

# Pre-industrial Wool and Weaving

## Introduction

By the time that Thomas Whitty started to make carpets in Axminster in 1755, Devon had been a leading centre for sheep farming, wool production and cloth making for over 200 years, based on roots which go back at least 400 years before that.

This document deals with:

- an overview of early sheep farming, with particular reference to Devon;
- natural wool colours;
- an overview of wool and cloth production in Devon prior to the 1830s;
- types of cloth produced in Devon; and
- the process of turning a sheep's fleece into woven cloth in the pre-industrial era.

In this context the pre-industrial era means the period before the 18<sup>th</sup> / 19<sup>th</sup> centuries, when textile production was characterised by widespread small-scale craft spinning and weaving, as opposed to the large-scale capital-intensive industry that developed primarily in Yorkshire in the 19<sup>th</sup> century. There was a period of 50 years or more when the two systems operated in parallel, but the direction of change was clear, and from the late 18<sup>th</sup> century onwards Devon's textile industry was in clear decline.

In the specific case of Axminster the weaving of hand-knotted carpets provided some relief from this decline. Nevertheless, the process which was employed (basically intensive hand labour relying on children and young women) was a craft process rather than an industrial one, and when the carpet factory closed in 1835 that marked the end of commercial weaving in Axminster for 100 years.

It was not, however, the end of the textile industry in 19<sup>th</sup> century East Devon: the Coldharbour wool spinning mill at Uffculme, which operated on an industrial rather than a craft scale, opened for business at the very end of the 18<sup>th</sup> century, and for a long time continued to supply yarn to weaving factories in Somerset. It is now a working museum.

## Early sheep farming

Sheep were among the first animals to be domesticated, possibly second only to dogs. Although all of the sheep that have ever been farmed in the UK were introduced, having been domesticated elsewhere, their owners found here a combination of conditions that suited their flocks well. Indeed sheep and their wool provided the foundation for the wealth which became increasingly widely spread throughout England in the 15<sup>th</sup> and 16<sup>th</sup> centuries. Flemish and Italian weavers were considered the most skilful and demanding, and they became good customers for English wool, which developed a reputation for quality based on being of a directly comparable fine-ness to continental wool, while being longer. This extra length made English wool particularly suitable for worsted production.

From the 14<sup>th</sup> century evidence can be found of three basic types of sheep being kept in England.

- A few were of a type whose ancestry can be traced back with reasonable confidence to the Bronze Age. The closest surviving breed to this ancient type is the Soay, a

small, short-tailed, coloured-wool sheep which survived in the Western Isles of Scotland.

- Numerically, the largest group comprised polled (hornless) white-faced animals which produced predominantly white wool. Some sheep of this type had been brought to the UK by the Romans, but there had very probably been earlier introductions of similar animals before that.
- The third distinct group comprised relatively small, horned and black-faced sheep with quite long coarse fleeces. Those animals, whose modern descendants include the very widely farmed Scotch Blackface breed, almost certainly had Asiatic origins, but had been brought to England by Norse and/or Saxon settlers.

During this early Mediaeval period wool was of secondary importance to sheep farmers, whose primary concern was to produce milk from which they could make cheese, which in turn represented an important winter food. After milk and wool, sheep were valued for their manure, and finally for their meat.

As society became gradually richer, however, (and as cattle became more widely kept) the spotlight fell increasingly on wool, and the cloth which could be made from it. As cattle became more widely kept they pushed sheep keeping up-slope onto hillsides and higher ground. Given the tendency of sheep to suffer from foot rot on wetter land, this development was no bad thing for the sheep themselves, and the golden age of English sheep keeping (in the 15<sup>th</sup> and 16<sup>th</sup> centuries) saw the keeping of large flocks of sheep on the chalk downlands.

Distinct breeds as such did not exist at this time, but recognisable local 'types' developed to suit the natural variations in climate and pasture quality, and the origins of all these types can be traced back to the three original populations described above. By the 16<sup>th</sup> century sheep were generally described by reference to the county from which they came, and differences in both the animals and their fleeces became increasingly clear. It is perhaps surprising, therefore, to learn that monastic records do not reveal any evidence of active breeding with a view to improving wool production or quality.

This information, and much of the following analysis, comes from a paper by M L Ryder written in 1984 and entitled 'Medieval Sheep and Wool Types'. This can be found on-line, together with two other papers by the same author from 1964, on the website of the British Agricultural History Society<sup>1</sup>.

