

The wool and hair

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Introduction

In seeking evidence of the type of sheep kept in Britain during the Middle Ages it is necessary to go back to prehistoric times when the main breed of sheep seems to have been the small brown Soay sheep that now survives in a feral state on St Kilda off north-west Scotland. Evidence for this comes from the similarity of Neolithic bone remains with those of the Soay, and the similarity of wool in Bronze Age cloth with the fleece of the Soay (Ryder 1968).

The primitive features shared by the Soay with the wild ancestor are a short tail (all modern breeds have a long tail); a coloured fleece in which the belly is white (most modern breeds are completely white); and an annual moult (the wool of virtually all modern breeds grows continuously). To these major and obvious differences between wild sheep and modern domestic breeds can be added the change from a hairy coat to a woolly fleece; the wool of the Soay is already much less hairy than the coat of the wild sheep, but there are hairy and woolly types.

Colour changed next with the appearance of white sheep in the Iron Age, but there was in fact a range of colour: black, white, and grey, in addition to the brown of the Soay (Ryder 1987).

This vari-coloured sheep still had hairy as well as woolly fleece types and a spring moult. It appears to have been common until after the Middle Ages, and widespread throughout Europe, since small pockets of relic breeds survive in isolated areas (Ryder 1983a). Many of the surviving breeds have a short tail, but only the rams are horned: the skeleton is, however, otherwise similar to the Soay (see below). But the wild-pattern white belly has gone (or at least is

extremely rare), and so this marks the Soay as truly unique among domestic sheep. Grey animals are, however, a notable feature and the type could be described as 'European grey or vari-coloured'.

The surviving breeds of this type in Britain are the Orkney and Shetland. During the 19th century these two breeds formed a single population, but the Shetland has since been selectively bred for white woolly fleeces, and so only the Orkney retains the full range of colour and fleece type (Ryder 1968). The tendency to shed meant that in the past the wool had to be obtained by plucking (Ryder 1992), but this has mostly been bred out today, so that most sheep are shorn.

Roman textiles from Britain and the Continent show that more changes in fibre diameter were taking place at that time. The predominant wool type during the Roman period, in addition to being white, is fine to the naked eye, but microscopic examination reveals that the wool contains medium fibres, and so is of generalised medium type. Hairy medium wools were still common, however, and these predominated at Vindolanda on Hadrian's Wall for instance (Ryder 1983a). A comparison of Roman and Saxon wools is shown in Table 3.

Ryder (1968) summarised previous textile remains from Scotland and Viking wools from the north were on the whole more hairy than either the Roman or medieval examples examined up to that date. Twelve of 14 Viking yarns were hairy medium, one was generalised medium, and one true medium. The six medieval yarns comprised one hairy medium, four generalised medium, and one fine type. All the Viking and medieval wools had natural pigmentation.

Table 3 *Comparison of Roman and Saxon wools.*

	Vindolanda (Roman)		all other Roman (including Europe)		Saxon (England only)	
H		(1)		–		–
HM	34%	(19)	14%	(12)	23%	(10)
GM	34%	(19)	15%	(13)	23%	(10)
FGM	18%	(10)	39%	(34)	30%	(13)
M	2%	(1)	3.5%	(3)	5%	(2)
S	4%	(2)	1.5%	(1)		–
F	9%	(5)	27%	(23)	19%	(8)

H = hairy

HM = hairy medium

GM = generalised medium

FGM = fine, generalised medium

M = true medium

S = short

F = fine

Table 4 Wool fibre diameter measurements and incidence of hairy pigmented fibres.

