General discussion

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Apart from their interest as the first large body of medieval textiles from Scotland, the finds of cloth and related material from the High Street are a potential source of information for a momentous period in the history of Perth (as of Scotland as a whole). Over 75% of the deposits pre-date the 14th century and are exactly contemporary with the two hundred years of relative peace and prosperity which saw the emergence of towns in Scotland. It was the time, indeed, of the rapid development of Perth to a position second only to Berwick as a port and centre of commerce when, it has been argued (Duncan 1974, 42–9), the manufacture of cloth played an important role in the economy of the burgh. Most of the remaining material dates from the early and mid-14th century and therefore relates to the years of the Wars of Independence and the occupation and re-occupation of the burgh by invading forces, which resulted in the demise of Perth as one of the chief towns of Scotland. What then may be learnt from the finds concerning the production of and trade in textiles in the burgh during this period?

Silk

At 7.54% of the finds, silk, both loom-woven and in other forms, is well represented among the High Street textiles; these silks do not come from one level alone, but are drawn from all periods of the excavation. As there is no evidence for silk throwing (spinning) or the weaving of silk yardage in medieval Scotland, all such finds must be regarded as potential imports. Even so, it is not impossible that some of the non-loom-woven items were made locally from imported yarn. The Exchequer Roll for 1331, for instance, mentions the purchase for the royal wardrobe of Parisian silk, *cerici Parisiensis* (*ERS*, i, 380), which since it was bought by weight, not by the piece or length, may be deduced to have been yarn rather than a textile. While such a purchase may have been intended principally for use as sewing thread, it could also have provided the material for making braids or for tablet weaving. In theory the examples of *lacis*, the embroidered silk hair nets, could also have been made locally from yarn bought in, but the similarities of technique and design to probable Germcin work of the period strongly support a foreign origin for these items (see Net, above). Netting needles with an open eye at each end are known at some European sites, for instance from eighth- to 11th-century Mikulžice in the Czech Republic (Kostelníková 1990, 117), a tentatively identified example in wood (yew) from a 13th-century house at Winchester (Biddle and Elmhirst 1990, 817), from 14th- and early 15th-century deposits in London (Crowfoot et al 1992, 146–7) and from late 15th- to early 16th-century Amsterdam (Baart et al 1977, 126, Cat No 123). A documentary reference to an *agora de rete* (a 'needle to make a net') also appears in an inventory of items sold at public auction at Pisa in 1176 (Robbert 1983, 401; see also below). However, such needles have not been recognised amongst the High Street finds.

In at least some cases, silk yarns were used for decorative stitching. There are instances of two leather uppers of shoes/boots with such stitching (this Fascicule, Leather Cat Nos 229/A7588c and 172/A7580a). In the latter, two rows of white thread enclose a row of pink thread. A colour contrast was also used in repairing or reusing silk fabrics. One of the compound weave silk twills, which had been stitched into a tube, has a pink yarn clinging to its edge (Cat No 46/A7323). Pink silk yarn was also used to repair Cat No 271/A09–0097, an item composed of lengths of tablet weaving and narrow ribbon. In both these cases, a yarn plyed from two strands of pink silk was used to stitch what appears to have been a recycled silk textile of a contrasting colour; the colours may, of course, have faded over time.

That loom-woven silks of this period are imports is beyond doubt and, as suggested above (see Tabby weaves of silk and Twill weaves of silk, above), some of the 11 fragments of woven silk from the High Street might have come from as far afield as Central Asia. They are, perhaps, more likely to have come from the Byzantine or the Islamic world, which at that time reached as far as Spain. The 2/2 lozenge twill (Cat No 233/A09–0122) is likely to have been woven in 13th-century Spain, whether in a Christian or Islamic workshop. The near-by site of Kirk Close also produced a patterned silk either from 13th-century Spain or Aragonese Languedoc (Muthesius 1987; see also above). Another possibility is that the tabbies were woven in Italy or France (Amt 1993, 194).

