Madder could, doubtless, be most profitably grown with us in the light, rich soils of the south. Whether it can be profitably grown at the north, and its superior quality compensate for the greater trouble, may only be ascertained by actual experiment and a knowledge of the effect upon it of northern winters.

SILK.

We visited the estate of Mr. Strickland, near Naples. This gentleman is much interested in silk culture. He is just finishing a stone cocoonery, one hundred and twenty by thirty feet, and thirty feet high, which is heated by earthen stoves, and will hold the worms from twelve ounces of eggs. He is very particular to throw out all the defective eggs, and consequently no disease has yet appeared among his worms, while it is abundant elsewhere in Naples, and all through Tuscany and Lombardy. The arrangements of his new cocoonery are complete. The frames are made of cane and brown paper, and covered with nets. Upon these nets the leaves are placed, and while the worms are feeding they are lifted off, and the frames cleaned. Mustard is cultivated to give bosquets for the worms to spin upon, the branches being hung above them, and the seed paying the cost of cultivation.

His mulberry trees are planted fifteen feet apart, grafted, and cut down every year, leaving two new branches, each with six eyes. They generally vegetate about the twentieth of March, although a variety called *Filippino* is two weeks earlier. Those known, however, as *Bolognese* and *Majatica* are most generally used. The leaves are ready two weeks after vegetation, and the hatching of the eggs is deferred till they are certain of the right food. The use of substitutes, as in Sicily, might produce disease. The quantity of leaves consumed is about twenty-four hundred pounds to an ounce of eggs, or one hundred and fifty pounds of cocoons. The trees being kept down to the height of seven feet, children can pick the leaves; but this operation is not allowed till the tree has been grafted ten years, when it will produce fifty pounds.

The best worms, and those from which the finest silk is obtained, are called *Pestallini* and *Valdarnesi*, while a coarser kind is made by the *Bolognese*. The hatching is generally about the end of April, but depends somewhat upon the season and the state of the leaf. The cocoons are sold alive at forty cents a pound, and some are always reserved for eggs, which sell for four ducats, or three dollars and twenty cents per ounce. Five hundred pounds of cocoons will produce two hundred ounces of eggs.

The production of silk has been larger in the provinces, but limited in Naples to domestic cultivation among the peasants, who had suffered severely from inferior eggs until Mr. Strickland came, and, by his clean mode and uniform success, induced them to imitate his practice and buy the eggs from him. Whoever may desire a supply, should order not later than the fifteenth of May, as Mr. Strickland only reserves from his sales of cocoons sufficient to meet actual demands. A better source cannot be found, as he is an educated, intelligent man, and an attentive manager, taking great pride in keeping his worms free from the disease which has ravaged Tuscany and Lombardy.

LUPINS.

Mr. Strickland cultivates lupins and plows them in for manure. He thinks them indigestible and unfit for horses, although often cut by others for that purpose when a foot high.

BARLEY.

Two or three crops of barley are grown successively for fodder.

CLOVER.

The Italian clover, in his opinion, deepens the soil.

CASTOR OIL.

Castor oil is grown and manufactured to some extent, but requires much irrigation.

APPLES.

The best apples here are *Limoncelli* and *Melagelata*.

GRAPES.

A grape called Wafrancola is spoken highly of, with a strawberry flavor and coarse leaf, not subject to mildew.

FIGS.

They have a mode of ripening figs ten days earlier by touching the blossom end with sweet oil.

TREES AND PLANTS.

In the botanic garden are *Magnolia soulangiana*, *Pyrus japonica*, and Camellias, in the open ground, all in bloom early in March, with some fine specimens of rare trees, such as *Laurus camphora*, fifty feet; *Araucaria excelsa*, thirty feet; and *Araucaria brasiliensis*, twelve feet; a large tree of *Taxodium mucronatum*, and a fine plant of *Chamœrops humilis*. The place appears well kept, under the direction of M. Tenore, but will not compare in richness with the botanic garden at Palermo. There were two trees in the garden of Baron Rothschild which, to a lover of arboreal beauty, would almost be worth a trip from Rome to Naples. They were *Araucaria excelsa;* and those who have admired the small specimens in green-houses can imagine, in some degree, how superb are these, forty feet high, straight as an arrow, full, rich, and feathery, and clothed with a shade of incomparable green.

