NEW

COMMERCIAL PLANTS

WITH DIRECTIONS

HOW TO GROW THEM TO THE BEST ADVANTAGE.

No. 1.

LIBERIAN COFFEE.

AFRICAN INDIA RUBBER.

TURKISH TOBACCO.

CAUCASIAN PRICKLY COMFREY.

BY

THOMAS CHRISTY, F.L.S.

LONDON:
PUBLISHED BY CHRISTY & CO.

1878.

[*Entered at Stationers' Hall.*

PREFACE.

It is well known that there are a vast number of plants, more especially in countries bordering upon the tropics, which would be of incalculable value to mankind, if they were more generally known and cultivated in our colonies, but the want of commercial enterprise in hot countries, and the indolence of the natives, has always been a great bar to their discovery, and to their application for purposes of commerce. The Liberian Coffee, and the various India Rubber plants are instances of this. For the former fancy prices have hitherto been demanded, and the supply of young plants and seeds has been precarious, until a garden was established by my Agent in Liberia.

The best kinds of India Rubber trees are being destroyed at a rate which will soon necessitate their reproduction by planters, in order to keep the markets of the world supplied with Rubber. It is of the first importance that cultivators should know how to treat economically the crops they raise and ensure a high quality of produce. This is especially the case with India Rubber, than which few articles come into the market more adulterated.

The advantages which accrue from proper cultivation are exemplified in the very high prices which are now obtained for the Cinchona bark grown in Java, which realizes from twice to three times the price of that which is obtained from the South American forests. With the view of furthering the cultivation of plants valuable for purposes of agriculture, horticulture, medicine and the textile arts, I have made arrangements for obtaining in quantity and supplying in a condition fit for growth, and at a rate which will permit of profitable cultivation, the new plants which are from time to time discovered, thus placing the matter on a truly commercial basis. Arrangements have already been made with agents in Brazil, Liberia, Sierra Leone, Mozambique, Natal, British Guiana, Fiji and various other countries to form gardens and collect seed, and propagate plants in their native climates and in the open air, and to forward them direct to the ports where they are required. That no opportunity of procuring important plants may be lost, arrangements will be made to exchange Liberian Coffee, India-rubber Plants, new Orchids and other plants from foreign countries remarkable for beauty of flower or foliage, or valuable for their commercial products. From time to time, as new and useful plants are discovered or come into demand, I purpose giving the fullest accounts that can be obtained of the best methods of cultivation, and such other particulars as may prove of commercial interest. The plants at present attracting considerable attention, such as the Liberian Coffee and India Rubber Plants and Tobacco, are the subject of the present pamphlet. I shall be glad to hear from residents abroad of any new products or plants which may come under their notice, and which promise to be of commercial value if their properties were made known. If a specimen of the leaf and flower of the plant be sent to me, in drying paper, by post, it will receive my immediate attention, and will greatly expedite any arrangements that may be made. Specially prepared Wardian cases and properly ventilated Orchid cases, which have only to be screwed together to be ready for use, are always sent out by me for the purpose of bringing home the plants in a healthy condition.

THOMAS CHRISTY, F.L.S.

COFFEA LIBERICA.

D'Elam, F.L.S. del. et Lith.

Christy & Cº Publishers London

THE NEW LIBERIAN GIANT COFFEE.

"COFFEA LIBERICA."—*Hiern.*

THE attention of planters in all Coffee-growing countries is now turned towards this remarkable tree. The ravages which disease has made in the plantations of Coffea Arabica, in various countries, have caused the Liberian Coffee to be eagerly sought after. That it should so long have remained unknown is not surprising, for Liberia has been but little explored, its climate is believed to be fatal to Europeans, and there is almost an entire absence of commercial enterprise in that country. Now, however, that the vigorous growth, excellent yield, large berry, and freedom from disease of the Liberian Coffee are becoming known, it is being tried in all Coffee-growing countries, and the success which has hitherto attended its cultivation promises soon to cause it to supplant the Coffea Arabica. Already it has been sent to Ceylon, Brazil, Java, &c., and the demand for plants has considerably exceeded the supply. However, there is now a certainty of obtaining fine plants in considerable quantity, for one of the largest Coffee planters in Liberia (a man educated in America, where he obtained a medical degree) writes in November, 1877, that he has 75,000 fine young Coffee plants ready, which he places at my disposal.

Papers relating to the cultivation of Liberian Coffee were recently laid on the table of the Legislative Council of Ceylon, and they contain the following particulars, made up from information collected in Liberia:—

"The Liberian Coffee grows equally well in the immediate neighbourhood of the sea, and at considerable distances from it;"

so that whole tracts of land will, in various countries, now become valuable for Coffee growing, which have hitherto been unsuitable for that purpose, as "Coffea Arabica" could not be cultivated to produce a paying crop except at a certain elevation, while the Liberian sort flourishes equally well on the lower lands, and on the coast.

The paper referred to, further remarks—

"The first crop is generally only a few berries, but the tree goes on increasing until it becomes capable of yielding 20 pounds. We have heard of trees giving 24 pounds each; those are very old trees. More generally depends upon cultivation than upon age. The tree grows to a height of twenty feet or more; we have seen one more than thirty feet in height, this was in the woods near an old plantation. Some cultivators top their trees, others let them grow up *ad libitum*. Our trees are topped at a height of five feet. Trees that are topped are more conveniently picked, and other things being equal give a larger crop; when the trees grow up tall, moreover, they are frequently injured by climbing with ladders, and pulling down the limbs, &c., and as the tree ripens its crop, and blossoms for the next year, at the same time, much of the blossom and young fruit is rubbed off the tree; whereas, the low trees are picked by standing on the ground. With us the Coffee plant is not a shrub, it is a forest tree. There are trees here forty years old, flourishing in all the vigour and verdure of youth, and bending down under their weight of berries. We have seen a few of these old trees, when cut down, shoot up more rapidly and more vigorously than when first planted from the seed."

A well-known Ceylon Coffee planter went especially to Liberia to judge for himself of the commercial importance

of this new product; and, in a letter to the *Ceylon Observer*, he writes as follows :—

"An estate of 20 or 30 acres well looked after would yield as much Coffee as one with 200 or 300 acres of Coffea Arabica or Ceylon. Coffee berries are like plums, as big. The unpruned Coffee has no leaf disease."

This Giant Coffee has already established a reputation in the American market, for its delicious flavour, and blends well with other varieties.

Plants of this new Coffee, grown in the open air, can be sent safely, in Wardian cases, to any country without removing the native earth from their roots.

In three weeks after leaving Liberia they reach England, where, if necessary, they are watered, and re-shipped without their roots being disturbed. The Wardian cases being put together with oiled screws, when the plants reach their destination, the side and one end of the case can be taken off, and the roots easily separated.

This arrangement must insure a more healthy tree than the plan hitherto adopted of propagating from seed in England, or allowing the young plants to remain here in hothouses, in artificial heat, for months, before exportation to the Colonies.

The advantage of getting established plants in preference to seed is great; as the risk with the latter is known to be considerable. A large proportion of the cases sent home will, besides containing plants, be thickly sown with seed, and this plan has proved most successful.

In Ceylon it has been found that the Liberian Coffee is hardier in every respect than Coffea arabica, being scarcely at all affected by the fungus disease, bearing full exposure to the sun much better, and growing more luxuriantly.

One property which the Liberian Coffee possesses will render it very valuable to growers—it is susceptible of great improvement, both in yield and quality. Thus Mr. Creswick, in a letter to the *Journal of the Society of Arts*, states :—

"The yield has been steadily increasing, as more care and knowledge are brought to bear upon the subject of its cultivation."

There seems no doubt, that by careful cultivation, and selection of the best seed, and of the finest varieties of the young plants, excellent results might be obtained. This may be gathered from the following quotation from the same journal.

"Distinct varieties of the plant are known, one of which produces fruit at an earlier age than the other; the berry also is smaller.* The large variety is however preferred, as yielding a superior quality of Coffee, and a larger crop. This large variety,† again, varies in itself under changed conditions of soil: in the moist lowlands the berry is very large, while in the dry rocky hills or uplands it becomes somewhat smaller, but of a finer flavour."

There is, therefore, a possibility of obtaining by cultivation a variety equalling, if not excelling, in flavour the finest Mocha Coffee.

Being a tropical species it does not, when once established, suffer from the sun. The temperature at which the plants flourish in their native country is from 72° to 87° Fahr. in the shade. The distance at which the young plants are set should be 8 to 12 feet. If planted sufficiently close to each other for the branches to meet, provided that the branches have both light and access of air, they thrive well, while the shade thus cast on the ground prevents the growth of weeds; but when planted so close, pruning, manuring, and collecting the crop cannot so conveniently be carried on. Probably planting even further apart, and protecting the plants when young by some quick growing annual might be found advantageous.

The Liberian Coffee plant delights in frequent refreshing showers, but the roots are averse to standing water; hence, when planted on level ground, care should be taken not to

* A supply of plants of one of the small varieties will shortly arrive.

† Called "Giant" Coffee to distinguish it from the small varieties, which are not without merit.

allow water to stand on the roots. If planted on sloping ground precautions should be adopted to prevent the surface soil from being washed away, since the fibrous roots always keep near the surface. With regard to soil, a loose, rich, earth, such as the mould of a virgin forest, is most suitable, since it contains a large amount of nourishment for the plants, and obviates the expense of manuring for several years. The plants will not thrive in stiff clay.

Under shade, neither the quality nor the quantity of the Coffee crop is good. Sun and air are especially necessary for a free development of fruit. The smoke of burning plants is very injurious to the plantations.

When the plants are young (before they are large enough to shade the soil with their branches and leaves) they should be mulched in the dry season, *i.e.* their roots should be covered with dried grass, straw, shavings, or anything capable of shading them.

Manure is not often used in Liberia, but, when needed, Coffee pulps, mixed with cattle manure, decomposed vegetable matter, and the earth from the ant hills, are used. Nitrogenous manures suit the Coffee plant, and should be spread on the surface, for the reason above mentioned.

Although the Liberian Coffee does not appear to be attacked with the Coffee fungus, *(Hemileia vastatrix)* yet it is advisable to prevent the introduction, as far as possible, of any growth of that kind.

A source of these pests (fungi) which is often overlooked, has been pointed out by Dr. M. C. Cooke. It consists in allowing the stumps of old trees to remain and decay in the ground. All trees shewing any tendency to die should be immediately removed, and destroyed by fire at a considerable distance from the plantation, care being taken also to remove the roots and the surrounding soil as much as possible. Indeed, it is best not to put fresh plants in the ground where a diseased plant has died.

THE AFRICAN RUBBER TREE.

"LANDOLPHIA FLORIDA."—*Benth.*

The India rubber of western tropical Africa is much better known than the plants yielding it, which have not hitherto been introduced into cultivation for commercial purposes.

In the West of Africa India rubber is collected from several species of Landolphia, of which the best known are L. Owariensis and L. florida. According to Speke and Grant L. florida is stated by the natives to yield the best rubber of any of the species. This plant is a woody climber, growing well in places where little else could be profitably grown, *i.e.* in damp rocky ravines. Its trunk often travels along the ground, looking like a large boa constrictor, until it meets with a trunk to climb up. The stem attains a diameter from 6 to 8 inches at a few feet from the ground, and then soon divides into more slender branches, which ascend to the top of the tree, and throw down long pendulous branches and clusters of large snowy-white flowers, scented like Jessamine. The fruit has a sweet acidulous pulp, which is eaten by the natives. The leaves are opposite, and their colourless midribs are sharply angular underneath. The young shoots are deep green and spotted, jointed every 10 inches, and about $\frac{1}{3}$ of an inch in diameter; they are brittle, and a cord of pith may be pulled out of them. The plant climbs by means of tendrils which arise from the joints, and which consist in some species—as in L. Owariensis—of the hardened flower-stalks after the ripe fruit has fallen off.

The natives make playing balls of the juice of the L. florida, and consider its rubber to be the most adhesive known. The milk if rubbed upon the skin adheres like birdlime, and can scarcely be rubbed off.

'ch del et Lith

LANDOLPHIA FLORIDA

Christy & C° Publishers. London

According to Mr. J. Collins' statement, in the Government Report on the Caoutchouc of Commerce, African rubber is collected and prepared in a very slovenly and wretched manner. The natives cut off a piece of the bark, and the milky juice is allowed to run into holes made in the ground or on leaves. In some districts the natives simply allow the juice to trickle down their arm, going from tree to tree until the arm is covered, when, beginning at the elbow, they roll the caoutchouc back towards the hand, till it comes off in the form of a ring. In other districts the juice is collected and allowed to coalesce in wooden vessels. The wood of the plant contains a gum, so that if the cut penetrates beyond the bark, the gum becomes mixed with the caoutchouc and spoils it. Recently, however, the collection has improved in some districts, and the price has risen in consequence.

From the above statements it will be seen that the Landolphia florida possesses many advantages. Its flower might be used for the extraction of a perfume; its stems, from their character, permit the easy extraction of the juice; the plant could be grown on land otherwise useless, while the rubber, if carefully collected, promises to be of considerable value. From its climbing habit and rapid growth it would more speedily attain maturity, and yield a quicker return than the Para and other rubbers, which are trees, and which could not be safely or profitably tapped under 25 years, whereas the Landolphia could be tapped when 3 years old. By the system of growing them in plantations, and cutting down the young shoots almost to the ground every year,* the stems and leaves could be taken to the rolling mill, and the crushed mass digested with bisulphide of carbon,† in which the rubber is soluble, but which does not dissolve the gum and

* I am indebted for the idea of growing India rubber in plantations, and cutting down the stems yearly, to Mr. Sowerby, Secretary of the Royal Botanical Society of London.

† Sir Charles Price & Co., Castle Baynard Wharf, Upper Thames Street, London, are the manufacturers of this ingredient.

resinous matters contained in the plant, and which if left in the rubber would injure its quality.

The plants could be grown around existing trees, and thus trouble, time and expense be saved. They are easily cultivated, and, with proper care, are susceptible of much improvement. In cultivating these plants it must be remembered that their chief requirements are a tropical temperature, and a thoroughly moist atmosphere.

There is no reason why the Landolphia florida should not become a favourite ornament of hothouses in the country, for which its soft green laurel-like leaves and delightfully fragrant handsome flowers especially fit it.

In preparing rubber for commerce it should be remembered that large masses of caoutchouc never fetch so high a price in the market as small pieces, for the simple reason that it is much more easy to detect admixtures of dirt and bark in the small pieces. The more free from foreign substances the rubber is, the higher the price it will realize in commerce.