There are precedents for the discovery of such exotic material in Scotland. Fragments of textiles recovered from the probable grave of Robert I (d 1329) included the remains of silk presumed to have come from Northern Italy (Henshall et al 1956, 22–6). Entries for the same period in the Exchequer Rolls, that is, from 1326 on, indicate that those at Court, at least, had access to clothing and furnishing fabrics from the textile manufacturing centres of Europe and sometimes beyond. There is mention, for instance, of the purchase of large quantities of fabrics in Flanders and of silks and velvet bought in London (*ERS*, i, 119, 385), and in addition to the Parisian silk there are specific references to silk cloth of Antioch and Tripoli and coloured cloth

Table 2 *Direction of twist in woven silks.*

cat/accession no		warp	weft	phase	date of deposition
tabby					
4/A9976*		Z	loose Z	Ib	early 12th century
267/A09–0127*		loose Z	I	IVb	second half of 13th century
271/A09–0097		loose S	loose Z	IVb	second half of 13th century
323/A09–0059*		Z	I	IVc,IVcc	late 13th century
343/A09–0046		loose Z	I	Va	early 14th century
344/A09–0047a		loose Z	I	Va	early 14th century
346/A09–0044*		loose Z	I	Va	early 14th century
362/A6149*		Z	Z	Va,Vaa(VI)	early 14th century
twill (compound)					
6/A9500	main warp	loose Z	I	Ic,Icc	first half of 12th century
	binding warp	loose Z	I		
46/A7323	main warp	loose Z	I	Ie	slightly before 1150
	binding warp	loose Z	I		
342/A09–0088	main warp	Z	I	Va	early 14th century
	binding warp	Z	I		
twill (2/2 lozenge twill)					
233/A09–0122*		Z	I	IVaa,IVb	second half of 13th century
tablet–weave					
80/A11162b		loose Z x 2	†	IIc	mid to later 12th century
102/A12651		2S	†	IId	later 12th century
117/A9899		2S	†	IIb–IIff	second half of 12th century
217/A6694b		2S	†	<IIId–IVaa	mid 13th century or slightly earlier
234/A09–0124a		2S	I x 2	IVaa,IVb	second half of 13th century
235/A09–0124b		2S	†	IVaa,IVb	second half of 13th century
238/A09–0109		Z(?)	†	IVaa,IVb	second half of 13th century
271/A09–0097		2S	loose Z	IVb	second half of 13th century

Notes
Z yarn twisted in clockwise direction
S yarn twisted in anti–clockwise direction
I untwisted yarn
† disintegrated yarn
* denotes textile without a selvedge; warp and weft inferred

(of wool, it seems) of Tarsus (*ERS*, i, 150, 380). The significance of the fragments excavated from Perth, a few of which come from some of the earliest levels of the site (Period I: pre 1150), is the demonstration that these foreign luxury fabrics were being imported for at least two centuries before those recorded in the Exchequer Rolls, and that their use was not confined to a small circle at the Royal Court. The implication is that from the beginning the burgh of Perth had inhabitants of wealth and substance.

Some of the silks, loom-woven and otherwise, were heavily worn when buried; they may have been heirloom goods not discarded until some time after their manufacture. The cloth of aresta from Kirk Close may represent such an inherited item. Nonetheless, there is sufficient variation in date to indicate a continuing degree of prosperity for the inhabitants of the High Street site. Four of the loom-woven silks and a yarn identified as being probably of silk were recovered from the make-up of a path (P8.4). Since these four textiles are offcuts, they could be the product of an Islamic centre or of a Parisian or other European craft guild. Hence they may have been woven close to the date of deposition in the first decades of the 14th century. Whatever the exact date of manufacture of the High Street loom-woven silks, it is noteworthy that over a third of the silk samples recovered came from layers that dated from the period when Perth frequently served as a forward supply base for the English armies. The presence of the embroidered silk hair nets also confirms that there were those in early 14th-century Perth with access to the latest in European fashion. There is, of course, no means of knowing whether these head-dresses belonged to members of local families or came, say, from the households attached to the English garrison.

If the silk textiles are treated as a group consisting of tabby, twill and tablet weaves, it is possible to review the chronological changes in the throwing of yarns employed in such weaves in the light of comparable finds from Scottish sites and further afield. An examination of the literature on changes in the direction of throwing silk yarns indicates that the warp elements in silks of the 12th to 14th centuries are usually either Z thrown or untwisted. Following technological changes in Northern Italy, which took place from the end of the 13th century, fine S thrown warp yarns became gradually available (Crowfoot et al 1992, 124). The direction of twist in the Perth woven silks is presented in Table 2. Dating from the early 12th to the early 14th centuries, the tabbies and twills in the group do indeed have Z thrown yarn in the warp elements (or in system 1 where the warp is inferred). The one exception is the narrow tabby ribbon stitched to the tablet weave in Cat No 271/A09–0097.

