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AN EXPERIMENT IN SILK-CULTURE.

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IN an article on silk-culture, published in "Harper's Magazine" more than a quarter of a century ago, the following passage occurs: "We shall soon be ready to begin that which the next century will find us doing with all our might—commanding the silk as we now do the cotton markets of the world." When we consider how little has been accomplished since that time, it is to be feared that this prophecy will not be realized unless greater advances are made in the next twenty-five years than were made in the last. Repeated trials seem only to show that silk-raising in the United States is not as profitable an industry as it was formerly thought to be.

The culture of silk is so old that we can not tell when it was begun, or by whom it was first discovered. The Chinese claim that it was known to them as early as 2600 B. C. Almost all Roman and Greek authors mention it, but it was probably unknown in Europe until the sixth century after Christ, and not until the sixteenth century was it successfully started in France.

In the year 1714 the manufacture of silk was begun in England. James I tried to establish it in Virginia; and in Georgia in 1732 lands were granted on condition that on every ten acres of cleared land one hundred white mulberry-trees should be planted, and, on the seal of that State, silk-worms in various stages of their growth were represented. Two or three years later the first export, consisting of eight pounds of raw silk, was sent to England, and the silk manufactured from it was presented to the Queen. In the year 1759 ten thousand pounds were exported, but after the introduction of cotton the culture of silk declined, and the last exportation from Georgia was made in 1790.

In the year 1771 Pennsylvania and New Jersey began the culture of silk, and experiments were also tried in New York and other States. In an old newspaper, under the date of 1786, we read, "Late Philadelphia papers mention, as an extraordinary circumstance, that a family in Maryland have upward of two thousand silk-worms at work."

The Revolution put an end to silk-raising for a time, but in the early part of this century the culture of silk was again started in a number of States, among others in Louisiana and South Carolina, and even before this one of our New England States—Connecticut—began the culture of silk. In the year 1790 it was said that fifty families in New Haven were raising silk, and in a newspaper for the year 1787 we read that "a young miss in New Haven will soon wear a silk gown of her own make." In the same paragraph the hope is expressed that

soon it may be "esteemed disreputable, by both ladies and gentlemen, to wear any thick silk but of our own manufacture."

In 1819 five tons of raw silk were raised at Mansfield, Connecticut, and the manufacture of silk is still carried on there. In the year 1835 we read of a company formed in Rhode Island having a large plantation of about thirty thousand mulberry-trees, and the State Legislature of that year offers a premium of fifty cents on every pound of silk raised and reeled in that State within two years from the passage of the act. "Rhode Island is likely," so the paper says, "to take the lead in the manufacture of silk as she did in cotton.

That the interest in the culture of silk must have been kept up, for a time at least, is shown by the fact that in 1840 the United States exported 61,552 pounds of raw silk, and in 1844 396,790 pounds, but in 1850 only 14,763 pounds were exported, while in 1870 the census gives no statistics of silk raised in this country.

About 1860 the culture of silk was started in California, where the conditions of climate seemed specially favorable for its success, and for some years it was carried on; but by 1878 it had greatly declined, owing possibly to commercial and industrial depression. Whether the industry continues to any extent we have not ascertained.

In the year 1882 the Department of Agriculture received many letters from persons interested in the culture of silk, and distributed a few silk-worm eggs, but there was no general distribution.

In 1884 the department appropriated fifteen thousand dollars for the encouragement of the industry, and a special agent was appointed to attend to the work, the department offering to send eggs to any one who would try the experiment of raising them. I should judge, however, that no very favorable reports were received, as, at a meeting of the American Association for the Advancement of Science, in 1885, as reported in "Science," Professor Riley stated that the culture of silk had been tried in the United States for fifty years, and all that the experiments had shown so far was that silk could be raised over three fourths of the United States if there was a market for the cocoons. He considers the industry best conducted on a small scale, and adapted for women and children who have no other way of earning money. The profit for three persons he estimates at fifteen to twenty-five dollars for the season, provided the cocoons bring one dollar a pound—a price, by-the-way, which only the best cocoons bring.

The care of silk-worms is decidedly wearisome, interesting though it may be; and certainly any woman enterprising enough to start in the experiment of raising silk, and strong enough to do the necessary work, might find some more profitable way of utilizing her time.