AGRICULTURE.

The agriculture of the vicinity of Naples presented nothing beside the madder worthy of special attention. The usual proportion of olives and vines grows on its rich volcanic soil. These under a good government would be the source of wealth beyond measure.

ROME.

The agriculture of the Roman Campagna does not offer, like Sicily, numerous objects of interest; and, respecting its leading features, Hillard has written so well and thoroughly that repetition would be needless. One of our most interesting visits was to the estate of Count Herrick. His place is not a large one, but he has for manager a very intelligent Irishman, who has been in Italy some fifteen years, and thoroughly understands the comparative merits of Italian culture. He says that, with all the skill of his countrymen with the spade, they cannot compete with Italians.

VINES.

The soil is about two and a half feet deep, and, to prepare it for vines, the Romans have a mode which they call a *scasscata*. This consists of trenches four feet wide and four feet deep, by means of which the ground is thoroughly broken up and prepared for culture. After the first trench is dug out, the workmen, with a sharp-pointed, strong hoe, undermines the adjacent soil as far as he can reach it, commencing at the bottom and making a lateral trench a foot high; the other three feet soon fall in, breaking up entirely, and thus saving a large part of the labor of digging. For vines, the ground is generally thus prepared to the depth of four feet; still deeper is considered better, and ten feet, if possible, would be desired. When the ground is ready, a cutting five or six feet long is taken, and six or eight inches of its lower end twisted and bent upward, forming an elbow, in which is placed a strong, long-handled, two-pronged fork. Upon the handle is a step for the foot, three and a half feet from the forked end; with this the laborer is enabled to force the cuttings rapidly into the soil, to the depth of three and a half feet, and three feet apart. Thus planted, the cuttings rarely fail to grow, and are preferred to rooted plants, because, with greater facility, they may be planted very deep. There is the same aim in this country, as elsewhere in Europe, to keep the roots of vines as deep as possible; and they are equally careful to cut off all the roots which strike out within a foot of the surface.

CANES.

In the cultivation of the vine here, canes form an important feature, and it would be difficult to find a substitute for them. Four or six are placed around a vine, about a foot from it at the bottom, and meeting

at the top, where they are tied with osiers. They will last two or three years. In many places these canes are used for trellises and fences, and are capable of being applied to so many purposes that their cultivation should be introduced with us. They can be bought here, eight to fifteen feet long, at four dollars per thousand. The soil to grow canes is dug four feet deep, and should be rich. The eyes are planted four feet apart and a foot deep, and the spaces between kept clean; but no hilling up is required, as with corn. A good plantation will produce twelve thousand per acre, for twelve or fifteen years. The heavier the soil, the longer will the plantation continue to produce well.

CLOVER.

Lucerne is cultivated extensively. This is well known to require a very deep soil, and the ground in which it is sown is dug four feet deep. The seed is drilled in, at the rate of ten pounds to an acre. In its best condition, it will bear five cuttings during the season, of three tons per acre, at each cutting. It requires great care in feeding, to avoid injuring the cattle, and is never fed fresh, but cut in the morning and used in the evening. It is thought good for liver disease in horses.

MANURES.

Lupins are used extensively for manure, and are sown after harvest, broadcast, at the rate of three hundred pounds to an acre, costing one cent per pound. They are not covered, but will quickly germinate, growing two feet in three months, at which height they are plowed under. The next best article for this purpose is the French bean. Peas are planted between the rows of vines.

PEACHES.

Peaches are grafted on the almond tree, and are considered better on the sweet than on the bitter. They have no worms at the root, but ants destroy the bark when old.

GENERAL REMARKS.

Manure is not so abundantly used as further north, costing two cents per bushel. The great fertility of the soil and numerous laboring population would, under proper management, make the country around Rome very productive; whereas, under its present metayer system, and want of fostering care, either from proprietors or from government, agriculture is depressed, and there is neither ambition nor effort for improvement.

