Remarks on the Culture of Exotic Vegetables, adapted for the Soil and Climate of South Africa. By Mr. J. Bowie, Member of the South African Institution.

[*Continued from p.* 171.]

QUERCUS ROBER. Common Oak. Eiken. A tree of the Class Monoecia Polyandria of Linnæus, and Nat. Ord. Amentaceæ of Jussieu, and Sub-Order Cupuliferæ of Kunth.

This tree being so generally known to the colonists, I only mention it here to recommend the planting of acorns along with the seeds of such species of fir as may be sown on bleak exposures, and where the oak is as yet a stranger, or has hitherto failed in growth.

In choosing the seeds for planting, reject those of such trees as appear to put forth their leaves very early, instances of which are common in the Cape District. Such tendency to premature foliage, I consider as a certain indication of an inferior timber; and, unfortunately, the variety already in the colony, is one of the worst known, in this respect, in its native country.

When the oak-trees (planted among fir,) have attained a moderate height, the fir should be gradually removed, to enable the oak to gain strength, otherwise it might be drawn up too slender to form useful timber hereafter; and, where this is desired, the fir ought, eventually, to be wholly removed.

Where an oak-tree has remained in an inactive state for several years, or has only attained a few inches in height, this is most likely caused by its not having thrown out any lateral roots. Such trees, therefore, ought to be cut down to the ground. The *rising* sap will then exert itself, and form not only numerous roots, but likewise stems. After one or two seasons standing, choice should be made of one of those to remain, and form the future tree. The supernumary shoots are to be pruned away. This practice is also applicable to many other kinds of trees.

When oak-trees are planted near dwelling-houses, some encouragement should be given them at first, by preparing a light vegetable soil, and mixing it well with the earth which comes in immediate contact with the roots; and the planter ought to bear in mind, what he expects may be the size of the tree in a few years, and not what it is when planted. Trees of large growth, when planted too near the dwelling-house, often become nuisances, where the benefit and luxury of shade and shelter were designed.

The oak appears to have been introduced into the colony at

an early period. Several persons have considered it as an indigenous production, and have called it "African oak:" this appellation confounds it with another distinct Genus. Some species of Quercus have been discovered in Northern Africa, but none, as yet, in the southern parts. Much error has also been propagated respecting the growth and quality of Cape-grown oak-timber; but, although not equal to British, the ship and boat-builders in Cape Town, do not hesitate to use it in the way of their profession.

CYTISUS LABURNUM. Laburnum. Diadelphia Decandria of Linnæus, and Nat. Ord. Leguminosæ, Jussieu.

This tree has been successfully introduced to the colony within these few years, and it is presumed that its extended cultivation will prove valuable to the country at large.

Its native station on the Alps of Europe, its affinity to several South African shrubs of the same Genus, and its known hardy nature, render it eligible, as a tree of moderate height, for planting on the exposed mountainous districts of the colony. It forms an excellent shelter for rearing other trees under, and, for this purpose, may be treated in the same manner as recommended in the culture of furze.

Where the laburnum forms plantations for poles or timber, the seeds should be sown thinly, where they are to remain; it, however, bears transplanting well, and thrives either in deep rich soil, or the more shallow and sandy earths. It forms durable poles for various purposes; and, where hard woods are required for furniture, wedges, or pegs, &c. no wood can be better adapted than this. In character and appearance, it resembles green ebony.

Goats are remarkably fond of its leaves; and it has been celebrated by naturalists and poets for ages, as augmenting the milk of that animal. Hares and rabbits will not touch the bark of other trees, while they can procure food from the laburnum; the young shoots of which they eat down to the ground. The leaves are diuretic and resolvent; the green seeds of this tree are violently emetic: children should therefore be cautioned not to eat them.

Having briefly noticed some of the more interesting trees and shrubs adapted for fences, shelter, and timber; and, considering the rapid advance of the season for nursery operations, it will not be considered too abrupt to direct the attention of individuals to the fruit department, and some interesting and highly ornamental exotics of another description.

MANGIFERA INDICA. Mangoe, Mangas. Pentandria Mongynia, Linnæus, and Cassuviæ of Brown's Nat. Orders.

