Haldon, and a large tract of country richly wooded and diversified. To the right of the Oaks there is an ornamental lake (not a mud pond, as many of them are), with an island in the center. The white and yellow *Nymphaeas* luxuriate in this lake, and are very effective floating upon the surface of the bright clear water. Beyond the lake there is a broad curving band of hybrid *Rhododendrons*, perhaps the most artistic idea conceived in the laying out of the grounds. The various hues of the *Rhododendrons* are very striking by the side of the water, and the terraces above them have a tendency to concentrate the vision for the moment, which probably enhances the beauty of this particular view.

In the opposite direction the drive is bordered by a row of *Cupressus Lawsoniana* and *Thuja borealis*, and these are margined by seedling *Antirrhinums* and China Roses, which look well under the shade of the deep green Conifers. When the slope is nearly ascended approaching the house, the drive takes a bold sweep to the right, but persons on foot may reach the terrace by the Diana Walk, so called because there is a beautiful statue of Diana in its center. The steps and balustrades approaching the terraces are no doubt ornamental from one point of view, but they are eclipsed by the wealth of trees and shrubs which are met with at every turn in this fine garden. Never before have we seen Hollies and rare Conifers grow so freely under the shade of larger trees as here; and yet the secret is not far to seek. It is a question of cost. A thorough preparation was made before the trees were planted, and notwithstanding the adverse influences of shade and drip the Conifers seem to have established themselves in the rich compost, thrive surprisingly, and are apparently likely to thrive for many years to come.

Vases are freely used upon the second chain of terraces, where there are a pair of perhaps the finest specimens of *Retinospora plumosa* to be seen in England. The plants are over eight feet high and as much through, and are the most

shrubberies. They are grouped by themselves, and make a fine show.

The walled-in garden is surrounded outside the walls with a range of Johnston Brothers & Co.'s patent fruit-houses; and it would be well for gardening if there were more of them in the country. Before noticing the glass department it may be as well to state that they are not of the ordinary kind; but I do not say they are better for cultural purposes because they are costly. The forcing pits, I noticed, were filled with early crops, and houses of Melons and Cucumbers were both early and of first-rate quality—indeed, a house of Gilbert's green-fleshed melon would have done even that renowned Melon grower credit, so fine were the fruits, and so beautifully were they finished. A span-roofed fernery contains a splendid collection of Ferns and mosses planted out. The path is up the center—a broad grating; and two beds having irregular surfaces composed of rockwork are furnished with Ferns. The tall plants comprise an upright growing species of *Davallia*; *Nephrolepis exaltata*, looking all the better for being planted out; *Asplenium Belangeri*, *Blechnums*, *Pteris argyrea*, *Asplenium fœniculaceum* and *bulbiferum*, and a large variety of *Adiantums*, which, together with mosses and *Selaginellas*, form the groundwork of the beds. In the propagating house, which is fitted up with all modern improvements, there is a good stock of foliage plants for furnishing, and mosses and Ferns for the same purpose, good baskets of *Achimenes* and pans of *Campylobotris refulgans*. Peaches in a long lean-to house were a fine crop, large in size and highly colored. The great house of the place is, however, a plant stove in three tiers of spans, containing an extensive and remarkable collection of plants. Tall Palms and Ferns are arranged down the center, noble specimens of all the leading kinds, which are too extensive to enumerate in detail, and many fine foliage plants, including a superbly grown specimen of *Cyanophyllum magnificum*, with leaves over two feet in length.

SILK-WORM CULTIVATION.

Report by U. S. Vice-Consul JOHN GRIFFITT, of Smyrna, Turkey.

THE efforts that are being made at present in the United States to extend the culture of the silk-worm leads me to make this report, trusting it may be useful.

I have been engaged for many years in raising silk-worms, my object being the study of their diseases, and, after years of experiments, have succeeded in obtaining healthy grain, the basis of success in silk culture.

I was induced to make these trials in the hope of alleviating the losses that the peasants in Turkey have suffered for the last twenty-five years, and have endeavored to interest the governors of this Vilayet in my work, in order that I might obtain the moral support of the government, but thus far without success.