Amongst the silk textiles found in Scottish graves (see Twill weaves of silk, above), this chronological distinction holds true; the late 13th- or early 14th-century compound tabby from the probable tomb of Robert I has Z thrown warp elements, while the more recent compound twill from the 16th-century bishop's tomb at Fortrose has a fine S thrown warp. The distinction holds firm for the 13th-century cloth of aresta from Kirk Close, with its Z thrown warp, while a 15th-century velvet from Fast Castle has an S thrown warp. An exception to the chronological trend is provided by the 13th-century (or possibly later) satin from Aberdeen (Bennett 1982, 199). This satin might be an early example of a silk made from yarns produced from the technological developments in throwing silk occurring originally in Northern Italy.

It has been noted, however, that the warp in narrow silk ribbons did not fit into this chronological pattern. Ribbons excavated from pre-12th-century layers at 16–22 Coppergate, York, have S thrown yarn in both warp and weft and, additionally, a reliquary pouch from the site has an inner lining with S thrown warp and untwisted weft (Walton 1989, 367–70). Therefore the seeming anomaly amongst the Perth tabbies in Cat No 271/A09–0097, in which the warp has a loose S twist angle, would be attributable to the lack of standardisation in throwing silk for weaving into ribbons. A late medieval silk ribbon of tabby weave, which was compounded by the addition of a set of supplementary metal-wrapped warp threads to form a narrow central stripe, from Dairsie, Fife, was woven with an S thrown warp and an untwisted weft (Dransart 2012). The ribbon in Cat No 271/A09–0097 differs from the Dairsie and Coppergate examples because it has a slightly Z twisted weft. Yet the tablet-woven sections to which this ribbon is sewn conform to the general chronological pattern for silk yardage from medieval contexts, since the warp elements consist of Z thrown strands plied with an S twist (note that in plied yarns, the ply direction is generally opposite to that of the original spin). The other tablet-woven bands and cords from the High Street also share these directions in the throwing
and plying of the yarns.

The evidence considered here demonstrates that silks found in Perth and other Scottish burghs were being traded as high status imports before surviving documentary sources record the consumption of silk in royal circles. Besides royalty, the clergy wore sometimes costly vestments and relics were often wrapped in silk. It may therefore be no coincidence that the Kirk Close cloth of aresta came from the vicinity of St John's Kirk. Many of the Perth silks acquire particular significance in that they present particular information about the use of a luxury fabric from a period predating the early 14th-century. The narrow tubular tablet-woven silk cords with a spiral weft from the High Street, for instance, predate similar examples excavated from sites in London. At Perth, they belong to the century between c1160 and c1260, while the earliest of the surviving London examples date from the first half of the 14th century. A structurally related tubular cord survives attached to a charter of King John (Balliol) to Nicholas de Hay, dated 1 August 1294 (Henshall 1964, 161). Since the charter was granted at Lindores, the

cord or the component silk yarns could well have been supplied from Perth. In addition six silk items described as 'cords' were detected among the finds excavated from 80–86 High Street, Perth, but the textile report in the final publication of that site offers no analysis of them, making it difficult to incorporate them into a comparative study (Harrison and Janaway 1997, 757).

Animal hair (including wool)

Compared with the finds of silk, the origins of the wool cloths which make up the bulk of the textiles from Perth are much more problematic. The source of the difficulty is that whereas there is sufficient evidence from the documents of the period to indicate the availability of varieties of imported as well as Scottish-made cloths, our actual knowledge of any of them is small and highly imperfect. Thus, although some of the groups of cloths have a distinctive appearance, and were presumably recognisable types, identified by name, it is difficult to connect them with fabrics mentioned in written sources. Also, there are obvious limitations (and dangers) to the possibility of relating material evidence from one site in one burgh to general references to textiles in documents not directly related to that site. There are a few pieces for which foreign manufacture is a reasonable assumption. The best candidate for being regarded as an import is Cat No 82/A12553b, a 2/2 twill which has characteristics unusual among the High Street finds; it has sufficient affinities with material from the Norse sphere to be identified as *vaðmál* imported from there. Other possible imports are Cat Nos 19/A12340b, a 2/1 twill coloured with a rare and expensive dye (see Dyes, above), 97/A09–0001, a 2/1 twill and, perhaps, 84/A12553d, a 2/2 twill. Cat No 35/A11567f, a tabby, may also be guessed to be a stranger. Yet it has to be admitted that no fibre analysis has been done on the yarns used in these proposed imports. Cat No 84/A12553d was probably woven on a vertical loom, and there is evidence for the continued use of this type of loom in medieval Scotland at Aberdeen and at Perth itself. Even *vaðmál* was produced until the 18th century in Orkney and Shetland. Hence the basis for recognising imports and identifying the provenance remain very insecure with our present state of knowledge. The suggestions put forward here, therefore, are at best highly tentative and in need of testing against future discoveries.

