EUROPEAN

OLIVE-TREE.

AN ESSAY

ON

THE HISTORY AND CULTIVATION

OF THE

EUROPEAN OLIVE-TREE.

Quis divum aut hominum tam clari muneris auctor.
PASSERATII OLIVA.

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EUROPEAN OLIVE-TREE.

ADVERTISEMENT

TO THE FIRST EDITION.

THE following article was written for the North American Sylva, at the request of Mr. MICHAUX, for whom I seize with pleasure an occasion of expressing my esteem.

I have consulted the most judicious ancient and modern works, Columella, Pliny, the Memoirs of the Academy of Marseilles, etc., and have myself observed the Olive in Provence.

AUGUSTUS L. HILLHOUSE,
Citizen of the United States.

Paris, August, 1818.

ADVERTISEMENT

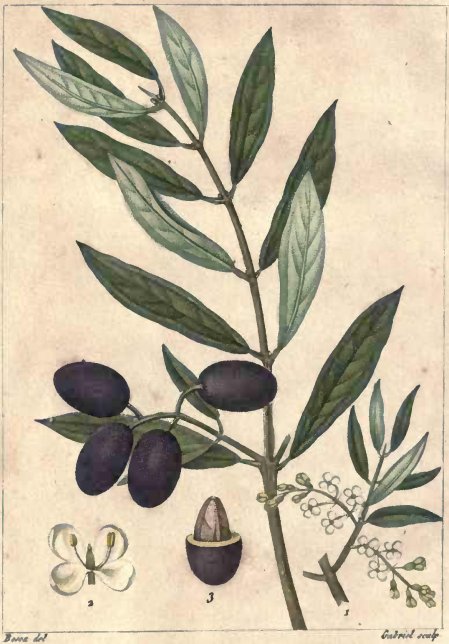
TO THE SECOND EDITION.

I am induced to reprint this Essay by the hope of its practical utility—a hope encouraged by learned Naturalists who have visited the United States.

I prefer leaving its faults to the reader's good nature, to correcting them.

A. L. H.

Paris, October, 1820.



Olive Tree.

Olea Europæa.

ESSAY

ON THE

EUROPEAN OLIVE-TREE.[1]

SINCE the introduction of the Vine, the Olive seems principally wanting to complete the vegetable riches of the United States; and, probably, it might be cultivated with success on some portion of their soil.

The genus of the Olives, of which one species only is found in North America, is more diversified in the eastern hemisphere: fourteen species are mentioned by botanical writers, which are natives of the remote extremities of the Old World. The *Olea fragrans* grows in China and Japan: its flowers are impregnated with the sweetest odour, and are employed by the Chinese to perfume their tea.

[1] OLEA EUROPÆA. *Foliis lanceolatis, integerrimis; racemis paniculatis.*

DIANDRIA MONOGYNIA, *Lin.* JASMINEÆ, *Jus.*

But none of these species forms an object of great importance in the rural economy of the regions to which they are indigenous, nor does their introduction promise very beneficial fruits to the agriculture of other countries. It is far otherwise with the European Olive. This ornament of the vegetable kingdom, which is called by Columella the first among trees, has constituted, from the remotest antiquity, the pride of some of the most celebrated regions of the globe; and, besides the commercial value of its products, it is invested, both by sacred and profane history, with a thousand interesting associations.

It is difficult, or rather impossible, to assign with precision the native climate of the Olive: the most probable opinion is that it came originally from Asia Minor, and that it was also indigenous to Egypt, or introduced into that country at an early period of its settlement. It was transplanted to Greece by the Egyptian colonies; the Phenicians probably carried it to Carthage, and the Carthaginians to Spain. Before its introduction into Spain, the Phenicians maintained a lucrative trade with the Spaniards in oil, which they

exchanged for bars of gold. Pliny informs us that this culture was unknown in Spain and Italy in the reign of Tarquinius Priscus, but that when once introduced it was rapidly diffused. The Olive was planted in France by the Phocean colony which founded Marseilles, six hundred years before Christ.

The Athenians held the Olive in such esteem, that they ascribed its production to their tutelary deity. This beneficent miracle, which is retraced in the monuments of Athens, is differently represented by ancient authors; it is thus agreeably related by *Apollodorus Atheniensis :* In the reign of Cecrops leave was first given to the Gods to assume the patronage of cities, in which they might appropriate to themselves peculiar honours. Upon which Neptune came into Attica, and, standing in the middle of the citadel, smote the earth with his trident, and caused the sea to flow at his feet. After him appeared Minerva, who, calling Cecrops to be a witness of what she was about to perform, caused an Olive-Tree to spring from the ground. A contention hence arose between these divinities, to appease which Jupiter appointed

the twelve Gods to be judges of the dispute, by whom, on the testimony of Cecrops, it was decided in favour of Minerva. The Goddess, thus become tutelar divinity of the city, called it after her own name, and Neptune, irritated by his defeat, inundated all Attica to revenge the affront.

The Olive has flourished chiefly on the shores of the Mediterranean Sea, between the thirty-sixth and the forty-fourth degrees of latitude. It still abounds in Greece : in the northern provinces it requires to be placed on hill-sides exposed to the south, that it may be warmed by the reflected heat; but in Attica the climate, as well as the soil and face of the country, is peculiarly favourable to its growth. Near the foot of the mountains, the Olives form vast curtains of a pale green, which is agreeably contrasted with the deeper verdure of the meadows beneath, and with the dusky grey of the rocks above.[1] The beautiful plain of Athens, as seen towards the north-west from Mount Hymettus, appears entirely covered with them.[2] The wild Olive

[1] *See* Beaujour's Commerce of Greece.

[2] *See* Olivier's Travels.

grows upon the mountains with the Pine and the Oak, and the cultivated varieties are reared about the villages with the Fig-Tree and the Pomegranate-Tree.[1]

The produce of the soil is said to be one third greater when planted with Olives, than under any other species of culture; and oil is the principal article of commerce which affords the Athenians the enjoyments of life and the means of paying their taxes.