The loss suffered by Turkey since 1857, when the silk-worm disease first spread so violently, is incalculable. I remember the time when the wife of every gardener in the vicinity of Smyrna obtained from her crop of cocoons a sufficient return to enable her to pay for the clothing of her family for the entire year. This fatal disease swept away our beautiful indigenous races, and this branch of industry was almost abandoned. Many mulberry trees were uprooted, those that were retained being kept by the gardeners solely for the use of their branches.

There were at that time three large silk-reeling factories, worked by steam, where hundreds of women were employed. Work had to be abandoned for want of cocoons. The Japanese race was introduced later on, with but partial success. There is a very great difference between the indigenous and the Japanese races; it requires at least double the number of the latter to give the same weight in cocoons; that is to say, if it requires 250 fresh cocoons of the indigenous race

SUGGESTIONS IN LANDSCAPE GARDENING.—GROUNDS, STREATHAM HALL.

fascinating objects of their kind upon the place. There are also large specimens of the Golden Yew (*Taxus baccata elegantissima*), and various others. It should be stated that the house is surrounded by chains of terraces one rising above another upon three sides. From the south terrace there is a good view of Exeter Cathedral and the surrounding country for many miles. Between the grounds and the park the show of *Rhododendrons* in spring is brilliant in the extreme, and the scroll-beds upon the terrace were just beginning to show color at the time of our visit. Looking eastward there is the large Camellia-house and conservatory, and further to the left a steep chain of four terraces planted with the choicest of American plants. The Camellias—plants worthy the house and the garden—are planted out, the roof is ornamented with creepers, and the side stages with flowering plants.

The conservatory is a large oblong building, and is furnished with a collection of hard-wooded, semi-hard-wooded, and other flowering plants, the latter, of course, predominating for the sake of supplying the necessary degree of color to adorn so large a house. Acacias of sorts, *Chrysanthemum fruticosum*, *Salvia patens*, *Fuchsias* and *Pelargoniums* of the decorative section are freely intermixed with Orange trees, Myrtles, and others already mentioned. From the grounds above the conservatory there is a good view of St. Michael's Church, Exeter, but the plants and trees are of so choice a character that the horticulturist is more inclined to look at and admire them than distant objects however pretty. The coniferous trees are very plentiful, and the shrubby beds and borders are alive with flowering plants, the choicest of everything that is useful and beautiful. The herbaceous garden is simply a continuation of the

There is a whole house devoted to the cultivation of the *Stephanotis*, which is trained upon the roof over a collection of Ferns in pots, which consist of many fine specimens of *Polypodiums*, *Davallias*, *Lomarias*, *Blechnums*, and other kinds of dwarfier habit, as well as mosses and *Selaginellas*. The ranges of vineries are proportionately extensive, and the crops are good throughout. Of course at such an establishment it is needless to say that early and late Grape growing is carried on as a matter of routine business, just as the forcing of Pines, Strawberries, and vegetables is carried on in a range of houses in five divisions, where every plant is in its place and in good health. The Orchid houses I omitted to mention, but where all is done so well it is needless to say that the collection is well grown, and that under the management of Mr. Franklin, the head gardener, a great future is in store for gardening at Streatham Hall.—*The Gardener's Chronicle*.

DISINFECTION BY HOT AIR.—Koch and Wolfhügel, in experiments made to determine the disinfecting power of hot air, were led to the following conclusions: 1. Bacteria are destroyed by being exposed to a temperature of a little over 100° C. for an hour and a half. 2. Spores of brewer's mould require for their destruction an exposure for the same time at 110°–115° C. 3. Bacilli are killed only by three hours' exposure at 140° C. 4. The heat of hot air penetrates articles so slowly that in three or four hours' heating at 140° C. of small objects, such as a bundle of clothes, etc., disinfection was not secured. 5. Five hours' heating at 140° C., necessary to certain disinfection, does serious injury to most articles.

to weigh a pound, it requires 500 of the Japanese, and the quality of the silk is much inferior.