Mr. Edward Atkinson, at the same meeting of the Association above mentioned, maintained that the culture of silk in the United States was not desirable, since there was no lack of employment, as the high rate of wages shows, and we can not afford to do for our-

selves what foreign laborers will do cheaper ; and, moreover, the raising of silk has always been carried on by the poorest and most inefficient peoples, who, as they rise in the social scale, abandon it, as is now coming to be the case in Southern France—France being unable to compete with the cheap labor of China and Japan. It may be added that another reason for the decline of silk-culture in France is said to be due to climatic changes.

One spring my attention was called to an article on silk-culture in which it was stated that silk could be successfully and profitably raised in the United States. The article then went on to quote from a manual written by a young girl, who had tried silk-raising and had been very successful. By a strange coincidence, in a few days a friend offered me an ounce of silk-worm eggs which she had just received from the Department of Agriculture at Washington. Not having the time, and possibly the inclination, to raise the worms herself, she kindly gave them to me, and I determined to try the experiment of raising silk-worms in one of the New England States.

During three or four months of cold weather the eggs were kept in a cool place in a cellar, at as even a temperature as was practicable, the thermometer rarely, if ever, going below freezing-point, and never rising above forty degrees.

The mulberry-tree, upon which the worm feeds, is one of the last trees to leave out in the spring ; but soon after the 1st of June the leaves began to show themselves, and on the 11th of June the eggs were placed in a warm room, where, on the 13th, they had begun to hatch. Only a few worms appeared that day ; the two following days there were more, and on the 16th and 17th great numbers appeared. It is estimated that there are forty thousand eggs in an ounce, but only between two and three thousand of my lot hatched. However, a number of the eggs had been given away, and probably some were unfertilized, or had been killed.

Then began the task of keeping the worms supplied with food ; and, fortunately, I had found a friend willing to undertake the experiment with me, for a task it indeed proved. The white mulberry is not common in Salem, and the nearest tree was nearly one quarter of a mile from the house, and often we went a greater distance for the leaves. At first a small number of leaves were sufficient, but in a week or two my friend and myself had all we could do to keep the worms, which were growing rapidly, supplied with fresh leaves ; then, too, the lower branches of the tree, which was a large one, were soon stripped, and some one had to climb the tree for us. Fresh leaves had to be picked every day, sometimes twice and even three times a day. This in itself took some time, and, if the leaves were at all damp, they had to be wiped or dried in some way before filling the trays.

The trays in which the worms were kept had to be very carefully cleaned, and all the refuse removed every day. As the worms grew

larger they, of course, needed more space, and our room was gradually filling with extemporized tables and shelves covered with trays. The cleaning of one tray seems a small matter, but when there are over fifty trays to clean and fill with fresh leaves it takes a good while, and often we did not get to bed until midnight. As early as possible in the morning we were again at work feeding the worms, and for thirty days we were kept incessantly employed, oftentimes feeling discouraged, as the leaves were hard to get and the weather hot and debilitating. Still, we were determined to do the best we could, and so persevered in our self-imposed task.

Thirty days from the time of hatching, having lost no worms by disease, the spinning of the first cocoon was begun, and a relief it was to see a large worm crawling restlessly around the edge of the box leaving traces of silk in the corners. Two days later the worms were spinning in earnest, and we found our work of feeding and cleaning somewhat lessened. We tied together twigs and straw, upon which the worms made their cocoons. Following a friend's suggestion, we begged from a grocer some of the straw coverings of wine-bottles, and these the worms seemed to like very much. The room now presented a very different appearance from that which it had a week or two before. Instead of the rows of boxes, the tables were covered with straw tent-like arrangements upon which were the yellow cocoons.

Before all had finished spinning, we thought it time to steam a part of the cocoons, and here we met with our first difficulty. None of the books on the subject, which we had at our disposal, gave any very definite ideas as to the method by which this part of the work might be accomplished.

Finally, after considerable perplexity, we made arrangements to have the steaming done at a boiler-room. We laid about eight hundred of the cocoons on a layer of cloth netting in a large box, at one end of which a hole had been made and a round gas-tube inserted. To this tube was attached a pipe from the boiler, and for twenty minutes, the time specified in a report published by the Department of Agriculture, the steam was allowed to enter the box. At the end of that time we found to our dismay that many of the cocoons had been blown to one end of the box, forming a sticky mass. If we had been almost discouraged before, we certainly were discouraged now. However, we dried them in the sun, and a few were sent to the Woman's Silk-Culture Association in Philadelphia, with a letter, asking whether we had steamed them too much, and for information in regard to steaming the rest, of which we also inclosed a sample. In answer to our request, a printed circular containing general directions was sent to us, but no special directions as to steaming the others ; but we were informed that our worms had been insufficiently fed ; the cocoons were small, and steamed too much ; and the fresh cocoons could not be reeled.