By the 18<sup>th</sup> century the various county types were sufficiently differentiated to see in them the origins not just of most modern sheep breeds, but also of several others which have since died out. One point which is worth making at this point is that the different sheep types, like modern breeds, had fleeces with distinct characteristics based on their varying proportions of different fibre types (both hairs and different wool types). Whereas selective breeding and improved nutrition can affect the length of the wool which is produced, it cannot change a sheep which is characterised by a short-wool fleece into one that produces a long-wool type.

It would probably also be helpful to say something here about the way that different breeds of sheep are categorised. Although it can seem as though every different authority has a bespoke way of grouping breeds, these categories are usually based on the type of wool that the sheep concerned produce, and the conditions under which they thrive, usually combining these two very different features into a hybrid classification system. However,

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<sup>1</sup> The website address is [bahs.org.uk](http://bahs.org.uk). To find the source documents run a search there where author = Ryder.

there is plenty of scope for disagreement over whether (for example) an adaptation to moorland habitat makes a sheep a mountain breed, or just a hill one.

The British Wool Marketing Board classifies all current British sheep breeds and their wool types under seven headings:

- fine wool breeds;
- medium wool breeds;
- cross-breeds;
- 'lustre' wool breeds;
- hill breeds;
- mountain breeds; and
- naturally coloured breeds.

Their website ([britishwool.org.uk](http://britishwool.org.uk)) has photographs, descriptions and wool characteristics for all but the most obscure of modern-day breeds raised in Britain, organised under these seven headings.

Although most mountain breeds have longer fleeces and produce longer staple and coarser wool than lowland breeds, there are plenty of exceptions to this general rule. The 'lustre' wool breeds also produce particularly long-staple fleeces.

Other authorities use the face colour of the sheep and the presence or absence of horns as additional 'organising principles' when classifying breeds.

The main breeds which had emerged in Devon by the end of the 18th century included:

- the Exmoor;
- the Bampton;
- the Dartmoor; and
- the South Devon.

However, by that time some leading farmers were starting to introduce other improved varieties, such as the Leicester (a long-woolled variety), the Southdown (a short-woolled sheep better adapted to meat production) and the Merino (characterised by very short but very fine wool), into their flocks.

This process of cross-breeding and improvement eventually resulted in the emergence of a larger number of recognised breeds, albeit with only small differences between some of them. In the case of the Bampton breed, after being extensively crossed with the Leicester it lost its name and its very local identity, and was transformed into the Devon Longwool (see below). By the 20<sup>th</sup> century the following breeds were recognised as native to Devon:

- Devon Closewool: a white-faced polled (hornless) breed producing relatively short medium quality wool suitable for making cloth or carpets.
- Exmoor Horn: a white-faced horned breed producing similar wool to the Devon Closewool.
- Devon Longwool: a white-faced polled breed incorporating genetics from the Leicester as well as the Bampton to create one of the relatively few true long-wool English breeds, producing wool a bit coarser than the Lincoln breed.
- South Devon: similar to the Devon Longwool, but with a finer fleece.
- Dartmoor: similar to the Devon Longwool, and appreciably larger than the Exmoor.

In Dorset, which influenced East Devon, the two most local breeds were the Dorset Horn, which is similar to the Exmoor Horn but with the unusual characteristic of being able to breed year-round, and the Dorset Down, which had been selected for its meat production, and which produced much shorter wool than the main Devon breeds. By the early 19<sup>th</sup> century the Dorset Down was the main breed of sheep to be found in East Devon, much in evidence on the Blackdown hills and other upland pastures.

By the end of the 20<sup>th</sup> century the Devon Longwool and the South Devon, which had always been very similar in type, had merged into the Devon and Cornwall Longwool, and the Dartmoor had split into the Whiteface Dartmoor and the Greyface Dartmoor. All three of these breeds are classified by the British Wool Marketing Board as producing 'lustre' wools largely for use in carpet manufacture due to their length and coarseness. All three, together with the Devon Closewool, also fall under the aegis of the Rare Breeds Survival Trust, reflecting their greatly reduced popularity among commercial sheep producers.

### **Natural wool colours**

Most sheep now seen in the English countryside produce white wool, but there are still breeds which produce brown, grey and black wool. In Mediaeval times many woollen garments were made in their natural colours, and were not dyed at all. The cream-and-brown habits made by and for the monks of Newenham Abbey provide a case in point.