Mr. Collins recommends the preparation of rubber in the form either of separate sheets or cakes, not more than one or two inches thick; and if moulds are used, wooden ones, of the shape of a child's battledore, are preferable. Dryness is another important point; if the rubber be prepared by a wet process, such as the addition of alum or salt to the juice, &c., it is necessary to prepare very thin sheets of it, as thick pieces cannot be dried thoroughly. The gradual and cautious application of heat appears to produce the best rubber. Iron or stone vessels are much better for collecting the juice than vessels made of clay, which contaminate the milk and make the rubber of less value. In most of the plants yielding India rubber the milk goes to the flowers when the flowering season commences; hence, in gathering the flowers for perfume, there would be the further advantage of increasing the amount of rubber in the leaves by removing the flowers.

TURKISH TOBACCO.

NICOTIANA TABACUM, var. MACROPHYLLA.—*Dunal.*

AND

NICOTIANA RUSTICA.—*L.*

The demand for real "Turkish Tobacco" has become so large in Europe that applications for seed, of the best varieties, have become frequent. This led me to send to Constantinople for a supply of seed, and at the same time for full particulars of planting, cultivation, and preparation of the leaf. In giving the following account I have thought it best to keep as near as possible to the literal translation :—

SOWING.—Remove about 12 inches of soil from the beds which are to be sown, then refill up to about 6 inches with manure; on the manure, place finely sifted soil to the depth of 4 inches, then sow the seed very thickly, and cover it with another inch of fine manure.

When the plants are about 3 or 4 inches high, a little watering is necessary; the water must fall in fine spray. The proper time for sowing in Turkey is in December. The plant

being delicate, precaution is necessary against cold or snow, for this purpose thick matting is used to cover the plants during the night and day when necessary.

PREPARATION OF THE LAND BEFORE TRANSPLANTING.—The best land for Tobacco cultivation is that at a rather high elevation, with a rich soil. Three good ploughings are necessary. The best kind and the greater part of the Tobacco produced in this country is grown on the mountains. About the 10th or 15th of April commence to transplant, beginning with the largest seedlings, taking up in the evening those which it is intended to plant in the morning. In transplanting, remove from the plant as much of the soil as may be dry on the surface. The distance between each plant should not exceed 5 inches, and between each row, there should not be more than 9 inches; the seedlings should be planted close together so as to stunt the growth of the plant by crowding them. The largest plants are not the best, as their leaves are rank and strong, and lose the fine perfume; all plants that may have died off in transplanting should be replaced; if water can be obtained, a little may be used at the time of planting, but is not an absolute necessity; the first hoeing should take place fifteen days after the plants have taken root; fifteen or twenty days later a second hoeing is necessary.

GATHERING THE LEAVES.—When the lower leaves begin to change colour, they must be gathered (the quality of these is very inferior and they ought to be kept separate from the others). Gathering must commence before sunrise, so as to have the dew on the leaves; when sufficient has been gathered to employ labourers during the day, the leaves are taken to a tent and placed in the midst of the work-people, who commence threading the leaves on strings five or six feet long, which strings are attached to light sticks or canes and left in the tent till the following day, and are then removed and exposed to the sun. The canes on which the leaves have been strung are suspended on parallel rails,

so as to keep the leaves from touching one another, for an excess of moisture discolours them. The quality varies according to the part of the plant from which leaves have been taken: the lowest are inferior, the large leaves form a better kind, and the upper leaves furnish Tobacco of the finest quality. It is advisable, therefore, to keep the leaves in three lots, and when they have been exposed twelve or fifteen days to the sun, they should be taken into a dry room and there remain until wanted for pressing; when made up into bales they should not exceed 100 lbs. in weight.

Before putting the leaves in the hand press, they must be very slightly damped by squirting water upon them, or by using a sprinkling brush; the quantity damped at one time should not exceed a bale; when so damped the leaves must be covered up, so as to spread the moisture uniformly in the bulk, and when ready to be placed in the press, the stalks should be placed at the edges of the bales. The leaves should then be put in the box and pressed down, and more leaves added and pressed down until the box is full, and contains a hundred-weight. The bale of Tobacco must be wrapped in canvas, which ought not to meet by a foot all round, as it is often necessary to examine the bales. The two great points to be gained are color and scent; the first is obtained by careful manipulation, the second is the result of seed and climate. The seed should be renewed every second year. It is necessary to gather the leaves as soon as ready, that is to say, when they are green, with a very slight tinge of yellow, for if allowed to dry on the plant, there is no longer any possibility of working them. There is another way of drying leaves in the shade, which takes more time, and is more expensive, but it produces the finest Tobacco, although it is a tedious process when the harvest is large.

CAUCASIAN PRICKLY COMFREY.

(SYMPHYTUM ASPERRIMUM.)

This perennial plant, introduced into England in the year 1790, has prominently attracted public attention during the last few years, as a forage plant, to be grown on a large scale, as a food for horned cattle, horses, sheep, pigs, and all kinds of poultry. Its wonderfully quick growth, and fine cropping qualities, and its power of resisting drought, are making it a favourite with farmers and dairymen.

With but little labour, beyond cutting the green leaves, Prickly Comfrey will yield, year after year, from 60 to 150 tons of forage per acre. It comes up early in the spring, and may usually be cut for the first time in April, and will then continue yielding through the hottest and dryest summers, until the hard winter frosts cut down its foliage. It will grow well on clay, even the thickest and coldest, on loam, gravel, or pure sand. Farmers should make use of every waste patch and corner, under hedges, and by the lane sides, to grow Comfrey, and, when hard pressed in the summer months for green forage, will find their fore-thought repaid. Its value as a food for cows is now well appreciated. It is a diuretic, cooling, and strengthening, and its good effect in increasing and improving the supply of milk is beyond question. Every

countryman knows the estimation in which Comfrey is held as a cure for flesh wounds, and as a remedy for lung diseases, and its effect upon four-footed creatures fed with it is equally beneficial. Professor Buckman, F.L.S., F.G.S., &c., says of it:—"That while all creatures seemed to thrive upon the "Comfrey, yet in no instance could we find the slightest "evidence of any evil effects." A Clergyman writes of it in the *Field*, in May 19th, 1876:—"It is simply invaluable as "forage for horses, cows, pigs, or sheep, and its effect on the "milk of cows, both as regards quality and quantity, is mar-"vellous."

Mr. A. Goffart, in his work on the Cultivation and System of Ensilage of Maize and other Green Forage Plants, writes, Paris, 1877:—

"Maize barely contains 1.20 to 1.25 per cent. of Azotic matter, whereas a recent analysis gives 2.70 per cent. to Comfrey, or more than double. Thus these two plants, instead of rivalling one another, are rendered each one by the other more complete, (se compléteraient l'une par l'autre) to the great advantage of Agriculture.

"Comfrey, by its mode of growth and continuous yield, commencing with the spring and only finishing in autumn, appears to me especially adapted to small farm holdings."

It is, however, necessary, when purchasing Comfrey sets, to make sure of obtaining the true plant. Several worthless species, such as the *S. tuberosum* and the *S. officinale* grow wild in parts of England, and are not easily distinguished, except by the flower, or after a little experience. They must, however, be carefully avoided, as they are of a purgative nature, and quite useless as food.

Although Prickly Comfrey seeds, it rarely germinates in this country. The only successful way of propagating it, is by dividing the roots in spring or autumn.*

*For full particulars see "*Forage Plants*" illustrated with coloured drawings. By T. Christy, F.L.S.

5,000 sets, planted one yard apart, are sufficient for the cultivation of an acre of land.

Naturally, reports of the success of this new forage soon found their way out to the Colonies, where forage plants are more wanted than anything else.

In Ceylon, India, Australia, New Zealand, and all parts of South Africa, the demand is steadily increasing. To many of the planters in Ceylon and India, and on the sheep-runs in Australia, and ostrich farms at the Cape, Comfrey has become a household word, and its popularity is richly deserved by its good qualities. It seems almost independent of moisture, " still growing when coffee plants, cinchona, and maize have died for lack of rain ;" and, once established, no heat appears to have much effect upon it. Singular to say, it seems almost as independent of cold, for it flourishes in St. Petersburg, and in N. Britain gives great satisfaction. It dies down when the severe frosts commence, but no degree of cold appears to hurt its roots.

Like everything else, it has its degrees of perfection. The latest novelty in Prickly Comfrey, is a new variety of the *S. asperrimum,* distinguished by the appellation of "Solid Stem." Mr. Henry Doubleday, the introducer of this to the public, claims for it that it is a much quicker grower, and a purer *Symphytum* than any hitherto obtainable, and that its solid stem peculiarity makes it a heavier cropper, besides affording cuttings from the flower stem for propagation. In "Forage Plants," Mr. Doubleday fully demonstrates the superiority of his new variety, and explains at length its difference from the ordinary *S. asperrimum.*

NEW

COMMERCIAL PLANTS

WITH

DIRECTIONS FOR THEIR GROWTH AND UTILIZATION.

No. 2.

GYNOCARDIA ODORATA.
VOGEL'S AFRICAN RUBBER TREE.
THE MAHWAH TREE.
COCOA.

BY

THOMAS CHRISTY, F.L.S.

LONDON:
PUBLISHED BY CHRISTY & CO.

1878.

Price One Shilling.] [*Entered at Stationers' Hall.*

PREFACE.

A great many plants yielding India-rubber are now known to botanists, and more are being discovered every year. Comparatively few, however, are fit for general cultivation; some which yield excellent Rubber do not produce an adequate return until after many years; others require certain peculiarities of soil and climate for their successful culture; while others, again, which possess the advantages of rapidly coming to maturity and of being easily cultivated, yield a Rubber of low commercial value.

I am now investigating the properties of several new Rubber plants with the view of selecting those most suitable for cultivation. In the last number of *New Commercial Plants*, I described one of the African Rubbers eminently fitted for profitable cultivation, and in the present number, particulars of a second are given.

To one of the economic plants recommended for cultivation in the following pages, I wish to draw particular attention. This is the tree yielding the Chaulmugra Oil, which is one of the most important for all tropical countries. Physicians and Surgeons agree that the results given by this Oil surprise them more and more, and they much regret that they did not listen to the entreaties of my cousin, the late Mr. Daniel Hanbury, to test its properties sooner.

I beg for information upon new drugs and plants, and that residents abroad, in whose hands this book may fall, will take notes at the time of what they hear respecting any which possess really valuable properties, and that they will write me full details so as to enable me to disseminate the information.

Many travellers and residents in tropical countries object to the trouble of drying plants and flowers. This can be avoided if they will only put the flowers and leaves, and when possible fruit, into bottles filled with salt and water. In this way, the colour of the flowers is perfectly preserved for a considerable time.

THOMAS CHRISTY, F.L.S.

155, *Fenchurch Street, London.*

Cynocardia odorata.
Chaulmúgra.

Christy & Cº Publishers, London.

COMMERCIAL PLANTS.

No. II.

THOMAS CHRISTY, F.L.S.

GYNOCARDIA ODORATA.

CHAULMUGRA TREE.

THE seeds of this tree yield an oil (Chaulmugra Oil) which has long been known and valued in India* and China as a remedy for skin diseases and other complaints due to impurity of the blood, and as a specific for secondary syphilis.† One writer compares its action to that of mercury, over which it has the advantage of not being injurious to the system. In the Mauritius it is considered to be the only reliable remedy for leprosy, and so high a value is put upon its purity, that the seeds are imported from India for the purpose of obtaining the oil free from adulteration. But it is in cases of consumption that its wonderful alterative properties are most noticeable.‡ If the vitality be not too greatly lowered

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* See *Indian Pharmacopœia*, p. 26.

† See *Indian Annals Medical Science*, April, 1856.

‡ See *Flückiger & Hanbury's Pharmacographia*, pp. 70, 71.

by this dread disease, this oil has been proved to be a certain cure, and has been during the last few years administered with the greatest success by the few who have been aware of its properties. The first to bring it into notice in the treatment of consumption was Professor Richard Jones, of the Presidency College, Calcutta. This gentleman finds the curative property of the oil most remarkable in the case of scrofula in children, and other uses will doubtless be discovered as the oil becomes known.

An excellent account of the plant, giving its botanical character, and the medicinal properties of the oil, &c., may be found in *Bentley & Trimen's Medicinal Plants*, Part 26, No. 28.

Until within the last month or two this oil has not been so extensively used in this country as it merits, from its remarkable properties. It has, however, lately attracted considerable attention, and a pamphlet, in which many medical authorities are quoted, and a full account of the oil is given, has recently been compiled by Mr. Le Page.*

A few paragraphs extracted from the pamphlet will show how highly the oil is esteemed by that gentleman. On p. 15 Case 3, speaking of a patient, he says—

"The bones of the nose were completely destroyed (by syphilis) as was the soft palate, the pharynx was covered with unhealthy ulcers, the gums were swollen and painful, deglutition was difficult, and the patient had lost his voice from chronic laryngitis, . . . He was rejected from one of the surgical wards as a hopeless case. . . . . After regulating the natural functions and cleaning the sores, he was put under a course of Chaulmugra, a six-grain pill being given thrice daily. The only other treatment resorted to, was touching the ulcers with a strong blue-stone wash, and an occasional laxative. . . , . . The general health of the man improved rapidly, the sores healed, and *he left the hospital stout and well in six weeks.*"

Another case detailed on p. 11 is still more remarkable. This case was that of a Creole, who had been for ten months

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Now out of print.

an inmate of a Leper Asylum. He was picked up in the streets in a state of insensibility and brought by the police to the Medical College Hospital. When examined—

"The man was found to be a loathsome leper. His feet were bound up with filthy rags, his body exhaled an extremely offensive odour, and he was nearly reduced to a skeleton, so great was his emaciation. His body was covered with livid patches, the toes of the left foot were without nails and swollen at the extremities. Upon the sole of this foot there were three large ragged excavated ulcers, with hardened livid edges, and an offensive sanio-purulent discharge. One of these near the heel was of the size of a rupee, it had destroyed the skin, fascia, and muscles, and exposed the bones beneath them. After cleaning the surface of the ulcers, I dressed them every day with the Oil of Chaulmugra, and gave him internally a pill of the seed, beaten into a pulp, six grains three times a day. For nearly a fortnight there was no perceptible amendment, but after this the progress was rapid. The ulcers healed by healthy granulation, the livid spots gradually disappeared, the general health of the patient improved, and he declared that he was better than he had been for years previously. He left the Hospital clandestinely, and I have not since heard of him."

Chaulmugra Oil is now being used in St. Peter's Hospital, Berners Street; the Infirmary at Margate; in the Royal Hospital for Diseases of the Chest, City Road; in St. John's Hospital, Leicester Square, and other Hospitals, and by several leading members of the medical profession in London.

For stiff joints the best plan is to apply the pure oil, and rub it in with the end of the finger, not the palm of the hand. Many people who have suffered from rheumatic pains for years have been quite cured in twelve or eighteen days. Marvellous results have also been obtained in acute rheumatism.

I shall shortly be in possession of full particulars of several interesting cases, and shall be happy to communicate to members of the medical profession who are interested in this new drug, the information which is constantly coming to hand.