This interesting tree is a native of the East Indies. The

green fruit is much esteemed for pickling, and is also used in curries. The ripe fruit is considered depurative, and is excellent eating. The kernels are vermifuge. There are many varieties of this fruit; and in this respect the same attention appears to be paid to their culture in India, as the apple receives in Europe.

Two varieties of this tree are in the garden of Michael van Breda, Esq. (with many other valuable and interesting exotic productions), one of these may be considered as the original uncultivated variety, which seldom produces fruit until it has attained a large growth; the other is one of the cultivated kinds, produces fruit at an early period, and, with some attention, might become interesting to this colony.

To raise stocks of this tree, the seeds, from thoroughly ripe fruit, should be planted soon after they are divested of the pulp; it being one of those seeds which do not retain their vegetative powers for any considerable length of time. It may also be increased by layers and by cuttings. This latter method requiring particular care and attention, and being new to the colony, but necessary in practice for the increase of many plants propagated by cuttings, I shall offer sufficient instructions for the operation.

Pots, of unglazed earth, being well drained at the bottoms with broken potsherds or rough pebbles, should be filled to within half an inch of the tops, with pure sand (that washed from the mountains to be preferred), and must be well soaked with water to settle the sand firmly in the pots. The cuttings are to be prepared from the ends of the shoots, having three joints to each. The leaves are to be carefully cut from the two lower joints, and the lower part of the cutting is to be cut off transversely, immediately below the bottom joint. The leaves are to be left on the upper joint, but if they are of an inconvenient length, they may be shortened. The cuttings may now be planted by small dibbers in the pots; and, if the lower part of the cuttings should rest upon the stones, &c. in the bottoms, it will encourage their striking root. The two lower joints, from which the leaves were taken, should be covered with the sand. Immediately after planting, they should be watered, to settle the sand to the cuttings. Glasses, of a convenient size, so as to leave only half an inch clear between their circumference and the rim of the pot, must be firmly pressed down over the cuttings. The pots must then be plunged to their rims in decayed tanner's bark, in a warm situation. They must be sheltered from the sun's rays; or, if attendance in this respect may be considered too troublesome, the inside of the glasses may be moistened with water, and sprinkled with dry sand; enough of which will adhere to the glasses to shade the cuttings.

Every three days they will require water, which may be applied over, and without lifting, the glasses. Indeed, the glasses must be disturbed as little as possible. Once a week they may be lifted, to observe if any decayed matter, or mouldiness, is gathering on the pots; if so, it must be removed, as well as any grass or other weeds; cutting those off with a sharp instrument, so as not to disturb the soil or cuttings. The successful growth of the cuttings will be seen by the bud at the tops bursting, and putting forth new leaves. At this period they require more water, and strict attention must be paid to the appearance, in colour and strength of the shoots. The glasses must be tilted up on one side for the admission of air during the day, increasing the height until the glasses may be entirely removed. A little practice will render a careful and attentive person soon perfect in the above operation; and to many, an agreable and instructive amusement will be afforded by observing, first, the powers of vegetation in the descent of sap to form fibrous roots; and, afterwards, the essential properties of those organs in collecting matter from the earth for the formation of the future tree. The latter end of August is supposed to be the best season for the above operation; but in this respect the cultivator must be guided by his own judgment, only taking care to make the cuttings a few days before they would be forming new leaves, were they left on the parent tree.

When the mangoe is to be propagated by layers, the ground must be prepared as directed for the olive. The branch must be slit and extended, to receive and retain the earth; or, if a ring of the bark, about one-eighth of an inch in breadth, be removed from around the stem, immediately below the joint which is to be placed in the ground, they will root freely.

In raising the plants from seed, it is advisable to sow the seeds in pots or boxes filled with light vegetable soil, and to plunge the boxes or pots in the ground, and keep them moderately moist, giving a less quantity of water when the plants appear to have arrived at their full growth for the season. Water immediately from the spring ought not to be applied, either to the young seedlings or the cuttings; it should be kept in vessels for twenty-four hours, both to soften, and to approach in temperature the heat of the atmosphere.

Whatever method may be practised in the rearing of the mangoe, too much haste must not be exercised in the first planting out of the young trees. They should be well rooted and planted out in nursery beds at one year old, in rows, about one foot plant from plant, and three feet between the rows. The soil should be light, and manured with decayed oak-leaves. Such of them as are intended to be grafted with

approved varieties, will be fit for the operation in the second or third year; and it may be necessary to cover the band which fixes the graft with well-tempered clay and cow-dung, to exclude the air; taking especial care to leave the top buds of the graft free and unconfined.