But the industry of the Greeks languishes beneath a despotism restricted to no forms, and tempered by no public opinion, whose extemporaneous oppression it is impossible, by the most ingenious calculations, to elude. In ancient Athens a premium was given for the multiplication of the Olive, and severe penalties were inflicted upon proprietors who destroyed it on their own estates. The Turks, on the contrary, subject it to a return of one tenth, to which is added a tax of a *para* for each tree, imposed by Sultan Selim III. To avoid the exactions to which he is a prey, the unhappy Athenian peasant fre-

[1] *See* Beaujour's Commerce of Greece.

quently prefers cutting down his Olives, or selling them at a price unequal to the value of their annual produce.

The wild Olive is common on the islands of the Propontis, and on the declivities sloping to the sea upon the Asiatic side of the Hellespont.

Perhaps one of the finest countries of the world is the Persian provinces of Ghilan and Mazenderan, which lie north of the Caspian Mountains, between the thirty-seventh and the thirty-eighth degrees of latitude. The soil is fertile and watered by innumerable streams that gush from the bosom of those mountains : the surface is even, and, from the depression of the level, and from the proximity of the Caspian Sea, the climate is mild and equable. The Olive is found there with the Sugar-cane, the Orange-Tree, and other productions of warm climates, which do not flourish in the more southern parts of this dry and sterile kingdom.

In Syria the Olive grows spontaneously ; but it is rare, and its cultivation is neglected. The natural advantages of a country formed to be the seat of the richest and most power-

ful empire of Asia, are lost in the absence of an industrious and enlightened population. The slothful and improvident habits of the Turks themselves, and the paralysing influence of their government, are particularly unfavourable to a culture whose fruits are tardy, and which therefore requires to be encouraged by the security of property. The Island of Candia produces great quantities of oil, and Mytilene or *Lesbos* exports pickled olives. Several other islands of the Archipelago share in this commerce.

In Egypt a few stocks of the Olive are seen in almost every village; but it is not extensively multiplied, nor regarded as one of the resources of agriculture. Oil is made in several of the Barbary States, and Desfontaines found the wild Olive abundant on Mount Atlas.

But the greatest variety of Olives, the most judicious culture, and the most perfect method of extracting the oil and of preserving the fruit, are found in Italy, France and Spain. *Bœtica*, or that part of Spain which lies between the Guadalquiver and the sea, is mentioned by Columella as a country eminently

adapted to the Olive; and with a more intelligent husbandry it might again become, as it was in the age of Cicero, the admiration of Europe.

France is divided by agricultural writers into zones, each of which is named after one of its important vegetable productions, and bounded towards the north by the line at which this production ceases to flourish. The *Abbé Rozier* makes four of these zones, succeeding each other from south to north in the following order: that of the Orange-Tree, which ceases at Ouliolles, near Toulon; that of the Olive, which extends to Carcassonne, and of which Nismes may be taken as the extreme boundary; that of the Vine, and that of the Apple-Tree. In travelling from Toulouse to the shore of the Mediterranean, along the canal of Languedoc, I first observed the Olive at a little distance from Carcassonne; but it appeared to have ventured thither only upon trial, and from the size of the trees I judged them to be a recent settlement. About Beziers, Montpellier, Aix, etc., the hills in every direction are covered with Olives.

Thus we see that this inestimable production has been widely diffused by the bountiful hand of Nature.

The beauty of the Olive is far from corresponding to its intrinsic value. It varies in size according to the soil and climate in which it grows; and in France the temperature is not warm enough for its perfect developement. Pliny says that in Spain it was one of the largest trees : *Non alia major in Bœtica arbor.* On Mount Atlas, Desfontaines saw Wild Olives from forty-five to sixty feet in height; and Beaujour compares the Olives of the plains of Marathon to the finest Walnuts, for stature and expansion. Lofty Olives are still seen in the Island of Corfu, shading the spot where they once enriched the gardens of Alcinous.

In the olive-yards of France these trees are generally from eighteen to twenty feet in height, and from six inches to two feet in diameter. About Aix, Montpellier, etc., they are kept low, partly by the disasters to which they are exposed from cold, and partly by the care of the cultivator, to facilitate the gathering of the fruit. They ramify at a small

height, and form a compact and rounded summit. The open, coriaceous foliage is of a pale, impoverished verdure, and the general appearance of the tree is not unlike that of a common Willow which has been lopped, and which has acquired a new summit of three or four years' growth.

Indeed the Olive possesses neither the majesty of forest-trees, nor the gracefulness of shrubbery. It clothes the hills without adorning them, and, considered as an accident of the landscape, it does not charge the picture sufficiently to contribute greatly to its beauty. The rich culture for which the southern provinces of France are celebrated, is less conducive to rural beauty than some of the humbler species of husbandry. The richest country is not always the most lovely : a country of mines, for example, is usually ungracious to the eye; and the Olive is called by an Italian writer, a mine upon the surface of the earth.

This tree is remarkable for its longevity : the ancients limited its existence to two hundred years; but modern authors assert that, in climates suited to its constitution, it sur-

vives its fifth century.[1] Relations are made of the bulk of some of these patriarchal trees, too surprising to be repeated unless they were perfectly authenticated; but in France there are Olives which two men can hardly compass in their arms.

The main limbs of the Olive are numerously divided; the branches are opposite, and the pairs are alternately placed upon conjugate axes of the limb. The foliage is evergreen, but a part of it turns yellow and falls in the summer, and in three years it is completely renewed. In the spring or early autumn, the seasons when vegetation is in its greatest activity, the young leaves come out immediately above the cicatrice of the former petioles, and are distinguished by their suppleness and by the freshness of their tint.

The colour of the leaves varies in different varieties of the Olive, but they are generally smooth and of a light green above, whitish and somewhat downy with a prominent rib beneath. On most of the cultivated varieties

[1] The monks of Jerusalem affirm that the Olives of the garden of Gethsemane are the same which witnessed the agony of Christ.

they are from fifteen to twenty-four lines long, and from six to twelve lines broad, lanceolate, entire, nearly sessile, opposite and alternate[1] in the manner of the branches.