It is evident that so valuable a remedy ought not to be confined to one country. The tree deserves to be grown in every tropical country in the world, and the only obstacle in the way hitherto, has been the difficulty of procuring seed that would grow. Oily seeds as a rule, soon lose their vitality; and Chaulmugra seeds are no exception to this. The seeds met with in commerce have been subjected to a process of drying, necessitated by the fact that they are contained in a pulpy fruit. Such seeds as are obtainable through ordinary channels are therefore useless for the purpose of planting. To obviate this difficulty, I have made arrangements for obtaining the seed as soon as ripe, and preserving them without drying by a new process, by which oil seeds as well as fruit can be kept for many months, as fresh as if gathered from the tree.

The Chaulmugra is a large handsome tree, attaining the size of an oak or sycamore. It is furnished with entire, glossy, alternate leaves, and in April and May produces large yellow sweet-scented flowers, about $1\frac{1}{2}$ inches across, growing in clusters on the old wood. The fruit is large and globular, about the size of a shaddock, and contains numerous seed immersed in pulp. The seeds are from 1 to $1\frac{1}{4}$ inches long, and about half as wide in the middle and upper end, tapering slightly below. From pressure they are often obtusely angular. The husk or shell of the seed is thin and brittle, and encloses a dark brown oily kernel.

The natives use the seeds by beating them up with clarified butter into a kind of ointment, but by Europeans the expressed oil is used. This is prepared in two ways. 1st.—By cold expression of the seeds. 2nd.—By boiling the pressed cake in water.

The pure oil in India is expensive, and therefore offers a great inducement to the natives to adulterate it, indeed adulteration is carried to such an extent, and is so difficult to detect, that it has occasionally caused medical men in India to discontinue its use. Preference should therefore be given, in purchasing the oil, to that which has been expressed from the seed in this country. This I am prepared to supply.

* See *Le Page's Pamphlet*, now withdrawn.

The oil is applied to ulcers, and sores, or eruptions as a dressing, and is also taken internally in doses of three or four minims, three times a day, a short time after meals, gradually increasing the amount, as in large quantities it is liable to cause nausea and irritability of stomach. For infants the dose is one or two drops once a day. In consumptive cases it may be taken in cod-liver oil, and in other cases in a little warm milk, or in capsules.* Native doctors in India recommend that salt meats, sweetmeats, spices, and acids should not be taken during its use. To this list I may add that the same precaution should be observed with regard to tobacco.

F. R. HEYCOCK, Esq., F.R.C.S., 16A, Old Cavendish Street, W., reports among several cases—

30th October, 1878.

"R. S., aged 18, came under my care as an out-patient at St. Peter's Hospital, June 25th, 1878, suffering from a syphilitic sore. The ordinary applications were tried and failed. The sore shewed no signs of healing, but continued to spread gradually until it completely encircled the affected part. On July 28th *Ol. Gynocardiæ* was ordered to be kept constantly applied on lint, and changed three times daily. In three days the crusts, which were constantly forming, came away, and the next time I saw him, September 4th, the sore had assumed a healthy appearance, with very little secretion, and had commenced to heal round the edges. On September 18th he again presented himself, when it was found that the sore was entirely healed.

"I am still carrying out my investigations with *Oleum Gynocardiæ*, and some cases are now under observation. In St. Peter's Hospital in one case in which I tried it on as a local remedy it acted speedily and very beneficially. It was on a patient who had multiple sloughing chancres. The oil was mixed with Cod Liver Oil, and kept constantly applied to the sores. Within a few days the sores took on a healthy aspect, and entirely healed without any other applications.

"I am now trying it in scrofulous cases, and intend to use it more extensively for local sores, and also in old standing syphilitic cases."

* Mr. Davis has prepared me these capsules in two sizes, 3 and 5 minims or drops.

F. R. HEYCOCK, Esq., F.R.C.S., again reports on 6th Dec., that—

"I have found the Chaulmugra Oil given in the form of capsules very beneficial in the old syphilitic cases before referred to. In cases of Psoriasis (syphilitic) it has acted very speedily. I have given two to three capsules daily each containing five minims of the oil. In three weeks or a month all the scaling patches have disappeared, and the skin has assumed its natural appearance."

"A. C., aged 22, was training for running, and had a sprain in the groin and a hard swelling formed there ; five years afterwards he got another strain and the hard swelling returned. Belladonna was applied ; it alleviated the pain temporarily, but did not remove the swelling. Pure Chaulmugra Oil was rubbed in night and morning, and A. C. returned to his work. Without advice, a short time afterwards he obtained some capsules containing five drops of pure Chaulmugra Oil, and took one on an empty stomach (his brother having experienced great benefit from them).* It produced sickness, and he could not keep any food on his stomach for a day, and for 70 hours he experienced nausea and pain in the chest. He, however, persisted in the outward application and is now quite well."

In an article on Chaulmugra in *The Practitioner* for November, Dr. DAVID YOUNG, of Florence, considers the Oil to be of decided value in the macular and in the early stages of the anæsthetic forms of leprosy (p. 327).

"Several of the cases treated were complicated with bronchial affections which were quite relieved during the treatment. This taken in connection with the fact that all the patients gained flesh, may point to the probable usefulness of the Oil in affections of the chest.

"The Oil has a deserved reputation in cases of itch and parasitic pediculi, and forms a valuable addition to the ordinary sulphur ointment."

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* Care is necessary in giving this Oil.—T. C.

WM. KNIGHT TREEVES, Esq., F.R.C.S.,
Surgeon to the Royal Sea Bathing Infirmary.

MARGATE, 23*rd Nov.*, 1878.

"I have been trying the Chaulmugra and am beginning to find that it is a remedy of considerable value. In one case in which I have tried it the result has been very striking, viz., that of a boy who has been under my care for years with obstinate strumous sores in the neck. I had tried all the usual applications and internal remedies without effecting any material improvement: since the application of the Oil, although the boy has been under precisely the same conditions in other respects, the sores have rapidly improved. This is the best test I have had, as, of course the patients who come down to the Infirmary, get sea air and better food than they are accustomed to, and these remedies alone often effect a cure."

L.B., of BROOMFIELD, Essex, 10th October.—"I applied Chaulmugra Oil to a young horse that had symptoms of enlargement at the side of the knee, my veterinary surgeon having advised me to blister him. The Chaulmugra has entirely removed the swelling, and his legs are as firm as they ever were.

"About six weeks since I was thrown out of my cart and much shaken, and the third finger of my right hand was stiff and very painful. It is now well. I attribute this to the action of the oil which got into my hand when rubbing the horse's knee, for each time I used the Oil my finger was more pliable."

B.R., 52, a porter in the City, let a large case fall on the instep of his foot. Having heard of the Chaulmugra Oil, he sent for some of the oil and applied it by rubbing it in several times before he went to bed. So certain was he that he should not be able to return to his work for some time he made arrangements to remain at home. He rose as usual at 5.30 the next morning, and to his amazement he found his foot without pain and at once returned to work. He has not found any ill effects from the wound since.

VOGEL'S AFRICAN RUBBER TREE.

UROSTIGMA VOGELII.—*Miq.*

THIS tree, which is stated by Mr. Neyle to yield one of the best kinds of india-rubber in West Africa, was first collected by Vogel at Grand Bassa, but was afterwards discovered in Liberia, from whence the first specimens of living plants have been sent me by Mr. D. J. Dennis.

The tree grows from 20 to 30 feet high, and has large leathery, stalked leaves from 6 to 8 inches long, by 3 to 5 inches broad, furnished with four or five lateral veins on either half of the leaf. The small fruits, which are about the size of beans, are found on the terminal leafy branches, usually in pairs, on the stem near the base of the leaf-stalks.

The trees are tapped when about five years old by making slashes or incisions in the trunk, the juice is collected in vessels and the gum is separated from the sap by the use of acids; it is then made up into balls about the size of a large orange. Although the quality is at present remarkably good, it could be greatly improved by care in the collection and preparation for the market. If the trees are tapped before they are five years old, the juice is watery and does not yield such good or strong rubber. The natives, in order to get as large a yield of juice as possible, pollard the trees at a height of 10 to 12 feet and cut back the branches to prevent the strength of the plant being used up in growth, This causes a free and regular flow of sap. The cuttings which are removed are easily propagated and will grow vigorously.

The tree will grow near the sea at an elevation of 50 to 60 feet above sea level, but does not flourish well in marshy ground.

The ease with which the plant is propagated, its hardiness in sea air, and the excellent quality of the rubber which it yields, render this a desirable species for cultivation in the lowlands of southern India and Ceylon; also in Java, Sumatra, Penang and Siam.

The rubber has been tested here by the house of W. Warne & Co., who pay a very high price, in order to

Urostigma. vogelii.
African Rubber Tree.

N. Fitch, del. et. Lith.

Christy & C°. Publishers, London.

command the finest class of india-rubber, and their "make" is known all over Europe to be more durable and to remain flexible longer, while it is less liable to crack and become brittle, than any others. The pipes for the "Sonnerie à air" are made by this house for Mons. W. Walcker, of Paris. Messrs. W. Warne & Co., report very highly on the quality of this rubber.

THE MAHWAH TREE.

(BASSIA LATIFOLIA, *Rozel.*)

THE value of this tree deserves to be much more widely known than it is at present. Every part of the tree is of use to mankind, and if planted largely in those countries where it would grow, would do much to alleviate the horrors of famine, such as have recently occurred in China, India, Morocco, &c.

The tree is a native of Bengal, but is abundant in all parts of central India, from Guzerat to Behai, and is cultivated in other parts of India. It grows to a height of 60 feet, the trunk being often 6 or 7 feet in circumference. The timber is hard and strong, close and even-grained, and is used for the wheels of carriages, railway sleepers. &c. A gum exudes from the bark.

The flowers are produced in enormous quantities in March and April, after the old leaves have fallen and before the new leaves have appeared; the crop rarely fails. The fleshy flowers fall off and cover the ground beneath the trees, and are gathered eagerly by the natives every morning during the flowering season; a single tree yields from 200 to 400 lbs. weight of flowers. These flowers are stored as a staple article of food by the Bheels and other tribes, and so valuable do they consider these trees, that in time of war the threat of cutting them down generally reduces them to submission when unruly.

The flowers when dried have somewhat the odour and appearance of Sultana raisins. Lately examined by a French chemist, M. Petit, they were found to contain half their weight of sugar, and are therefore very nourishing.

In a paper recently read before the Linnæan Society by Mr. Lockwood, that gentleman stated that wild animals of

many kinds troop eagerly to the Mahwah trees during the season to feed on the flowers. He was therefore led to experiment upon domestic animals, and it was found that the flesh of pigs fed upon Mahwah flowers in this country was much improved and acquired a delicate flavour. The animals so fed rapidly came into condition.

As might be expected, from the quantity of sugar contained in the flowers, they yield when fermented a large quantity of spirit, as much as 6·16 gallons of proof spirit per cwt. having been obtained from them. The flavour of the spirit, roughly distilled, is very similar to that of Irish whisky, but when carefully rectified, it can be obtained exceedingly pure and free from flavour. This spirit is manufactured to a great extent in India, the Government duty on the spirits distilled (chiefly from this flower) in the island of Carauga, opposite Bombay, amounting to from £60,000 to £80,000 per annum. In Guzerat and Rajpootana every village has its spirit shop for the sale of the distilled liquor from the flowers. It has been found that when placed in an oak wood cask it takes a yellow tone of colour, and is then preferred to Irish whisky of high quality. The analysis shows it to be a most wholesome spirit.

The tree thrives in poor stony ground, and might therefore be cultivated on land not available for other crops. So regular is the yield of flowers, that it is said a bad Mahwah harvest has never been known in India.

The flowers when dried will keep for almost any length of time, and do not appear to be attacked by insects.

From the seeds an oil is extracted by the natives; it is used for lighting purposes and for soap-making. The smoke arising from the burning of the oil-cake, after expression of the oil, is said to be poisonous to rats, &c.

The Mahwah tree, then, affords a means of obtaining an almost unlimited supply of food, both for man and beast, a food which will keep a great length of time in any natural temperature, and which requires no trouble to procure, and no outlay in cultivation. The tree readily propagates itself by seed which, in India, is usually self-sown.

COCOA.

THEOBROMA CACAO.

It is not generally known that the flavour of Cocoa depends upon two things:—first, the nature of the soil, and secondly, the preparation of the nib after it is taken out of the fruit.

The finest Cocoa in the world is grown on one farm in Guatemala, but the natives pay such a high price for it, that there is only a small quantity exported for experiment or occasionally as a curiosity. I am informed by a gentleman holding land within a mile of this farm, that they cannot grow such a fine quality or anything approaching it. Seed obtained from this farm has been grown in other localities without any better result than from ordinary seed.

The Trinidad Cocoa commands a high price in the market, and an account of the mode of preparation of the nib will, therefore, be of interest to all growers.

The best Cocoa is picked from the pod, and the nibs or nuts are then placed in a pile and fermented with plantain or other green leaves for 5 to 7 days, according to the market for which it is intended. The heap will get so hot that the hand cannot be kept in it an instant. The nibs are then taken out of the pile and dried in the sun, and afterwards retain a rounded surface. This treatment makes the difference in the price of Cocoa, between 50s and 108s per cwt. Ordinary Cocoa is only fermented for three days. The fermentation takes out the bitter flavour. The Spaniards will pay a very high price for specially cured Cocoa. Poor and small seeds cannot support the same amount of fermentation that large, fat, round nibs will. The fermentation destroys the germ of vegetation, and prevents the nib from going musty.

I have had great success with the live seed collected in Trinidad and on West Coast of Africa, repacked in my own warehouse in London, and reshipped to Ceylon and Batavia, where it has arrived in good order packed in earth and moss in Wardian cases.

NEW

COMMERCIAL PLANTS,

WITH DIRECTIONS

HOW TO GROW THEM TO THE BEST ADVANTAGE,

BY

T. CHRISTY, F.L.S.

No. 3.

LONDON:

PUBLISHED BY CHRISTY & CO.

1880.

[*Entered at Stationers' Hall.*

PREFACE.

—:o:—

IN the present number attention is called to some new Forage Plants of great value, and to other economical products which are articles of considerable commerce in some parts of the world, although comparatively unknown in this country and in many Colonies in which they might be profitably cultivated.

The success which has attended previous attempts to introduce Liberian Coffee, new India-rubber plants, &c., which I believe is owing to the care exercised in procuring only healthy seeds and scions, has been most gratifying.

Chaulmugra Oil has been further studied and employed by physicians and surgeons; chemical analysis has also discovered its active principle, and thousands are finding entire relief from rheumatic pain since they have used it.

The reputation of this useful oil is now thoroughly established in this country, and several fresh cases are herein enumerated which have come under my immediate notice.