In the final planting out, they must be sheltered from the violence of the S. E. wind; and it must be remembered that the mangoe is a large spreading tree requiring much room, and that it may stand for ages; a single tree sometimes covers with its branches a space of forty feet in breadth. A loamy soil is favorable to the growth of this tree, but it thrives well also in light vegetable earths.

Seeds of this tree sent from India, should be packed in sand; or they should be planted in boxes of light soil just before shipment, and kept on deck, where they will require no water, unless they vegetate on the passage.

PSIDIUM PYRIFERUM. Guava. Bay Plum. Goyaves. Icosandria Monogynia, Lin. and Nat. Ord. Myrtaceæ, Kunth.

This fruit, so well known throughout the colony, is a variety of the worst description, of an otherwise wholesome and agreeable fruit; attempts should therefore be made to improve, by culture, that which we already possess, or to endeavour to procure seeds or plants (from elsewhere) of a better kind.

The fruit of the guava should be left on the trees till they fall dead ripe, The seeds may be then separated from the pulp, slightly dried, sown, and treated in a similar method as directed for the mangoe. Rotten dung should, however, be added to decayed leaves as manure.

In the Brazils, where there is an abundance of this fruit, they are particularly fine, and, in size and flavor, are as much superior to those of this colony, as the apricot exceeds the Hottentot plum. A very fine marmalade is made of the fruit, and, in such quantities, as to form a source of great profit to the peasantry of that country.

Seeds of the guava may be procured from Rio de Janeiro, as well as several other species of the same family, particularly the Arasá, the Arasá do Pedras, and the Arasá do Chiné: which last was introduced from Rio to England in 1816, and is known in botanical collections there, by the name of Psidium Cattleyanum. It is, as the Portuguese name imports, a native of China. The plant, with its glossy dark-green leaves, and crimson-coloured fruit, is highly ornamental.

The young leaves, buds, and fruit of the guava, in decoction, are astringent, and the marmalade the same. The seeds, cleaned from the pulp, keep good for some time, re-

quiring only to be packed in paper, and kept dry. The loamy soils of Uitenhage, Graaff-Reinet, and Albany, appear particulary adapted to the growth of this tribe. In the latter district are two indigenous kinds of fruits, belonging to the same natural family as the Psidium. The common guava also thrives in moist sandy soils.

CITRUS. Orange-tree. Polyadelphia Polyandria, of Lin. and Nat. Ord. Aurantiaceæ. Decandolle.

We need require no more convincing proof of the necessity to improve our exotic fruits, than to take into consideration the value and importance of the Genus Citrus; and we may rely on the chance of success which must attend on well conducted experiments, in the endeavour to procure so desirable an object. Notwithstanding the praises bestowed by persons coming direct from Europe, on the goodness of oranges grown at the Cape of Good Hope, others, who have visited South America, on giving their candid opinion, must declare in favour of the produce of that continent. Among the many varieties of orange grown (I cannot say cultivated) at the Cape, there is none which deserves to be called excellent. I shall, therefore, endeavour to point out the most likely methods of improvement, and hope that some of these suggestions will be put in practice, at least those which will enable us to get rid of the worst kinds, which now disgrace the country.

Of Citrus Aurantium. Orange, or Zoetlemoen; there are three leading varieties—the sweet, the sour, and the bitter; and those will produce, from seed, sub-varieties without end, and of different qualities. Although this method may be deemed tedious, it is necessary to pursue it.

In choosing seeds for planting, the finest flavoured, and deepest coloured, well shaped fruit, and such of these as produce the fewest seeds should be selected. In regard to the seville, or bitter orange, a thick rind is to be preferred. The fruit may be allowed to remain till nearly rotten, before the seeds are cleaned from the pulp, and dried for a day or two before they are sown.