The Olive is slow in blooming, as well as in every function of vegetable life. The buds begin to appear about the middle of April, and the bloom is not full before the end of May or the beginning of June. The flowers are small, white, slightly odoriferous, and disposed in axillary racemes or clusters. A peduncle about as long as the leaf issues from its base, upon which the flowers are supported by secondary pedicles, like those of the common Currant. Sometimes the clusters are almost as numerous as the leaves, and garnish the tree with wanton luxuriance; at others, they are thinly scattered over the branches, or seen only at their extremity. It is essential to remark that they are borne by the shoots of the preceding year. Each flower is complete in itself, consisting of a calyx, a monopetalous corolla divided into four lobes, and of the organs of reproduction, namely, two stamina and one pistil.

[1] *Folia decussata* is the botanical phrase.

A week after the expanding of the flower, the corolla fades and falls. If the calyx remains behind, a favourable presage is formed of the fruitfulness of the season; but the hopes of the husbandman are liable to be blasted at this period by the slightest intemperateness of the elements, which causes the germ to fall with the flower. Warm weather, accompanied by gentle breezes, that agitate the tree and facilitate the fecundation, is the most propitious to his vows.

The fruit of the Olive is called by botanists a *drupe*: it is composed of pulpy matter enveloping a stone, or ligneous shell containing a kernel. The olive is ovate, pointed at the extremity, from six to ten lines in diameter in one direction, and from ten to fifteen lines in the other: on the wild tree it hardly exceeds the size of the red currant. The skin is smooth, and, when ripe, of a violet colour; but in certain varieties it is yellowish or red. The pulp is greenish, and the stone is oblong, pointed, and divided into two cells, one

of which is usually void.[1] The oil of the olive is furnished by the pulp, which is a characteristic almost peculiar to this fruit : in other oleaginous vegetables it is extracted from the seed. The young olive sets in June, increases in size and remains green through the summer, begins to change colour early in October, and is ripe at the end of November or in the beginning of December. On the wild Olive five or six drupes are ripened upon each peduncle; but on the cultivated tree a great part of the flowers are abortive, and the green fruit is cast at every stage of its growth; so that rarely more than one or two germs upon a cluster arrive at maturity.

It has been observed from early antiquity that the produce of the Olive is alternate; and in France it is proverbially said to labour one year for itself, and one year for its owner. The cause of this phenomenon will be mentioned hereafter. It is asserted that the wild Olives are sometimes barren; but these must be trees that have sprung from stones drop-

[1] *Semen unum sœpe abortivum.* DE JUSSIEU.

ped upon arid rocks, in whose crevices the roots barely find nourishment enough to sustain the abject existence of the plant.

On the branches of the Olive, and on the trunk of the young tree, the bark is smooth and of an ashy hue. When the epidermis is removed, the cellular integument appears of a light green. On old trees the bark upon the trunk and upon the base of the principal limbs is brown, rough and deeply furrowed. In the spring and autumn, when the sap is in motion, the bark is easily detached from the body of the tree.

The wood is heavy, compact, fine-grained and brilliant. The alburnum is white and soft, and the perfect wood is hard, brittle, and of a reddish tinct, with the pith nearly effaced, as in the Box. It is employed by cabinet-makers to inlay the finer species of wood which are contrasted with it in colour, and to form light, ornamental articles, such as dressing-cases, tobacco-boxes, etc. The wood of the roots, which is more agreeably marbled, is preferred. The Olive was classed by the ancients among the hard and durable species of wood, such as the Ebony, the

Cedar, the Box and the Lotus. On account of its hardness it was used for the hinges of doors; and before metal became common in statuary, it was selected by the Greeks for the images of their Gods. Three statues of Minerva were preserved in the citadel of Athens, which exemplified the progress of this exquisite art : the first, made of olive wood, and of rude workmanship, was said to have fallen from heaven; the second, of bronze, was consecrated after the victory of Marathon; the third, of gold and ivory, was one of the miracles of the age of Pericles.[1]

From its resinous and oleaginous nature, the olive wood is eminently combustible, and burns as well before as after it is dried. The value of its fruit renders this property unimportant; but after the severe winter of 1709, which proved fatal to the Olives throughout Languedoc and Provence, the country was warmed for a considerable time with this precious wood.

The Olive accommodates itself to almost every variety of soil; but it shuns a redun-

[1] *See* Barthélemy.

dancy of moisture, and prefers loose, calcarious, fertile lands mingled with stones, such as the territory of Attica and of the south of France. The quality of its fruit is essentially affected by that of the soil : it succeeds in good loams which are capable of bearing corn, but on fat lands it yields oil of an inferior flavour, and becomes laden with a barren exuberance of leaves and branches. The temperature of the climate is a consideration of more importance than the nature of the soil, as all the varieties of the Olive dread the extremes both of heat and cold. Neither do they delight in very low, nor in very elevated situations, but rather in gentle declivities, with an exposure adapted to the climate, where the fresh breezes, playing among the branches, may contribute to the health of the tree, and to the fineness of the fruit.

Notwithstanding the delicacy of its complexion, the Olive is extremely tenacious of life. When the trunk has perished by frost or by fire, it sprouts anew; and we are assured that if a bit of the bark, with a thin layer of wood, is buried in the earth, it becomes a perfect plant.

In this respect the Olive is the polypus of vegetables. It is multiplied by all the modes that are in use for the propagation of trees : by sowing the seed, by layers, by slips, by cuttings of the root, and by sprouts separated from the trunk or from the roots of the parent stock. The most obvious method, that of forming nurseries from the seed, is generally censured in books, and rejected in practice ; the difficulty of obtaining the young plants, and the length of time which must elapse before they begin to reward the labour of the husbandman, have discouraged its adoption. But if these objections could be obviated, it is doubtless the most eligible practice : as the plants thus reared begin a new life, they are more vigorous and of longer duration than off-setts from an old tree; they form also a perpendicular root, which penetrates deeply, and secures them from the danger of suffering by drought.

In most of the experiments that have been made of this method, the fruit has been sown entire; and this is even enjoined, as a necessary precaution. But, however it may seem to be indicated by Nature, such is not her

own process. The stones which produce the wild Olives are deposited by animals that digest the pulp, or by birds that carry away the fruit in their beaks, devour the pulp, and leave the stones to take their chance with the elements. The principles of vegetable physiology, also, support the conclusions derived from these observations:[1] the pulp not only invites the depredations of animals such as field-mice, pies, etc.; but this oily envelope, by preserving the shell from moisture, prevents its decaying in season for the germination of the kernel, which, in the meantime, becomes rancid and loses its fecundity.

