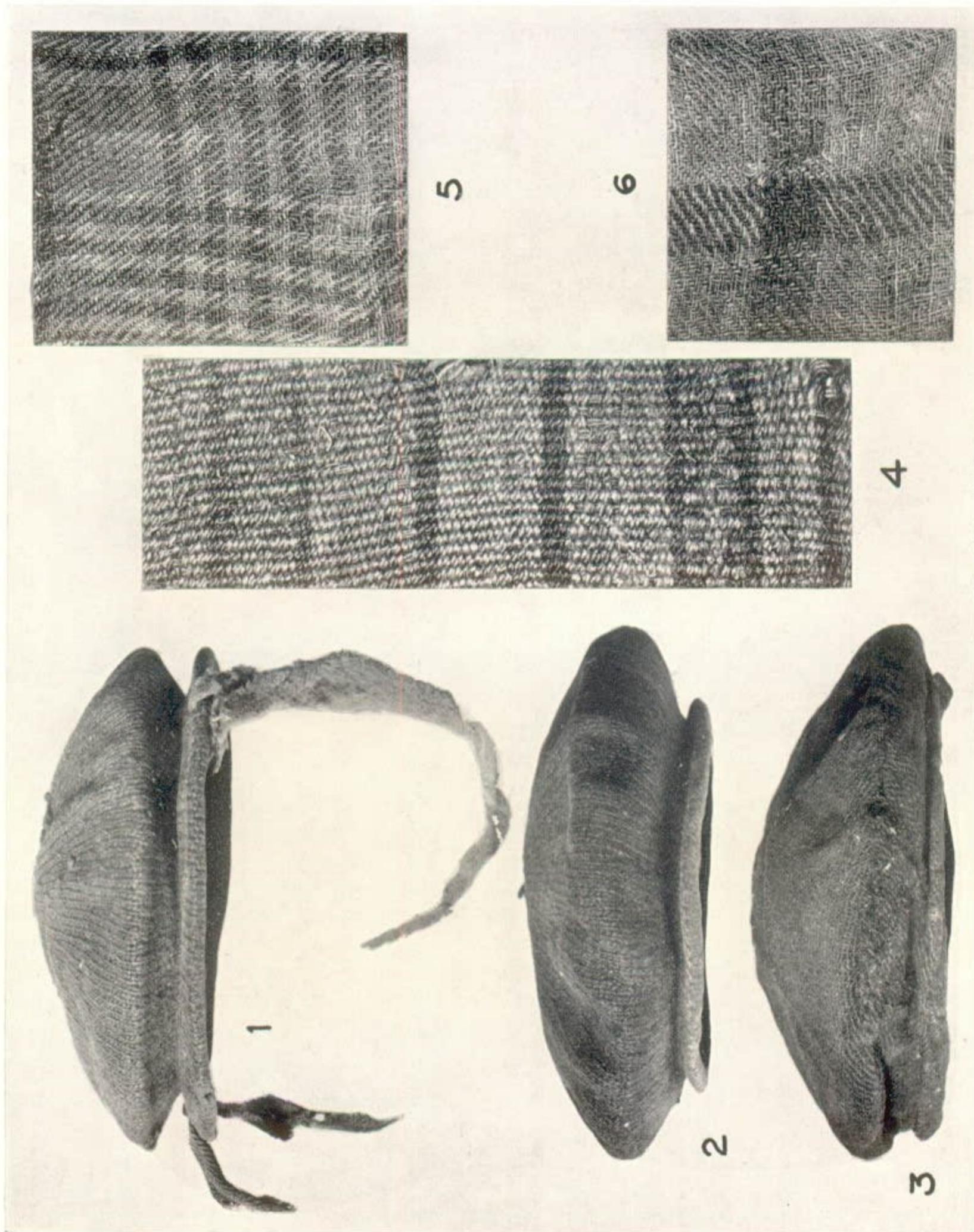


3



1

1. Shirt from Rogart, Sutherland. No. 24. ($\frac{1}{3}$).
2. Detail of sleeve fabric. ($\frac{2}{3}$).
3. Detail of looped edge on sleeve. ($\frac{1}{4}$).



1-3. Caps from Dava Moor, Tarvie and Barrock. Nos. 26, 27, 29. (4.)
4-6. Cloth from Dava Moor. Nos. 26 j, d, e. (5.)

of the upper side of the brim is attached to the brim, but the junction of the brim and crown are too felted to distinguish the stitches or ascertain whether the brim and crown were continuous or stitched together after knitting. The crown must have started with about 103 stitches, and after $2\frac{1}{4}$ ins. it reached its maximum diameter with 230 stitches. The first row of decreasing is almost at the edge of the crown. There are 9 rows of decreases between here and the centre 13, 9, 7, 5, 4, 5, 2, 1 and 1 rows apart; the last 6 stitches are pulled together at the centre of the crown.