Some credit, however, should be given to the government for the establishment of a small agricultural school in 1852. There are seven pupils, who pay from their labor, after their education is finished, at the rate of one hundred and fifty dollars per year. There were excellent drawings by the students of flowers, architecture, vegetables, high

and low vine-culture, different modes of farm-culture, and inventions. The course lasts three years, and the ages of the students are from nineteen to thirty. The artistic tendencies of young Romans were here well illustrated, and more rapid progress was never exhibited than by the drawings of these pupils.

FLORENCE.

The finest specimen of landscape-gardening in Italy is the Villa Demidoff, at Florence, and this owes much to the taste of an English gardener, Joseph Goode.

Near the entrance to these grounds there is a mass of rock-work, covered with ferns, mosses, and flowers. A rustic path leads to the top, from which is a view of a miniature lake, filled with fish, and dotted with aquatic plants. The interior of this rock-work forms a grotto, used by the bathers in the lake as a dressing-room. The variegated ivy, which grew in great profusion, produced a pretty effect. There were beyond this some acres of lawns and gardens laid out with taste, and looking very beautiful with the flowers and fresh foliage which thus early in April were in full luxuriance. The purple magnolia, *Spiræ Reveesii*, and Judas tree were in bloom, and masses of *Rhododendron*, *Weigela*, and laurel were very brilliant, the latter filling the whole air with its fragrance. There were large *Paullinias*, *Pittosporum*, and *Arbutus Unedo*. The Banksia roses were in full bloom, and quite astonished us by the great size of the plants. A rose garden, one hundred and fifty feet in diameter, was judiciously planted, with standards and dwarfs, and very pretty seats were formed by roses trained so as to make little alcoves. An island in the middle of a lake was ornamented with a large cage, in which were birds of fine plumage or song, while around it swam several black swans. There was, also, quite a menagerie of the more useful animals, among which we noticed a dromedary and a llama. Each of the animals had a house and large paddock for its especial use. The stables and carriage-houses were in perfect order. The horses were fine, and four black ones, of mixed Norman blood—were showy, and of admirable action. The villa was under repair and could not be seen, but we entered the conservatory through a most charming horticultural library. The glass structures here contain one of the most rare and valuable collections of plants in Europe, among which are an oak leaf, *Grevillea*, fifteen feet high, and a *Metrosideros albicans* twenty feet. An *Agave gracilis*, five feet, was valued at $5,000. *Rhopala corcovadensis* had a very beautiful leaf, like young ferns. *Dicksonia antarctica* was a beatiful fern, four feet high. None of the fern tribe, however, could equal the *Cheilanthes lentigera*, or Brussels lace. Its leaves were finely cut, soft, and feathery, and there was a gracefulness about it quite unequaled in its way. *Lycopodium leptophyllum* was a moss of unusual beauty. But the great charm of this collection was in the variety of plants remarkable for their foliage, among which were some five hundred of *Dracœna nobilis*, scattered all over the house, with their soft luxuriant leaves, tinted crimson, purple, and pink, resembling masses of flowers. There were, also, *Caladium argente*, *Maranta roseolineata*, and many others. These

foliage plants are becoming deservedly popular in Europe. Curious, often brilliant, and growing luxuriantly, they are constantly changing their form, and present always the beauty which belongs to other plants only when in bloom.