The Colonists of Great Britain, and indeed those claiming allegiance to European Governments generally, have, thanks to the Press, learned that if they are to advance, it will be necessary not solely to raise and export year after year the same native plants, but to obtain new plants producing fibres, seeds, drugs, or other commercial products that command a good price in the European markets. In England we have learned that the old-fashioned system of cultivating year after year the same crop is a bad one, and nature has taught the same lesson to the Colonists. We see in the leaf-disease of Ceylon one of the effects of this system, and, for an instance nearer home, the Phylloxera in the vineyards of France.

There are several plants in different parts of the world which contain either more Theine or Caffeine than Tea or Coffee, or which

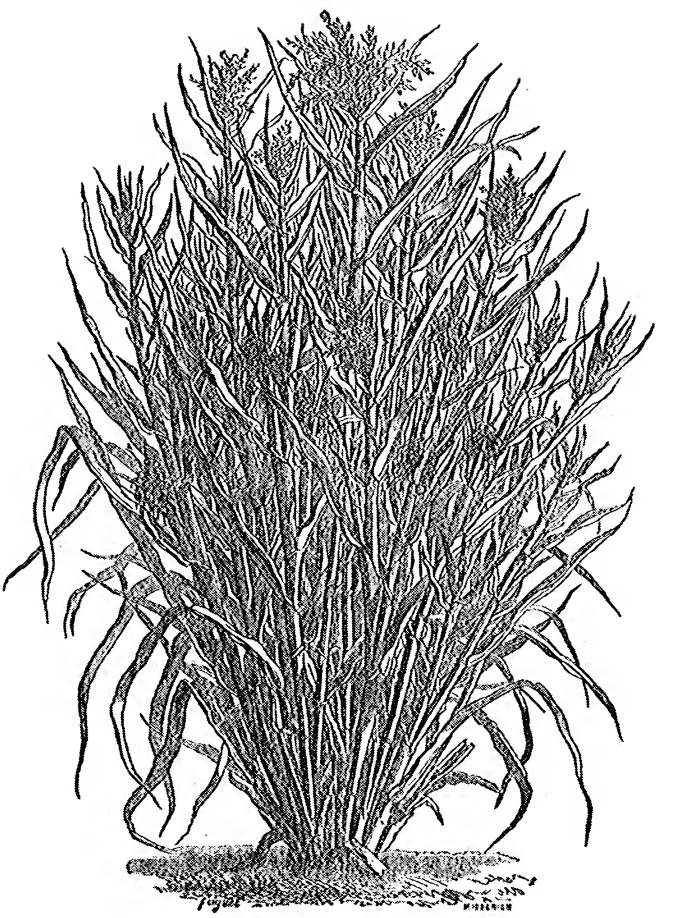
possess some special advantages over those beverages. One of my objects in this number will be to bring before my readers some of these valuable plants, which as yet are undeveloped articles of commerce.

To a new Australian plant, "Pituri," attention is specially directed, as possessing the same active principle as tobacco, and which has not as yet been the subject of experiment, but would probably be found valuable for many purposes, both medical and commercial.

I must continue to urge upon residents abroad into whose hands this book may fall, the importance of observing the plants around them which may be useful for tanning, fibres, oils, colours, and especially plants supposed to have medicinal properties by the natives. As a rule, any plants regarded as poisonous are almost sure to possess some medicinal property. There are also many plants of great beauty of flower or foliage which are absolutely unknown in gardens and hot-houses in this country, and which would be well worth sending home. Samples of drugs, leaves, seeds or bark, are most easily sent home in small calico bags by post. When any article is found of value, instructions will be sent out with cases (if necessary) so that all difficulty is removed in sending the produce home in proper order.

THOS. CHRISTY, F.L.S.

LONDON, *January* 1*st*, 1880.



TEOSINTE.

(Euchlœna luxurians—DURIEU.*)*

THIS new fodder-grass has attracted considerable attention in France and her Colonies during the last few years on account of the excellent quality and enormous yield of its foliage. It is a native of Guatemala, and was first introduced to the notice of the Acclimatisation Society of France in 1872 by Monsieur Durieu de Maisonneuve, and was then tried in various parts of the south of France with considerable success, the plants growing to a height of 10 feet, and each plant throwing up about 100 stems, or sometimes even 150, according to M. Ascherson's statement in the *Bulletin*

Mensuel de la Société Linnéene de Paris, January, 1877. In this publication, Professor Baillon points out the neccessity of distinguishing the Téosinte from the *Tripsacum monostachyum*, a grass with which it has been confounded, and gives a full description of the flowers of the Téosinte, by the structure of which it may be recognised.

The Téosinte is a remarkably handsome plant, having leaves three to four feet long and two or three inches wide, and having an appearance resembling maize, but on a much larger scale; the cob, as in that plant, is contained in a leafy sheath, from which the stigmas protrude in a tassel-like manner.

At Kew, where it flowered in December, in the Water-lily House, it attained a height of 15 feet.

Schweinfurth, who has seen it growing and producing seed at Cairo, confirms its valuable qualities.

I have already distributed seeds to Ceylon, the East and West Indies, Australia, and tropical Africa.

The following extracts from letters with which I have been favoured by a correspondent in France, will show better than any description the progress in public favour which this grass is making: —

ALGIERS, *September*, 1876.

"I have never seen such a vegetation, but no flowers yet; plants three metres high, and quite as much in circumference."

ISLE OF BOURBON.

"Having found this forage plant to be of great service, I have extended my culture. It grows well in a moist fresh climate, brings tufts which give a very good forage for cattle and horses; one plant, well grown, is sufficient for one head of cattle for a whole day."

S.W. FRANCE.

"This plant has grown well; the tufts are two metres high."

S. FRANCE.

"The *Euchlæna luxurians* gathered about the end of October has yielded a crop on the scale of 80,000 kilos of good green forage per hectare (32 tons to the acre). It can be left in the ground till December without danger. Cattle eat it greedily."

ALGIERS.

"The seeds have been put in at one metre distance and all have germinated. Each plant has thrown up 20 stems or more, some of which have attained four metres in height. Six cuts have been made, and the forage produced was eaten with avidity by cattle, and horses. It is the opinion of some that this plant can give eight cuts in a year, and it would be well to place the plants at a distance of five feet, as the plants throw up so many stems, the number of which increases at each cut."

The *Gardeners Chronicle* states: that in the Isle of Bourbon it flourishes at different altitudes, and is regarded as an acquisition to the country, and further says "It should be looked after by our agricultural friends enjoying a suitable climate in the Colonies, for if half that is said of it be true, it will produce a profitable crop.

In a hot climate where the thermometer does not sink below 32° F. in winter, the plant is a perennial; but in countries where the winter is cold, it needs to be sown afresh every year. Moisture is not injurious to it; in fact it is worthy of cultivation in marshy ground in hot climates, and might probably enable waste land of this description, with slight drainage, to grow highly remunerative produce. Its great value consists in the enormous yield of fodder, in the rapid growth, and the sweetness of the foliage, which induces cattle of all kinds to feed greedily upon it.

The grass is essentially tropical in its habits. Mons. Thozet, in Queensland found single seeds to give rise to as many as 32 stems, each 12 feet high. Dr. Schweinfurth is said to have harvested at Cairo as many as 12,000 seeds as the produce of three single grains, and Vice-Consul Calvert states that at the same place in July of last year "the plant, after having been mown down, grew one foot in four days."

Dr. R. C. Sandars, of Azimgurh, reports to the Agricultural and Horticultural Society of Madras:—

"Each seed was put in at intervals of five feet, but some two months back each plant had so spread that all touched; some have from 100 to 120 shoots. To give air to those plants which I wished to seed, I had some of the plants cut nearly to the ground. Cattle ate what was cut most greedily, both in its fresh state and also when dry; and the plants which were mown instantly grew again, and are now fit to cut afresh. The plants have had the advantage of the goal garden, which induces a rich soil and abundance of water."

Mr. Murton writes from Singapore (2nd October, 1871:—

"I am going in largely for the *Euchlæna;* it promises to turn out a capital fodder-plant for this place."

Dr. Schomburgh reports from Adelaide:—

"I am in hopes that the plant will turn out a great acquisition to our summer fodder plants . . . . . Notwithstanding that after planting, our young plants have never been watered, and considering the great dryness of the season, their growth is vigorous."

TAGASASTE.

(Cytisus proliferous, var.)

THIS shrub is a native of the Isle of Palma, where as well as in the neighbouring Canary Islands it has been cultivated for some years past as a valuable forage plant.

The plant grows at a rather lower altitude than the "Escobon," of Teneriffe, and hence, and because of its more herbaceous character, is better fitted than that plant for forage in agricultural districts.

It flourishes best in loose sandy or stony soil. In clay soils it does not thrive so well, and animals do not relish it so much, probably because the essential oil is more abundantly developed in plants growing on heavy land.

The roots penetrate very deeply into the soil, which they thus improve, while the plant is enabled on this account to produce a supply of green forage in the driest seasons. Its cultivation is, therefore, one of the best means for covering with vegetation the slopes which have been rendered sterile by the careless destruction of trees and herbage. The wood is also of fine quality, and is used for making carts.

The plant thrives best at an elevation not less than 500 metres above sea level, and where the temperature does not sink below 60° Fahr.

The seed is sown in July and August, and is scattered broad-cast in the ordinary way. As, however, only some of the seeds come up the first year, it is found more advantageous to force the seeds and transplant the seedlings. To do this the outer coat of the seed is slit on one side or soaked in water at 110° to 120° F. for one or two days before sowing, so as to soften it and allow the seed to germinate more quickly. The transplanting should be performed on a rainy day, or if this be not possible the seedlings must be watered for several days afterwards. They are planted out at the distance of a yard or more according to the space available. For the first two years the crop does not attain its full developement, but the third year the full yield of foliage is obtained and

continues thereafter. The following table gives the yield of plants sown in the Island of Palma, in 1875.

		FORAGE.		WOOD.	
		Kilogrammes.		Kilogrammes.	
1876.	November . .		71,000		8,000
1877.	February . .	50,500			
	June	115,000		10,000	
	December . . .	43,000		6,000	
			208,500		16,000
1878.	June	129,000			
	October . . .	70,000		45,000	
	December . .	140,500		43,250	
			339,500		88,250

The plants may be cut once or twice a year, taking care to cut only from the most vigorous branches, a better yield is thus obtained, and the plant is less injured than if cut indiscriminately. The product of the third year may be considered as the normal amount, as the bushes are then full grown.

Tagasaste has the advantage of containing a large quantity of nitrogenous matter. It is estimated to contain 1.136 of nitrogen against 1.028 yielded by the finest clover hay. Each 100 lbs. of fodder is calculated to produce 2.60 lbs. of meat. Animals fed upon Tagasaste come into condition more rapidly and to a greater degree, than with any other food except corn.

A fanegada (4,500 square fathoms) will yield forage worth 3,043 reals, or after deducting the expenses of gathering, carting, chopping and loss of rent on the land for the first two years (until the plants are full grown), a clear profit for each fanegada of 1,421 reals.

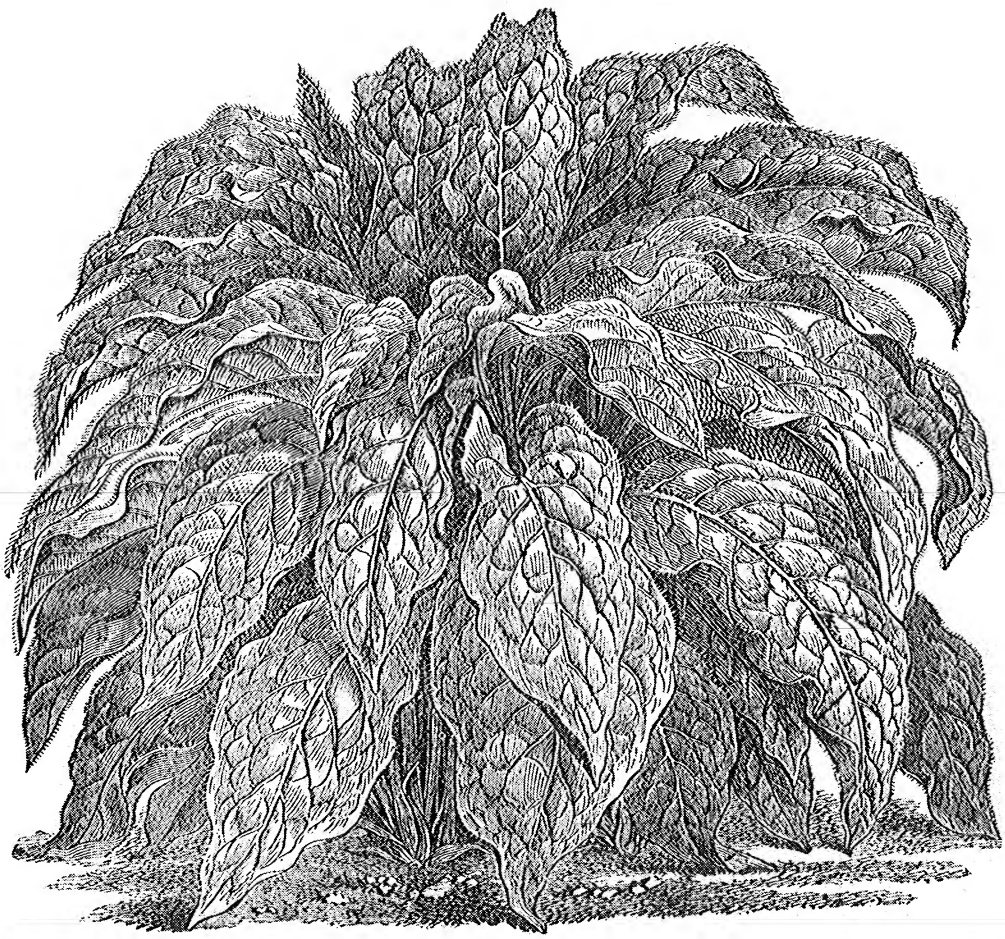
The fodder is usually prepared by mixing 35 lbs. weight of fresh Tagasaste with 20 of chopped straw. This amount is sufficient for the daily nourishment of a horse or cow.

In comparing the Tagasaste with hay, it must be remembered that out of the 55 lbs. of mixed forage, the 35 lbs. of green Tagasaste would by drying be reduced to 7 lbs., which weight is the real equivalent of the 20 lbs. of chopped straw, showing a wonderful economy by using this forage plant.