When lambs are born, it is their hair which determines whether they are white, black or brown. It is far from unusual to see a white sheep with black lambs, but this state of affairs does not last. As a black lamb's wool grows through its hair, it is likely to turn rapidly from black to white (or at least like its mother).



Most English lambs are like their mothers, and are white from the outset.



Others start pure black, and develop a different colouring as they grow.



A few breeds produce a fleece that is predominantly coloured. Their lambs also change over time.

### **Wool and cloth production in Devon prior to the 1830s**

Although sheep were widely kept throughout Devon by the 12<sup>th</sup> century, there is not a great deal of evidence to suggest that at that time Devon was much involved in the wool export trade on which England's wealth was based, and the cloth made in Devon was apparently considered somewhat inferior, being based on the coarse wool typical of moorland and upland breeds of sheep. Devon also suffered disproportionately in the Black Death, which adversely disrupted the county's economic development. A good overview of the industry is provided in W G Hoskin's history of Devon (originally published in 1954, and subsequently revised and re-issued several times), from which several of the facts cited here are taken.

One of the factors which helped to change Devon's fortunes was the invention in the 13<sup>th</sup> century of the water-powered fulling (or tucking) mill, which made the process of cleaning up the woven cloth much easier and much less labour-intensive (a particularly important consideration where the population had dropped steeply). The widespread availability of rivers and streams throughout the county encouraged the adoption of this technology, which spread rapidly. One of the earliest tucking mills in Devon was established at Dunkeswell in 1238, and the evidence of persons and places bearing the name Tucker, not least around Dalwood and Kilmington, provides further support for this statement. Even so, the cloth made in Devon was still somewhat coarse. The decisive shift in Devon's fortunes came in the late 15<sup>th</sup> century when the county's weavers switched from their more traditional cloth to the production of kerseys (see below for a brief explanation of cloth types).

At that time the centre of gravity of Devon's textile industry was on and around the moors and on the hills of mid-Devon, where the population of sheep was concentrated. The main spinning and weaving centres were towns such as Ashburton, Buckfast and South Molton, and much of the cloth was finished in and around Exeter.

Axminster's weaving heritage was fostered by, but not limited to, the efforts of the monks and lay brothers of Newenham Abbey, who kept large flocks of sheep on Abbey grange farms (including Shapwick, for which evidence of sheep keeping goes back to at least 1167), and had a fulling mill of their own. However, it should be borne in mind that the soil and climatic conditions around Shapwick have much more in common with the downland of southern England, where the national woollen business was centred, than with Dartmoor, where Devon's was.

The demand for kerseys was such that in 1599 the historian John Hooker noted in his 'Synopsis Chorographical of Devonshire' that (in his opinion) Devon had more sheep than almost any other county in England. Soon after Hooker's observation Devon's weavers again switched their focus, from kerseys to serge (again, see below for a brief explanation of

cloth types), and made Exeter one of the most important centres of the English wool and cloth trade.

By around 1750 the wool industry was starting to get more developed in and around Bradford, and the years 1767 and 1773 saw the development of the 'spinning jenny' and the 'flying shuttle' respectively. These two technical innovations in particular signalled the beginning of the end for run-of-the-mill cottage spinning and weaving.

Throughout the latter half of the 18<sup>th</sup> century the East India Company (EIC) was the main buyer of Devon cloth, reportedly buying two thirds of the county's output as 'long ells' (see below for an explanation), with the cloth being finished and dyed in London. The EIC then used its monopoly position in trade with India in particular to sell the finished product. This trade peaked at the very beginning of the 19<sup>th</sup> century. Even so, 'Road Transport Before the Railways'<sup>2</sup> tells us that although all of the cloth was transported from Devon to London by road, this still only required six wagons a week in 1803, which puts the scale of the industry into some sort of context.

By around 1830 hand weaving had declined to almost nothing in Devon, and in 1833 the EIC lost its monopoly privileges. This really marked the end of the road for Devon as a large-scale cloth-making centre.

### **Types of cloth produced in Devon**

Reference may be found (here and elsewhere) to the following types of cloth produced in Devon.