I obtained some years ago a quantity of indigenous grain of a very fine race, but very much diseased. I raised the worms from the moment they were hatched in separate cells, in order that the diseased ones might not infect the healthy (all the worms of a diseased moth are not diseased), and from the few healthy ones I obtained my present race, which I have since then continued to improve, and I now find it in every way superior to all other races I have raised, not only as to the vigor of the worm, but also as to the weight of the cocoon and the quality and quantity of the silk it yields. From one ounce of 30 grammes I obtain invariably from 150 to 155 pounds of fresh cocoons, 12 pounds of which, just taken from the brushes, yield over one pound of silk of the best and finest quality. Another great advantage of my race is that it has not more than 4 to 6 per cent. of double cocoons, while other races have from 15 to 30 per cent.

In my experiments in raising grain I find that double cocoons should never be used for reproduction. On the contrary, they should be carefully avoided, as the worms obtained from grain the moths of which issued from double cocoons have a tendency to form double cocoons the next season.

All the grain I raise is manufactured on the system of the distinguished Pasteur, to whom sericulture owes everything in the regeneration of the silk-worm. Each moth is placed on a small cloth to lay its eggs, and when finished laying it is pinned by its wings to the cloth, to prevent it from falling off. It is afterward examined with a microscope of a magnifying power of 500 diameters, and when found diseased, which can easily be ascertained by the appearance of cor

puscles on the disk, the grain is thrown away. In this way I am certain that my grain is free of one of the principal diseases of the silk-worm, the one that makes the greatest havoc, called "pebrine." The corpuscles are easily distinguished; they are of a brilliant oval shape.

The other great disease, known by the name "flacherie," can easily be ascertained without the aid of the microscope by watching the worms in their last age. If there are few deaths at that period, and if the worms do not hesitate in mounting the brushes to spin their cocoons, it is safe to consider them free from that dread disease which carries them off in their last age, just when the educator counts upon the probable reward for labor and outlay. The grain, when examined, is washed off the cloth after the lapse of a month from the time of laying. The washing process is as follows: A sufficient quantity of soft water is boiled over night, and there is then added thereto 10 per cent. of alcohol. The grain is washed off in this water, and then exposed to the air in a shady place, to dry as rapidly as possible. When thoroughly dry, say in two or three days, the grain should be placed in a box of perforated zinc, containing drawers of the same material, each layer of the grain not to exceed a centimeter in thickness. The box containing the grain is hung from the ceiling in a dry, airy locality, and kept there till the next season. The cold of winter need not be feared; it is, on the contrary, very beneficial to the grain.

In March I have my nursery whitewashed and thoroughly cleaned, and all the utensils exposed to a fumigation of sulphur. Toward the end of March the mulberry tree, in this climate, begins to bud, and when the leaf attains the size of about a silver dollar I place my grain in thin layers in a room heated with an earthenware stove and gradually bring the temperature to 70° Fahrenheit, taking care to keep a vase of water constantly on the stove. The grain begins to hatch in six or seven days, and continues to do so for four or five days. I throw away the last day's issue, as the worms are not numerous, and weak, although not sickly. Each day's issue is kept apart; to the first day's issue I give two feeds of leaf, cut up very thin with a clean knife, and I give an extra feed to each day's after-issue. The first day's issue I place on the lowest frame of the stand, those of the second day on the one above, and so on. The object of this is to enable the worms of the last day's issue to reach the others in their first molt, as the higher the worms are placed on the stand the greater is the heat, and this, joined to the extra meals, enables them to make their first molt with those hatched earlier, thus forming a regularity in the education. In the second, third, and fourth ages I feed my worms four times a day, at 5 and 10 A.M., and at 3 and 8 P.M. The feeds are given with great regularity. In the last age they are fed constantly from 5 A.M. to 11 P.M., and when I raise worms in my large nursery I employ extra hands to continue feeding them during the whole night, not in large quantities, but never allowing them to remain without food. It is indispensably requisite that the worms should not be crowded, especially in their first ages. I give to the worms of one ounce of grain, in their first age, a space of 2½ square yards; in their second age, 5 square yards; in their third, 10 square yards; in their fourth age, 25 square yards, and in their fifth and last age there should not be more than 500 or 600 worms per square yard. The leaves of the wild mulberry are preferable for the first three ages, and the leaves of the grafted mulberry should be given for the fourth and fifth ages. The leaves should be gathered after the dew has evaporated, and if wet by rain they should be dried before they are given to the worms. The leaf is cut up to the end of the third age; after that the leaves are given entire to the worms.