According to Boussingaults' synoptical tables, an animal weighing 250 to 300 kilogrammes, such as Dr. Perez

experimented on, consumes daily 9 kilos. of ordinary hay. Although from the small quantity of Tagasaste used in comparison, the proportion of nitrogen is rather less than in the amount of hay mentioned, yet animals so fed, fatten more rapidly with the Tagasaste fodder than with hay. This result Dr. Perez (who has published his experiments in a pamphlet), thinks is due to the presence in the plants of an essential oil, which he suggests may retard waste of tissue and thus cause fattening. On this account he specially recommends the Tagasaste for feeding animals not intended for work, but for food, since the result of feeding on Tagasaste, is that the animals sooner become tired, and it is a common excuse in the Island of Teneriffe, for a man to say, "I cannot lend you my mule, he has just fed on Tagasaste." The curious effect was noticed in a very striking manner, in the following case :—

A mare of low stature, nervous temperament, and vicious disposition, had three colts at different times, all foaled in the same locality. The first, which was born before Tagasaste was introduced into use, inherited its mother's appearance and temper. The other two, which were fed for the first three years on Tagasaste fodder almost exclusively, were of greater height, finer build, and of more gentle disposition. Dr. Perez suggests that by the use of this fodder it might be possible to obtain a breed of cattle of superior qualities both in temper and physique. Tagasaste grows well in the Eastern Pyrenees, Spain, and Italy, and is considered by Dr. Perez to be especially fit for dry countries, such as the Cape of Good Hope.



SYMPHYTUM ASPERRIMUM

OR

CAUCASIAN PRICKLY COMFREY.

Russian Variety.

SINCE I have proved the value of this forage plant by numerous reports from all parts of Great Britain as well as from abroad, the authorities at Kew, who for some years past have discredited the value of Prickly Comfrey, have deigned to notice it. (See *Fodder Plants, No.* 2, p. 11–13, and *Kew Report*, 1879.)

The author of the "Kew Report," for fear of having to insert the statements of other authorities on the subject, who have made Prickly Comfrey a special study in this country, and collected, as I and many others have done, reports from all parts of the world where it has been tried, have made no reference in the "Kew Report" to my books on the subject, but two reports are quoted against the value of this forage plant and one in its favour from India and Australia.

In *Nature* for October 30th, 1879, the Rev. M. J. Berkeley reviewing the "Kew Report," says:—"A notice is given of "that form of the Prickly Comfrey plant which is likely to "be a valuable fodder plant in Great Britain and Ireland. It "seems to be a hybrid between *Symphytum officinale* and "*S. asperrimum;* we have lately seen it in great perfection "and in full usage, where *it is greedily consumed by cattle* "*which thrive upon it immensely, while they will not touch* "*the common Comfrey.*"

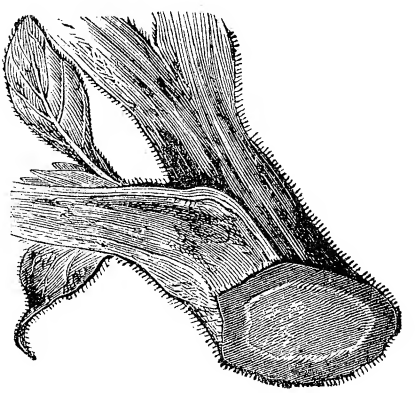
FLOWER OF THE TRUE VARIETY—THE BUD IS RED AND THE EXPANDED FLOWER IS BLUE.

The Rev. G. Richter reports from Coorg:—"The Prickly "Comfrey appears to be firmly established in Coorg; fields "seen in different Coffee plantations are as luxuriant as can "be desired."

Comfrey changes in flavour when grown on different soils; but there are varieties of Comfrey (of which I have sent speci-

mens to Kew) the nutritive qualities of which were only found out by growing them in beds; all these had to be propagated from one root, at considerable trouble and expense.

It is not possible to judge of the "forage value" of a plant by growing a single specimen in the exhausted soil of a botanical garden. Plants may not vary much in botanical character, which yet differ exceedingly in value as food. My statements are founded on the cultivation of considerable quantities and are therefore more reliable than any evidence that can be given by those who have only grown single plants. I have observed that the cultivated Comfrey plants are poor slender-looking things, without any richness, all through the public gardens of Europe.



SECTION OF COMFREY WITH SOLID STEM.

The variety I have found to be the best has been raised from one plant out of a number of others sent me by the Director-General of the Botanical Gardens at St. Petersburg. Upon growing a quantity of it, Mr. H. Doubleday noticed that the animals preferred it to all others growing on the same land. Poultry would pass over all the other beds of Comfrey, but stop at this one and greedily devour the leaves; so much was this the case that it had to be protected to enable Mr. Doubleday to save sufficient for propagation.

Where Comfrey has been planted with any degree of care and knowledge of what is required for a fodder plant in regard to soil, preparation of the land and manure, this plant has always succeeded.

In reference to its action upon animals a letter appeared in the *Standard* in October :—

I should like to say one word on another subject which has been mentioned from time to time in your columns, and this is the Prickly Comfrey. I use it frequently and regularly, both for my fowls and for a number of Belgian hares which I breed. The fondness of the latter for it is most extraordinary. They will always leave cabbage for Prickly Comfrey ; but its value to me for their keep is that, however much they eat of it, and no matter how frequently I give it them, Prickly Comfrey never has the pernicious effect upon them that too much green food of any other kind produces. For the fowls I hang up a fresh-cut bunch for them to peck at, and much they enjoy it. Prickly Comfrey answers admirably with me, but of two purchases of it which I made, one has turned out worthless, and is, I suppose, the wrong sort.

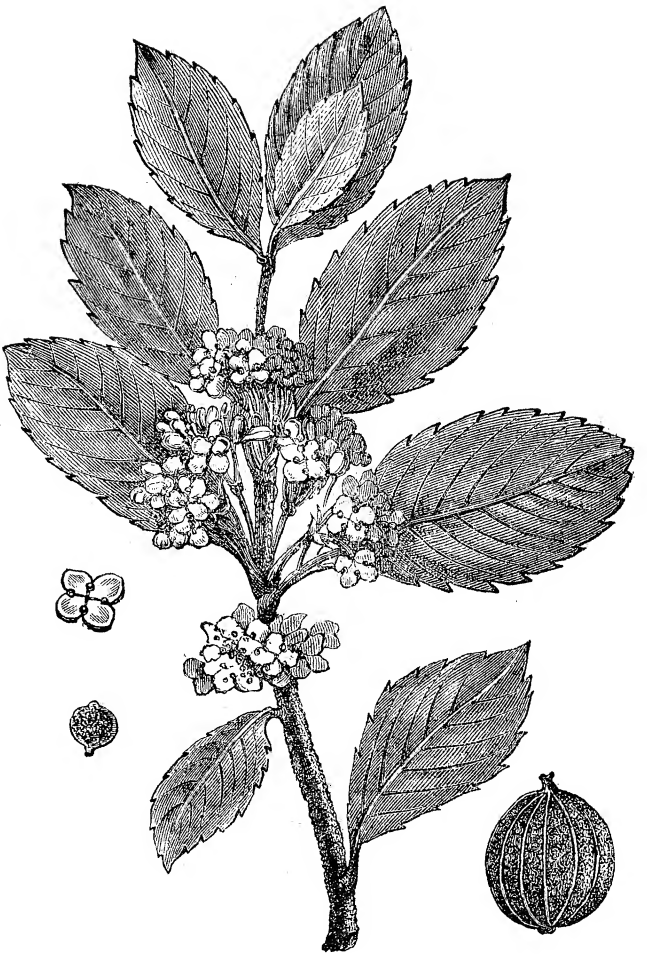
ROSE COTTAGE, HIGH STREET, E. J. BARNES.
LEYTONSTONE, ESSEX.

Farmers keeping large herds of milch cows have found it invaluable; it not only improves the quantity but the quality of the milk. It can be grown under the trees in plantations, and owing to the protection thus afforded an earlier crop is secured.

THE NEW OIL PLANT.

(Lallemantia Iberica.)

THIS plant is well known and cultivated to a considerable extent from Syria to Northern Persia, and is known in Kerman under the name of *Gundschit Sivah.* It is very similar in habit to plants of the genus *Dracocephalum,* of the Labiate family. It attains a height of 1½ to 2½ feet; a single plant has been calculated to yield 2,500 seeds, which yield a very pure oil, suitable even for culinary purposes. It has lately received some attention in Russia, and has been acclimatised at Cherson, in South Russia, from seeds sent to the Agronomical School there, by Professor Haberland, of Vienna.



MATÉ, OR PARAGUAY TEA.

(Ilex Paraguayensis.)

(Yerbe Maté.)

UNDER the Jesuit régime the Maté tree was extensively cultivated, and a product obtained which, though much sought after, has not since been equalled. The present sources of Maté are the so-called "Yerbales" forests in which the *Ilex Paraguayensis* grows naturally, but this valuable tree is becoming more and more scarce on account of the wanton

destruction caused by the yerbateros, or gatherers of Yerba Maté. In gathering the Maté, the leaves and small branches are cut with a sickle and then dried over a fire upon bamboo hurdles. The fuel used has great influence on the quality of the product, which is exposed to the smoke. When dry the twigs and leaves are crushed under edge-runners driven by mules or cattle, and afterwards packed in skins, forming packages called serons. The quality of the tea might be much improved by selecting the younger leaves only, and by a better method of grinding and drying.

Taken in moderate quantities, it is extremely refreshing, and enables those who drink it to go without food for a considerable time. With some persons it is said to act as a sudorific, but this action seems uncertain.

Maté, or Paraguay Tea, known also under the names of Jesuits' Tea, St. Bartholomew's Tea, Tea of the Missions, &c., is said to have been used among the South American Indians from time immemorial; has been drunk as tea by all classes in Paraguay since the beginning of the seventeenth century, and is now used by "almost the whole population of South America." In 1855 the amount of Maté annually consumed in the whole of South America was estimated by VON BIBRA at 15,000,000 lbs., and the consumption now is probably three or four times as great. In the Argentine Republic alone the annual consumption of Maté is not less than 27,000,000 lbs. per annum (about 13 lb. per head), while the proportion of Coffee and China tea consumed is only 2 lbs. of the former and ¼ lb. of the latter for each person per annum. The use of Paraguay tea has this advantage over Chinese tea, that it has a tendency to keep the bowels open, and acts slightly on the kidneys; the infusion also has a slight but pleasant bitter taste, and thus acts as a tonic stimulant. It contains the same active principle as tea or coffee and, in a proportion (nearly 2 per cent), intermediate between the two. It also contains a volatile oil, to which its peculiar aroma is due, 16 per cent. of an astringent principle, and about 10 per cent. of nutritious gluten, only a small portion of which dissolves in the tea, and the benefit of which is obtained only when the leaf is afterwards chewed, as is done in some districts. The manner in which Maté is

taken is as follows :—Hot water is poured on the powdered leaf, then a lump of burned sugar, and sometimes a few drops of lemon juice are added. The infusion is not drunk from cups like tea, but sucked up through a tube *(bombilla)*, which is furnished at the lower end with a perforated bulb or strainer. The cup and tube are passed round from hand to hand. The leaves will bear steeping about three times, and the infusion is usually drunk soon after it is made, as it blackens rapidly if allowed to stand. Persons who are fond of it drink it at every meal, and consume about 1 oz. a-day.

The tree which yields the Maté grows wild in large natural plantations in the forests of Paraguay, the principal woods being situated in the neighbourhood of a small town called Villa Real, about 1,500 miles above Assumpcion on the Paraguay River ; also in various localities between the rivers Uruguay and Paraná. The tree is from 4 to 8 metres high, very leafy, and at a distance bears some resemblance to an orange tree. The Maté is collected by Indians, who are employed by merchants for the purpose. These merchants pay a money consideration to Government. When a Yerbal or Maté wood is found, the Indians build wigwams and settle down for about six months to the work. An open space (*tatacúa*) is then prepared and the surface of the soil beaten hard and smooth with mallets. An arch of hurdles (*barbacúa*) is then erected over it, and the branches of the tree are placed on the arch and a fire kindled underneath, by which means the branches and leaves are thoroughly dried without being allowed to become scorched. During this process the aroma is developed. Sometimes the leaves and branches are subjected to a preliminary drying by being placed on the ground and surrounded by a fire, and then removed to the *barbacúa* to complete the drying. The floor is then swept clean and the dried branches placed upon it, and the leaves beaten off with sticks and then crammed into sacks made of hides, which shrink in drying, and form hard compact packages, each of which contains about 200 lbs. of the dried leaves, and in this state they keep well. The finest tea is obtained from the smallest plants. Three varieties are prepared—one

(*caacuys*) from the half-expanded buds, which is used only in Paraguay and will not bear exportation, as it does not keep well; a second (*caa-miri*) consisting of the blade of the leaf freed from its nerves before roasting; and a third (*caa-quazú*) consistin gof the leaves beaten off the branches and dried as above described. In Brazil the Maté is rubbed to powder before being infused, but in Paraguay and the Argentine Republic this is not always done. The dried leaf has an aroma resembling tea, and the infusion has a pleasant odour. The Creoles in South America never travel without a supply of the leaf, and infuse it before every meal, never tasting food until after having drunk Maté.

More recently a different method of drying the Maté has been adopted, the leaves being dried in large cast-iron pans set in brickwork, in the same way that tea is dried in China, and afterwards powdered by machinery. The different modes of preparation influence to a certain extent its properties, the Maté of Paraguay being considered the best, and that of Oran and Paranagua being regarded as less valuable.

Mr. O'Conor of the British Legation in Brazil calls attention to Maté in a recent official report, and says that it is more fortifying and alimentary than either tea or coffee and much more wholesome, and can be sold at a price sufficiently low to bring it within the reach of all classes. He also states that the Ministry of Agriculture has devoted a small sum to making this plant known in Europe.

Mr. Julius Beerbohm, in his book, *Wanderings in Patagonia; or, Life among the Ostrich Hunters*, thus speaks of Maté:—"Yerba-Maté is a kind of tea in great repute throughout South America, especially amongst the country people, who drink it at all their meals and whenever they have nothing particular to do, which is very often. It has a bitter aromatic flavour, and though usually taken with sugar, many find it equally palatable without the latter adjunct."

Mr. Reid states, that its restorative powers are marvellous, and frequently, when thoroughly exhausted after a hard day's ride, he has taken a cup or two of Maté, and found himself immediately revived and invigorated. It is decidedly a

better stimulant than either China tea, or Coffee, as it does not lose its flavour by exposure to the air and damp as quickly as those articles do; it is naturally preferred by those whose profession forces them to take these qualities into account in the selection of their victuals. Maté is indispensable to the hunter in Patagonia. For months it is often the only addition he can make to his otherwise exclusively meat diet. In fact, he is never without it, except when in the saddest plight, and for it he will forego any other luxury, such as sugar, biscuit, or rice. It is surprising that hitherto no attempt has been made to introduce Yerbà Maté into Europe as an article of domestic consumption. It has only to be known to be appreciated; and as it could be imported pure, far cheaper than tea or coffee, it might in time prove a formidable rival to those beverages, especially among the working classes, to whom its invigorating qualities would particularly recommend it.