28. *Birsay, Orkney*. (NA 2.) *P.S.A.S.*, XVI (1881-2), 11. Some pieces of extremely worn and patched woollen clothing found, about 1881, with the skeleton of a girl in a bog. The find has been included with the 17th-century pieces because of the similarity of the single thread colour stripes in piece *g* with those from Dava, including 26 *h*. Another fragment of interest is *b*, which originally had a pattern of warp stripes but one of the two warps has completely disappeared; presumably it was of vegetable fibre.

a. 3 pieces of yellow-brown cloth, the largest $16 \times 10\frac{1}{2}$ ins. Weave, 2/1 twill. Probable wa. Z, 18, we. S, 13, thicker, softer and lighter colour. The cloth is very heavy, firmly woven and slightly felted.

b. 1 piece yellow brown, $9\frac{3}{4} \times 10\frac{1}{2}$ ins. Either the warp or the weft was made of two materials, one of which has completely disappeared. There is an edge to the cloth which, if it is the selvedge, means the warp was mixed. The arrangement of the stripes is irregular, sometimes the vanished threads alternating with the woollen threads, but not more than three of either coming together. Weave, plain. ? Wa. Z., 18, we. Z, 16.

c. 3 pieces light and dark brown cloth. Weave, plain. Probable wa. darker, harder spun, Z, 19, we. S, 19. Regular but rather loosely woven.

d. 1 piece light brown cloth. Weave, plain. Count, 20. One yarn Z the other S. Cloth firmer and more felted than *c*.

e. Similar to *d*. Count, 26×20 .

f. Similar to *d*, but more irregular. Count, 19×23 .

g. Light brown. Weave, 2/1 twill. Probable wa. Z, 32, we. S, 26, lighter spun. Stripes, probably in the wa., consist of 2 green, 2 brown, 2 red, 2 brown, 2 green threads. This combination is placed at intervals of $2\frac{1}{2}$, $4\frac{3}{4}$ and $4\frac{1}{4}$ ins. There is a broad green stripe parallel with these at one side over $1\frac{1}{2}$ ins. wide.

h. Cloth forming foundation of garment. Largest piece $21 \times 17\frac{1}{2}$ ins. Dark brown. Weave, plain. Wa. Z, 27, we. Z, 16. Selvedge has double thread in outside place. Less evenly spun than other cloths.

29. *Quintfall Hill, Barrock, Caithness*. (NA 408-416.) *P.S.A.S.*, LV (1920-1), 213-21 (contains full report). Clothing found on the skeleton of a man buried in the moss: dated by the coins in his purse to the end of the 17th century.

a. The bonnet. Dark brown. 2/1 twill. ? Wa. Z, 28, we. Z, 21. The inside is very felted and the threads quite obscure; on the outside

they are distinct. The bonnet was shrunk and the nap raised after sewing. One piece of the brim has been used with the side with weft threads predominating to the outside, but the nap is raised on the inside like are the rest of the bonnet (Pl. IV, 3).

It is not correct to say (as in the report) that the bonnet would only fit a child; it fits the present Keeper of the Museum.

b. The outer coat. Mid-brown. 2/2 twill. Wa. Z, 22-30, we. Z, 19-23. Width of warp over 31 ins. Selvedge, double threads in 2 outside places. There are gores in the cloth at the bottom of both front pieces, with at least 4 extra threads. The cloth has been rather felted but the nap has worn off on the front, especially at the waist. The buttons here and on the breeches are of cloth.

c. The inner coat. Mid-brown. 2/1 twill. Wa. Z, 28-30, we. Z, 19. Width of warp 27 ins. Selvedge, one side double threads in 2 outside places, on other side in 3 outside places. The cloth has been somewhat felted but the nap has worn off the front. A similar fabric to the plaid. The positions of the buttons all show very distinctly, and they would seem to have gone since the coat was buried—possibly they were of leather.

d. Outer breeches. Dark brown. 2/1 twill. Wa. Z, 27, we. Z, 15. Width of warp over 26 ins. Selvedge, double threads in 4 outside places. Cloth very felted inside and very firm. There has been a lining to the waistband which has totally disappeared though the stitching remains. Patched with various cloths: (1) 2/1 twill, we. with lighter fleece mixed in it, light weight, felted. (2) Similar, but all dark brown. (3) 2/1 twill, hard spun, unfelted.