Foreign cloth of various kinds was undoubtedly used in medieval Scotland. For much of the period covered by the finds, mentions of specific fabrics are rare but, for the 14th century, the Exchequer Rolls provide repeated reference to two distinct types –striped cloth, *panni de radiato* or *panni radiati*, and coloured cloth, *panni coloris*. Interestingly, some of them are recorded as being supplied to the Royal Household via Perth (*ERS*, i, 65–6). Often the market is not mentioned, but one entry notes the purchase of 23 pieces of each type, together costing the substantial sum of £173 9s 2d, in Flanders in 1328 (*ERS*, i, 119). There is no further description of the cloth, but the purpose for which it was intended – to provide robes for the knights at the marriage celebrations of the future David II and his Queen Johanna – is suggestive of good quality; further, since highly-finished cloth was the fashion at this period, it was presumably fulled and napped. In other entries the colour of the *panni coloris* is specified, russet, green and red all being mentioned (*ERS*, i, 69, 117, 150), and, as its name suggests, it was clearly a dyed cloth. The red cloth is the cloth of Tarsus mentioned above, but there is no need to suppose that all *panni coloris* came from one place; it may well have been a general term for well-made dyed, fulled and napped cloth. If so, the vigorous cloth industries of Flanders, Artois and northern Italy are all possible 12th- and 13th-century sources, while England had developed its own reputation for luxury cloth making by the 15th century (see below). As has been shown by Professor Whiting (see Dyes, above), dyed cloths are poorly represented at Perth and only among one category group – the 2/1 Twills with nap, ZS – are there indications of a substantial proportion of pieces being dyed to a good standard. Perhaps significantly, this is also the group that contains the best of the fulled, napped and sheared cloths. If *panni coloris* is to be equated with any of the Perth finds it can only be with some of these. Less information still is available for the striped cloth mentioned in the Exchequer Rolls, but it is possible that the description refers to the weft-striped cloths, found in 13th- to 15th-century levels on a number of European sites, of which Cat No 283/A09–0077b may be one (see 2/1 Twill with nap, ZS above).

As indicated above, less than one third of the wool textiles in the High Street sample have the appearance of being fulled. Ellen Schjølberg examined the cover factor of the warp and weft in 2/2 and 2/1 twills excavated from a fire layer dated to 1170 at Bergen, Norway. The cover factor takes into account both the yarn count and the diameter of the yarn (Schjølberg 1998, 210). Among the 2/1 twills are a large number with apparently impossibly high cover factors. The fabrics, therefore must have been subjected to a shrinking process after removal from the loom. She suggested that a specialized setting process must have been used and that these textiles were imported, perhaps from eastern England (Schjølberg 1998, 212–13).

Dyed, fulled and sheared cloths were also being produced in Scotland as indicated by regulations dated to the 13th century or earlier, which limited the making of such to professional craftsmen in the towns (*Ancient Burgh Laws*, 11, 97–8). More specifically, the charter granted by William I (the Lion) to Perth early in the 13th century (probably 1209) implies that the manufacture of this dyed or sheared cloth, *pannus tinctus vel tonsus*, was of considerable importance to the burgesses (*RRS*, ii, no 467). Another prerogative of the Perth burgesses, within Perthshire, was the making of 'mixed' cloth, *pannus mixtus*, but it is not clear what is meant by this term. Perhaps it referred to cloth made

from naturally-coloured wools, or a combination of undyed and dyed wools? This uncertainty illustrates the problems of linking the information in the charter to the surviving material from Perth; because the document is essentially concerned with the promotion and protection of the industry, not the quality of the product, there are no technical details. This difficulty in applying documentary evidence to excavated materials is equally valid for cloth production in medieval Scotland as a whole, for which, unlike some other European countries (especially for the late medieval period), there is a dearth of regulations concerning the width of webs, the density of the threads, the quality and preparation of the yarn and so on, which would give a clearer picture of the goods being made.