Ripe fruit of the finest varieties is selected, (that of the *Gros Ribiés* is the best), and the stones, after being separated from the pulp, are cleansed in an alkaline solution. A sheltered situation is chosen, where the earth is thoroughly loosened to the depth of three feet, and enriched with the warmest manures. In the month of March the stones are sown, at a small distance apart, in trenches

[1] *See* De Saussure's Chemical Researches on Vegetation.

two or three inches deep, and covered with earth. The soil should be kept free from herbage, and occasionally watered during the summer. The young plants appear in October, and continue to vegetate through the winter. By the following spring, the most thriving among them will have attained the height of thirty inches. The feebler stocks should now be eradicated. With proper attention, and in a favourable soil, the remainder will be four or five feet high, and six or seven lines in diameter, in the course of the third spring, with a perpendicular root of thirty inches. This is the season for transplanting them. Great care should be bestowed upon the preparation of the ground, and the young plants should be placed three feet apart. After two years they will be sufficiently advanced to be grafted; and at the end of five years they may be transplanted to the olive-yard.

To accelerate the germination, the stones may be kept in fine mould during the summer and autumn, and sown in the beginning of January. They soon begin to vegetate, and before the following winter the young stocks

acquire strength enough to support its rigours, while the tender plant that comes up in October, is in danger of suffering by the lightest hoar-frost. Perhaps some advantage would be found in reducing the thickness of the shell before it is committed to the ground, in order to expose the germ more speedily to the influence of those agents which are necessary to its expansion.

Every mode of grafting is successfully practised on the Olive : the most common, and the most proper for young stocks, is that of inoculation. The operation should be performed in May, while the juices are in active circulation. Different opinions prevail respecting the insertion of the graft above or below the surface of the ground : grafting below the surface is attended with this advantage, that, when the trunk is destroyed, a generous progeny springs from its base.

A few stocks should be left to form new varieties. Fruit trees and flowers lose in reproduction, the properties which they had acquired by culture, and tend anew to the state of nature; but, in a great number of plants reared from the seed, a few are found

that equal or excel the parent. Florists consider themselves as fortunate if, among a thousand Hyacinths or Tulips, they obtain three or four deserving of notice.

The young Olives begin to yield fruit the tenth or twelfth year, and are fully productive about the twenty-fifth or thirtieth : thus Hesiod's observation, that no man gathers fruit from an Olive of his own planting, must be admitted with the abatements of poetry.

A second method of forming a nursery, which has been successfully adopted near Toulon, is by transplanting the young wild Olives.

The ancients relied principally upon propagation by slips,[1] and this easy and expeditious mode is still generally followed in Spain. A smooth, thriving sprout or branch, one or two inches in diameter, is cut into pieces twelve or fifteen inches long, which are carefully set, without wounding the bark, in ground prepared as for the seed. They are placed at the distance of three feet, and at

[1] *See* Geopon., lib. ix, cap. v.

such a depth that three inches only appear above the surface. To encourage the formation of roots, the larger end, which is committed to the earth, should be smeared with a composition of mould and animal manure, and the end which is exposed to the air should be protected by a covering of clay. Cuttings of the roots, also, buried in an inclined position in trenches four inches deep, will sprout in the course of the year; a few months later the feebler stocks are plucked up, and the more vigorous ones are left at the distance of three feet. Another easy resource is found in the shoots that spring up round the base of an old Olive, or from roots laid bare and wounded for this purpose.[1]

It is necessary, in every case, to ascertain the point at which the original stock was grafted. The offspring is invariably identical in its nature with that part of the parent tree from which it was separated; it requires grafting, therefore, if it was detached from

[1] Prizes have been repeatedly offered by the Agricultural Society of Paris, for the best essays on the formation of olive-nurseries.

a point below the insertion of the graft, or from a tree which had not submitted to this process.

All these operations are performed at the close of winter or the opening of spring. The length of time which the young plants should remain in the nursery, varies with their size and strength; but it rarely exceeds four or five years. During this period the ground should be kept mellow and clean, and occasionally watered in the summer, if the season is dry. But this indulgence should not be prodigally bestowed : vegetable as well as animal and moral life, is susceptible of habitude. For this reason it is also an important precept in the formation of nurseries, to select a soil analogous to that in which the trees are to reside. If the young plant is lavishly supplied with nutritious juices, its pores become distended, its fibres gross, and its vegetation luxuriant. Superfluous enjoyments easily become necessaries of life ; hence, when it is removed to a different scene, and condemned to struggle for existence in an ungrateful soil, it loses heart and perishes where it might have been long-

lived and fruitful, if its temperament had been hardened by early privation. —Thus it fares, if I may be pardoned the reflection, with the mind of an ingenuous youth, which, under better influences, might have been formed to virtue. If the lesson of disinterestedness had been early inculcated, it might have been indelibly learned; he might have been lead to sacrifice fame to humanity, as unhesitatingly as he sacrifices pleasure to fame. But, instead of being taught to consult only the unchanging principles of rectitude, and to be satisfied with the pleasures of benevolence, he is sedulously inspired with the love of glory; his ambition is fomented till this ungenerous passion assumes the ascendant in his breast, and becomes the arbiter of his existence.

When the nurselings are arrived at a proper age, the next step is to transplant them to the olive-yard. The task of preparing the ground for their reception should be begun immediately after the harvest. Holes or trenches, at least three feet wide, are dug, and left mouldering till the close of winter, which is the season for transplanting

the Olive. The stock and principal branches are lopped, and the wounds are covered with clay; but as much of the roots as possible should be preserved, with the earth adhering to them. When the trees are carried to a distance, which may be done with the precautions that are used for other fruit trees, they should be set during several hours in water, before they are replaced in the ground. Mellow, fertile mould should be spread upon the bottom of the holes, and thrown first upon the roots, among which the earth should be lightly forced, though it is not useful to render it compact, nor to heap it about the trunk. A copious watering follows, and is repeated in the course of the season, as the weather and the health of the plant may require.