There are several other villas about Florence, the grounds of which are found delightful in the early spring, when bright flowers and fresh foliage abound, but they offer no distinctive features worthy of record. One of the best was the *Torrigiana*. In this, masses of blooming flowers, some twelve feet in diameter, in pots, were surrounded by an edging of tile twenty inches high, and produced a good effect. There were an imitation temple of Janus, a high tower and observatory, patches of China roses, hedges of Japan *Euonymus*, weeping *Sophoras*, and an artificial river, with miniature island and stone bridge. A large *Photinia serrulata* was in full bloom, and those who have seen only the shrubby specimens we have in America can scarcely conceive the beauty of a tree fifteen feet high, and the same in diameter, with its glossy, rich leaves, and covered with masses of white fringe like flowers. *Banksia* and Chromatella roses were trained twenty-five feet; and *Souvenir de Malmaison* was grafted on *Banksia*, which, in this climate, makes the best stock possible. There were, also, imitation Gothic ruins, and the unfailing circus of wooden horses—a part of every Italian villa of any pretension. Anemones, tulips, and carnations were in full bloom, and a fine effect was produced by roses trained on fences, in the form of inverted arches. The turf was good at this season, but the summer heat is said soon to destroy it.

Pratolino, about seven miles from Florence, in the mountains, is a place of much beauty, belonging to the grand duke. Here are very few flowers, but delightful, shady walks, miles in extent; fine lawns, openings, and vistas; lakes, cascades, old trees, rose gardens, and well-kept turf. It has, from one point, a superb view of the whole valley of the Arno, with the city of Florence.

The botanical garden at Florence is in good order, and has some fine specimens of trees and shrubs, but is small, and cannot compare with that at Pisa.

One of the specialities of Florence is the Cascina, or farm of the grand duke, through which is a drive, well kept, and flanked by woods and broad meadows, on which some of his best cattle and horses were grazing. For each horse a small stable was erected in the middle of the field.

PISA.

We found time to visit the duke's farm at Pisa, where are kept some two hundred camels. We could not discover, however, that they were of much use, although it is reported that they performed part of the farm work. Those which we saw were quietly lying in their stables, and none could be seen at work about the fields. The farm, which is flat, consisting mostly of woods and pasture grounds, possesses very little interest. There were some fine sheep, and a few cattle, apparently crossed with Durham stock. The cattle of Rome and Tuscany are generally long-horned, large-boned animals, destitute of the beauty

of the English breeds. The best were in the market at Perugia, where there were some beautiful animals, and on the road between Genoa and Pisa, the pet bullocks being driven to town would have been highly prized at any show with us. Count Herrick had a pair of large cows, which did the work of the farm and also supplied him with milk—too much duty for any animals, but evincing their strength and valuable qualities for crossing with other stock. He had a cross between the Roman and Swiss cow, which partook of the best qualities of each. There never can be improvements, however, in cattle, or anything else, where the metayer system prevails. There is, under it, a very thorough cultivation of the land, but no peasant is able to bestow such benefits on his one or two acres as a farmer with us would eagerly introduce.

The country between Pisa and Genoa is well cultivated; wheat prevails, and the vines are trained upon trees, the deep roots of the former and the surface roots of the latter not interfering with each other. Sometimes the center of the tree is cut out, and the other branches trained in the shape of a goblet, with the vine branches interlacing them. The effect is pretty, and every farmer with us could adopt the same plan successfully, by digging a hole, near each apple tree, six feet square and three or four deep, securing good drainage in the bottom, and filling in with rich soil. A Diana or Delaware vine, planted there, would soon cover the whole tree, and give an abundance of fruit.

ARONA.

I searched the surrounding country for the bees desired by the department. I could find nothing which met the description given me, and upon examining the bees of the country carefully, I could discover none different from those with us. Intelligent men, in whose business honey formed an important item, had no knowledge of a bee like that which I described, and I was almost ready to doubt its existence. I made an attempt to get to Milan, to inquire there, but the Austrians had cut off all communication. A similar attempt to reach Turin was frustrated by the closing of the railroad, the advance of troops, and the expectation of an immediate battle. I was obliged, therefore, to defer further search until hostilities should cease.

The charms of Lake Maggiore have been long celebrated, but no description can exaggerate the reality. There is here a mode of training vines which produces a fine effect, namely: upon a sort of trellis, four or five feet high, and then brought over at the top and tied to branches from the next trellis, the point of union being supported by a stake. Every other row of these ties is supported by a shorter stake than its alternate; thus one row forms a gothic, and the next an inverted arch.