Among the terms of the Perth charter granted by William I (ibid) is a clause allowing the burgesses of the burgh their own merchant guild 'save for the fullers and weavers' (*exceptis fullonibus et telariis*). It has been noted that in documents dating from the first half of the 13th century relating to the burgesses of Perth and their property, trade names listed include *furbar*, *taillur*, *tenteman* and *tinctor*, but exclude webster (weaver) and walker (fuller) (Duncan 1975, 489–90). Therefore Duncan concluded that websters and waulkers belonged to a different social and economic group than the tenteman and dyer, who might aspire to the status of burgess in the burgh. The high standing of the burgesses who were responsible for the dyeing industry has been attributed to the fact that dyers had to trade for expensive dyed stuffs and mordants from abroad, in addition to coping with the complexities of the craft itself (ibid, 490). They would have hired servants to undertake the actual work. Duncan (ibid, 490) found the names of two dyers in the charters relating to Perth which he examined. Hence there is a distinct possibility that red dyed textiles from the High Street, such as Cat No 19/A12340b, were finished locally and were not always imported from abroad, as suggested above.

Waulking, or the fulling of cloth, was extremely hard work until the introduction of mechanised waulkmills or fulling mills. In the Highlands, it was traditionally the women who pounded the wet cloth with their feet, singing waulking songs to assist them in the arduous task (Ross 1895, 20–26). A 17th-century engraving entitled 'The Prospect of ye Town of Dundee from ye East' by John Slezer shows women, with their skirts tucked up, in large wooden vats treading cloth (Cavers 1993, 55), but Slezer might have observed them beating or washing previously fulled cloth. As mentioned previously, the earliest known mill seems to have been set up by Coupar Angus Abbey, Perthshire in c1260 (see Finishing, above). Because of the considerable financial outlay involved in such a project, fulling mills were often funded by major land-owners, whether lay or monastic (Higham 1989, 49). In addition to the mills, potash pits and tenter banks were essential components. Potash was obtained from burned wood or bracken for use as soap in the fulling process. After the cloth was fulled, it was stretched on frames placed on tenter banks to dry. Such activities would have been conducted outwith the burgh, close to an appropriate water supply, such as the Lade at Perth or even further afield. A study of place names, historical records and the surviving remains in north-west England by Mary Higham (1989) has revealed evidence for the development of a cloth finishing industry by wealthy landowners probably during the 12th and 13th centuries. This aspect of cloth production has yet to be fully studied in Perthshire.

Despite the difficulties of interpreting the Perth charter granted by William I, since the fulled cloths from the High Street, including those which have been additionally finished by napping and shearing, are almost entirely confined to the 2/1 twills, it is a reasonable supposition that it is among examples of this weave that locally-made cloth is to be found. As has been noted above, some of the 2/1 twills with nap are of good quality, but equally, there are others of unimpressive or even poor appearance, this lack of quality being more marked among the fulled 2/1 twills without nap. It cannot necessarily be supposed that all the well-made pieces are imports and the inferior ones the local products, for despite the almost universal reputation of Scottish cloth at the end of the Middle Ages for coarseness and bad workmanship (for example *Halyburton's Ledger*, xl–xli) it is possible that cloth production in Scotland was in a healthier state in earlier years, that is, before the troubles of the 14th century.

The 2/1 twills from the High Street have much in common with contemporary fabrics woven in a 2/1 binding from other northern European sites, such as those from 10th- to 15th-century Novgorod (Thompson 1967, 96–7); late 10th- to 13th-century Poland (Kamínska and Nahlik 1960, 116); various sites in Holland (Vons-Comis 1982a, 162); 14th-century London (Crowfoot et al 1992, 31); and 12th- to 14th-century York (Walton 1989, 383). By far the largest category represented in the High Street assemblage is that of 2/1 twill without nap, ZS. It was noted above that fabrics in this category tend to have a firmer spun, more regular Z twisted element (identified as the warp) interwoven with a fuzzier, more woolly and looser S spun element (identified as the weft). This contrast in character between the yarns of the two systems imparts a certain quality to the cloth which may, to the modern observer, appear unfavourable when compared with earlier European textiles. Some cloths dating from the ninth to eleventh centuries found, for example at Birka, Sweden (Geijer 1938, 22–9), and York (Hedges 1982, 102–4) belong to the same category, but they have an even, tightly twisted combed warp and a combed weft. They are closely woven, with a high thread count and are often diamond twills. There is evidence for this tradition in Scotland, but from a later date, from Coldingham Priory, Berwickshire, and from the High Street itself (see above). Yet textile Cat No 97/A09–0001 also displays frequent weaving errors, probably due to problems occurring in the lifting of the heddles. This cloth represents a paradox apart from its 'foreign'

appearance. It has a high thread count, which one would associate with a quality product, but faults, possibly caused by broken heddles, mar the appearance in a textile woven from evenly spun worsted yarn. One might expect to find errors associated with a weave executed in a low thread count, as in a third- to fourth-century AD diamond twill textile with a mistake in the knitting of the heddles and an error in the lifting of the shafts from Thorsberg, Germany, discussed by Möller-Wiering (2011, 62–3).