fleece type		n	overall diameter	modal diameter		mean diameter		medium hairy fibres		pigmented fibres	
			range	range	mean	range	overall mean	range	mean	range	mean
H	Perth	17	12–124	20–30	24.5	33.4–46.8	39.8	1–57%	22%	0–100%	35%
	Aberdeen	2	12–128	54&66	60.0	52.6&54.9	53.8	19&31%	25%	7&13%	10%
HM	Perth	39	12–100	20–40	26.3	26.4–43.3	34.5	0–51%	17%	0–100%	57%
	Aberdeen	3	14–90	24–30	26.6	26.8–32.8	29.6	5–9%	7%	2–10%	5%
GM	Perth	16	10–60	20–31	24.9	24.4–33.3	29.5	0–10%	4%	1–100%	25%
	Aberdeen	7	10–58	20–24	22.6	21.6–30.8	26.7	0–11%	3%	0–21%	6%
FGM	Perth	6	12–52	23–24	23.8	24.2–28.8	26.7	2–20%	4%	0–100%	7%
	Aberdeen	1	12–56	–	16	–	23.6–9.6	–	–	–	8%
M	Perth	7	10–66	26–40	32.3	31.0–38.6	33.7	0–65%	15%	0–100%	14%
	Aberdeen	2	14–60	30&32	31.0	28.2&32.5	30.4	1&4%	2.5%	0&4%	2%
S	Perth	4	10–50	24–30	27.0	26.0–28.9	27.6	0–46%	22%	0	0
	Aberdeen	–	–	–	–	–	–	–	–	–	–
F	Perth	–	–	–	–	–	–	–	–	–	–
	Aberdeen	1	12–36	–	18	–	21.0–4.3	–	0	–	0

Measurements expressed in microns, that is, thousandths of a mm

H = hairy

HM = hairy medium

GM = generalised medium

FGM = fine, generalised medium

M = true medium

S = short

F = fine

Material and methods

From the vast amount of cloth and hair found, a range of apparently different hair and unspun fibre finds was selected for identification only but 93 yarns were chosen from the cloth to give a random sample of the wools for microscopic examination and measurement. Samples from Aberdeen, supplied by Dr Helen Bennett, were included for comparison. Diameter measurements were made of 100 (or close to 100) fibres from each wool sample using a projection microscope. The definition of fleece type and the criteria on which they are determined from the diameter distribution are detailed by Ryder (1983a).

Findings

Hair and unspun fibres

Hair from the following species was identified: horse (A6698), pig (A9140), ox (A6700, A9526), goat (A6629, A6690, A6776, A7342), plus two cloths woven of goat hair (Cat Nos 63/A9993a, 64/A9993b). There were also four unspun sheep's wool samples (A7065, A8082, Cat No 369/A8911, A10483) the measurements of which are included with the yarn measurements summarised

below. Two cloths (Cat Nos 4/A9976, 362/A6149) were made of silk. Some apparent hair finds turned out to be plant material.

Further details

Horse (A6698)

Mostly coarse non-medullated hair with heavy pigmentation. Could be from the tail.

Pig (A9140)

Hairs have characteristic fraying tip of the pig.

Ox (A6700)

Pointed staple seen with naked eye suggested hairy sheep.

Ox (A9526)

Straightness under microscope indicates cow. One was 40mm and the other 80mm long. The diameter distributions were typical of cattle hair.

The goat samples were measured to assist identification; two were 60mm long, one 70mm and one 90mm. These compared with a mean winter length of 148mm in some

Table 5 Summary of fleece types in British medieval wools.

		H		HM		GM		FGM		M		S		F	
Winchester	11th century	14%	(1)	57%	(4)	29%	(2)	–		–		–		–	
London, Baynard's Castle	1200	–		25%	(2)	63%	(5)	–		–		–		12%	(1)
York	12th–13th centuries	27%	(3)	37%	(4)	27%	(3)	–		9%	(1)	–		–	
Southampton	13th–14th centuries	–		11%	(2)	58%	(11)	–		5%	(1)	5%	(1)	21%	(4)
London, Baynard's Castle	14th century	13%	(3)	8%	(2)	8%	(2)	38%	(9)	4%	(1)	13%	(3)	16%	(4)
London, Baynard's Castle	15th century	7.5%	(2)	11%	(3)	15%	(4)	18%	(5)	11%	(3)	30%	(8)	7.5%	(2)
Yorkshire	15th century	–		33%	(2)	(66%)	(4)	–		–		–		–	
Perth	12th–14th centuries	19%	(17)	44%	(39)	18%	(16)	6%	(5)	8%	(7)	5%	(4)	–	
Aberdeen	13th–14th centuries	12.5%	(2)	19%	(3)	44%	(7)	6%	(1)	12.5%	(2)	–		6%	(1)
average		10%		27%		36%		8%		6%		6%		7%	