From the road, the field presents an undulating surface of green leaves, the top branches completely hiding the trellis. It was thought at one time that the *oidium* was owing to the age of the vines. Many of the old vineyards were therefore destroyed, and new plantations made. The use of sulphur has since proved efficacious, and this destruction useless.

Another charming feature of the cultivation here is, that mulberry and other trees are not disfigured by close pruning, as in Lombardy and southern Italy. They grow with luxuriance, and are kept down by the same degree of pruning that we apply to dwarf pears. Hawthorn hedges and primroses, blooming along the roadside, give the country quite an English look.

Taking a boat, with four sturdy rowers, for the lake had become rough, we visited Pallanza, to obtain some information about bees, and then landed on Isola Madre, one of the Borromean islands. This island is far out in the lake, and beyond the shadow of the mountains. It therefore enjoys an almost tropical climate, and many New Holland plants grow luxuriantly in the open air. There is very little taste displayed in its plan, and many small places in England are, in this respect, vastly its superior. But the combination of agreeable objects is unequaled. You stand in the midst of trees and plants, with us found only in green-houses. From this forest-like luxuriance, the eye passes to the white houses of Pallanza opposite, the strongest possible contrast of the works of Nature and of man. Then the eye wanders over the rippling lake, and, upward, catches the sloping shores, upward still, the crowning hills, covered with foliage, and above all, the highest peaks of the Alps, white and glistening with snow. Here are all the elements of natural beauty—rich vegetation, quiet water, hills, mountains, and snow. Isola Madre contains scarcely more than four or five acres, yet in this small space is an unrivaled collection of trees and plants, and one could ramble about for days, and find each hour some new beauty to admire.

Among the trees which with us require green-house cultivation we noticed a Camelia, thirty feet high, and another of twenty-five feet, with a mass of foliage twenty-five feet in diameter, and covered with flowers; *Acacia dealbata*, fifteen feet high; an oleander, grafted with five sorts, twenty feet high, and twenty-six feet in diameter; a *Rhododendron arboreum*, twenty feet high, in full bloom, incomparably superb; Cactus, on the rocks which bound the shore; Palmetto; *Cycas revoluta;* Carob; Indian fig, in fruit; *Fabiana imbricata; Hakea pugioniformis; Encalypta saligna;* Lemons trained on walls, and in full fruit; large specimens of *Magnolia grandiflora*, some thirty-five feet high; Iris, in bloom; *Escallonia floribunda; Araucaria imbricata;* Ericas, fifteen feet high, in full bloom; masses of Azaleas; *Phillocladus trichomanoides; Cryptomeria*, twenty feet high; Weeping cypress, eighteen feet; *Taxus baccata*, forty feet; *Arbutus Andrachne*, thirty feet; immense *Quercus Ilex; Araucaria brasiliensis*, thirty feet; *Cunninghamia*, eighteen feet; *Euonymus fimbriatus*, six feet; with glossy acuminate leaves; and many other plants and trees too numerous to mention. One of the most striking objects was made by four plants of *Juniperus sabina* forming one evergreen mass, four feet high, and thirty in diameter. Several large *Lagustremias*, twenty-five feet high, are seen a mile distant when in bloom. *Pinus patula*, twenty feet high, with a head twenty feet in diameter, greatly resembled *Pinus excelsa*. A white Banksia rose, with trunk five inches in diameter, showed well the fine effect of this variety.

ISOLA BELLA.

A visit to Isola Bella was productive of less pleasure. It is far more expensive, but constructed with little taste, being a succession of terraces, with too great a predominance of brick and mortar. It reminds one of a fine piece of confectionary. There are, however, many interesting objects; *Cerasus caroliniana,* thirty feet high, and with foliage thirty feet in diameter; groves of oleander, eighteen feet high; Tree Box, thirty feet high; parterres; groves of *Magnolia grandiflora; Metrosideros alba,* twelve feet high, and eighteen in diameter of foliage; *Magnoliaii hartwg,* fifteen feet; *Arbutus unedo,* twenty feet; *Laurus camphora,* forty years old, and some fifty feet high; *Cunninghamia sinensis,* sixty feet; *Cupressus glauca pendula,* twenty feet; and a singular *Abies monocaulis,* forty-six years old, and ten feet high. One of the best things was a grotto, made to resemble the temple of peace, filled with ferns, kept damp by trickling water, and apparently supported by columns of ivy, five feet in diameter, and twenty-six feet long, which grew down from above, and, being detached at the bottom, would swing at a touch from the hand.