Tapes at bottom of leg: (1) 1 tape, $\frac{3}{4}$ in. wide, rep with warp stripe. Wa. fine 2-ply S, we. brown, 2-ply S, 10, thicker. Warp pattern 4 brown, 4 red, 4 B, 4 light green, 2 dark green, 4 R, 8 B, 2 LG, 2 B. (2) 2 tapes, $\frac{1}{8}$ in. wide. Similar, heavier. We. green, 7 per in. Warp pattern 6 B, 1 G, 1 B, 1 R, 1 B, 1 R, 1 B, 1 R, 1 B, 1 R, 1 B, 1 G, 1 B, 1 G, 1 B. The tapes are similar to that from Gunnister (p. 35), especially *b*, where the use of alternate threads of different colours in a warp rep makes a design of transverse stripes.

e. Inner breeches. Mid-brown, warp of lighter colour. 2/2 twill. Wa. Z, 24, we. Z, 20. Width of wa. $26\frac{1}{2}$ ins. Selvedge, double threads in 2 outside places. Gore of 6 threads above left knee. Cloth rather felted, worn off in places now. There was apparently a leather facing inside to the front opening, a leather pocket to the right of the front, and the long side slit has been loosely whipped and must have held a pocket too, and there was a lining to the waistband; the leather leaves slight traces, in the other places nothing but the stitching remains.

Linings and patches: (1) 2/2 twill, Z, 26 × 21, unfelted. (2) 2/1 twill. Z, 30 × S, 18.

f. Stockings. Mid-brown. 2/2 twill. Wa. Z, 27, we. Z, 24. The tops are rather felted, but not much below.

g. Plaid. Mid-brown with dark stripe. Dimensions about 64 × 107 ins. 2/1 twill. Wa. Z, 21-24, we. Z, 18-20. Selvedge, double in 2 outside places. Felting seems to have been little originally, but now rather varied. There are no weaving mistakes to be seen at all.

The plaid is made of 2 identical strips sewn together down the centre, the warp being 28–33 ins. wide. The dark stripe is 3–4 ins. wide, $1\frac{1}{4}$ ins. from the selvedge at each side; it is not an even colour, but the inner half is mixed with noticeably lighter coloured threads. Both ends of the plaid have been cut, one is hemmed and the other oversewn. Against the former end is an area of lighter colour which the “shaped piece” mentioned in the report exactly fits, its long edge having been sewn to the end of the plaid. Holes of vanished stitches can be traced round the edge of the “shaped piece” and round the shadow on the plaid; originally the “shaped piece” was sewn down on all sides to the end of the plaid, with the deliberately made hole in the centre, with inturned edges. The shaped piece was evidently a later addition to the side with weft predominating, but was not a patch for there is a patch on the plaid under it, but no other hole. No explanation of its use can be offered.

Most of the sewing is by 2–4 strands of wool, but in places, as round the shaped piece, the sewing has gone and was probably by a vegetable-fibre thread. There are also the remains of a patch at the other end of the plaid, which seems to have been a cloth with a warp of wool and weft of linen. Now there are only the woollen threads left, Z spun, about 20 per inch, showing the positions of the vanished threads by a series of indentations.

A piece about 18×20 ins. has been cut from the centre of the plaid shortly before its burial; the edges are quite unfrayed.

h. “Shaped piece.” Mid-brown with dark brown stripes. 2/1 twill. Wa. Z, 24, we. Z, 21. Width of warp over 32 ins. Selvedge, double in 3 outside places. Hardly felted. Similar cloth to plaid. Against one selvedge, 1 in. mid-brown, $1\frac{1}{4}$ ins. dark brown, $1\frac{1}{4}$ in. mid-brown, $\frac{5}{8}$ in. dark brown. There is a gore of 6 threads against the striped side and another on the other side. There are warp mistakes, loose threads and threads running together.

30. *Gunnister, Shetland.* (NA 1037–1049.) Clothing and other articles found on the skeleton of a man buried in the moss. The latest date on the coins in his purse is 1690 (see pp. 30–42).

18TH CENTURY.

31. *Bootees in Naalebinding.* (NA 1013.) This pair of child’s bootees of the 18th century is included because of the unusual technique employed to make them. The labels on the soles read “supposed to be made about the year 1780. Belonged to Agnes Taylor’s great-great-aunts. 1880.” The uppers are a red wool fabric, the soles are leather. The dimensions are: length $4\frac{1}{4}$ ins., width $1\frac{3}{4}$ ins., height 3 ins.

The general appearance of the fabric is fine and close, rather like

knitting or crochet, worked in an evenly spun red 3-ply wool. The fabric is a simple form of naalebinding. It is worked, with the wool threaded through a needle, in a series of stitches in rows working into the current and previous rows simultaneously (Pl. II, 3, and fig. 4). The joins between the lengths of wool are visible in places either as knots or darned-in ends. The booties are worked horizontally round and round with two converging lines of decreases on either side of the toe. It is uncertain if the top edge, which is finished with three horizontal ribs, is the beginning of the work. The ribs are formed by working the new row into the centre of the preceding row instead of the edge of it, the edge loops standing up on the outside surface making the ribs. The other edge is folded to meet under the foot and is attached to the sole.