Having heard so much in its favour, I sent for a supply of Maté prepared in the different ways before described, so anyone wishing to test its flavour and judge of its value can now do so.

Sterculia Acuminata.

Cola.

From P. Beauvois,
Flore d'Oware.
Vol. 1, Pl. 24.

CHRISTY & Co., PUBLISHERS, LONDO

KOLA-NUT TREE.

(Cola Acuminata.—R. Br.*)*

The tree which bears these celebrated nuts is a native of Tropical Africa; and now that this almost unknown country is being opened up to commercial enterprise, these valuable nuts will probably receive the attention they merit as an article of trade.

In the words of Dr. Daniell, who resided for some time in West Africa, "it would be difficult to find any product which occupies such an exalted position in the social and dietetic economy of the Negro tribes, and which constitutes such an important article of commerce in Soudan, as the Kola Nut."

With the majority of the aboriginal races populating the vast extent of territory between Senegambia to the north, and Angola to the south of the Equator, Kola Nuts have from time immemorial been held to be of inestimable value, and their virtues have been so highly prized that they have become an indispensable and permanent luxury.

Within the last few centuries, however, their use has been still more extensively diffused, and to such a degree as to cause a large commercial intercourse to spring up between the coast districts and the regions of Central Africa, or Soudan. This profitable trade has been carried by Pagan and Mahomedan merchants (the latter especially), into more remote countries beyond the Sahara, so that for many years these valuable commodities have been offered for sale in the markets of Fez, Tripoli, and other local depots on the shores of the Mediterranean. So highly are the nuts valued, that the presentation of a few, or even one, is esteemed a high compliment, and when given by a chief to a white trader, conveys an assurance of welcome, friendship, and protection; and, where the nuts are not indigenous, no business can be transacted without a few of them being previously eaten. So highly are they appreciated, that formerly no

marriage gift of the bridegroom to the father would be deemed acceptable for the purchase of his daughter, unless it comprised a considerable amount of the Kola Seeds. The fetishman or necromancer relies especially upon feeding the "Spirit" with the Kola Nut to raise it before the unfortunate votary as a propitiatory offering to the malign god of the earth, to avoid sickness, misfortune, or to ensure happiness, or a bountiful harvest. On the departure of a guest the host feels bound to bestow a few Kola Nuts upon him. These are only a few of the ceremonial uses of the Kola Nut, which appear to have arisen from the recognition of its valuable properties.

Although slightly bitter and astringent, strangers quickly become accustomed to the taste, and the habit of chewing the nuts soon becomes an imperative necessity—just as much as drinking tea and coffee in this country. This has been the case with the Portuguese, Dutch, and English who have used them. As an example of how highly they are prized, it is stated that at Fezzan the seeds sell, in their fresh state, at the large sum of a dollar for four seeds, and that they are offered to visitors as a substitute for coffee, being handed round on salvers. In conjunction with gold dust and salt, these nuts form the staple commodity of Soudan.

Their use is said to support the strength, allay inordinate appetite, assuage thirst, and promote digestion, and to render those that use them capable of prolonged fatigue.

Their effect upon the system must be considered to be of a bracing character, for Dr. Daniell states than, when suffering from a peculiar form of diarrhœa to which Europeans are subject, and which arises from relaxation of the mucous membrane of the intestines, he was relieved by drinking a decoction of the fresh seeds. The valuable properties of these nuts are doubtless partly due to the fact that they contain the same chemical principle as tea and coffee, of which (theine) they contain more than two per cent. It is well known, however, that coffee owes some of its valuable properties to a small quantity of a volatile oil. Kola Nuts also contain a peculiar aromatic volatile oil, to which, perhaps, their beneficial effects are in some measure to be attributed. The power

which they possess of clearing muddy water and rendering it sweet is perhaps due to the albuminous matter of the seed producing a kind of mucilage, which carries down particles of impurity with it. Besides their dietetic and medicinal value, they also yield a yellow dye.

The tree flourishes well by the sea coast, and is worthy of the attention of those who intend trading with the interior of Africa, where it does not grow. By the negro it is preferred to tea or coffee, so that where it is attainable, the coffee which grows wild, and is also cultivated for sale, is not used by the natives. To what this preference is due it is difficult to say, since the nuts have only been chemically examined in the dry state, in which condition they lose their bitterness. It is certain, however, that they have a beneficial action on the stomach and liver, a small piece being commonly chewed before meals to promote digestion, and their continual use prevents those attacks of constitutional despondency which liver disease often induces, and to which the negroes are peculiarly liable.

Dr. Daniell alludes to an instance of this kind, in which the use of the Kola Nut put a stop to an epidemic of suicidal mania, which threatened at one time to depopulate the estate on which it occurred.

The natives prefer Kola Nuts in the fresh state, and they can preserve them for months by wrapping them in a peculiar kind of leaf, which is kept moist. Those which I have recently received, arrived in this country as fresh as if they had just been gathered. I have sent some to Kew, and have myself planted the remainder. Some had been sent to me packed in loam and some in leaves—the latter plan is the best.

COCA.

(*Erythroxylon Coca*, LAM.)

THE leaves of this plant have long been known and used by the Indians of Peru and Bolivia as a valuable nervous stimulant, and have been used by them to sustain hunger for long periods, and endure prolonged labour without fatigue. Of late years the plant has attracted considerable attention in this country and on the Continent, and large quantities of the leaves have been imported. The *dried* leaves, however, vary exceedingly in activity, so that they are scarcely to be depended on, their active principle being apparently very easily injured by a sea voyage. In Bolivia it is always "*Coca fresca*," *i.e.*, fresh Coca that is offered for sale, as the natives know how liable the leaves are to deterioration. In a recent number of *The Druggists Circular and Chemical Gazette*, October, 1879, Mr. D. F. Shull reports a series of experiments made with Coca, and arrives at the following results:—

"There is much variation in the quality of the leaves. Some specimens obtained, which were of a light brown colour, I found to be entirely worthless. The leaves, when of good quality are of a light green colour, with an aromatic odour similar to tea. The leaves, when chewed have a slightly astringent and aromatic taste, producing smarting and a feeling of numbness of the tongue, due to the alkaloid cocaina. Those specimens of the leaves which did not possess this property were entirely devoid of any medicinal effect, which goes to prove that the alkaloid must be the medical principle. In small doses cocaina has strong stimulating properties; it produces a feeling of intoxication."

Mr. Shull also prepared an extract, a fluid extract, and an infusion of the leaves, and found that that all three produced the full stimulating effect of the leaves on the heart's action: of the three preparations, he thinks the fluid extract preferable, as it is not so liable to be affected by age as the others. His remarks upon the therapeutic effects of Coca are so important that I quote them fully:—

"In a few experiments made as to the therapeutic effects of coca, I found that in doses of from 30 to 60 grains it produces a

gently excitant effect, with an indisposition to sleep, in this respect resembling tea and coffee, but having a more decided action on the heart, increasing its contractions and giving elasticity to its action. It also possesses a peculiar stimulating power over the digestive organs, giving almost immediate relief to that feeling of depression after eating caused by indigestion. Taken in larger doses of from two to three drachms it excites the whole system, causing the face to flush and imparting increased vigour to the muscles as well as to the intellect, with an indescribable feeling of satisfaction.

I took note of the stimulating power on the heart's action of a good quality of coca in doses of thirty grains each, on four young men at the same time, by noting the pulse of each before taking, and again twenty minutes after taking, with the result of an increase of the pulse in the first from 90 to 110, in the second from 76 to 86, in the third from 66 to 82, and in the fourth from 92 to 125, making the average increase of the pulse $19\frac{3}{4}$.

Many contradictory statements have been made by those who have studied coca as to its stimulating properties. I think this is largely due to the difference in the quality of the leaves used. Some extraordinary stories are told by travellers in South America of the endurance of hard labour and loss of sleep, afforded to the natives by the use of coca. They are probably in most cases exaggerated, although there can be no doubt that the fresh leaves used by them are more active than those we obtain."

The use of Coca in medicine has lately been recommended in this country. (See *British Medical Journal*, February and May, 1874.

Mr. McBean has found the tincture of coca very useful in doses of one to three drahms in typhoid fever, its action being to restrain tissue metamorphosis. (See *British Medical Journal*, March 10th, 1877).

In order that the valuable properties of this interesting shrub may be fairly tried in this country, I have imported a quantity of the fluid extract made from the fresh leaves in the country where it grows, as well as some bottles of the different forms in which it is sold in Peru.

PITURI.

(Duboisia Hopwoodii.—MUELLER.*)*

In the writings of several Australian explorers, a remarkable substance called Pituri is described as being used as a stimulating narcotic. The name is variously spelt as *bedgery, pedgery, picherie, pecherie,* or *pitury.* Until recently, the leaves, which could only be obtained in a broken state from the natives, could not be identified with any known plant.

Pituri is a substance chewed by the natives of some parts of Australia as a stimulating narcotic, and is carried in oval pointed bags. It is very difficult to obtain it, for the natives like their Pituri, which they chew (as the Coca is chewed in Bolivia) to strengthen themselves on long journeys, or to increase their courage in battles. A strong dose makes them furious. In 1872, Dr. Bancroft of Brisbane, having got some genuine Pituri, made some very interesting experiments on animals, which led him to believe that it was a most dangerous poison, acting principally on the respiratory system, producing shivering and convulsions.

At length Dr. Bancroft, obtained some tops of the Pituri bush from Mr. W. O. Hodgkinson, who had gathered it; these were forwarded through Mr. Bailey, a resident botanist, to Baron von Mueller, who sent the following reply:—

"I am glad, dear Mr. Bailey, that at last the doubts concerning the origin of the Pituri poison seem solved. The specimens procured by Dr. Bancroft's efforts, though without flowers and fruits, appear certainly referable to my Duboisia Hopwoodii (*Frag. Phytograph, vol.* x. *p.* 20), formerly when fruit was unknown referred to Authocercis. It comes not quite unexpectedly that the pituri is traced to Duboisia, because I am aware of the poisonous properties of several species of Anthocercis, and this added to my reasons, to restore both Duboisia and Authocercis to Solanaceæ, from which Bentham had wrongly removed them to Scrophularineæ."

In another letter to the *Australian Medical Journal,* Baron von Mueller says:—

"Some weeks ago I was asked by our last President about the origin of the Pitury, a stimulant said to be of marvellous power, and known to be in use by the aborigines of Central Australia. It so happened that after years of effort to get a specimen of the plant, I at last, this week, obtained leaves, and although I have seen neither flowers or fruits, and although these leaves are very similar to those of various otherwise widely dis-allied plants, I can almost with certainty, after due microscopic examination, pronounce those

of the Pituri as derived from my Dubosia Hopwoodii, described in 1861, (*Fragm. Phytogr. Austr.* II., 138). This bush extends from the Darling River and Barcoo to West Australia, through desert scrubs, but is of exceedingly sparse occurrence anywhere."

Baron Von Mueller thus describes the *Duboisia Hopwoodii*:—

"A tree or bush, the leaves smooth, linear, narrow, finely acuminated with the end often bent, rather thick, and tapering into a short petiole, and from 3 to 4 inches long. Calyx small bell-shaped, from about 2 to 3 lines long. The lobes are broad and very obtuse, shorter than the tube; the anthers are cellular; fruit is unknown; plant very rare; is found from the Darling river to Western Australia, in the barren deserts."

Dr. Bancroft has described at length the symptoms produced by Pituri, in a paper read before the Queensland Philosophical Society, and it has also been experimented with in this country by Drs. Ringer and Murrell.

In a letter to Dr. Bancroft, Mr. Hodgkinson says:—

"I have much pleasure in giving you the information I possess relative to the herb, specimens of which I had the honour of giving you. Its name, as pronounced by the natives of the district from whence it is procured, is "Petcherie." The locality in which I found it was approximately latitude 22° 53′ 51″, longitude 138° *in situ*. Owing to my ignorance of botany I can give you no other description than this. It is a bushy shrub, attaining, in the specimens from which I plucked the parcels given you, a height of eight or nine feet, with dark thick glossy foliage, leaves of lanceolate form and growing from the base in a regular rounded outline, conferring quite an ornamental appearance. The locality in which it was noted there was a sandy spinifex (*Triodia pungens*) flat, flanked by red sand-hills, miserable country, *either destitute of water or in the vicinity of saline springs*. The whole district, lying between Spencer's Gulf and the Gulf of Carpentaria as it does, bears in a multiplicity of marine remains, strong proof that the connection between the points referred to was at (speaking geologically) no distant date, much closer than at present. Even now salt springs are abundant, and in droughts the surface water existing becomes unfit for consumption. To the natives the habitats of this herb are known by the names of pecheringa, and their precise position neither coaxing or presents would induce them to disclose. In common with other savages under similar circumstances, petcherie and pecheringa are protected by legends from curious inquirers, and the district itself is sufficiently inhospitable to repel intruders, as I had made two days' stages without water when I gathered the specimens I was so fortunate as to obtain. The resident natives carry on a considerable traffic in this plant, representatives of tribes from other quarters coming to procure it. It is used, after being sweated beneath a coating of fine sand, as a narcotic stimulant, strictly kept for the solace of the old men, or for occasions when long privations have to be endured or some solemnity performed. As I never had the slightest misunderstanding with the natives I am unable to speak of its employment to excite a combative spirit. After being sweated in the sand as before stated, it is dried, roughly pounded up and

stowed in netted bags, skins, or any available wrappings. When used on the march a portion is put into the mouth, chewed until it assumes the form and consistency of a sailor's quid, passed round to each one of the party, the saliva promoted by its use being swallowed, and finally it is restored to the original donor, who carries it behind his ear, until constant employment has extracted all its virtues. When time will permit, potash prepared from the leaves of any plant suitable for the purpose, is sprinkled over the petcherie, and probably for the same reasons as when used in connection with the betel nut. Your remarks as to the toxicological properties of petcherie, I confess, much astonish me. Sixteen years ago, when with Burke and Wills' expedition, subsequently with Mr. Jno. McKinlay, and recently in the north-west expedition, I used petcherie habitually, when procurable, in default of tobacco, and have very often chewed it both in its raw and prepared state."

The active principle of Pituri appears to have been first prepared at Dr. Bancroft's request, by Mr. Stayer, Analytical Chemist. Dr. Bancroft describes it thus :—

"It looks like a brown oil, and has no crystalline appearance; it mixes easily in water, and a drop so dissolved produces on cats and smaller animals all the phenomena detailed in my paper of 1872. Death is caused chiefly as in tetanus by excessive contraction of the respiratory muscles and suffocation. Mice, with small doses of pituri, may at times be seen to walk on their knuckles. Pituri does not dilate the pupil when applied locally, though dilatation is seen to some extent when given by subcutaneous injection. The extreme retraction of the eyeball in dogs is very remarkable."

