SILK CULTURE IN JAPAN.

The rearing of silkworms, Consul Robertson informs us, has always received great attention at the hands of the Japanese, and has now attained to a high degree of perfection. The commencement of the season varies in the different parts of the country, according as the temperature happens to be high or low. When the climate has a pretty equal temperature, the silkworm egg cards are taken out of store about the beginning of April, and hung up in some quiet nook of the house. After the lapse of twenty-two or twenty-three days the worms will appear; they are carefully watched and paper is wrapped round the cards, which are now placed in a basket-tray. They are looked at every morning, and brushed off lightly with a feather fan on to another piece of paper. Mulberry leaves are then taken, cut very fine, and well sifted, tossed so as to get rid of the leaf fibre, and then mixed with a certain proportion of millet bran. With this the worms are fed. Fresh paper is wrapped round the cards, and this course is pursued for three days, when all the worms will be out. The paper with the worms on it is then placed in clean basket-trays over a layer of matting. The worms are fed about five times a day. After three days the paper is removed, and the worms are transferred to matting. This stage is known as the "Kaminuke." One card will probably multiply itself sixty times so far as the number of worms go. As a rule, about ten days elapse before the first sleep is entered upon, but this depends upon the temperature. When the cocoons are observed to be preparing for the first sleep they are sprinkled with millet bran, and covered with a net, mulberry leaves being placed over the net. After a couple of hours the net is raised, and the worms brought away with the mulberry leaves, to which they will have attached themselves. They are then placed in a fresh basket tray, and the one from which they have been taken is well cleaned. When the worms have roused themselves from the first sleep they are sprinkled with rice-bran and covered with a net as before, after which they are shifted to a fresh basket. The same course is pursued when the worms go through the second and third sleep, but for the fourth sleep the net is not used. The period that elapses between the second, third and fourth sleeps is from six to seven days at each stage. Much attention is paid to cleanliness, as neglect in this respect exposes the worm to disease. Mulberry leaves are given with an unsparing hand, the leaves being chopped coarser and coarser as the worms grow in size. Sieves of different sizes are used so as to meet the feeding requirement with fine or coarse leaves. As a rule, the worms are fed five times a day, but in hot weather, when the leaves are apt to get dry, they are given as often as eight or more times a day; in cool weather the leaves are given perhaps only three times, but with no reduction in the actual quantity. The leaves are measured out with great nicety. An important feature in the rearing of silkworms is the giving the proper quantity of food, neither overfeeding, nor, on the contrary, starving the worms. After the fourth sleep the leaves are given whole. The worms have now attained full size, and soon cease feeding altogether. When they are observed to be seeking for a place to spin in, the best are picked out and placed on the "mabrushi;" this is a contrivance made either of straw or light twigs, and intended to facilitate the spinning of the cocoons. The cocoons are spun in three days. Those selected for silk are dried in several ways, either in the sun, or by artificial heat, or by steam If the reproduction of eggs is desired, the cocoons are ranged in baskets. After thirteen or fourteen days the chrysalis will have changed into a moth, which will emerge from the cocoon. The male and female moths are then placed on a card, which is surrounded with a framework of oiled or varnished wood, so as to prevent the moths from escaping off the card. In a very short space of time, say about twelve hours, the card will be covered with eggs. Strings are then run through the cards, which are strung up in some quiet corner. In autumn, they are stored away in boxes, and so left till the following spring. The great thing to guard against is disease, so that careful watching of the worms day and night is most essential. If the weather is exceptionally hot, then the worms are kept cool, if, on the other hand, cold, then proper warmth is looked after.

There are several varieties of the mulberry. Exposed and open ground is generally selected for a plantation, with a stream near at hand. The ground is always well drained. With worms intended for reproduction, more than ordinary care is exercised in the selection of leaves for their food. The cocoons are used for two purposes, that is, either for the reproduction of seed or for the reeling into silk. In the case of the former, care is taken to preserve the chrysalis, and the cocoons are carefully stowed in a place of safety. When it is intended to use the cocoons for silk, they are dried as above. Two or three days' exposure will ensure the destruction of the chrysalis, and thus prevent the egress of the "uji," or moth. The mode of drying generally in use amongst the Japanese is by exposure to the sun's rays, though drying either by artificial heat or steam is not unknown. If dried in the sun, the cocoons should be left till after sunset, and until they are slightly moist with dew. If taken in when hot from the effect of the sun, it tends to make the silk brittle, and difficulties will be experienced in reeling. With a climate affording equal temperature, say 79° Fahrenheit, the worm takes seven or eight days to change into the pupa; if the cocoons are picked off the spinning beds too soon—in fact, before the change is perfectly effected—it results that when the cocoons are undergoing the drying process the feet of the silkworm are entangled in the cocoon fibre and the silk is consequently damaged It is a mistake to keep cocoons too long after they are dried; the fresher the cocoon the better the silk, the thread, too, is more easily reeled, and the silk will be heavier. About ten days after the worm has woven its cocoon, the chrysalis has changed into a moth, or "uji," and makes its egress by eating through the cocoon fibre. If the cocoon is intended for silk, great care is taken to preserve it from injury of any kind. When the cocoons are eight or nine days old, they are placed on baskets and laid out in the sun to dry. Two days' drying will effectually kill the chrysalis, and the cocoons are then placed where a draught can play freely on them. If it is intended to steam them they are placed in a basket-steamer, specially made for this purpose, over a cauldron of hot water. Two or three mulberry leaves are put in the basket with the cocoons, and the whole is then covered with stout wrapping paper. So soon as the mulberry leaves have completely changed colour the chrysalis may be reckoned on as killed. Another plan is to place a large box with a series of drawers or shelves over a fire. At the bottom of each drawer a layer of thick paper is placed, and on this the cocoons are laid Two or three mulberry leaves are then put into each drawer. The drawers should be constantly shifted, so that each may receive the same amount of heat; when the leaves pulverise to the touch the killing process is looked upon as effected. The water in which the cocoons are immersed prior to reeling is the best and purest that can be obtained, and, however good of its kind, is generally filtered before use. If ordinary well water, or water in the least degree tinged with mud is used, the thread is apt to lose in weight and natural gloss.

Silk is reeled either by hand or by machinery. The latter has been brought to bear recently upon the industry in question; but hand-reeling is most in vogue, and has been so from time immemorial. Hand-reeling is carried out in the following fashion:—About 8½ lbs. of cocoons are taken, and these are divided into thirty parts, one portion is put into boiling water and the thread reeled off first from five or six cocoons, increasing to seven or eight. This number will turn out the best silk, for medium and inferior silk eight, nine, to twelve or thirteen cocoons are used. A small ring, made either of horse hair or human hair, is attached to the edge of the basin containing the cocoons and the hot water. The thread is run through this ring, and then passed in and out of the first and second fingers of the left hand, the right hand meanwhile turning the handle of the reel. The Japanese seem to think that by the hand process greater evenness of thread and more absence of impurities is obtained than by machinery Cocoons are easily reeled at first, but the process gradually becomes a matter of difficulty, requiring a careful and expert hand The alleged superiority of hand-reeled silk to that turned out by machinery is combated by the fact that the latter commands a far higher price in the Yokohama market than the former, and the large outlay that has been made on the establishment at Tomioka, where silk is reeled by machinery under foreign supervision, not to mention other establishments in Yedo, and elsewhere, tends to confirm the success achieved over hand-reeling.