H = hairy

HM = hairy medium

GM = generalised medium

FGM = fine, generalised medium

M = true medium

S = short

F = fine

Scottish feral goats, which are likely to represent past domestic animals (Ryder 1970). Of the five diameter distributions determined (including the hair in the four yarns), two had the mean diameter, modal value and skewed distribution typical of the winter coat, and three had the symmetrical distribution found in the summer coat by Ryder (1970).

Wool

Only 30% of the Perth wools analysed lacked natural pigmentation, but as few as 14% showed evidence of dye (mostly red and yellow, with occasional blue and green) under the microscope, and these included some wools with a few naturally pigmented fibres, which indicates grey or roan wool. Eleven of the 16 Aberdeen yarns had slight natural pigmentation (up to 20% fibres with pigment). It was common for only the coarser fibres to be pigmented, as in grey wool.

The four unspun wool staples comprised three hairy fleece types, two 40mm long and the other 60mm, and one hairy medium wool which was 25mm long.

A summary of the fibre diameter measurements of all the wools is shown in Table 4, along with those of the Aberdeen samples for comparison. The hairy medium-generalised medium type predominates, few of the modern short and medium types emerged.

But there is a high proportion of true hairy and hairy medium wools, compared with for instance the Aberdeen examples, among which the generalised medium fleece predominated. Comparison with other sites is made in Table 5 and covered in the discussion below.

Table 6 gives a classification of fleece types by yarn and catalogue number, and also indicates the extent of pigmentation and the presence of dye. A high proportion of cloths have the same fleece type in each yarn and, indeed may in fact be from the same wool. Because of the difficulty of determining which is the warp and which the weft, the yarns have been designated 1 and 2, but the presumed warp is always designated 1. Where a different wool was used, that in the warp is usually coarser.

Discussion

No attempt was made to study the breed type of any material other than the wool from sheep. More detailed investigation and measurement should, however, yield much more information than the simple identification listed here.

The wool finds form an extremely interesting and valuable collection in being not only the largest group