- Devonshire shalloons: A loosely woven worsted cloth, twilled on both sides.
- Druggets: A coarse woollen fabric, felted or woven, and either self-coloured or printed on one side.
- Kersey: A coarse but lightweight cloth, made using both long and short woollen fibres. Kersey gave way to Serge (see below) in the 17<sup>th</sup> century.
- Long ells: A fine white serge (see below) made in unusually long lengths. The warps and wefts used combed and carded wool respectively, and the resultant cloth was a twill weave. Mainly made for the export trade (via the East India Company).
- Perpetuanas: Durable woollen fabrics with a twill weave.
- Serge: A coarse but lightweight cloth, first made around 1615, but widely used by the 1680s, made using both long and short woollen fibres. The resultant cloth was a twill fabric, often used for military uniforms and similar.

### **From fleece to cloth**

The main processes involved in turning a sheep's fleece into a woven cloth are as follows:

- shearing or fellmongering;
- grading;
- scouring;
- carding;
- combing;
- spinning; and
- weaving.

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<sup>2</sup> Axminster Heritage Centre has a copy of this excellent book, by Dorian Gerhold (Cambridge University Press, 1993).

The dyeing process can take place at various points, usually between scouring and carding; or between combing and spinning; or between spinning and weaving; or after weaving.

Before scouring was developed as a technique for cleaning the wool (see below for details), a process known as fulling (or tucking) was used, which involved pummelling the cloth in a bath of stale urine and/or Fuller's earth before rinsing it in clean water. Initially this process was carried out after the cloth had been woven, though later it was also used prior to spinning. Dyeing could only take place after the fulling process had been completed, because otherwise the pigments would not attach themselves to the wool due to the residual natural grease (or lanolin).

Not all wool is got by shearing. Historically some was got by plucking loose fibres from the sheep's back; and some (known as 'slipe wool') was, and still is, recovered from the skin of sheep that have been slaughtered, as part of the fellmongering process. Because a dead sheep cannot struggle, slipe wool fibres are longer than those that would be obtained by shearing the same sheep whilst alive, and slipe wool was historically valued for the weaving of stockings.

Sheep shearing was until the 20<sup>th</sup> century a wholly manual task, carried out with hand shears not unlike a pair of domestic scissors. After the fleeces from a flock have been collected together, they are sorted and graded according to the quality, length and cleanliness of the wool fibres. Historically this was done by a merchant known as a wool stapler, who then supplied different grades and mixtures of wool to different sorts of weavers.

Scouring results in the removal of grease, salts, dust, burrs and other foreign materials. It is an important process because poorly scoured wool will not dye evenly. It starts with the scrubbing of the fleece in soap and soda at a variety of temperatures and in a sequence of tubs. After the clean fleece has been rinsed, it is dried in hot air. Fleeces which are particularly dirty may sometimes be treated with an acid solution, and if there is any risk that the fleece might be carrying anthrax spores (for example), it can also be sterilised at the end of the scouring process.

Wool is then either carded or combed, depending on its future use. Combed wool is used to make worsted cloth, and most other wool is carded.

Carding is the process of mixing long and short staple fibres, and different colours of fibres (and different types of fibres, not just wool), to create a homogenous mixture which can then be spun and twisted into a yarn. In pre-industrial times this was a manual process using a pair of flat boards with teeth to mix the fibres. Carding is now a fully mechanised process which uses complex wheeled plant to achieve the same outcome.

Combing is used on fleeces with long and lustrous fibres. As with the process of combing human hair, the objective is to get the fibres all aligned with each other. 'Slipe wool' (see above) could be combed while still on the skin.

The following images come from 'The Young Tradesman; or Book of English Trades (A new and enlarged edition)'<sup>3</sup>, which also gives descriptions of various wool-related trades, on which the summaries below are based.