The Olive, arrived at an advanced age, may be transplanted in the same manner as the young tree. In general, whatever vegetable is to support this trial, the most important precept is that the earth be widely broken up and minutely subdivided, so that the roots may be placed in their natural position, and that their first efforts to extend

themselves may not be embarrassed by compact masses, which they penetrate with difficulty, and from which they derive a scanty subsistence.

The Olives should be planted at such a distance that they may not interfere with each other, and that every portion of the soil may contribute to their nourishment. In meager lands from which no other produce is exacted, eighteen or twenty feet are enough; but in vineyards or corn-lands they may be thirty-five or forty feet apart. Cato assigns twenty-five or thirty feet, which, as a mean term, is sufficiently exact. In warmer climates, certain varieties attain such dimensions as to require a space of sixty or seventy feet.

Our olive-yard being thus formed, our next enquiry is concerning the culture necessary to obtain the most certain and the most abundant produce. Virgil, after describing the assiduous attention exacted by the Vine, leaves the Olive almost to Nature :

Contra non ulla est Oleis cultura : neque illæ
Procurvam expectant falcem, rastrosque tenaces,

Cum semel hæserunt arvis, aurasque tulerunt.
Ipsa satis tellus, cum dente recluditur unco,
Sufficit humorem. . . . . . .

VIR. GEOR. II.

Not so the Olives : when their roots have found
The needful moisture from the nurturing ground,
And, firmly seated, can securely bear
The summit tempted by the sportive air,
No more the harrow nor the knife they ask —
The plough completes, alone, the easy task.

Columella, on the contrary, advises the husbandman to bear in mind a judicious proverb : *Eum, qui aret olivetum, rogare fructum; qui stercoret, exorare; qui cædat, cogere.* It is true the Olive does not become barren when totally abandoned; but, like other vegetables, it repays the neglect of the husbandman with a diminished produce, and his care with larger and more abundant fruit.

In Provence it is customary to turn the soil in the spring and in the fall. Besides the tillage of the plough, the ground should be carefully dressed with the spade about the foot of each tree. More labour is required by some soils than by others; a compact,

argillacious loam must be more frequently turned than a light, calcarious mould.

The olive-yard should be manured at least once in three or four years; but it would be more beneficial to sustain its strength by moderate annual supplies. Most species of manure, while they increase the produce of the Olive, impair the quality of its fruit; the finest oil is made from wild trees growing in calcarious lands of moderate fertility. Vegetable substances are preferable to animal manures for fruit trees in general, and especially for the Olive and the Vine. When animal manure is employed, it should be tempered with marl, sea-weed, leaves, etc., and applied only when the whole is reduced to mould. To soils deficient in this ingredient, calcarious matter is of the utmost utility, and great benefit is said to be found in Spain from sea-water poured upon the roots of the Olive.[1] But the finest manure is the offals of the fruit that has been pressed,

[1] For other particulars of the practice in Spain, see the *Seminario de la Cultura à los Parrocos*, by Don Antonio Melon, an enlightened Spanish ecclesiastic.

and the washings of the utensils and the oil-vessels.

The manure is spread in the fall, in the winter, or before the tillage in the spring. Its effects are most sensible when it is applied at the beginning of winter, as during this season, its virtues are imbibed by the soil, and communicated to every fibre of the roots. Through the spring and summer, on the contrary, it sometimes remains nearly inert beneath the surface. But in climates where the Olive is liable to injury from cold, the most serious accidents are to be feared from keeping its roots too warm in the winter; its vegetation being in this manner quickened, so that the sap is set in motion by every genial sun that softens the bosom of Nature, it is exposed to the most imminent danger from the returning frost. The fatal effects of cold are frequently less attributable to its intensity than to its suddenness: a plant which has become relaxed by the tepid breath of a deceitful Zephyr, is surprised and killed by the frozen blast of the north wind. To maintain an even temperature at the roots during the winter, earth

should be heaped about the base of the trees, and the manure should be spread early enough in the fall to assist them in ripening their fruit and preparing the bloom of the succeeding year, or late enough in the spring to avoid the accidents of frost. The Greeks do not make use of manure, except when chance conducts a flock of sheep to the foot of an Olive, which immediately becomes conspicuous by a richer vegetation.

When substances proper for manure cannot be obtained in the requisite abundance, the deficiency may be supplied by sowing grasses or cereal plants, and ploughing in the green herb. The intelligent cultivator is aware that he thus not only renders back what was extracted from the earth, but, as vegetables imbibe nourishment from the atmosphere, and as their roots arrest nutritious particles which would have escaped by filtration or evaporation, that he enriches the soil by an accession of new matter.

Vegetable chemistry has probably important secrets to reveal in this part of practical agriculture. As a soil may be exhausted by the continued growth of the same plants while it

is still capable of bearing those of another genus, we should examine the nature of the particles consumed by different vegetables, in order to repair the waste by analogous supplies.[1]

The most glaring imperfection in the agriculture of those parts of France which I have visited, is the deficiency of manure. The number of cattle on the soil of the kingdom is unequal to its wants; and the modes of supplying the deficiency of animal manure are not generally understood. Where the species of husbandry admits of rotation, a field is sometimes exhausted by the repetition of the same crop, and left to recruit itself by a period of absolute repose; and in Languedoc the vineyards are often prematurely destroyed, that the soil may recover heart by lying fallow, or by the substitution of some other culture.

In some parts of France agriculture has made approaches to perfection; but the zeal of improvement is not widely diffused. Agricultural societies exist in almost every de-

[1] *See* Davy's Elements of Agricultural Chemistry.

partment, whose labours are seconded by the ardour of enlightened individuals; but great meliorations must spring from a general spirit of emulation, which it is not easy to awaken. The French, notwithstanding the rapidity of their conceptions, are a passive people, tenacious of routine. The number of liberally educated men who unite a taste for rural life with a fortune sufficient for experimental farming, is comparatively small. The gentry of France rush into the capital to escape from *ennui*, as, in the noble days of chivalry, the defenceless inhabitants of the champaign fled into the castles, at the approach of some plundering knight or lawless baron. The inspired twilight of their native groves is forsaken for the luxurious shades of the royal gardens, and the simple independance of rural life, for the gilded servitude of the court. Existence has a charm only in Paris; those who cannot reside in the metropolis, hurry into the provincial capitals to attend the levee of the prefect, and prefer bending in the saloon of this humble representative of royalty, to dispensing instruction and happiness among their dependants

at home. What *place* should a man solicit, before his country invites his services, who can breathe an untainted air upon his own estate?—Nor have the French, in appreciating the dignity of agriculture, modelled their taste upon that of the ancients, as scrupulously as in their literature : under the former monarchy, rural employments were considered as degrading to a gentleman.[1]

[1] Respect for the useful arts has long been taking place of admiration for the frivolous accomplishments of the ancient court, and it will finally dissolve the charm of military glory. I am aware, also, that the present court is not brilliant, but the cause is less simple and profound than a thorough renovation of the public character.