Beds of a sandy loam, well manured with old cow-dung, should be prepared for their reception. The seeds are to be sown in drills drawn about three feet apart from each other; and, if the weather should prove dry, they must be occasionally watered. The young plants will appear in about three weeks; soon after which they must be thinned out to about nine inches from each other in the rows. The leaving them thus close, is to cause them, if possible, to form but one clean and upright stem, from 18 inches to 5 or 6 feet in height, which will give a variety of stocks for grafting upon, (should

their fruit not render them worth keeping) suitable to every purpose of useful or ornamental planting. While in a growing state, they must be supplied with liquid manure to strengthen and continue their growth; and, when this is applied, simple water will not be required.

The liquid manure is prepared as follows:—take two barrow-fulls of fresh cow-dung, one barrow full of fresh horse-droppings, without litter, and one barrow full of fresh sheep-droppings, to which must be added one skepel of quick-lime for each hogshead;* it is to be made of the thickness of cream, by adding water, when it will be fit for application. The beds must be kept from weeds by occasional hoeing; which, loosening the soil, will admit the liquid manure more freely to the roots. By a liberal supply of this manure, some of the stocks will be large enough to receive buds or grafts for dwarf trees, at twelve months old.

The citrus may be propagated by cuttings, which may be put in the ground at all seasons of the year, while the trees are not forming young wood. The cuttings must be formed of the ripened and round-shaped stems; cutting off the angular and less matured wood, and leaving a few leaves on the upper part of the cutting. The cuttings being planted in a light rich soil, may remain without water for some time, unless the season should be very dry. Shade them from the glare of the sun; and when they begin to shoot, treat them as directed for the seedlings. It is hardly necessary to observe that cuttings of the best kinds only should be planted. They should be made from 9 to 18 inches long, allowing from 2 to 6 inches being left above ground. The citrus cuttings do not require glasses.

Good kinds may also be increased by layers; treating them as directed for the mangoe, but allowing them a richer soil, and liquid manure.

Where it is intended to rear stocks solely for grafting or budding the orange upon,—the best is the seville, or bitter orange; next, the citron; and lastly, the sour lemon; the last appears well adapted for the purpose in this colony, as it thrives better than the orange, on light sandy soils.

Budding and grafting are resorted to for the express purpose of securing good flavoured kinds of these fruits; and it would be creditable to persons who possess old and healthy trees, which produce an inferior description of fruit, to head them in, and graft approved kinds upon the branches, as near the trunk of the tree as possible. One scion on each stem would be the best, as this method admits of a sloping cut, which allows the fresh bark to cover the wound more readily

* Fifty-one gallons.

than over a transverse cut. In adopting this plan, the loss of fruit for one or two seasons at most, would be the extent of damage; but it would be of further benefit in the destruction of insects infesting the trees, and at a less loss than cutting them down to the ground.

Another method of propagating citrus, borrowed from the Chinese, and lately termed *local radication,* is worthy of attention, and suitable to the circumstances of this country; fruit-bearing trees being formed by it in a few months. It may be performed thus:—select a handsome fruit bearing stem, (on an old tree,) about half an inch or an inch in diameter, cut a ring of the bark half an inch in breadth from round the stem, which part place in any convenient vessel of wood or cork, or in a canvas bag, capable of containing about eight cubic inches of a rich compost soil, with which the vessel must be filled, and made fast to the stem inclosed therein; above this fix a calabash, or other vessel filled with water, but perforated at the bottom with a small hole, to allow the water to drop constantly on the soil in the lower vessel. In a short period the branch will take root. In a few months it may be cut from the tree, and at any season of the year, if found to be sufficiently rooted. It is then to be planted where it is intended to remain. Care must be taken to keep up a constant supply of water in the upper vessel; and, if the one containing the soil is covered with moss, it will hasten the progress of the roots. The above practice is applicable to many species of trees; especially apple, pear, and plumbs, &c.

In planting an orangery, if possible, a loamy soil must be selected. A clay soil, also, is favorable to the growth of the orange, provided it is well manured. The manure applied to such soil, should be composed of two parts cow-dung, one part horse-droppings, and one part decayed leaves (those of fir should be rejected); this compost ought to be prepared some months previously to using it, by throwing it in heaps, and occasionally turning and mixing it till wanted; when it must be trenched in with a liberal hand.

The ground being ready, the best trees are to be selected from the nursery-beds and planted out in the quincunx manner, at 25 feet apart each way; especial care must be taken not to bury the roots; but, of two faults, choose the less evil, and rather expose the upper roots on the surface, than place the stem deeper than it has been in the ground before.