As there is but little market for cocoons in this country, all attempts to reel the silk here having been unsuccessful, we had not expected to realize much from the sale of the cocoons, still to be told that they were absolutely worthless was rather disappointing after our six weeks of hard work. We decided, however, to have the rest of the cocoons steamed, and these we did ourselves in a common steamer, and very much nicer they looked than our first lot.

But what was meant by our worms being insufficiently fed was not understood, and again we applied to the Woman's Silk-Culture Association for information, and this time we received a more satisfactory answer, though it seemed that our worms, instead of being underfed, may have been overfed, for the letter said they must not be fed while molting, and our worms had been fed at these periods. The "Report" gave the same information, but we understood the reason to be simply that time might be saved if worms of the same age could be made to molt together. But we found it difficult and well-nigh impossible to make them all molt at the same time, so finally were compelled to give them leaves as usual, supposing that those worms molting would not eat unless they needed food. In everything else we followed the directions given in the "Report" as nearly as possible. The worms certainly had plenty of room, fresh air, a uniform temperature, and as to the last requisite mentioned in the book—namely, cleanliness—we are sure that that condition at least was rigidly complied with, the trays being cleaned every day, and sometimes even oftener if it seemed necessary.

The room in which the worms were kept was on the northern side of the house, and had one northern and one eastern window, and a fireplace in which a fire was made whenever the weather was a little cool or damp, so it was comparatively easy to regulate the temperature.

In the second letter received from the Woman's Silk-Culture Association we were told that no one could expect to make anything from silk-raising until after two or three years' experience, and yet many papers speak of silk-raising as an employment, perhaps not very profitable, still a light employment for children and old people who can earn money in no other way. For farmers' wives this industry is also recommended, though where the ordinary farmer's wife is going to find the time for the business, coming as it does in the middle of the summer, when her work is heaviest, is not explained. One would think that any woman who could take care of silk-worms might earn more money in the same time raising chickens, selling eggs, or in light gardening, than by the sale of cocoons. Of course, like everything else, it requires skill and more especially experience, but there are few light employments that would not bring in a little money even the first year. To be sure, the outlay in the beginning is small; but had our cocoons been the ordinary size, and suitable for reeling, we could not, at the price cocoons are now bringing, have received more than

five dollars to pay us for the time spent in taking care of the worms during six weeks of intensely hot weather. Our expenses, not counting the cost of the fuel burned, amounted to over one dollar and fifty cents.

That others have had somewhat similar experiences is shown by the following extracts from recent newspapers. From Springfield, Massachusetts, a lady writes that, although she had but about eight hundred silk-worms, they kept her very busy during the last molt picking leaves, and she should not advise any one to engage in the business unless one is willing to work, for it is not an employment for lazy people. In return for her cocoons, which she sent to the New York Silk Exchange, she received a silk handkerchief and some embroidery floss made from her own cocoons, valued at about one dollar and twenty-five cents, which she thought "poor pay for six weeks' work." Her expenses, not counting time and labor, amounted to one dollar and sixty-three cents.

A widow in Ohio thought that the culture of silk might prove a pleasant and profitable way of supporting herself and two children; but after some expense and "six weeks of hard work, Sundays and all, found that she had not made a dollar by the operation."

From the "Massachusetts Plowman" the following extract is quoted: "Silk-culture requires a very close, unremitting attention on the part of those engaged in it, and if the work is not laborious it is so constant as to prevent the following of any other occupation at the same time. Those who desire to engage in sericulture will do well to consider thoroughly the matter."

One thing I can say in regard to the experiment, it is interesting work, though, whether it would be so to a person not interested at the outset in such matters I can not say; and, besides, it keeps one so busy that the interesting points are often overlooked. Yet I am sure that numerous friends who saw the worms in their different stages thoroughly enjoyed them, and it was of some account certainly to have interested so many people in a subject of so much importance. How many children, and I may say older people as well, never knew before that a moth came from a caterpillar, or that a worm formed the cocoon from which all our silk is made!