I speak on this subject, however, without pretentions to authority, and am farther than any man from meaning to affront the gallant and amiable French. Who can forbear admiring the constancy with which they have adhered to the legitimate principles of the revolution, through an anarchy the most terrible, and a despotism at once the most splendid and the most liberal of modern ages!

France was never more truly great than in her voluntary humiliation; her prospects were never brighter than in the midst of her adversity. Though vestiges of arbitrary power in every branch of administration remind her that she has always had *a government of men and not of laws*, public opinion is advancing with inevitable steps;

Though these reflections were doubtless more applicable before the revolution, and even before the restoration of the throne, they are still, to a certain degree, just.—But let me not lightly reproach an august nation with faults to which a corrective has been applied, radical in its effects, though necessarily slow in its operation. They will disappear as its institutions become more popular, so that public consideration shall be obtained by public services, and not by the favour of the great. Experience has not been thrown away upon the French people; they are forming a national character, in whose splendour, the glory by which they and Europe have been dazzled, will be swallowed up and lost. Their liberty was planted amid storms that threatened the social world with dissolution; it has resisted the hostile influence of every element, and it will rise and spread itself, ample and strong, till it

and the misguided sovereign who should seek to arrest its progress, would be treated, not like Charles I and Louis XVI, but like James II.

One of the greatest benefits of the revolution is to have obviated the necessity of future violence.

overshadows this happy country, and till its roots pierce the soil of distant lands. England herself, if she does not rise up betimes, and assert the reforms that have become vitally necessary to her constitution, may take lessons from her rival widely different from the contrasts with which she has been wont to feed her pride.

The remaining part of the cultivation of the Olive is pruning. Bernard informs us that this practice was but lately introduced into Provence, and that it is not universally adopted, nor reduced to correct principles and uniform rules. In some places a limb is lopped away every year to renew the wood; but this is an injudicious mode, as the suckers to which it gives birth engross the sap, to the prejudice of the productive branches. Pruning consists in cleansing a tree from dead wood and other impurities, which may be done at all seasons and by the simplest hand; and in retrenching its superfluous growth, which is a delicate operation, and requires judgment and experience. Its object is to determine the form of the tree, to open it to the light and air, and to regulate its pro-

duce. This is done by diminishing the number of branches, and by extirpating such as are too feeble or too luxuriant. The pruning of the Olive is subject to the general principles of the art, modified by the peculiar nature of the tree. A part of its branches should be curtailed every year, and the number of bearing shoots determined, so that it may not be exhausted by its fruit. After twelve or fifteen years, one or two of the principal limbs may be lopped; and at intervals, which must depend upon the condition of each tree, the whole summit may be retrenched. The most favourable season for pruning the Olive is in March.

Such is, summarily, the husbandry of Provence, which, though susceptible perhaps of improvement, is the most perfect in Europe.

More than thirty varieties of the Olive[1] are

[1] The most exact and extensive catalogue is found in the New Duhamel. The following are some of the most esteemed varieties:

1. The *Olivier pleureur*, *Olea craniomorpha*, fourteenth variety, is one of the largest and finest trees. Its branches are redundantly numerous, and pendant like

known in France, which are distinguished by their size, by their temperament as to soil and climate, and by the qualities of their

those of the Weeping Willow. Its fruit is good for the table, and yields a pure and abundant oil. It should be placed in vallies rather than on elevated grounds, as it has more to apprehend from drought than from cold: there are individuals of this variety in Languedoc that have three times survived the general destruction of the Olives by frost.

2. The *Olivier à fruit arrondi*, *Olea sphærica*, twenty-sixth variety, is also among the least sensible to cold. It requires moisture, a good soil, and abundant manure. Its oil is of a superior quality.

3. The *Olivier de Lucque*, *Olea minor Lucensis*, ninth variety, is hardy, and yields a fruit proper for preserving.

4.-5. The *Aglandaou*, *Olivier à petit fruit rond*, *Olea fructu minore et rotundiore*, third variety, and the *Olivier de Salon*, *Olea media fructu subrotundo*, nineteenth variety, are good for oil, and prefer dry and elevated grounds.

6. The *Olivier amygdalin*, *Olea amygdalina*, twenty-fifth variety, is much esteemed about Montpellier for its fine and abundant oil.

7. The *Picholine*, *Olea oblonga*, eleventh variety, yields the most celebrated pickled olives. This variety is not delicate in the choice of soil and climate.

fruit. Some of these varieties, like those of the Vine, owe their characteristic properties to the scene in which they are reared.

The principal product of the Olive is oil, but the pickled fruit is also a valuable article of commerce. The simplest manner of preserving the green olives, is by covering them with a solution of common salt impregnated with fennel, cumin, coriander-seed and rose-wood. The most perfect method is that employed for the *picholines* of Provence, which are so called from *Picciolini*, by whom the process was invented. They are gathered in the beginning of October,[1] and the finest of them are selected and thrown into a weak solution of soda or potash rendered caustic with lime. In this solution they remain eight or ten hours, till the pulp ceases to adhere to the stone : they are then steeped, during a week, in pure cold water, daily renewed, and are afterwards transferred to an aromatic brine. Such of them as are destined for

[1] The Greeks leave them on the trees till they are ripe ; they are less agreeable to the taste at first, but after a little use are found more rich and savoury than those of Provence.

the tables of the luxurious, are taken out after a certain time, deprived of the stone, in place of which is substituted a caper or a bit of truffle, and closed up in bottles of the finest oil. In this manner they are kept palatable for two or three years. The sweet olive of the ancients, which was eaten without preparation, is said to exist in the kingdom of Naples.