If the natural soil should be either a stiff clay or a very sandy loam, a dressing of manure will be of service every year, and frequently supercede the use of water; which, if possible, should only be let on to the trees when the fruit is set, and during the period of its swelling. Local situations

sometimes require water to be given, but too much is injurious, and in the Citrus tribe produces disease, which is shewn by the leaves becoming of a sickly yellow colour, and together with the immature fruit falling off.

The insects which infest those trees may be destroyed by making a lye of soft or black soap, nearly of the consistence of cream, adding thereto four ounces of tobacco-dust, and one ounce of sulphur vivum to each gallon. On the stems this mixture may be applied with a brush, and the leaves sprinkled therewith by a garden engine or watering-pot.

Of citrus medica, lemon, or zuurlemoen, there are three leading varieties in the colony; of these the large oval-shaped with a prominent nipple, is the best, as being the most acid variety.

The citron is considered a variety of C. medica.

Citrus decumana. Shaddock or pampelmoes, is deserving extensive culture for sea stock, as it keeps good for some time.

Citrus nobilis. Mandarin orange or narretje. Several varieties of this fruit are in the colony, many of which are insipid. Grafts of better kinds should be placed on those stocks.

A young healthy plant of the Maltese bloody-orange was brought to the colony in 1827. When this variety becomes known, and can be increased, it will supercede many of the varieties of the Cape orange.

The Bahia orange, a large fruit without seeds in the centre, but having a *navel* at the crown containing the rudiments of seeds, would be valuable to the colony; plants of this sort may, perhaps, be procured from Rio de Janeiro; it was, however, scarce there in 1816.

Nat. Ord. CAMELIEÆ. Decandolle. Monodelphia Polyandria, Lin.

CAMELLIA THEA. Bohea tea.

This plant, which has become so interesting in regard to commercial pursuits, and whose leaves are even considered as a necessary of life to many millions of people in every rank of society, has been long since introduced to this country, but without attracting that notice, which even common curiosity might excite. I am not aware, however, of its being in existence at present in the colony; it was here in 1814.

This plant may be readily propagated by seeds, layers, and cuttings, treating them in a similar way as the citrus. If cultivated to any extent, the young plants should be placed in rows in a nursery-bed for one year, with about nine inches between each plant. On the final planting out where they are to remain, a distance of three feet is requisite.

The tea-shrub grows freely in light sandy soil, but some-

what quicker, and more luxuriantly, in such rich black earths as contain much vegetable matter. The plantations of this shrub near the city of Rio de Janeiro, are in a stiff loam, and the plants appear to thrive in the highest perfection; it will not, however, become, for ages, an article of export from the Brazils; the preparation of the tea for market requiring more manual labour than the Brazilians can spare at present from other occupations.

CAMELLIA OLEIFERA. Oleaginous camellia.

When this species is cultivated in China, it is for the sake of its seeds, from which a large portion of excellent oil for culinary purposes is extracted. It has not yet been introduced to this colony, but might be procured from China in the manner directed for the transport of the mangoe.

CAMELLIA SESANQUA. Lady Banks' Camellia.

This species (of which there are several varieties,) is not in the colony, but might be procured from Canton; it is deserving of cultivation. One of the finest teas of China is prepared from its flowers: the leaves are also used as tea, and, being odoriferous, are mixed with those of olea fragrans, to impart scent and flavour to the true tree, whose leaves have little or no smell. The seeds are pressed for their oil. This species grows wild on a very poor sandy soil. The lower classes in China principally use the leaves of it as tea.

CAMELLIA JAPONICA. Japan rose.

Three varieties of this species have been for some years in this colony; they are, 1st. single red, 2d. double red, 3d. double white; three other varieties were introduced in 1827, from England, viz: double white, double red, and double striped. As ornamental plants, there are few others which can compete with these in the variety and beauty of their flowers, and the vigorous growth and beautiful green of their foliage. It is not, however, for those pleasing qualities, that mention is made of them here; but to bring them into notice as ever-green shrubs, adapted to form hedges or skreens in gardens or plantations, and also to recommend their culture for the sake of their seeds; which yield, in common with the rest of this genus, an oil, easy of preparation, and valuable for the table and other domestic purposes; for which, at present, we employ the oils of Europe.