The collection in both these islands far surpassed that at the botanic garden of Pisa, and although not so large as that at Palermo, consisted of finer specimens, because less crowded.

The whole country about Lake Maggiore is full of delightful features, and in our pedestrian excursions among the mountains in search of bees there frequently burst upon us scenes of wonderful beauty. The quiet charm of the lake was always present, and we would sometimes walk over stretches of turf like an English lawn, or skirt along copses of underwood, fresh with the peculiar beauty of young vegetation. At one time old trees, with broad arms, would shelter us, and then we would be wandering amid the trained gracefulness of a vineyard, while an occasional mountain torrent, foaming and dashing, would leap across our path.

To visit Italy and not see the Italian Lakes, is to look at a frame and not see the picture. But the nations were gathering to the battle, troops were hastening forward, and, bearing in mind that in war there was lawlessness, we hastened to place the Alps between the combatants and our defenseless party.

FERTILIZERS.

BY HON. THOS. G. CLEMSON, L.L. D.

From the day when the *fiat* went forth, "In the sweat of thy face shalt thou eat bread," agriculture took its place among the arts of the world. It is true, while population was sparse, and man depended first on game and then on flocks and herds, this art made little or no progress. The tropical climate, where the infancy of man seems to have been cradled, would appear also to have led him to defer the necessity of much attention to it. Very soon, however, the increasing density of population must have necessitated its development, since we find that the Egyptians, at the earliest period to which history reaches, were *already* skillful agriculturists, and had carried the art to such a point of perfection as not only to have sustained their own dense population, but to have made Egypt the granary of the world. That it was not entirely the fertility of that favored region to which this was due, we have evidence in the present state of that country. The Nile still overflows the land with fatness, and the sun still sheds its vivifying influence; yet, there, agriculture has sunk to its lowest ebb, and the country scarce supports its miserable tribes; its immense world-renowned monuments alone remain to show what the land once was. Egypt is the most striking proof which history presents of the inseparable connection between a high state of civilization and a high development of agricultural resources. They rise and fall together, and the prosperity and, indeed, existence of the one is identical with the other. Let that nation beware, whose exhausted fields are forcing her population to emigrate. Civilization, in its highest degree, cannot exist without dense population; nor dense population, without calling to its aid the highest resources of agriculture.

Egypt stands a living, or rather a dead, type of the intimate connection between population and agriculture. China is one equally striking, on the opposite side. For how many thousand years has her pains-taking care for every foot of her soil maintained her prosperous and dense legions, in a region comparatively but little favored by Nature, and given a respectable position among nations to a people but little intellectually gifted! How many wonderful discoveries do we owe to the necessities of their compact masses! The struggle for existence has always been one of the greatest stimulus to the activity of the human mind.

This continuous prosperity, through a long series of centuries, is owing to the sedulous care of the government. No people, left to themselves, will think of future generations; and it is for that reason that all governments should foster and aid the development of this most important of arts, as government only can. This is so well understood in the present day, by all nations, that those who govern are turning their attention daily more and more to its aid and advancement. England has done so by direct legislation; her aristocracy, also an integral part of her government, having, consequently, the weight necessary to carry out a continuous system, has given all the impetus of this weight and their great wealth to its energetic development.

It is only within comparatively few years that science has revealed to us the true composition of bodies and the laws that govern their action; thus developing the wonderful resources of Nature, and reducing that to system which, in the time of our forefathers, was ignorant practice based upon hereditary experience.

It is true that this subject has occupied, from the earliest times, the attention of statesmen, philosophers, and philanthropists; but they only collected and reasoned from the results of experience, without