If the general run of fulled cloth from the High Street is typical of the artisanal fabrics produced in the burgh at the time, the mixed quality suggests that attempts to foster the industry had been partially successful. The reasons can only be guessed at; one might venture to suggest that if weavers were held in such low esteem then much of their handiwork may have been produced quickly, with little attention to detail. It may be that there had been a failure to develop the appropriate technology, although with so few indications concerning the introduction to Scotland of the equipment associated with the growth of professional cloth production in Europe – that is, the spinning wheel, cards, the horizontal loom and the fulling mill (see Spinning, Selvedges, Finishing, above) – this surmise is hard to determine. What is clear from the High Street textiles is that some cloths with a heavily napped surface are present from the 12th century onward, that is before evidence for the introduction of the new technologies. The same argument applies to the felt, present in low frequencies in all but Period I (pre-1150). Less clear is whether the textiles recovered from the excavation were made by specialist artisan weavers (usually presumed to be male) or whether domestic production took place in rural communities, in which case craftswomen may well have been active (Duncan 1975, 471).

In contrast with the excavations at Novgorod, where six working parts of horizontal looms were identified by Kolchin among the wood remains, but no firm evidence for the vertical loom was detected (Thompson 1968, 146), the High Street has yielded evidence for the warp-weighted loom, but not one part of a horizontal loom has been detected. If weavers did not have their own guild in the 13th century, then women may well have contributed to the production of cloth within the burgh, if it is acceptable to equate the vertical loom with women weavers, as is usually assumed (Hoffman 1964, 258–65).

Another factor may have been a shortage of raw material. Scotland, of course, was a wool-producing country, but much of the product was exported; throughout the Middle Ages wool was responsible for three quarters of the country's export earnings, reaching a peak in the 13th century (A Stevenson pers comm). Perhaps, therefore, despite attempts to protect local sources by controlling the sale of wool – as in William I's charter – the best of it continued to feed the looms of Europe, and those of Flanders in particular. If so, insufficient wool of the appropriate quality, notably the prime white wool, may have been available for the home industry. Whatever the accuracy of this suggestion, there is nothing among the Perth finds to contradict the view that at this period Scotland was essentially an exporter of raw wool. The presence of considerable numbers of what are believed to be bale pins from the High Street site probably provides additional evidence for the trade of wool (see Textile tools, below). Wooden bale pins have been used until recently in the West Riding of Yorkshire to fasten bales of wool in a covering of sacking for transport (Morris 2000, 2329).

The implication of the regulations outlined above is that cloth woven in Scottish burghs was a product of relatively small craft industries while that produced in rural areas would have been mainly undyed and subject to little or no finishing. It would have been made on a domestic basis, the yarn both prepared and woven up in the household. An alternative is that, as in later centuries, the yarn was taken to a customary weaver – although it is not known how far specialist or semi-specialist weavers were available outside the burghs at this period. Again, with so few indications concerning this mode of production, the cloth cannot be identified with certainty among the material from Perth. It is a reasonable supposition that country or domestic cloths are represented among the predominant twill weaves, the larger number of which appear to have been left in the natural colour of the wool and bear either scant signs of finishing or none at all. A tentative suggestion may be made that 2/2 Twills without nap, ZZ were produced outwith the burgh since they maintain a constant presence in all periods represented by the High Street finds. This is not true of other categories of textiles and fabrics, which are either greatly reduced or absent in Period III (the first half of the 13th century). This pattern of decline occurs generally in the archaeological material recovered from the High Street; it has been attributed variously to a disastrous fire in Phase IIff and the notable flood of 1209 (see Fascicule 1, The excavation, 52; 119–20).

Later the twills were to become the coarse twills – plaidings, fingrums and the like – which were exported from eastern Scotland in such quantity in the 17th century (Gulvin 1973, 19–21). But it must be noted that far from being homogeneous, the 2/2 and 2/1 twills without nap include cloths of varying types and widely differing quality, and there is no means of knowing how large a proportion were locally, or even Scottish made.

For another main group of fragments from the High Street – the 53 coarse tabby fabrics made from 2 ply yarn concentrated particularly in the 12th century – local manufacture may be suggested with more confidence, unless of course this category of textile served as packaging. In view of the state of development of the native sheep especially in Periods I and II (see The wool and hair, below), it must be supposed that there was a considerable quantity of coarse, hairy wool available, not suitable for the

production of normal cloth, which could have been utilised in this way. Further, it is difficult to imagine that it would have been economic to transport such a low-quality product over any distance.