UNKNOWN DATE.

32. *Culrain, Ross-shire.* (NA 4.) *P.S.A.S.*, xiv (1879-80), 91-2. Pieces of woollen cloth and knitting and part of a leather shoe taken from some fully clothed skeletons found in a moss in 1880. They are now rather decayed and fragile, all dark brown.

a. Regular firm cloth, $7\frac{3}{4} \times 2\frac{1}{4}$ ins. Weave, 2/1 twill. Probable wa. Z, c. 35, we. S, c. 30. Unfelted.

b. Similar cloth, but finer and looser, $5 \times 1\frac{3}{4}$ ins. Probable wa. Z, c. 40, we. S, c. 22.

c. Fragments of knitting, possibly part of a stocking, larger piece $4 \times 4\frac{1}{2}$ ins. The yarn is a 2-ply wool, 14 stitches and 18 rows per inch. The pattern consists of 3 rows of plain knitting and 1 of purl repeated, *i.e.* stocking stitch with a horizontal rib every 4th row.

33. *Norsewick, Mainland, Shetland.* (NA 6.) *P.S.A.S.*, i (1851-4), 95. The two small pieces of cloth, which are preserved with a lock of hair and piece of wood, come from "two tunics" found on a male and female skeleton in a moss in 1849.

Weave, plain. Probable wa. Z, 24, we. S, 15. The yarn is hard-spun, the weave irregular, the cloth much felted and a nap raised. Weaving mistakes of loose warp threads, in parts they are brushed up and give the appearance of a pile: the inside of the jacket from Gunnister has the same effect.

34. *Loch Laggan, Inverness-shire*, probably from King Fergus Isle. (NA 679 and 680.) *P.S.A.S.*, LXXXV (1950-1), 162.

a. A piece of brown woollen cloth measuring $4\frac{1}{2} \times 7\frac{3}{4}$ ins. Weave, plain. Count Z, about $15 \times Z$, 15. One set of threads, probably the warp, is finer than the other. The yarn is well spun, the weave is rather loose. Along one of the long edges are 3 black stripes consisting of 4 threads each and separated by 4 threads of the main colour. Along one of the short edges there is the same arrangement of stripes, but only

2 threads of the outside dark stripe remain; beside the dark stripes are 3 brown stripes only slightly darker than the main colour, consisting of 4 threads and divided by 4 threads of the main colour.

b. Fragment of brown cloth, presumably linen, measuring about 9 ins. long. Weave, plain. Count, Z, 30 × Z, 23. The cloth is firm and regular.

Both cloths were examined under a microscope by the British Cotton Industry Research Association, Shirley Institute, who report the first piece to be all wool and the other probably linen, though it could be hemp or nettle.

35. *Shetland*. (NA 249.) *Catalogue of the National Museum of Antiquities of Scotland* (1892), 354. Found in the moss in or before 1884; presented by the Sheriff-Substitute at Lerwick.

a. A plain hemispherical cap measuring 8 ins. from crown to rim, and a circumference of $26\frac{1}{2}$ ins. It is a mid-brown colour, and shows no signs of spinning or weaving, but is made of felted wool with a coarse long staple. The wool must have been beaten and shrunk into the felt over a block to form the shape of the cap, which has no constructional sewing.

The lower edge is whipped with large stitches in green and blue-green yarns, Z spun, 2-4 threads used together. The green wool is also sewn into the main part of the cap, though it does not show on the inside. The purpose of this sewing is not apparent; it now shows as a number of irregularly spaced short ends. The cap is torn in places and two of these are mended with a thick 2-ply brown wool. A hole near the edge has been roughly patched by two pieces of cloth.

b. Brown cloth, considerably felted on the inside. Weave, 2/1 twill. Count probable wa. Z, 30, we. S, much thicker, 20.

c. Similar cloth. Wa. Z, 22, we. S, 22. Selvedge with double threads in 3 outside places.

36. *Dunrossness, Shetland*. (NA 297.) *Ibid.* Pieces of woollen fabrics found in the moss about 1847: no bones were found.

a. Pieces of cloth, one with 4 stitched buttonholes and hemmed on two edges, probably from jacket or trousers. Weave, 2/1 twill. Probable wa. Z, 30, we. S, 30. Both hard-spun and unfelted.

b. Similar cloths, much felted on inside. One piece, $10 \times 6\frac{1}{2}$ ins., has hem on two sides; might be from jacket. Weave, 2/1 twill. Probable wa. S, 30, we. S, 26.

c. Tiny fragment. Weave, plain. Count, S, 20 × S, 22. Unfelted, looser woven than others.

d. Knitting, 6×4 ins. Yarn Z spun and seems 2-ply. 6 stitches and 10 rows per inch. The inside is not much felted.