The proper season for gathering the olives for the press, is the eve of their maturity, which varies in different climates and in different varieties of the Olive, but which is easily distinguished by the colour of the fruit. Two powerful considerations should engage the cultivator not to delay the olive-harvest. We have already observed that the produce of this tree is alternate : the phenomenon, it is true, is more uniformly witnessed in some varieties than in others; but it might be assumed as a constant character, if it was not proved by experience to depend upon accidental causes. It has been attributed to the injury sustained by the trees in beating off their fruit; but it is not observed in some places where this practice prevails, and is

constant in others, where it is discarded. It has also been ascribed to injudicious pruning; but it is witnessed alike in olive-yards pruned in the most opposite modes, and in those that are unconscious of the knife. The little fruit that is borne in the year of repose is also of an inferior quality. Some other explanation must therefore be sought, and a satisfactory one is indicated by Pliny, in the continuance of the fruit upon the branches after its maturity : *Hærendo, enim, ultra suum tempus, absumunt venientibus alimentum.* This cause, which is generally admitted by vegetable physiologists in France, has been developed by Olivier in a Memoir presented to the Economical Society of Paris. Evergreen trees, and among them the Olive, put forth the young shoots that are to bloom the succeeding year, not in the spring, like trees with deciduous leaves, but at the close of summer; and the buds are prepared during the autumn and the beginning of winter. If, then, the tree is overladen with fruit, this second growth is prevented, and the hopes of the following season are precluded; or if the fruit is left too long upon the bran-

ches, it diverts the juices which should be employed in the preparation of the flower-buds. At Aix, where the olive-harvest takes place early in November, it is annual and uniform; in Languedoc, Spain, Italy, etc., where it is delayed till December or January, it is alternate. The quality of the oil, also, depends upon gathering the fruit in the first stage of its maturity. It should be carefully plucked by hand, and the whole harvest completed, if possible, in a day. To concoct the mucilage, and allow a part of the water to evaporate, it is spread out, during two or three days, in beds three inches deep.

The oil-mill retains nearly its primitive form; it consists of a basin raised two feet from the ground, with an upright beam in the middle, round which a massive mill-stone is turned by water or by a beast of burthen. The press is solidly constructed of wood or of cast iron, and is moved by a compound lever. The fruit, after being crushed to a paste, is put into sacks of coarse linen or of feather-grass, and submitted to the press. The virgin oil, which is first discharged, is the purest, and retains most sen-

sibly the taste of the fruit. It is received in vessels half filled with water, from which it is taken off and set apart in earthen jars. To separate the vegetable fibres and other impurities, it is repeatedly decanted. When the oil ceases to flow, the paste is taken out and broken up. As the sacks are returned to the press, boiling water is shed over them, and the pressure is redoubled, till every particle of the oil and water is extracted. The mixture is left in a vat, from which the oil is taken off as it rises to the surface. This oil, though less highly perfumed, is nearly as fine as the first, and is usually mingled with it. The offals of the fruit are sometimes submitted to a third process: in a basin into which a rill of pure water is admitted, they are ground anew; the skins and mucilaginous particles floating on the surface are drawn off into reservoirs, and the shells are preserved for fuel. The utmost cleanliness is necessary in making the oil; with the nicest economy in the process, which is finished in a day, it amounts in weight to nearly one third of the fruit. The mean produce of a tree may be assumed, in France at ten pounds, and in Italy

at fifteen; but single trees have been known, in the productive season, to yield three hundred pounds.

The kernel of the olive affords an oil, the mixture of which with that of the pulp is said to injure its flavour and to hasten its rancidity. A machine has, in consequence, been invented for bruising the pulp without crushing the stone: that the arguments for its adoption have not prevailed over the established usage, is no proof of their unsoundness; more convincing evidence is found in the exquisite quality of the oil of Aix.

But there are abuses which experience has demonstrated, without being able to correct them: the fruit, after hanging too long upon the trees, is kept fermenting in heaps, to increase the quantity of oil, while the only effect is to vitiate its quality.

Before the revolution, an apology was found for these abuses in France, in the embarrassments to which industry was subject from the oppressive exactions of the feudal lords, and from the absurd interference of the government. The tenants were compelled to use the mills of the lord, which were

never sufficiently numerous; and in Languedoc the period of opening them was fixed by the police, as the time of collecting the gall-nuts is appointed by the Turkish Agas in Asia. The ancient practice is now gradually yielding to a more perfect method; yet how slowly is prejudice subverted, even by interest!

Besides the finest oil which is used upon the table, immense quantities are employed in the making of soap, and for other mechanical purposes. A part of what is consumed in this way at Marseilles is imported from Greece and the Mediterranean Isles.

I have thus rapidly sketched an outline of the history and cultivation of the far-famed Olive.—Among the gifts of Minerva which adorn our rising empire, policy, and arts, and arms, may we hope to see her favourite tree enrich our soil? Some light may be thrown upon this enquiry by an examination of our climate, but it can be resolved only by experience.

The eastern and western shores of the At-

lantic Ocean differ essentially in the phenomena of climate.[1] In Europe the distribution of heat through the seasons is more uniform, and the medium of the year more elevated. This equability is highly favourable to the perfection of organized bodies; hence the vegetables of America are meliorated in the corresponding latitude in Europe, while many productions of Europe cannot exist under the same parallel in America.[2] We are obliged, also, to migrate in the train of the Seasons in quest of an agreeable temperature, which the more favoured Europeans enjoy without changing their native signs. We experience, in the same latitude, the summer of Rome, the winter of Copenhagen, and the mean temperature of the coast of Britany. Nor is this difference attributable to the state of cultivation, nor to any accidental cause with which we are acquainted: in

[1] *See* De Humboldt's Memoir on the Distribution of Heat.

[2] Yet vegetation is more vigorous and more varied in the United States than in the same latitude in Europe. *See* De Humboldt's Vegetable Physiognomy, in his charming work of the Pictures of Nature.

the eternal forests that shroud our north-western coast we find again the delicious climate of Europe, while Tartary and China repeat the phenomena of our own. For the enjoyment of life and for the richness of agriculture, we should have been more advantageously situated on the opposite side of the Continent.

