

WOOL.

WOOL is a variety of Hair (q. v.). The term hair is applied, in ordinary language, to a smooth, straight-surfaced filament like human or horse hair, without serrations of any kind on its surface. Wool, on the other hand, is always more or less waved, as in fig. 1; besides which, externally each woolly filament is seen under the microscope to be covered with scales overlying each other, and projecting wherever a bend occurs in the fibre; fig. 2, in which one of the leading varieties of wool is shewn both in its

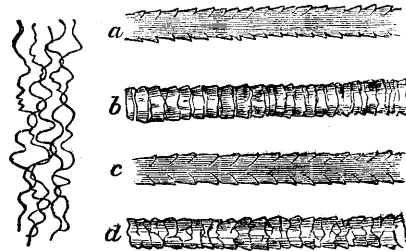


Fig. 1.

Fig. 2.

natural state (*a* in outline, and *b* complete) and after it has undergone the process of carding (*c* in outline, and *d* complete), in each condition both as a transparent and as an opaque object. Upon the minute points of difference here shewn, the value of wool chiefly depends, especially with regard to the great variety of its applications. If each fibre were straight and smooth, as in the case of hair, it would not retain the twisted state given to it by spinning; but would rapidly untwist when relieved from the force used in spinning; but the wavy condition causes the fibres to become entangled with each other, and the little projecting points of the scales hook into each other, and hold the fibres in close contact. Moreover, the deeper these scales fit into one another, the closer becomes the structure of the thread, and consequently of the cloth made of it. This gives to wool the quality of *Felting* (q. v.). By combing, or drawing the wool through combs with angular metal teeth, some of the scales are removed, and the points of many more are broken off, so that wool which has been combed has less of the felting property, and is consequently better adapted for light fabrics; and yarn made of such wool is called *worsted*, and the cloths made of it *worsted goods*. But such is the variety of wools obtained by careful breeding and selection, that these differences can be

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got without combing, some wools being found to have naturally fewer serratures, and a less wavy structure, than others. These are consequently kept separate, and are called *combing-wools*; whilst those which are much waved, and have many serratures, are called *carding-wools*, from their being simply prepared for spinning by carding-machines. The serratures or points of the scales are exceedingly small, and require the aid of a good microscope to see them. They vary from 1200 up to 3000 to an inch.

Wool is the most important of all animal substances used in manufactures, and ranks next to cotton as a raw material for textile fabrics. Its use as a substance for clothing is almost universal in the temperate regions of the globe.

Previous to 1791, British woollen cloths were made almost wholly of native-grown wools. At that time, the whole supply of the country could not have much exceeded 100,000,000 lbs. The merino wool of Spain then began to displace them in the best kind of goods, and the imports from that country reached their maximum in 1805, being in that year 7,000,000 lbs. Before 1820, the German wool had begun to supersede the Spanish, and was imported largely till 1841. After that, the cheaper wool of the British colonies to a great extent took the place of the German, and the latter is now chiefly used for only the finest cloths.

Wool varies in character according to the peculiar breed of sheep which yields it, and also with the nature of the soil, food, shelter, and climate. In a wool of first-rate quality, the fibres are fine, soft, elastic, sound, of good colour, and free from deleterious or troublesome impurities: the commercial value of any sample depends, therefore, upon the extent to which it possesses these properties. If it be a combing wool, it will also depend upon its length of staple.

For technical purposes, shorn fleeces are divided into two classes, one called *hogs* or *tegs*, the other *wethers* or *ewes*. The former are the first fleeces shorn from the sheep, the latter are those of the second and succeeding years; but the meaning of these terms varies a little in different districts. The fleeces of yearlings are, as a rule, longer in the staple, and otherwise of superior quality to the wool of older animals. In the south of England, it is customary to clip lambs, and the wool so obtained is called *shorn lamb's wool*. Wool taken from the skins of slaughtered sheep is called *skin-wool* or *pelt-wool*, and is of a more variable quality than fleece-wool, on account of its being obtained in all stages of growth.