The active principle has been more recently eliminated by Mr. Petit of Paris, whose researches are published in the *Journal de Pharmacie*. He identifies it with nicotine, the alkaloid of tobacco. The odour of the dried plant is also highly fragrant like good tobacco. It remains however, to be seen whether the plant contains any other active principle, as nicotine scarcely accounts for all the symptoms produced by Pituri.

Since this, Dr. Bancroft has had occasion to examine the seeds of Pituri; they are kidney-shaped, and the surface is covered with little pits, and it is impossible to distinguish them from those of Duboisia.

At all events a drug of considerable medicinal power is now made known to the medical public, and only awaits a practical application.

It should be noted that this plant grows readily in sandy, "miserable country, either destitute of water or in the vicinity of saline springs;" and hence is suitable for cultivation on land where tobacco, or, indeed, hardly anything else could be profitably cultivated.

THE PAPAW TREE.

(Carica Papaya.)

THE important property possessed by the juice of this plant, of rendering tough flesh tender, has long been known to the natives of tropical climates, but the statement has until lately met with a considerable amount of incredulity on the part of those who have not witnessed the phenomenon.

In the "History of Barbadoes," Griffith Hughes says of the juice of the Papaw Tree, "This juice is of so penetrating a nature that if the unripe peeled fruit be boiled with the toughest old salted meat it quickly makes it soft and tender." Browne, in his "Natural History of Jamaica," says, that meat becomes tender after being washed with water to which the juice of the Papaw Tree has been added, and if left in such water ten minutes it will fall from the spit while roasting, or separate into shreds while boiling. Holden states, that a joint of meat hung to a branch of the tree is rendered tender. In Quito, according to Karsten, the use of Carica juice when boiling meat is a common one. Drury, in "The Useful Plants of India," states that old hogs and poultry which are fed upon the leaves and fruit, however tough the meat they afford might otherwise be, are thus rendered perfectly tender and good, if eaten as soon as killed, but that the flesh passes very soon into putridity.

Surgeon B. Evers, in his interesting notes on Indian medical plants, says, "I have employed the milky juice in the treatment of splenic and hepatic enlargements, and with good results. I have treated sixty patients with this drug, and in thirty-nine cases a cure was effected, in eighteen cases the results were not reported, and in three cases of enormously enlarged spleens relief was afforded. The juice was administered as follows:—A teaspoonful of the juice was mixed with an equal quantity of sugar, and the mass divided into three boluses, of which one was taken morning, noon and evening. For children, a single drop of the juice was given as a dose, mixed with sugar. The juice of this plant acts more

rapidly than chloride of ammonium, bromide of potassium, or the external application of biniodide of mercury. From 20 to 25 days is the longest time that a patient was kept under treatment. This solvent action is not confined to muscular fibre, but is exerted also on circulating blood. In the Mauritius the juice of the plant is considered to be one of the most successful remedies for intestinal worms, a single dose being usually sufficient for a cure. The juice is also used to remove freckles on the skin caused by the sun's heat.

For further medical particulars our readers are referred to the *London Medical Record*, for April 28th, 1875, and the *Pharmaceutical Journal*, June 26th, 1875, p. 1029.

Recently Dr. T. Peckolt has contributed a most valuable and elaborate paper on this plant and its active principle to the *Zeitschrift der Allg. Ost. Apotheker Vereine*, Vol. XVII, pp. 361–373, a translation of which has appeared in the *Pharmaceutical Journal*, Nov. 1879, pp. 343–383. From these papers the following particulars have been derived:—

"This herbaceous tree is in Brazil a constant companion of the banana, and is never wanting near the huts of the natives. And rightly do the Indians honour this useful and most grateful tree, specially selected by Providence for people averse to any cultivation, for without the slightest care or labour after a few months' growth it yields harvests the whole year through.

"Notwithstanding that in respect to nutritive value the fruit cannot compete with the banana, its use makes a refreshing change, and as will be seen subsequently by the analyses it is not so very poor as a food stuff.

"In Brazil the tree is scarcely cultivated, or with but little care, its continued planting, like that of the banana, being self-effected, but with this difference, that instead of shoots from the roots it is done by the seeds of the fruit falling on the ground. The tree is simply left to stand where the seed has been planted either by the use of the fruit as manure or by the agency of birds; the tender young plants brave all weathers and are very tenacious of life, are not eaten by animals, and after becoming ten inches high are not prevented by injury to leaf or bark from growing luxuriantly and almost perceptibly to the eye, even more rapidly than the banana."

The following particulars as to cultivation will probably be of value to those who desire to grow the best varieties of the plant:—

"The improved variety called 'mamao melao,' which yields a fruit as large as a pumpkin, is treated with somewhat more care, and its management may even be called cultivation. The seeds are planted, together with the flesh of the fruit, in a light soil, not too moist, and

containing abundance of organic matter; if they be planted without the flesh of the fruit, only trees that yield the original fruit of the uncultivated kind are obtained. I had doubts respecting this, but have satisfied myself of its correctness by numerous experiments.

"When the plants are about 3 or 4 inches high they are transplanted, and for this a lighter soil is selected, which is not too shady, and too much watering must be avoided; this is usually left to the weather. After fourteen to eighteen months the tree-like plants bear fruit through the entire year without cessation. After four or five years of this fruit-bearing existence the top commences to decay and it dies from above downwards, the stem being eventually completely destroyed by the wind if not previously removed by man.

"The fruit, like the banana, is collected in the full grown, but still green condition, so as to ripen in the house. If perfectly ripe when taken from the tree the flesh, especially in the neighbourhood of the skin, is bitter; moreover, the ripe fruit is difficult to secure against destruction by birds.

Analysis of the Fruit.

"In 100 grams of fresh fruit, freed from rind, taken from the three kinds of 'mamao,' I found the following substances:—

	1. Mamao femea.	2. Mamao melao.	3. Mamao macho.
Caoutchouc-like Substances	—	—	0 046
Soft Yellow Resin	0·165	—	—
Reddish-yellow Fat	—	0·020	—
Albumenoid Substrnces	1·070	0·500	0·753
Sugar	3·238	3·580	4·333
Pectinous Matter	1·315		
Tartaric Acid	0·075		
Citric Acid } combined with Bases	0·020	0·480	2·332
Malic Acid	0·083		
Dextrin, Extractive Matter, &c.	5·503		
Water	85·351	92·500	89·445
Cellulose	3·180	2·920	3·091

Dr. Peckolt has discovered the active principle which he calls "Papayotin," and which he finds dissolves an equal weight of flesh and albumen.

We have here, then, a most valuable plant, both for culinary purposes, medicine, and food, and one that ought to be cultivated in every house where a sufficient temperature can be maintained for its growth during the winter. It can easily be grown as a pot plant, and then a fresh leaf or juice can be obtained when required. The plant grows very quickly and bears fruit in three years after putting down the seed. (See Drury's "Useful Plants of India," p. 115). The fruit is pleasant to the taste, and in India it is both pickled and preserved for curries.

JAPANESE PEPPERMINT.

(Mentha species.)

Peppermint Camphor.—A crystalline substance called Menthol, bearing a strong resemblance to Epsom Salts in appearance, but having a powerful odour of peppermint. Is much used in China and Japan. Sometimes this substance is sold mixed with an oil of peppermint and sometimes separately. During the last few years Menthol has been introduced into this country, but until the present year has not attracted much notice. When in China I was treated for sunstroke with this essential oil and entirely cured in two days. A short time since I had in my hands a quantity of the plant yielding this oil and these crystals, and it was examined at my request by Professor Flückiger, of Strassburg, who, in a recent letter, says :—

"The Japanese peppermint herb which you kindly sent some time ago was distilled in my laboratory. I was *very much* surprised to see what a large yield of fine Menthol (peppermint camphor) it afforded. The herb must make a profitable article of importation, I fancy. Yours very sincerely,

"STRASSBURG, *Nov. 18th*, 1879. "PROF. FLÜCKIGER."

In the *Pharmaceutical Journal*, November 15th, 1879, Mr. A. H. Mason, F.C.S., says :—

"A few years ago my brother-in-law brought with him from China some bottles of *Po-ho-yo*, which he said was used out there as a specific for headache, and as he happened to call when I was prostrate with a severe nervous headache, he insisted upon anointing my forehead with this magic liquid. I immediately experienced an agreeable burning sensation and perceived a powerful odour of peppermint, fell asleep and awoke minus the headache. When I smelt this liquid Menthol I fancied I recognised my old restorative, and I should not hesitate to apply it, of course diluted should occasion require."

Little bottles of liquid commonly sold at extravagant prices at Vienna and Paris as "*Gouttes Japonaises*", or *Po-ho-yo*, consist entirely of the liquid oil. Singularly enough, the Japanese prefer the Chinese oil to their own. Mr. Mason further observes :—

"Whatever source they are from, *Chinese and Japanese have a more decided effect than either the English or the American oils; the two latter do not relieve neuralgia to the same extent. The crystals are now used in dental cases.*" (See *Practitioner*, Nov. 1879, p. 448.)

"Mr. Macdonald recommends it for sciatica and neuralgia, particularly for intercostal neuralgia." (See *Lancet*, Vol. II., 1879, p. 449.)

"A little Menthol camphor was put into a carious tooth, from which the patient was suffering great pain; this it relieved at once, but for some time afterwards the patient was so elated that she appeared as though she had had a little of something else."

The peppermint-plant yielding this essential oil and camphor is evidently a most valuable plant and deserves cultivation in this country, as it obviously possesses more powerful properties than the English plant. I have therefore sent for regular supplies of fresh seed of the plant, shall shortly be in a position to offer it for cultivation. I have also a large stock of the beautiful white peppermint camphor from this plant.

THE COW TREE.

(Brosimum Galactodendron.)

Although by no means new to science, the properties of the Cow Tree have not received the attention they deserve from practical men. In order to draw attention to this valuable tree, a translation is here offered of a letter which appeared lately in the *Journal d'Agriculture.*

"In South America there is a vegetable sap which is considered a very salutary food, and which, when I left Europe, Alex. de Humboldt advised me to submit to a chemical analysis. The great traveller said also that amongst the many curious phenomena he had observed, there were few that attracted his attention so much as this tree, which produced milk as abundantly as the cow."

"The Cow Tree *(Palo de leche)* has the appearance of the "*Caimitier*," and its height varies from 48 to 70 feet. The leaves are oblong, alternate, and terminate in hard points. When a cut is made in the bark of the tree, a white viscous liquid of an agreeable taste runs out."

"It is on the slopes of the mountains near the coast of Venezuela, above Ocunare, that Mr. De Rivero and myself saw the Cow Tree—the '*Brosimum galactodendron*' as described by the learned botanist, Mr. S. Linden. We had made the little town of Maracay our abode, near the fresh water lake called Tacarigua."

"The natives used to bring us every day some of the vegetable milk, and we had abundant opportunity to find out both its composition and nutritive properties, for we had this milk to mix with our coffee and chocolate for more than a month. The second time I came across the *Palo de leche* was under very singular circumstances. The War of Independence was drawing to an end, and the only place remaining in the hands of the Spaniards was the fortress of Puerto-Cabello, and the American army was surrounding the town. Having made up my mind to visit the camps distributed on the south slopes of the Cordilleras, I left the hot springs of 'Las Trincheras,' where can still be seen the remains of the fortifications made by some French buccaneers who,

over a century ago, plundered the town of Nueva Valencia. When I came to the torrent of Naguanagua I met some soldiers carrying cans. I supposed they were going to fetch water, but seeing them pass the torrent, I asked them where they were going, when one of them replied that they were going to 'milk the tree.' At first I did not understand, but nevertheless followed them. After an ascent of about 600 yards, we came to a beautiful forest where there were plenty of fine trees of '*Brosimum galactodendron*,' of which the roots covered the surface of the soil. The temperature of the air was about 72° Fahr. (22° centig.) The soldiers made many cuts in the trees with their swords, and in less than a couple of hours the cans were full, and we returned to the camp. The place where the camps were situated is not far from the farm of Barbula, where Humboldt saw the natives of the plantation come to gather the vegetable milk, and dip their biscuits of 'Cassava' in it. The bailiff assured me that the slaves fattened by drinking this milk. In the morning the neighbouring natives also came to gather it in gourds: some drunk it on the spot, and some took it home to their children.

"The *Brosimum galactodendron* is very plentiful in the intertropical regions. More than a century ago, Loet noticed it near Cumana; Mr. S. Linden saw it on the mountains above the lake of Maracaybo, and A. Gaudot saw it in the Sierra d'Ocana, where he discovered the fine variety of cocoa called Montaraz. The milk produced from the tree is of a thicker consistence than that of the cow; its reaction is slightly acid; exposed to air it turns sour, and coagulates into a sort of cheese. We have found in this milk:—

"(1.) A fatty substance like beeswax, melting at 122° Fahr., very soluble in ether, but less soluble in boiling alcohol. It probably consists of several substances, and after being melted and cooled down has the appearance of virgin wax. We made good candles with it."

"(2.) A nitrogenised substance analagous to caseine, and recalling the vegetable fibrine which Vauquelin discovered in the sap of the *Carica Papaya*."*

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* See note on Carica Papaya, pp. 29–31.

"(3.) A saccharine substance, the exact nature of which we were unable to determine."

"(4.) Salts of potass, lime, and magnesia, partly in the state of phosphates."

"As to the solid matter, at Macaray we estimated it at 42 per cent. of the milk coming from the forest of Perquito, as follows:—

"For some time I was not able, for want of time, to find out the nature of the sweet matters, which we only perceived. Afterwards, however, Mr. A. Goudot sent me an extract of the vegetable milk that he obtained by means of evaporation in a water bath; and I had the good fortune to observe in the Exhibition several bottles of this sap, which M. Vicente Marcana put at my disposal so as to enable me to continue my researches."

"In 100 parts of extract of the milky sap, not subjected to fermentation, we find:—

Complex fatty matters	84·10.
Inverted sugar	2·00.
Sugar	1·40.
Gum easily altered to sugar	3·15.
Caseine, albumen	4·00.
Alkaline ash, phosphates	1·10.
Non-nitrogenised matter	4·25.
	100·0.

"To 100 parts of milky sap, containing 42 of fixed matter, we find:—

Wax and saponifiable matter	35·2.
Saccharine and analogous substances ...	2·8.
Caseine and albumen	1·7.
Mineral matter	0·5.
Undetermined substances	1·8.
Water	58·0.
	100·0.

"The vegetable milk by its constitution approaches as nearly as possible to the milk of the cow, for it contains a fatty substance, saccharine matters, albumen, and phosphates. But the proportion of these substances is different in the

vegetable milk. The amount of fixed matter is three times larger than that in the milk of the cow; so that the vegetable milk approaches more nearly to cream than to milk. As an example, Mr. Teannier, when he analysed a sweet cream, found it to contain in 100 parts—

Butter	34·3
Sugar of milk	4·0
Caseine and phosphates	3·5
Water	58·2
	100·0

"The butter in cows' milk is about equal in proportion to the waxy substance in the milk of the '*Brosimum galactodendron.*' The other solid matters are nearly the same. This analogous constitution explains the nutritive properties of the milk, or rather of the vegetable cream; the fatty matters susceptible of being resolved into fatty acids and glycerine being very similar, as made out by our learned and regretted colleague Claude Bernard."