Yet the presence of fine-generalised medium, medium and semi-fine fleece types should be noted in the sample of analysed fleeces at the High Street. From 15th-century Fast Castle, Berwickshire, semi-fine fleece was found to occur in a higher than expected proportion (25% of analysed samples) in both textiles and raw wool (Ryder and Gabra-Sanders 1992, 15–17; Gabra-Sanders and Ryder 2001, 131–5). This fleece has been understood to represent the 'white, fine and excellent wool' described by Hector Boece in the early 16th century, later known as the Old Scottish Short-woolled Sheep (Ryder and Gabra-Sanders 1992, 17; Gabra-Sanders and Ryder 2001, 135). This early occurrence was followed by the later appearance of similar types in England (ibid). It has been pointed out that during medieval times, generalised medium fleece would have been regarded as fine (ibid). In the examples analysed from the High Street, the fine-generalised medium, medium and semi-fine types tend to occur in Periods IV and V (1250–1350>). Given that a far higher number of samples were tested from Period II (the second half of the twelfth century) than any other period, and only two from Period I (the first half of the twelfth century), it is unsafe to draw firm conclusions. However, it may be implied that there was an improvement in fleece types through time at Perth. Further research on the Perth material would probably produce more evidence concerning the development of fleece types in the area.

Bast fibres

For the reasons explained (see Fibres above), the absence from the site of the third major textile material available during the period under discussion – namely linen – is not remarkable; the presence of empty needle holes in both the cloths and the leatherwork, and the finding of glass linen-smoothers (see Fascicule 4, The glass, 119), provide useful confirmation that linen and related vegetable fibres, such as hemp, were used but have not survived. A 12th-century manuscript illumination (Illus 3), albeit probably of northern English provenance, shows Eve spinning a bast fibre from a distaff that she holds between her knees; the manner in which the distaff is dressed is characteristic of prepared flax.

The extent of the use of vegetable fibre is another matter. Flax (*Linum usitatissimum* L.) was undoubtedly available in a number of forms. There is mention in the customs lists of both linen thread and thread to make nets (*Ancient Burgh Laws*, 105–06). The Exchequer Rolls for the 14th century record the importation of four different grades of yardage: canvas, linen cloth, napery and towelling (eg *ERS*, i, 119). For the Scottish production of linen, though, little evidence is available. Linen occurs in Viking graves in Scandinavia and Scotland; for instance, two fragments of tabby contained in oval brooches accompanying the burial of a woman at Kneep, Lewis, are probably linen (Bender Jørgensen 1987, 166). During excavations south of Bernard Street, Leith, a decayed piece of linen in a tabby weave was found at the top of a pot containing a coin hoard, which was deposited 1470–5 (Bennett and Habib 1985, 423). Despite the conditions of preservation which permitted the survival of almost complete woollen garments on some Norse farm sites in Greenland, linen has only been recovered in a fragile state, usually when carbonisation occurred. Just one fragment of a narrow braid stitched to *vaðmál* survived in an uncarbonised condition on the site of a farm at Hvalsey Church (Østergård 2009, 78). At the High Street, such accidental burning leading to the survival of linen was not reported.

In the case of the Greenland sites, it is possible that linen was an import rather than being produced locally. In order to explore whether or not bast fibres were being grown in Perth, it is necessary to look for indirect types of evidence. Excavations at Pool on the Isle of Sanday, Orkney, indicate that flax was grown there in Norse times, although the earliest occurring *Linum* plant remains in Scotland date back to the Bronze Age and Neolithic (Bond and Hunter 1987, 175). The plant may be used to produce both linseed oil from the seeds, and flax fibres, for spinning into linen yarn, from the stems (ibid, 175–6). It is preferable, however, to harvest the stems before the seeds are mature if they are to be processed into yarn (Barber 1992, 12), an activity which would have the effect of reducing the number of seeds in archaeological deposits.

In medieval Aberdeen, flax remains including seeds were recovered from Queen Street (Fraser and Dickson 1982, 241–2) and 45–75 Upperkirkgate (Kenward and Hall 2001, 287). Fragments of textiles which may be of linen have occasionally been excavated from 13th- and 14th-century contexts in the north of England. A partially mineralised tabby from 33–35 Eastgate, Beverley, was identified as being of vegetable bast fibre (either flax or hemp) by Walton (1992b, 610). Further examples, possibly of vegetable fibre, are known from 16–22 Coppergate, York, where a tabby was more positively identified as flax (Walton 1989, 441 Cat No 1445). The difficulty in identifying the species in processed plant fibres is paralleled by the documentary use of the term 'linen' in English, which can refer to fabric types, such as bed linen, made from plant fibres or to fabric made specifically from flax (Cruikshank 2011, 240).