Table 6 *Tabulation of fleece type and pigment by yarn.*

Cat/accession	phase	weave	system	H	HM	GM	FGM	M	S	pigment	dye
South Sector											
29/A7439	Id,Ie	tabby	(1)	+	—	—	—	—	—	+++	—
			(2)	—	+	—	—	—	—	+++	—
92/A10193b	IId	2/2 twill	(1)	—	—	—	—	+	—	—	+
			(2)	—	—	—	+	—	—	—	+
93/A10193c	IId	2/1 twill	(1)	—	+	—	—	—	—	++	—
			(2)	—	—	—	—	+	—	+	—
98/A10332	IId	2/1 twill	(1)	+	—	—	—	—	—	+++	—
			(2)	—	+	—	—	—	—	+++	—
99/A10787	IId	2/1 twill	(1)	—	+	—	—	—	—	++	—
			(2)	—	+	—	—	—	—	++	—
107/A10784	IId,IIf	tabby	(1)	+	—	—	—	—	—	++	—
			(2)	+	—	—	—	—	—	++	—
108/A6125	IId–IIf	2/1 twill	(1)	—	+	—	—	—	—	+	—
			(2)	—	+	—	—	—	—	+	—
113/A8863a	IIa–IIff	2/1 twill	(1)	—	+	—	—	—	—	+	—
			(2)	—	—	+	—	—	—	+	—
115/A8871	IIa–IIff	2/1 twill	(1)	—	+	—	—	—	—	+	—
			(2)	+	—	—	—	—	—	++	—
116/A6716	IIa–IIff	2/1 twill	(1)	—	+	—	—	—	—	+	—
			(2)	—	+	—	—	—	—	+	—
125/A9478a	IIe–IIg	2/1 twill	(1)	—	—	—	—	+	—	—	—
			(2)	—	—	+	—	—	—	—	—
128/A9481	IIe–IIg	2/1 twill	(1)	+	—	—	—	—	—	—	—
131/A9126	<IIg(IIh)	felt	—	+	—	—	—	—	—	+	—
139/A9506	<IIg(IIh)	2/1 twill	(1)	—	—	—	—	+	—	+++	—
			(2)	—	—	+	—	—	—	+++	—
143/A9536c	<IIg(IIh)	2/1 twill	(1)	—	+	—	—	—	—	+	—
			(2)	—	+	—	—	—	—	+	—
153/A11266	<IIg(IIh)	tabby	(1)	—	+	—	—	—	—	+++	—
			(2)	—	+	—	—	—	—	+++	—
158/A8432	IIIi	2/1 twill	(1)	—	—	+	—	—	—	—	—
			(2)	—	—	+	—	—	—	—	—
164/A9108	IIIi	2/1 twill	(1)	—	—	+	—	—	—	—	—
			(2)	—	—	+	—	—	—	—	—
166/A9974	IIIi	braid	(1)	+	—	—	—	—	—	+++	—
			(2)	+	—	—	—	—	—	+	—
167/A9056	IIIi	2/2 twill	(1)	—	+	—	—	—	—	+++	—
			(2)	—	+	—	—	—	—	+++	—
168/A9057a	IIIi	2/1 twill	(1)	+	—	—	—	—	—	++	—
			(2)	—	+	—	—	—	—	+++	—
181/A8085	IIIa–IIIc	2/2 twill	(1)	—	+	—	—	—	—	+++	—
			(2)	—	+	—	—	—	—	+++	—
199/A9766a	<IIIc–IVa	2/1 twill	(1)	—	+	—	—	—	—	+++	—
			(2)	—	—	+	—	—	—	—	—
211/A9903a	IVa	2/1 twill	(1)	—	+	—	—	—	—	+	—
			(2)	—	—	+	—	—	—	—	—
212/A9903b	IVa	2/1 twill	(1)	—	—	+	—	—	—	—	—
			(2)	—	—	+	—	—	—	—	—
213/A9905	IVa	2/1 twill	(1)	+	—	—	—	—	—	—	+
			(2)	—	+	—	—	—	—	—	+
221/A6126	IVa,IVaa	tabby	(1)	+	—	—	—	—	—	++	—
			(2)	—	+	—	—	—	—	+++	—
228/A6124a	IVb	2/1 twill	(1)	—	—	—	—	+	—	—	—
			(2)	—	—	—	—	—	—	—	—

Table 6 (*continued*)

Cat/accession	phase	weave	system	H	HM	GM	FGM	M	S	pigment	dye
231/A9906	IVb	2/1 twill	(1)	–	–	–	–	+	–	–	–
			(2)	–	–	+	–	–	–	–	
297/A8101	IVb,IVc	2/1 twill	(1)	–	–	–	–	+	–	+	+
			(2)	–	–	–	–	–	+	–	+
299/A9904	IVb,IVc	tabby	(1)	–	+	–	–	–	–	+	–
			(2)	+	–	–	–	–	–	+	–
302/A8097b	IVb,IVc	2/1 twill	(1)	–	–	–	–	+	–	–	+
			(2)	–	–	–	+	–	–	–	+
348/A6710a	IVcc,Va	2/1 twill	(1)	–	+	–	–	–	–	+++	–
			(2)	–	–	+	–	–	–	+++	–
349/A6710b	IVcc,Va	2/1 twill	(1)	–	–	–	–	–	+	+	+
			(2)	–	+	–	–	–	–	+	+
361/A6148	Va,Vaa(VI)	2/2 twill	(1)	–	+	–	–	–	–	+++	–
			(2)	–	+	–	–	–	–	+++	–
364/A6626	Va,Vaa(VI)	2/1 twill	(1)	–	–	–	+	–	–	+++	–
			(2)	–	+	–	–	–	–	+++	–
368/A8861	Va,Vaa(VI)	2/1 twill	(1)	–	–	+	–	–	–	+++	–
			(2)	–	+	–	–	–	–	+++	–
371/A6146	Va,Vaa	2/1 twill	(1)	–	–	–	+	–	–	–	–
			(2)	–	–	–	+	–	–	–	–
397/A6709	Vaa–Vc(VI)	2/1 twill	(1)	–	+	–	–	–	–	–	–
			(2)	–	–	–	+	–	–	–	–
398/A8869	Vb–Vc	tabby	(1)	–	+	–	–	–	–	+++	–
			(2)	–	+	–	–	–	–	+++	–
404/A1268	u/s	2/1 twill	(1)	–	+	–	–	–	–	+	–
			(2)	–	+	–	–	–	–	+	–
North Sector											
410/A7336	(1)2	tabby	(1)	–	+	–	–	–	–	+++	–
			(2)	–	+	–	–	–	–	+++	–