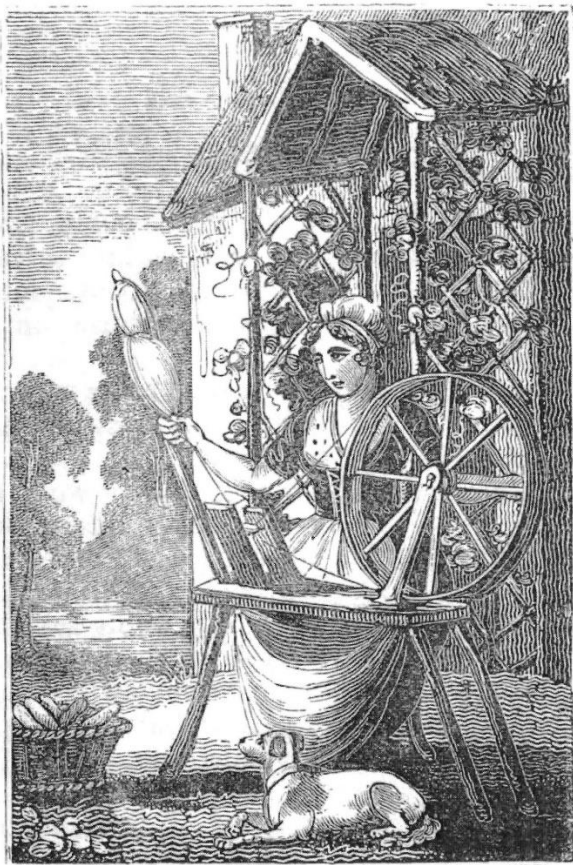
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<sup>3</sup> This was published by Whittaker & Co, London, 1839. It is accessible in full via the [archive.org](https://www.archive.org) website.





The woolcomber would receive fleeces from the wool-stapler, and his was the first process in the manufacture of flannel, serge and several other cloth types. He washed the wool, and once dry he combed it with heated combs. Each woolcomber could at that time supply about 10 spinners and six weavers. Wool for making stockings was usually combed from the fleeces of dead sheep; other wool was shorn from the living sheep.

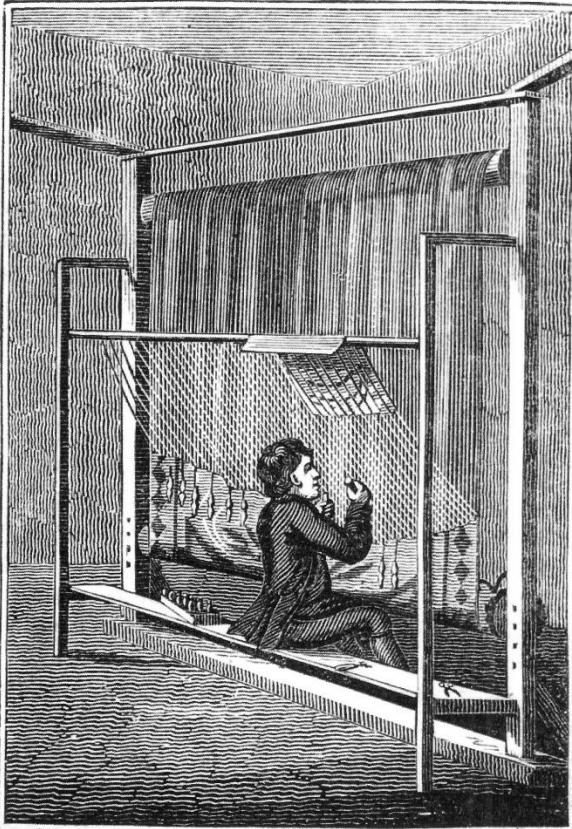


The spinner (typically female, and still at that time using a spinning wheel in her cottage), would take fleece from the woolcomber and hold it in her hand, using the spinning wheel to draw it out to a finer thread, which was wound onto a spindle. When the spindle was full, the thread was transferred to a reel and taken off in skeins. These threads were then wound together (plied) before weaving.





The pre-industrial cloth weaver used both his hands and his feet to control his loom (most weavers were men). After mounting the warp (length-wise) threads, he used a shuttle to pass the weft (transverse) thread from side to side. Different materials (e.g. flax or silk as well as wool) could be used for warp and weft threads if required.



By contrast carpet weavers worked on two distinct webs which were woven at the same time. Carpet looms had two thick rollers, and the warp was divided into sets of 10 threads. The pattern, which would be pinned to the frame for easy reference, was divided into squares, and each square was further divided by 10 vertical and 10 horizontal lines: one for each thread on the row. This would tell him which colour to use for every stitch. By working on a series of squares, more than one weaver could work simultaneously on the same carpet. After weaving, the carpet was 'sheared' so that its pile was even.



Finally, the 'Young Tradesman' (see above for details) explains how the dyer used mainly vegetable dyes to add colour to either wool or woven cloth. After the wool had been cleaned the dye was applied by soaking the wool or cloth in a brass or copper cauldron.