The Olive requires a climate whose mean temperature is equal to fifty-seven degrees seventeen minutes, and that of the coldest month to forty-one degrees five minutes.[1] In the United States, where the mean temperature of the year is fifty-seven degrees five minutes, that of the coldest month is only five minutes, with many days far more intense. The capriciousness of our climate is still more dangerous to delicate vegetables than its inclemency; the difference of temperature in a single day is almost equal to that of the whole year, in the South of Italy. The Olives near Charleston were rendered barren by the vernal frosts, which congealed

[1] *See* De Humboldt's Essay on the Geographical Distribution of Plants.

the young shoots. In a more southern latitude they would be secure in the winter, but they would languish through a sultry summer, unrefreshed by the healthful breezes which they respire on the shores of the Mediterranean Sea : they would, besides, find a silicious instead of a calcarious soil.

But with all these disadvantages, tracts uniting the conditions necessary for the growth of the Olive may probably be found, sufficiently extensive for our wants. The possibility of its flourishing on our shores has been demonstrated by at least one experiment.[1] While the Floridas were held by the English, an adventurer of that nation led a colony of Greeks into the eastern province,

[1] Mr. Warden has obligingly pointed out to me proofs of its existence, before the middle of the last century, in other parts of the United States : *See* Burton's British Empire in America; Du Pratz's History of Louisiana; American Husbandry, by an American, etc. The last mentioned author asserts that it thrives well in the interior parts of Georgia. "The Olives of Louisiana, says Du Pratz, are of surprising beauty; the Provençal settlers affirm that they yield as good oil as in their own country, and the prepared fruit is found equal to that of Provence."

and founded the settlement of New Smyrna: the principal treasure which they brought from their native clime was the Olive. Bartram, who visited this settlement in 1775, describes it as a flourishing town. Its prosperity, however, was of momentary duration: driven to despair by hardship and oppression, and precluded from escape by land, where they were intercepted by the wandering savages, a part of these unhappy exiles conceived the hardy enterprise of flying to the Havannah in an open boat. The rest removed to St. Augustine when the Spaniards resumed possession of the country. In 1787, a few decaying huts and several large Olives were the only remaining traces of their industry.

Louisiana, the Floridas, the islands of Georgia, and chosen exposures in the interior of the State, will be the scene of this culture: perhaps it will be extended to some parts of the Western States. It has been hastily concluded that the Olive can exist only in the vicinity of the sea; it is found in the centre of Spain, and in Mesopotamia at the distance of a hundred leagues from the shore.

The trial should be made in every place where its failure is not certain; and for this purpose young grafted trees should be obtained from Europe, and the formation of nurseries from the seed immediately begun.

The Olive is perhaps the most valuable, but it is not the only accession that might be made to our vegetable reign, if a more enterprising spirit prevailed in our husbandry, and if establishments were formed for the reception of exotic plants. This important subject claims the attention of government: amid its labours for the promotion of commerce and manufactures, why should not its fostering care be extended to agriculture?

The people of the United States, instructed by experience, have consecrated an altar of oblivion to the Genius of the waves and to the Genius of the soil. They will not allow one system of industry to be promoted at the expence of another. We have solved the transcendant problem of reconciling the interest of the individual with that of the public, by throwing down the barriers to every species of industry, and by leaving every man to enjoy the fruits of his labour

undiminished by the exactions of a rapacious government. Let these principles be the immovable basis of our political economy. The height of prosperity to which we have attained is doubtless attributable to the successful enterprises of our merchants; and our commerce should still be cherished and defended like the sacred soil of the Republic. But is not the moment arrived when we may begin to measure the greatness of our country by some other standard than simply that of commercial prosperity? With means so ample and unembarrassed, might we not give more activity and extension to works of domestic improvement? Slavery remains to be abolished — education to be perfected — a national character to be formed — our strength to be established on durable foundations, by the developement of our internal resources. Institutions should be devised, which, by assimilating the feelings of our citizens, may corroborate that union which is the bulwark of our national independance, without intrenching on those subordinate sovereignties which are the guarantees of our political liberty. A taste for pacific

glory should be inspired, and an impulse given to public spirit, in harmony with that magnanimous moderation which becomes the future arbiter of nations.

From these great objects no schemes of vulgar ambition should for a moment divert our ardour. The influence of our character already far exceeds that of our strength, and our claims to the rank of a primary power are admitted by anticipation. The attention of the world is daily becoming more intently fixed upon our actions. Old Europe contemplates us with reverent affection, as the hoary-headed warrior gazes on the blooming hero whose youthful achievements eclipse the glory of his sire. A great example is wanted by mankind; from us they demand it; and the cause of universal liberty is interested in our conduct.

I do not utter these sentiments in the language of reproach. Much has already been done by my country, which is admired by contemporary sages, and which will go down with honour to a more enlightened and philosophical posterity: all that is great and good may be expected from her maturer wisdom:

but I feel interested in her glory; she has risen upon my affections by absence, and upon my esteem by comparison; her progress, however rapid, halts behind the impatience of my wishes.

Our fathers have left us a noble inheritance, and it is our duty to improve it. What surer basis can we choose for national wealth, than a learned and enterprising agriculture? How can we more effectually strengthen the ties of interest that bind the extremities of our country in indissoluble union, than by augmenting the number and the value of their useful productions? How can the intelligence of a people be more favourably developed, than by an art which gives so wide a scope to comparative sagacity, and which brings its conclusions to the test of immediate experience? Who are more likely to be devoted to their country, than those who have attached the hopes of their children to its soil?—There is, besides, in the profession of agriculture, something so congenial to republican manners, that we should naturally expect to see the freest country the best cultivated. Remote from the contest of sordid passions,

and surrounded by all that is necessary to his happiness, the husbandman has no inducement to calculate the interest upon political corruption A laborious life, spent in the open air, in the majestic presence of Nature, lends a corresponding simplicity and elevation to his character. In public stations a patriot is often driven from his purpose by the jealous opposition of his rivals, or by the invincible prejudices of his age; he must, at least, sacrifice his freedom to the duties of his office; but in a life devoted to agricultural improvement, the purest sources of rational enjoyment are united: the first want of a generous spirit is that of being useful to mankind; the second, is that of liberty.

FINIS.