H = hairy

HM = hairy medium

GM = generalised medium

FGM = fine, generalised medium

M = true medium

S = short

of medieval wools found in the British Isles, but second only to the Vindolanda Roman collection in size. Such large samples enable a meaningful assessment of the proportion of different fleece types among the sheep to be made for the first time.

The high proportion of coloured wools from Perth and Aberdeen indicate the persistence of sheep with natural pigment into the Middle Ages, survivors of which persist today in the Orkney/Shetland type.

Staple lengths of 40mm and 60mm are the same as reported by Ryder (1983a) in samples from London (Baynard's Castle) and Winchester respectively. The fourth staple, which was only 25mm long, may not represent a full year's growth. Among the survivors of the hairy medium-generalised medium type, even the finer varieties have a fleece longer than 60mm, but in the hairy variety it is commonly over twice this length.

Table 5, which compares the Perth and Aberdeen wools with other British medieval examples, indicates that the range of fleece types in Scotland is typical. On the other hand, the relatively small sample size of all but the Perth collection means that some of the other findings may not give a true representation. The occurrence of true fine wools (notably one from Aberdeen) does not necessarily indicate import from the continent since a fine diameter distribution can be found in such breeds as the primitive Orkney.

Fragment counts of the mammal bones from this excavation (see Fascicule 4, The mammal bone, Table 15) indicate 63.5% from cattle, 22.2% sheep/goat, 4.9% goat, 8.3% pig, and 1% from horse. The high proportion of cattle, sheep and goat horn cores suggests a horner's shop, while the leather together with much hair and some raw wool suggests skin working.

Table 7 *Hair identification.*

Accession	context	species	area	rig	feature	phase
South Sector						
A7342	C3625	goat	2	VI	M14b(b), Pit 3625	Ie
A7065	C3601	sheep	2	V	M14b(c)	Ie–If
63/A9993a	C2386	goat	4	VI	B16 (Phase 2), Destruction	If,IIa
64/A9993b	C2386	goat	4	VI	B16 (Phase 2), Destruction	If,IIa
A6776	C3589	goat	2	VI	MC061	IIb
A6629	C3577	goat	2	V	B5, North Room–Floor/Occupation (2)	IIa–IIff
A9526	C2611	ox	3	VI	M1.2, Pit 2648	<IIg,IIh
A9140	C2267	pig	4	VI	B13, Occupation (1ba)	IIh
A10483	C2462C	sheep	3	VI	M1.3	IIi
A8082	C2516	sheep	3	VI	B2, Floor (2a)	IVa,IVaa
A6698	C2508	horse	3	V	P2.3a	IVaa
A6700	C2480	ox	3	V	MC155	IVb,IVc
369/A8911	C2404	sheep	3	V, VI	M1.5a	Va,Vb(VI)
A6690	C2048	goat	2	-	Unstratified	u/s

Sheep bones predominated in medieval excavations in High Street, Edinburgh (Chaplin and Barnettson 1976, 232–8). The lowest levels of 15th-century deposits had horned sheep skulls of both sexes, while higher levels had hornless skulls from which Armitage (1976, 239) suggested that there were two distinct varieties. Since all the Scottish breeds not of recent origin are either

horned in both sexes, or horned in the ram only, it is not clear what these varieties might be. Another possibility is that they represent a single type in which some of the ewes are horned and others polled, the Soay in fact being a breed in which not all the ewes have horns.