One of the midden layers on the 45–75 Upper-kirkgate site also yielded one piece from a hemp plant (a *Cannabis* achene) but, as Kenward and Hall (2001, 287) commented, although hemp was useful as a fibre for spinning and a source of oil-seed, it is difficult to envisage how it might have been used on the basis of one fragment. Flax and hemp flourish under different geographical and climatic regimes, the former requiring

more moisture and displaying a greater sensitivity to weather conditions than the more varied conditions under which hemp can be grown (Eckhel 1988, 59). Remains of both hemp and flax were recovered from layers dated to the 12th to 14th century at Park Street, Birmingham; of interest is that hemp was detected in deposits filling a ditch (Ciaraldi 2009, 246–9). Large amounts of stems provisionally identified as hemp were found lying horizontally in an organic layer in another section of moat at The Row, Digbeth where slowly flowing water would have been suitable for the retting of bast fibres (ibid, 256–7). Retting is a means of partially rotting the stems to break down the woody parts and separate the fibre.

The common stinging nettle (*Urtica dioica* L.) is another useful source of vegetable fibre, and its abundant presence is attested among the High Street plant remains (see Fascicule 4, The botanical remains, 72). Unfortunately, there is no indication whether its economic potential was exploited in medieval Perth. In order to extract the fibre, it may be processed in a similar fashion to flax. However, ethnographic accounts demonstrate that fibres may be obtained from nettle stems by beating, scraping and rubbing without the need for retting (Hald 1980, 125–6). Since nettle fibre is thought to be even more perishable than flax (ibid, 126), the chances of identifying it in archaeological deposits are extremely rare. A carbonised sample of a textile woven in a 2/2 chevron twill from a 10th-century deposit at 16–22 Coppergate, York (Walton 1989, 312 Catalogue No 1334) was found to differ from other vegetable fibres and was thought to be nettle.

Given the comparative material discussed above, the discovery at the High Street site of flax seeds in ten different contexts (see Fascicule 4, The botanical remains, 69) and what had probably been a flax-breaking mallet (see Fascicule 2, Wood Cat No 8/A11104) suggests some local processing of flax or other bast fibres. Four linen smoothers found in deposits laid down during the second half of the 13th century provide evidence that linen was used if not produced (see Fascicule 4, The glass, 119; see also below). That some of the shoes were sewn with wool or hair (see The Leather, this fascicule), neither of which is well suited to the purpose, may point to periodic shortages of linen. Such a shortage would not be altogether surprising given the military history of Perth in the late 13th and 14th centuries.

The preparation of flax involves the extraction of the stem fibres in the process of retting, after which the stems are beaten with a wooden tool such as the High Street mallet, which dates from the second quarter of the 12th century, or a tool known as a flax break, which is thought to have come into use during the 14th century (Leadbeater 1976, 14). Retting may be done with different sources of water – under dew, in stagnant water or in running water (Leadbeater 1976, 59). Dew-retted fibres produce grey or darker brown fibres, while retting in stagnant or running water gives a honey-cream colour (Leadbeater 1976, 61). Hence the latter methods may have been preferred if the linen was later to be bleached white. The development of a linen industry would have required the construction of ponds from which the water could periodically be discharged if retting was to be done in stagnant conditions, or crates constructed and filled with the flax stems and left in the river for ten to twenty days, if running water was to be used (ibid, 59). Alternatively the flax might simply have been spread out in a suitable position under trees (which retain morning dew) for six to eight weeks (ibid, 61).These activities would have been easily disrupted by the attacks to which Perth was subject during the Wars of Independence. Photographs of peasant families processing flax in the former Yugoslavia may be seen in Radauš Ribarić and Rihtman Aguštin (1988, 74–5); they present a vivid impression of the extent of the land and water necessary to process in quantity flax fibres from harvested stems.

Hence the coarse tabby fabrics in the Perth textile assemblage might have been regarded as alternatives to lower grades of vegetable fabrics, whether because wool was cheaper or linen not so readily available. In either case, it seems likely that the large scale production and bleaching of linen in Perth lay in the future. The post-medieval development of the textile industry in the burgh is briefly discussed in Fascicule 1, 23.