

SILK, is properly an animal fluid, hardened by the air; being an extremely soft and glossy thread, spun by the silk worm. the body of which consists of eleven rings.

The humours found in the body of this insect approach to the nature of silk; since, on being rubbed in the hand, they leave a solid crust behind. In the sides of the belly, all about the ventricle, there are deposited a vast number of vessels, which contain the silky juice: these run with various windings and meanders to the mouth; and are so disposed,

disposed, that the creatures can discharge their contents at pleasure at the mouth; and, according to the nature of the juices that they are supplied with, furnish different sorts of silk from them, all the fluid contents of these vessels hardening in the air into that sort of thread that we find the webs or balls of this creature consist of.

As soon as the silk-worm is arrived at the size and strength necessary for beginning his cocoon, he makes his web; for it is thus they call that slight tissue which is the beginning and ground of this admirable work. This is his first day's employment. On the second he forms his folliculus or ball, and covers himself almost over with silk. The third day he is quite hid; and the following days employs himself in thickening and strengthening his ball; always working from one single end, which he never breaks by his own fault; and which is so fine, and so long, that those who have examined it attentively think they speak within compass, when they affirm, that each ball contains silk enough to reach the length of six English miles.

In ten days time the ball is in its perfection, and is now to be taken down from the branches of the mulberry tree, where the worms have hung it. But this point requires a deal of attention: for there are some worms more lazy than others; and it is very dangerous waiting till they make themselves a passage, which usually happens about the fifteenth day of the month.

The first, finest, and strongest balls are kept for the grain, the rest are carefully wound; or if it is desired to keep them all, or if there be more than can be well wound at once, they lay them for some time in an oven moderately hot, or else expose them for several days successively to the greatest heats of the sun, in order to kill the insect, which, without this precaution, would not fail to open itself a way to go and use those new wings abroad it has acquired within.

Ordinarily, they only wind the more perfect balls; those that are double, or too weak, or too coarse, are laid aside, not as altogether useless, but that, being improper for winding, they are reserved to be drawn out into skains. The balls are of different colours; the most common are yellow, orange-colour, isabella, and flesh colour; there are some also of a sea-green, others of a sulphur colour, and others white; but there is no necessity for separating the colours and shades to wind them apart, as all the colours are to be lost in the future scouring and preparing of the silk.

In the philosophical transactions, n<sup>o</sup> 252, we find the following observations concerning the goodness of silk, which is best distinguished by its lightness. The organcine silk is the best made in the country of Piedmont of any; and two threads are equal in fineness, that is, in smoothness, thickness, and length, for the thread of the first twist. For the second, it matters not whether the single thread be strong before the two are joined, unless to see whether the first twist prove well.

It is necessary that the silk be clean; and it is to be observed, that the straw-coloured is generally the lightest, and the white the heaviest of all. The skains should be even, and all of an equality, which shews that they were wrought together: otherwise we may with justice suspect that it is refuse silk, and cannot be equally drawn out and spun; for one thread will be shorter than the other, which is labour and loss.

It will also be requisite to search the bale more than once, and take from out of the parcels a skain to make an essay; for unless it be known, by trial, what one buys, there is the greatest danger of being cheated in this commodity. To make an estimate, and know the lightness, fix the essay upon one eighth of a portée or hand of silk of a hundred and ten aunes or ells of Lyons in length, and see what it makes of aunes by the eighth part. The skain, which is of eighty threads, must be multiplied by a hundred and ten aunes of Lyon, and from this number must be deducted one eighth: as for example, 110 by 80 makes 8800, the eighth part of which is 1100: and this is the eighth part of a portée, or hand of silk. Now, to calculate what these 1100 aunes weigh, which is the eighth part of a portée, or of 110 aunes of Lyons, it will be proper to take a skain out of the parcels, which you take out from the bale which you judge may contain at least 1100 aunes, to make the one eighth part of a portée; which portée must be divided on two bobbins, half on each; then fix the two bobbins on the centre, or beam, and from thence pass it through the comb hurdissoir, viz 550 from the two bobbins, will make 1100, which will be one eighth part of what you desire to know. This done, you cut off your silk, and carry it to put on the hurdissoir: then weigh it, and multiply the weight by eight, it will weigh just as much as a portée of 110 aunes of Lyons, which is the general rule for calculating. When they draw the silk out by this means, one may learn to adjust the weight.

There are silks of Piedmont, which are very light and clean, and are to be preferred before any on the sale: the portée of silk of the lightest weighs near twenty-four penny-weights, and from this it arises in gravity to twenty-five and twenty-six penny-weights the portée, and sometimes to twenty-seven and twenty eight: but even these weights may be dispensed with, provided that the other qualities be good, that is, that it be well wrought, even and clean. When the silk is more than twenty-eight penny-weights the portée, it must always be proportionably cheaper.

*Methods of preparing SILKS.* The several preparations which silks undergo to fit them to be used in the manufacture of silken stuffs, are reeling, spinning, mulling, bleaching, and dying. To wind silks from off the balls, two machines are necessary; the one a furnace, with its copper; the other a reel, or frame, to draw the silk. The winder, then, seated near the furnace (first heated and boiled to a certain degree, which custom alone can teach) a handful or two of balls, which have been first well purged of all their loose furry substance. She then stirs the whole very briskly about with birchen rods, bound and cut like brushes; and when the heat and agitation have detached the ends of the silks of the pods, which are apt to catch on the rods, she draws them forth; and joining ten or twelve, or even fourteen of them together, she forms them into threads, according to the bigness required to the works they are destined for: eight ends sufficing for ribbands; and velvets, &c. requiring no less than fourteen. The ends, thus joined into two or three threads, are first passed into the holes of three iron rods, in the fore-part of the reel, then upon the bobbins or pullies, and at last are drawn out to the reel itself, and there fastened each to an end of an arm or branch of the reel. Thus disposed, the winder, giving motion to the reel,

reel, by turning the handle, guides the threads; substitutes new ones, when any of them break, or any of the balls are wound out; strengthens them, where necessary, by adding others; and takes away the balls wound out, or that, having been pierced, are full of water.

In this manner, two persons will spin and reel three pounds of silk in a day; which is done with greater dispatch than is made by the spinning-wheel or distaff. Indeed, all silks cannot be spun and reeled after this manner; either by reason the balls have been perforated by the silk worms themselves; or because they are double, or too weak to bear the water; or because they are coarse, &c. Of all these together, they make a particular kind of silk, called *floretta*; which being carded, or even spun on the distaff, or the wheel, in the condition it comes from the ball, makes a tolerable silk.

As to the balls, after opening them with scissars, and taking out the insects (which are of some use for the feeding of poultry,) they are steeped three or four days in troughs, the water whereof is changed every day to prevent their stinking. When they are well softened by this scouring, and cleared of that gummy matter the worm had lined the inside withal, and which renders it impenetrable to the water, and even to air itself, they boil them half an hour in a lye of ashes, very clear and well strained; and after washing them out in the river, and drying them in the sun, they card and spin them on the wheel, &c. and thus make another kind of *floretta*, somewhat inferior to the former.

As to the spinning and reeling of raw silks off the balls, such as they are brought from Italy and the Levant, the first is chiefly performed on the spinning-wheel; and the latter, either on hand-reels, or on reels mounted on machines, which serve to reel several skains at the same time. See REEL.

As to the milling, they use a mill composed of several pieces, which may mill two or three hundred bobbins at once, and make them into as many skains.

For the dying of silk, see DYING.