

are different. The *Leicester* may be considered the type of one and the *Merino* of the other, though the distinct processes are older than the former name, as a variety, and possibly older than that of the latter kind, which originated in Spain. See MERINO.

Examined under the microscope, *short* wool presents the appearance of being serrated and imbricated. In a fiber of *merino* wool an inch in length, there may be 2,400 of these serrations; in one of *Sazony*, 2,700; in *Southdown*, 2,080; in *Leicester*, only 1,860. In *long* wool these saw-like cusps, or points, are less developed; indeed, in some sorts they are nearly altogether wanting. For the production of woolen cloth that wool is most suitable which possesses the greatest number of these serrations, because it is by means of these that the *felting* process, which is the essence of such cloth, is accomplished. On the other hand, in worsted fabrics this felting operation is avoided, or takes place only to a very limited extent. The fibers are drawn and spread out separately and evenly, by means of the *comb*, which, in all its forms, aims at disjoining each separate lock or ringlet of wool, and arranging the fibers longitudinally. See COMB, 2, page 597.

The wool, being *sorted*, is next *washed*. Iron tanks, full of soap and water, are kept by steam constantly at a high temperature. Into these the wool is thrown, and repeatedly drawn through the liquid by iron rakes, which, moved by machinery above, expose it completely to the action of the detergent mixture. The water is then squeezed out by passing the wool between rollers heavily weighted, and the drying process is completed by quickly revolving fans, or drawing the atmosphere through it.

The white and clean wool is then run through *screw-gills*, or revolving leather straps armed with fine iron teeth. It is thus made ready for *combing*. This separates the fibers and lays them parallel. It is analogous to the carding of short wool (*carduus*, a thistle); a *teazle* was first employed, now iron wire. (See CARDING-MACHINE.) The operation of *combing* also removes the shorter fibers which are found even with long wool; these are *bits*, *nibs*, *noils*, according to the custom of a country or district. The process was formerly done by hand, and is shown at Fig. 1395, page 597. It was necessary that the combs should be heated, and for this purpose they were placed in an earthenware stove, or *pot*, as it was called, which was kept at a high temperature by burning charcoal in it. The wool was oiled to render it more pliable.

In the combing-machine, the wool is passed under the action of the long thin spikes of the comb: the locks of wool are drawn out in perfectly parallel lines, each fiber laid smoothly and the *noil* passed over into its appointed receptacle.

The wool, thus combed, is made up into balls called *tops*, a sort of round *heads*. It is now prepared for spinning by passing the *slivers* or ribbons of combed wool between a series of pairs of rollers, moving with regulated and gradually increasing degrees of velocity, and brought, with corresponding gradations, closer to each other, thus diminishing the space between them through which the wool has to move. The result is to draw out the fibers more completely. This is repeated from six to ten times. The strips of slightly cohering wool thus gain length at the expense of thickness, and are called *rovings*; the word is probably cognate with the sailor's *reefing*, from the Anglo-Saxon *reafian*, to pull. The bobbins on which these rovings are wound, while revolving, impart a slight amount of twisting to the wool, and a sort of light woolen rope is produced with the smallest possible amount of strain. It is immediately from these *rovings* that *yarn* — literally, *prepared* wool (Anglo-Saxon, *gyrnan*, to make ready) — is produced.

The yarn varies according to the quality of the wool from which it is produced, and according to the fineness of thread to which it is spun. In what is called the *fly-frame*, for spinning long wool, the spindles have a velocity of 2,500 revolutions per minute. In the *cop-frame* they attain the speed of 6,000 per minute, or 100 revolutions per second. The tenacity of the yarn is indicated by the *number*, which represents how many skeins or *hanks* go into a pound. (See HANK.) Thus, 40 s. yarn means that in one pound weight there are forty hanks, each measuring 560 yards. The worsted yarn thus produced is used almost entirely for *weft*.

Wors'ted - ma - chin'er - y. Machinery for the manufacture of *combing* or *long-stapled* wool, as distinguished from ordinary *woolen*-machinery (which see), which works staple of the ordinary length, and in which the felting quality is much more developed (see FELTING). The breeds of sheep yielding the two