As long-stapled wools are used for worsted goods, and short-stapled for woollen goods, the various breeds which yield these two leading kinds are naturally divided into the long-woolled and short-woolled classes of sheep. The Lincoln, the Leicester, and the Cotswold breeds are considered good types of the former; and the Down, the Welsh, and the Shetland breeds, of the latter.

The following brief notice of the characteristic properties of the various native wools, is founded upon the description given of them in the Jury Report of the International Exhibition of 1862, Class IV.

Of the 'long wools,' the *Lincoln* has greatly risen in value of late years. It is coarse, of great length, and silky in appearance, so that it is well adapted for 'lustre' goods, in imitation of alpaca fabrics. *Leicester* wool is highly esteemed for combing. It is rather finer in the hair, but not usually so soft and silky in the staple as the last. *Cotswold* wool is similar to the Leicester, but somewhat harsher. It is not suited for lustre goods. *Highland* wool is

long stapled, and of coarse quality, but known to be susceptible of great improvements. The practice of 'smearing' greatly depreciates its value. It is chiefly used for the coarsest kinds of woollen fabrics, as carpets, rugs, and similar articles. It is also used for Scotch blankets.

Of the 'short wools,' the different breeds of Downs partake very much of the same characters, but soil and climate so far affect them. The *South Down* is a short-stapled, small-haired wool, the longer qualities of which are put aside for combing purposes, and the shorter for the manufacture of light woollen goods, such as flannel. The *Hampshire Down* differs from it in being coarser, and in having the staple usually longer. The *Oxford Down*, again, exceeds the last in length and coarseness of staple. The *Norfolk Down*, on the other hand, when clean, is of a very fine and valuable character. The *Shropshire Down* is a breed increasing in importance, and is longer in the staple, and has more lustre than any of the other Down breeds. *Ryeland's* wool is fine and short, but the breed is nearly extinct. The *Welsh* and *Shetland* wools have a hair-like texture, deficient in the spiral form, upon which depends the relative value of high-class wools. They are only suited for goods where the properties of shrinking and felting are not required. Shetland wool is obtained of various natural tints, which enables it to be used for producing different patterns without dyeing.

Of the intermediate wools, *Dorset* is clean, soft, and rather longer, and not quite so fine in the staple as the Down breeds. The *Cheviot* has increased very much of late years in public estimation. It is a small, fine-haired wool, of medium length, and is suitable for woollen and worsted purposes, for which it is largely used.

Some of the British colonies are very important wool-producing countries, Australia in this respect standing far in advance of all other countries whatever. The Australian wool has in general a beautiful, short, silky staple, well adapted for the manufacture of soft, pliable, and elastic fabrics. All the settled districts of this continent have been found well adapted to the growth of fine-woolled sheep, and the extraordinary increase in the flocks forms one of the most remarkable features of the colony. The breed has sprung from three merino rams and five ewes taken out by Captain M'Arthur in 1797. The alpaca wool grown in Australia since the creature was introduced some years ago is of inferior quality; but this is supposed to have arisen from rearing the animals too near the coast, and hopes are now entertained of succeeding better with it inland.

The wool of Cape Colony has of late years been greatly improved by the introduction of merinos, and, as will be seen from the table below, the exports from it are increasing very rapidly.

Among the imports from India, wool has of late become an important article, the quantity having risen from about 2,500,000 lbs. in 1840, to 21,500,000 lbs. in 1877; but the supply is rather fluctuating. A great deal of the Indian wool is coarse and hairy, and can only be used for low-class goods. We may state here that the most costly of all wools is obtained from the Tibetan goat, and is found next the skin, under the thick hair of the animal. From it, the far-famed Cashmere shawls are made. The highest price of any quality which is sold is from 6s. to 7s. per lb. in the native markets, but the Maharajah of Cashmere keeps a strict monopoly over the best kind.

Turning now to European countries, it is somewhat sad to think that Spain, the native country of the merino, which not so long ago sent all the wool