"BOUSSINGAUT."

MAHWAH.

(Bassia latifolia.)

I have received, by the assistance of Mr. E. Lockwood, several tons of Mahwah in very fine order. It has been tried in this country by several cattle feeders and poultry keepers, and is so much appreciated that they have given conditional* orders for next year's crop.

The 50 per cent of sugar contained in the flowers will render Mahwah exceedingly valuable and economical as a food.

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* That the price shall not exceed £8 to £10 per ton delivered to the Railways in England.

CHAULMUGRA OIL.

Although Chaulmugra has been known in the East for centuries, several medical men who have practised in India inform me that it is too strong for the natives, except when they are in a European Hospital, or in the service of a rich man where they get plenty to eat. They have such a small amount of food as a rule, that their stomachs cannot support this oil, but Europeans experience no inconvenience when taking it.

Wherever Chaulmugra oil has been tried in this country or America, the demand has increased. Some medical men, I am pleased to say, are trying the effect of mixing it with other drugs, and I intend to follow it up and chronicle the results for the benefit of patients, and those interested in the advance of new remedies.

Mr. John Moss in a valuable paper in the *Pharmaceutical Journal* on the chemistry of Chaulmugra oil, reports that the properties of the oil are probably due not to the alkaloid which is contained in it in very minute quantity, but to a body which he has named gynocardic acid. His analysis is as follows—

Gynocardic acid	11.7
Palmitic acid	63.0
Hypogæic acid	4.0
Cocinic acid	2.3

"These bodies exist in combination with glyceryl as fats, the two former in the free state as well."

Mr. Moss also demonstrates that the test of the purity of the oil as described by Dr. Dymock is fallacious, in as much as palm oil gives a colour of the same character as that afforded by Chaulmugra oil when treated with sulphuric acid as Dr. Dymock directs.

It is to the gynocardic acid in the Chaulmugra Oil that this green coloration is owing, and it is to the same acid that the slightly acrid burning taste noticed when Chaulmugra Oil is swallowed, is due.

The enquiry comes so often to me for some guide as to the best way of taking Chaulmugra Oil, that I propose to give such information as I possess on this point.

FOR RHEUMATISM and RHEUMATIC GOUT.—The oil should be liquified by heat and then well rubbed into the parts affected with the ends of the fingers.

At bed-time commence by taking one capsule containing 5 drops of Chaulmugra Oil—the next night two capsules, and if it is a case of long standing another capsule of 5 drops may be taken after the midday meal.

It is most important to remember that Chaulmugra must not be used if the stomach is empty, or it will produce nausea.

It is a perfectly safe medicine to give to a child, one or two drops in cod-liver oil at bed-time, if care is taken to adminster it after food.

In the case of sprains and bruises many hunting-men can testify to the relief that they have experienced from Chaulmugra after severe falls. The application in this case is external rubbing.

Stiff joints will yield to a few days rubbing with this oil.

FOR NEURALGIA, TOOTHACHE and SCIATICA, this oil should be mixed with Camphor and Choloroform and applied externally, and well rubbed into the part affected: when the pain is confined to the nerves in the face a piece of cotton-wool may be saturated and placed in the ear and it will not cause inflammation. If in the jaw or tooth, then a piece of cotton-wool saturated with the mixture may be placed in the mouth, and the face well rubbed. The relief is so rapid that many who have tried it declare it to be instantaneous.

For eruptions in the skin it is always best to consult the medical adviser before using the remedy, as to the best means of using it.

It may be applied externally by rubbing, and taken internally. It is always best to commence with small doses of not more 5 drops at night.

Whenever this oil is being used it is found to cause an increased appetite for food, and this symtom must be attended to, and a generous supply of food taken, or a pain in the chest may result.

TESTIMONIALS—

(In continuation of those in the last number.)

1, STANLEY TERRACE, UNION ROAD,
To THOS. CHRISTY, Esq., F.L.S. LEYTONSTONE, E.

DEAR SIR,

Please accept my sincere thanks for the Chaulmugra Oil you kindly supplied me with. A month since I was suddenly seized with a severe attack of Rheumatism; so acute was the pain that for two whole nights I could not sleep, and the swelling of my hands made me quite helpless—I could neither dress or feed myself. Having had a sharp attack of Rheumatic Fever about 20 years ago, you may be sure I was very much afraid that I was again to be laid aside from business, and you, I fear, will hardly believe that within *three hours* of the application of the Oil the use of my hands was restored to me, and that from that day to this I have not had a return of the pain. I shall have to get another supply as I have lent my bottle to several people suffering from Rheumatics. One of my friends who lives in the Leytonstone Road told my wife that she never tried anything that gave her such speedy and permanent relief. And one old friend who has suffered for years from Rheumatic Gout, and whose age (72), makes her case almost hopeless, with tears in her eyes thanked me for its having been the means of giving her a good night's rest—which she had not had for months.

Do please, Dear Sir, make its use extensively known, and you will be doing a great service to poor suffering humanity.

I remain, yours truly,

Aug. 29*th*, 1879. P. W. LEWIS.

"'R.F.' had been a great traveller and a sufferer continually from Rheumatism. He had sought for the best medical advice both abroad and in this country. His brother, hearing of the 'CHAULMUGRA OIL,' obtained some for him, as the physician attending him had not heard of it." He writes 13th January, 1879, as follows—:

15, GLOUCESTER STREET, *January* 13th,

"I have received so much benefit from the 'CHAULMUGRA OIL' which you sent me for the Rheumatism, that I must let you know in case you may have any more friends who are in as poor case as I was. I have taken the capsules now, on and off, for about a month, and can safely say I have never had a touch of rheumatism since. As I have been a perfect martyr to this complaint, as you know, for the last five and-twenty years, you may fancy my delight at finding anything to do it good. I have tried everything I have ever heard of, both here and in New Zealand, each if possible more beastly than the last, but have never found anything else do me any good except 'Chlorodyne,' and that only deadened the pain, but did not cure it as this stuff does. mean to carry a supply of the capsules where-

ever I may wander to in my next travels. The only thing I am not clear about is as to whether it is safe to take the oil "neat," or as one takes any other oil. If you can find out this for me I should be much obliged.

"Your affectionate brother,

"R. F."

P.S.—Even this change from frost to rain has not brought my old enemy out again.

"'J.N.' was suffering from rheumatism, and his neck was quite stiff and his head on one side. He could get no relief. Hearing of the effect of 'CHAULMUGRA OIL' on a friend, he sent for some capsules. After taking one capsule, containing five drops, for a few days, the pain left him, also the stiffness in the neck; he found his appetite increase and his spirits revive, and he has had no return of the pain."

"CHARLES ELLERY had a severe attack of Rheumatic Gout. His foot was so swollen and the pain of it so great that he could not bear the bed clothes to touch it. Having applied several remedies, which failed to alleviate the pain or reduce the swelling, he at last procured a supply of 'CHAULMUGRA OIL AND CAPSULES.' The Oil he rubbed on the affected parts and took some of the Capsules.

"The use of the 'CHAULMUGRA' gave him so much relief that on the fourth day after the first application of this Oil, he was able to walk about the room, and continued gaining strength till the tenth day, when he was able to pursue his occupation, which necessitates his rising at about five o'clock in the morning, and walking about the greater part of the day."

The Hon. Mrs. H. writes, 7th Oct., 1879:—

"The other day I suffered torture from an attack of acute neuralgia for 5 or 6 hours, and when dressing for dinner, I suddenly thought of a little drop of Chaulmugra I had left in the bottle, which I had mixed with camphor and chloroform as you told me for neuralgia, and rubbed it on my shoulder. It took the pain away like magic, and I have had no return of it. Never again will I be without a bottle of this mixture."

DR. BANCROFT'S BEEF ESSENCE.

I make no apology for inserting in this number the full particulars of a very important discovery by Dr. Bancroft, of Queensland, who has done so much for Australia by sending over to this country the result of his botanical and other researches, and the clearly defined facts he has arrived at by practice and experiment.

Dr. Bancroft having sent to me several tins of his preparation of the essence of beef, which he calls Pemmican, in compliance with his request, I have distributed it to some of the Hospitals and to some of my friends who boast of having first-class cooks. In every instance the reports from the hospitals were, "let us know the price, we find it excellent." The cooks and their masters equally appreciate it, so I have encouraged Dr. Bancroft to prepare it in quantity. It keeps perfectly, even if the lid is off the tin, and it is in the form of a granular powder which is even improved by being ground in a mortar.

Dr. Bancroft writes from Brisbane, June 18th, 1879:—

"I find the *Lancet* of March 8th, 1879, contains a paragraph stating that Pemmican is a desideratum in the London market. This has caused me to prepare a case of 56 lbs. as a sample of what I have produced formerly. At present it takes two hours to prepare. I could send by Orient ship each month 500 lbs. or more, without much expenditure for new plant. I formerly worked up three beasts per week.

"When house-surgeon to the Colonial Hospital (in which we had over a hundred patients), I used this Pemmican for soup daily for nearly a year (without a single complaint), by way of experiment.

"If you would bear in mind the necessity of urging sufficiently long boiling or maceration of the meat particles, which are so very hard, you will get good results after adding sufficient salt or other seasoning.

"I find a printed form of the letter from Mr. Youl, to which I refer you, also a letter from the captain of the "*Osman Pasha*" ship, which was burnt on the voyage home. The passenger and crew, saved by a barque, took some hundreds of pounds of my Pemmican and lived on it."

DR. BANCROFT,

BRISBANE, *February* 1, 1869.

DEAR SIR,—I have much pleasure in bearing testimony to the value of the DESICCATED MEAT prepared under your patent as a substitute for fresh meat. My experience during the four months it has been used in the department of the Brisbane Hospital under my charge, has convinced me that its use has been economical to the institution and also satisfactory to the inmates.

W. HOBBS,

Visiting Surgeon.

MESSRS. ORR & HONEYMAN,

IMPORTERS, &C., BRISBANE.

BRISBANE, *January* 1869.

GENTLEMEN,—I have much pleasure in testifying to the usefulness and excellence of the DESICCATED BEEF prepared by Dr. Bancroft's process, having frequently used it during eight months of bush travelling and camp life. It makes excellent soup and mince, in flavour almost undistinguishable from that prepared from fresh beef. And the fact of its being **DRY, CONCENTRATED, AND NOT THE LEAST LIABLE TO SPOIL**, renders it particularly adapted for travellers. I know of no other preparation of beef that is at the same time so portable and palatable, and should be sorry ever to be without a stock of it in my camp.

I am, Gentlemen,

Very truly yours,

C. D'OYLY H. ALPIN,

Government Geologist for South Queensland.

MESSRS. ORR & HONEYMAN, GLASGOW.

LONDON, *February* 26, 1868.

GENTLEMEN,—I have much pleasure to be able to send you a favourable report upon the PRESERVED MEAT, prepared by Dr. Bancroft, and put on board my ship by your firm in Brisbane.

Dr. Bancroft's PRESERVED MEATS were used throughout my last voyage from Queensland to London, and were pronounced by all the passengers to be excellent. I found it a most wholesome and nutritious food for children and invalids; and, although exposed to different climates, it kept perfectly sound and good to the last.

Hoping that this new PRESERVED MEAT will be universally patronised,

I have the honour to be, Gentlemen,

Your most obedient servant,

CHARLES GREY, LIEUT, R.N.R.,

Commanding ship "Young Australia."

MESSRS. ORR & HONEYMAN, BRISBANE.

BRISBANE, *December* 2, 1868.

GENTLEMEN,—I have much pleasure in testifying to the excellence of Bancroft's DESICCATED MEAT, with which you supplied me for my last voyage to London. I prefer it to any other fresh preserved meat that I have tried. My passengers also expressed themselves highly pleased with it. I shall be glad to give it another trial on my homeward voyage this time, and will, as you desire, report upon it to your firm at Glasgow.

I am, Gentlemen,
Yours truly,
JOHN DEASON,
Commanding barque "Harmodius."

MALDEN ISLAND, SOUTH PACIFIC,
January 4, 1868.

MESSRS. ORR & HONEYMAN,
BRISBANE.

GENTLEMEN,—I have to thank you for the samples of PEMMICAN forwarded per "*Courier.*" I have tried it both in soup and in other ways, and find it fully comes up to the description in your Prospectus, and have consequently recommended it to the attention of our firm in Melbourne.

I remain, yours, &c.,
WILL. A. DIXON,
Manager, Malden Island.

LONDON (on board the "*Young Australia*),"
February 3, 1869.

WE, the undersigned passengers on board the ship "*Young Australia*" from Moreton Bay to London, have much pleasure in bearing testimony to the value of Dr. Bancroft's DESICCATED BEEF, which was liberally issued to the children and invalids, and was much preferred to the condensed milk. Several of the children and two or three mothers were very delicate on leaving Brisbane, and found much benefit, and a great increase of strength and energy from the use of the DESICCATED BEEF made into soup and broth.

M. HOWARD, with two children.
ELLEN EDEN WEBSTER.
HELEN MITCHELL, with two children.
JANE M'CARTER, with three children.
JANE JAGGER, with three children.
MRS. MARY FINCH, with two children.

The Beef was also issued to the crew, and was very much liked; and, served in various forms, was also esteemed a very nice change by myself and saloon passengers, and should like to see it supplied to the Government Emigrant ships.

DANIEL E. ROLT,
Commander of ship "Young Australia."

To MESSRS. ORR & HONEYMAN, Brisbane.

DIRECTIONS FOR USE.

SOUP À LA JULIENNE.—To one quart of water take four ounces of the meat, two carrots, one turnip, and one onion sliced, some chopped parsley and sweet herbs; simmer for two hours, or longer if convenient, and strain through a hair sieve; then add salt, half a teaspoonful of soy, and return some of the vegetables cut small. Bring the soup to the boil before serving.

BEEF TEA, of excellent quality, may be made by simply boiling the meat, as above, and then straining.

A GOOD PLAIN SOUP may be made by using pearl barley or rice instead of vegetables.

POTTED MEAT.—To one pint of water take a quarter of a pound of the meat and simmer until nearly dry, then beat in a mortar until smooth, adding pepper, salt, and a little nutmeg and cayenne; then pot, and cover with melted fresh butter.

CURRIES, HASHES, &c., may be conveniently made, without special directions.

TRAVELLERS may eat the meat with a litle salt on their bread, no cooking being necessary.

Four pounds of fresh meat are by this process reduced in weight to one pound, none of the original nutritive value being lost.