The double flowers of this species rarely produce seeds, but the semi-double and single varieties afford an abundance. When these plants are raised from seed, there is a chance of their varying from the parent stock in colour, and in the size of the flower. If their beauty should not be considered sufficiently great to recommend them as ornamental plants, more favorite varieties may be grafted on them.

If those plants are propagated by cuttings, these must be taken from the last year's wood, and before the buds begin to burst; they will sometimes remain in an apparently quiescent state for a long period, during which they must be sparingly watered, and kept shaded from the sun: glasses placed over them will hasten their growth; on removing these care should be taken not to injure the roots; they must not, on any account, be transported while forming new wood.

The method of procuring the oil from the seeds is this:—the seeds are reduced to a course powder in a mortar, by manual labour, or by such machinery as can be moved by water; the powder is stewed or boiled in bags, and then pressed; when the oil is yielded.

For instructive and amusing accounts of the camellicæ, and other Chinese plants, the reader may refer to Barrow, Abel, and other scientific travellers who have published accounts of their visits to China, &c.

There is no doubt but that tea might be cultivated in many parts of this colony, even in the coldest districts; but it is very doubtful, even if the population were sufficient to spare hands for its preparation, whether the growth of it to any extent would be advisable.

RIBES RUBRUM. Currant. Aalbezie, Pentandria Monogynia, Linnæus. Nat. Ord. Grossulariæ, Decandolle.

There are two principal varieties of this species, distinguished by the colour of the fruit—the white and the red. They were introduced to the colony previous to the year 1695, and several times since that period, but hitherto without beneficial results.

The heat and droughts prevalent at the Cape are not favorable to the cultivation of this shrub, and the production of its fruit, as, in these circumstances, it continues in leaf throughout the year; but there is little doubt that, should it meet with proper treatment, and be planted in the colder districts, its berries will become a useful and acceptable addition to the other fruits grown here.

The plant is most readily increased by cuttings of the young ripened wood, which strike root quickly. These may be planted in the months of June and July. It may also be reared from seeds, which should be sown as soon after they arrive at perfection as possible. There is little chance of procuring a superior variety of fruit by this method, but one more suitable to the climate of South Africa may be produced.

This plant should be planted in a southern exposure, to avoid as much as possible the solar rays; which, in this country, are too powerful for it. The plantations may be formed and treated in a similar manner as practised with the vine in

this colony; but, in the autumnal or winter pruning, the leading shoots should be left somewhat longer, in proportion, than is done in the vine.

The fruit is acid and cooling; the juice of the fruit, with sugar, is drank as lemonade; it also, with the addition of sugar, makes a pleasant wine.

RIBES UVA CRISPA. Smooth gooseberry. } Kruizbe-
GROSSULARIA. Rough gooseberry. } zie.

By the list of plants cultivated in the once interesting garden of the Cape, this shrub appears to have been introduced to the colony at the same period as the currant; several varieties of the seeds and plants have been brought of late years to the country, but without beneficial results, as the fruit yet remains a stranger to our market; hence, many persons who have long resided in the colony infer, that the fruit cannot be produced here; but this is not the case: I have frequently seen the smooth-fruited kind here; and, particularly, a very fair sample of them produced at Stellenberg, near Wynberg, in 1820.

The gooseberry requires much the same treatment as the currant; but care must be taken in the summer pruning to divest the leading stems of superfluous spray or water-shoots. In raising plants from seeds there is one great advantage, viz. that it is likely to produce many new and superior varieties. This plant also requires attentive cultivation by frequent manure and careful pruning, or the fruit will degenerate. It may be trained as espaliers to advantage; and as small standards, keeping the stem free from any suckers which may be thrown up by the roots. Attention to this circumstance is also necessary in the currant.

The juice of the berries is used as a sauce for fish, and is astringent; but when very ripe, laxative: and makes an excellent vinegar. The red hairy kinds make a superior Champagne. The seeds, washed and roasted, are a substitute for coffee.

In the environs of Cape Town, where those plants have been injudiciously exposed to a northern aspect, the plant has become an evergreen, and being constantly growing, and without the necessary rest, can never produce fruit. In the colder districts of the colony there is no doubt of its thriving, particularly in the *Sneeuwberg, Langekloof,* and *Bokkeveld.*