

Correspondence.

SERICULTURE—FEEDING THE WORM.

BY LOUIS A. BERTRAND.
XII.

I have heretofore omitted speaking of the number of times worms should be fed during the twenty-four hours. Some say eight, some say ten, and so on; but I would lay down no absolute rule, but would say, keep some fresh food constantly within the easy reach of them all, night and day. After the last moulting, the worms exhibit an incredible voracity—they are then insatiable, especially during the first forty-eight hours. To form an accurate idea of their prodigious appetite it may be well to state that a learned agriculturist, a well read man in sericulture, has proved that a worm, which has arrived at the fifth age, consumes every day six times its own weight, and that, when the disproportion in size is duly considered, that it eats precisely as much as thirty-six horses. And he thinks that the same proportions exist from the beginning till the end of their lives. (Mr. de Gasparin, *Journal d'Agriculture pratique*, Dec. 1848, page 568.)

You must adapt the artificial feeding, as near as you can, to their mode of eating in a state of nature on the living and growing tree; for this, after all, is the great secret of success. Study to adapt every operation connected with the cocoonery, and the treatment and feeding of the worms as they can, to their wild nature. Keep the building clean and sweet; let no other smell be perceptible but that of the fresh mulberry leaves; raise no dust; make no noises; move about quietly; give them their food carefully. Indeed, let them go through their changes and transformations as though in the quiet recesses of their native forests, only protecting them from excesses of nature which are injurious to them such as exposure to the rays of the mid-day sun, to the storms of wind or rain, to flashes of lightning or peals of thunder, also from their natural enemies, such as birds, rats, mice and ants.

In moving the worms from one place to another in order to thin or spread them out, never touch or handle them. While feeding them with leaves, when you want to separate them, put on a few fresh leaves, and as soon as they are well covered with worms take hold of a leaf carefully, and lifting it up slowly lay it down on the place to which you wish to remove it. The same way when you want to remove the worms from any given place or paper for the purpose of throwing out the litter—the stems and offal of the worms. This should be done at least every other day while feeding on the flat surface, with leaves. To separate them after they have commenced feeding with branches, move the branches lately put on while the worms, or a portion of them, adhere to them. And when you wish to throw out the litter and offal, take hold carefully, lifting up the pen or top portion of it; let another person empty off the litter into a basket or sack.

Immediately after the worms have fully finished moulting, they should all be removed from the place where they have deposited their skins, as these become very offensive and injurious to them.

SPINNING COCOONS.

When the worm is within four or five days of its spinning time, it has acquired its greatest size and most ravenous appetite and formidable appearance. From this time until it begins its cocoon, it seems to lose its appetite and diminish in size and weight. It also from that time gradually changes its color from a rank greenish to a light pearly yellow, and generally assumes the appearance of maturity. The last three or four hours before going to spinning, it becomes in a degree diaphanous and translucent, as a white ripening grape. It becomes restless and uneasy, frequently raising its head as if to reach something. These signs admonish the keeper to prepare for the harvest, which if not a golden, is certainly a silken, harvest. At this stage the worm begins to hunt some nice nook or corner out of sight, in which to wind its body in a silken shroud, and the sooner it can find a suitable place to suspend its cocoon the more perfect and complete that cocoon will be made; and the more valuable will be the harvest to be gathered. Hence it is very important that good provision be promptly supplied in which the worms can all spin their cocoons. Many plans for this purpose have been invented. The best—or such as combine the qualities of economy, cleanliness and adaptation to the seeming fancy or real wants of the worm—should be adopted. Any kind of clean bushy twigs can be used, but aromatic shrubs are to be preferred.

After the worm commences the cocoon it must not in any manner be disturbed, and if allowed to proceed unmolested it will finish in three or four days. It is a beautiful and interesting sight to behold one hundred thousand worms spinning all at once their cocoons. Professor Robinet has made the following curious calculations: When the worm is spinning its cocoon, it makes a motion of five millimetres long every second. The thread which composes the cocoon having an average length of 3,000 metres (about 3,000 yards), the worm is compelled to make 300,000 motions with its head to accomplish its work. Should the cocoon be perfected in 72 hours, the worm has made 100,000 motions every 24 hours, 4,166 every hour, 69 every minute, a little more than one every second. What a mighty hard-working fellow!

In from six to eight days after the cocoons are formed, they should be gathered, and all, except those selected for producing eggs, must be exposed for three or four days to the direct rays of the sun, to kill the chrysalis within. It will be well to expose them longer, so as to be sure to completely dry up or evaporate the fluids of molts substances of the chrysalis, otherwise there is danger of injuring the silk by staining it with the putrid matter of the chrysalis. It is also important that this chrysalis be thoroughly dried, to prevent the bad smell that would otherwise be emitted from the cocoons when stored away, and also to prevent their heating. If you are prepared to reel the cocoons at home, this work may be now commenced; or if the cocoons are to be sold they are now ready for market. But in any event, it must be remembered that mice will destroy the

cocoons if not kept out of their reach; mice are so fond of silkworms that they will destroy them from the eggs to the cocoons.

PRODUCING EGGS.

Before exposing the cocoons to the sun, if it be desired to save any eggs for the reproduction of the worms, cocoons must be selected for this purpose and placed in any convenient place for hatching out the moth or miller. In order that the size and vigor of the worm may be continued or improved from generation to generation, it is important that only the very best cocoons should be chosen for propagating the species. Among the most precocious, select the largest and most regularly formed. This selection must be performed with the most careful attention. For all white races, purity of color is of the utmost consequence. For the yellow cocoons, those having a too deep or bright color must be rejected, because their threads are generally unequal and loose.

The shape and external appearance of the cocoons are no reliable evidence of the sexes. In a number of cocoons taken at random, there are always nearly as many males as females. One hundred pairs of large yellow cocoons, which weigh a pound, will produce an ounce of eggs; and an ounce of eggs is considered to produce about forty thousand silkworms. The white races, being generally less heavy, require of course a larger number of cocoons to make a pound.

The following mode is generally adopted in the largest cocooneries of France, in order to separate the sexes. The female cocoons are weightier than the male ones. A certain number of selected cocoons are taken at random and placed in a balance. They weigh, for instance, two hundred grammes (about six pounds). The average weight is, therefore, two grammes. It is almost certain that all cocoons which weigh more than two grammes will be females; those less weighty will be males.

Now it is necessary to fix the cocoons. The moths would experience great difficulties to emerge out of their cocoons should they remain free on the shelves. Upon sheets of grey paper, lay with a pencil some liquid gum arabic; common paste will answer. Then take your cocoons one by one and dispose them in rows, side by side, in placing them on the gum. The rows must be separated by an interval of an inch, in order that the moth may find no obstruction when its head commences to come out, and also that it may reach with its feet the opposite cocoon to grasp it and thus facilitate its release. It is well understood that male and female cocoons must be pasted upon separate sheets of paper.

In closing this chapter, I take the opportunity of crediting Mr. J. N. Hoag, of Yolo, with many valuable statements and rules I have found in his interesting report on silk culture in California. (*Transactions of the California State Agricultural Society during the years 1866 and 1867*, page 469.)

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