I clean my frames twice during the second, third, and fourth ages. Once immediately after their first meal, after their molt, and again the day before they began to molt. This is done by placing sheets of thick paper, pierced with holes sufficiently large to allow the worms to pass through. These pierced sheets of paper are placed on the worms, leaves are placed on them, and in a few moments the entire batch will crawl upon the leaf. The papers with the worms on are then raised and placed upon a clean frame; if a few should remain in the litter I put them apart from the others. The litter should be raised very carefully; no dust from it should be allowed to spread in the room.

The last age of the worm is certainly its most critical one, and requires the greatest care. At this period the worm eats twice as much as during its first four ages, and the litter remaining on the frames, together with the dejections of the worms, renders the air impure and unhealthy. Consequently the frames should be cleaned frequently, and there should be a constant renewal of fresh air. Diluted chloride of lime should be kept in each corner of the room during the entire period of the fourth and fifth ages.

Five days after the worms have formed their cocoons they should be taken off the brushes with great care, for if any diseased worms remain on the brushes in a state of putrefaction the good cocoons would be soiled and consequently depreciated in value. All imperfect cocoons should be separated and exposed to the sun for some days to destroy the chrysalis; the good ones steamed. The steaming process for destroying chrysalides is far preferable to any other; the silk is not injured thereby, as it is apt to be by baking or exposure to the sun. I steam them for twenty minutes, the water constantly boiling, and this I find sufficient to destroy the chrysalis; I then place them on the frames in thin layers to dry, and after this is effected the cocoons should be reeled off as soon as possible.

By raising the worms of healthy grain, such as I have above described, and by following the foregoing directions, it is impossible not to succeed in obtaining a good crop of cocoons. Years' experience has proved to me that, ignorant as some of the educators have been to whom I have given grain, they have invariably obtained a remunerative crop of cocoons, and even sometimes quite as good as my own.

In December next, the proper time for shipping, I will send some ounces of my grain, together with a sample of my reeled silk, to the Department of State.

Smyrna, July 5, 1882.

A LUXURY FOR CATTLE.—We do not say this hastily, but with the conviction derived from feeding late cut timothy and bright oat straw. With four feed racks in our yard—two kept filled with timothy, one with prairie hay, and one with bright oat straw, the latter was consumed first, and the other neglected until the last vestige of the oat straw had disappeared. It was the instinctive act of the urchin repeated. He took his cake, pudding, and pie first, and reluctantly finished off his dinner on the drier and less palatable bread and butter. Our late cut hay was merely a "fill up," to give their digestive apparatus the necessary distention so useful to ruminants, and that is about all late cut hay is good for anyway.—*Chicago Herald*.

THE PRUNE TRADE OF BORDEAUX.

Report by GEORGE W. ROOSEVELT, United States Consul.

PERHAPS the greatest favorite among the foreign dried fruits sent into the United States is the French prune. The raisin, the date, and the Turkish prune hold their places in the market, but the delicious *prune d'ente* is very properly the most popular with Americans, who are said to be the only people who know how to cook them.

The greater part of the fine prunes that are raised for exportation are produced in the department of Lot-et-Garonne, in orchards of especially grafted plums, which cover an area of about 500,000 acres. These orchards are the property of peasant farmers, and the acreage is constantly on the increase, owing to the failure of the vineyards, which are being replaced in the prune region by the more hardy plum tree.

Prune trees are generally planted about 20 feet apart, with other crops growing between them. The trees are usually healthy, but in some seasons require great care to protect them from small caterpillars.

The orchards being small and the peasants numerous, these marauders are usually dispatched in detail. Prunes grown near the river Lot are of a very dark violet color, and are possessed of a very delicious flavor, and this is the variety which is packed with so much care in fancy boxes for the confectionery trade.

The peasants begin to pick the prunes after the middle of August, and remove them from the trees only when they are dead ripe. Then they dry them in Dutch ovens, which are heated to a given temperature by a fire inside the oven; the fire is then taken out and the prunes placed in the oven on trays. The peasants do this drying so imperfectly that exporters are often compelled to put the prunes through a further process before they are fit for exportation, for, as the value of the prune largely depends upon its size after drying, the peasants stint that process to preserve the bulk. When properly cured they are cooked through, and the secret is to accomplish this desirable feat and still maintain the size and color of the prune.

The crop varies greatly with different years, but the maximum was probably reached in 1875, when 10,000,000 pounds were produced. A great quantity of prunes is consumed in France, and there are, of course, many varieties which come very much cheaper than the prices shown by the following table. The more ordinary varieties are not, however, exported to the United States, though they are sent in considerable quantities to England, Canada, and Germany. The reason why they are not sent into the United States is very apparent when it is considered that the duty on first-class prunes is 1 cent per pound, while that on the ordinary ones, called "plums," is 2½ cents per pound. In the English markets the large ones are called plums and the small ones prunes:

MARKET PRICES PER 100 POUNDS FROM 1876 TO 1881, INCLUSIVE.

	Minimum.	Maximum.	Average.
Prunes per pound:	Francs.	Francs.	Francs.
50 to 55.....	62	132	90
60 to 65.....	54	104	70
70 to 75.....	47	90	58
80 to 85.....	37	79	50
90 to 95.....	27	69	42
100 to 105.....	21	62	36

These averages are calculated upon six years ending with 1881, and they represent the net cost of the fruit as bought from the producers on the country markets as nearly as it is possible to ascertain them. It will be observed from the above table that the value of the fruit is in proportion to the size, or, which is the same thing, the number required to make a pound, the largest ones always fetching the highest price. The men, women, and children employed in the packing and curing receive from 10 to 80 cents per day and board themselves, and they work from 6 A.M. to 7 P.M. The total value of the prunes shipped from this port to the United States in 1880 was \$136,514.90, and in 1881 \$362,225.92, showing an increase of \$220,711.02.

Bordeaux, June 6, 1882.

A SUMMER WITHOUT RAIN.

THE summer of 1882 will be long known as the summer without rain. The drought, however, was somewhat local, extending over the New England States, and being most severely felt in Eastern Massachusetts. At our farm in Essex County, only three-sixteenths of an inch of rain fell in the interval between the 5th of July and the 5th of September, and during that period the most intense heat prevailed. The fierce rays of an unclouded sun were poured upon growing vegetation for sixty consecutive days, the thermometer ranging during the time between 80° and 90° F. The crops of every kind were virtually destroyed, and tillage lands and pastures have been dried so that not a green blade of grass can be seen. It is the first summer for a quarter of a century that the corn crop at the farm has failed; indeed, not for a century, probably, has the corn crop been so effectually destroyed by drought. It is the crop *par excellence* which withstands the influence of long-continued dry weather, and instances are exceedingly rare when corn has been materially injured from the withholding of rain. This season it has been almost a total failure in several of the New England States, and the dwarfed plants have been cut up and fed to animals taken in from the parched grazing-fields. Corn planted for ensilage has also failed, and many silos will remain empty during the winter. It is a great hardship for farmers to see their crops dry up in the fields, and many are greatly discouraged. Potatoes have also failed, and very large areas were devoted to their culture the past season, owing to the scarcity and high prices which prevailed during the spring months.

The hay crop in New England was a large one, but in the absence of a second crop, and from the need of farmers saving their herds of animals by feeding from their barns in the hot weather, the winter's stock of hay will be small. Altogether, the season has been one of the most discouraging experienced by farmers for many years, and the aggregate of losses will be many millions. If the New England States were as isolated as they were one hundred years ago,

a famine would probably occur, or at least there would be a scarcity of food which would cause great anxiety and suffering. But with railroads penetrating into the South and far West, an abundance of food, raised under more favoring circumstances, will be brought to our doors, and all will be fed. It is almost, or quite, impossible for crop failures to extend over the vast territory of the United States; and probably the time will never come when there will be an alarming scarcity of food in this country. It is something to live in such a country, for, of all calamities, none can be greater than famine.—*Boston Journal of Chemistry*.

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