

(8.)

LECTURE ON PERFUMES,

FLOWER FARMING,

AND THE

Methods of obtaining the Odours of Plants,

DELIVERED BEFORE THE

ROYAL HORTICULTURAL SOCIETY,

HIS GRACE THE DUKE OF BUCCLEUCH, K.G., PRESIDENT.



SEPTIMUS PIESSE, Ph. D., F.C.S.

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LECTURE.

LADIES AND GENTLEMEN,

Perfumes that are derived from plants, may be, for the purpose of description, conveniently divided into three classes.

CLASS I. are the most ancient, and have been in use from the earliest period of which there is record. They consist of the various odoriferous gum-resins, which exude naturally from the trees which yield them; and to increase the produce, the plants are often purposely wounded. The most important are Benzoin, Olibanum, Myrrh, and Camphor. No less than 5000 cwt. of these together are annually imported into Britain. Gum-resins form the chief ingredients in incense, and in pastilles.

We have here specimens of Benzoin, Olibanum, Myrrh, Frankincense, Camphor, Storax, and numerous others.

These odorous bodies are principally consumed in certain religious ceremonies, and from the early custom of burning incense upon the holy altar, our word perfume, from *per fumus* (by smoke), has been derived.

You will find displayed here some fine specimens of art workmanship in the contrivances for burning incense, and like bodies for fumigation. The most artistic Pastil Burners of Wedgwood are either copies, or but slight variations from copies, of the antique Grecian, Roman and Nineveh patterns. The church censer-burners, in metal, of

our day, appear not to exceed in artistic merit those made in former ages; indeed, those depicted on the walls of Mero, and upon the Greek coins, are even more beautiful than any we have here. This fault is not that nations burn less incense than formerly, but from the want of artistic education and taste among our people, whose manufactures are diffused throughout the world.

We may include in this class of perfumes all those parts of plants which are fragrant, such as the long seed pod of the *Vanilla* plant; the *Bean* of the *Dipterix odorata*, or Tonquin Bean, which our grandfathers carried in their snuff boxes; the root of the *Iris florentina*, or Orris root, about 25 tons of which are consumed every year by Britannia at her toilet; the Rhizome of an Indian grass, known as Vitivert or Kus Kus; fragrant woods, such as the Santal, and the Myall, or Violet wood of Australia; odoriferous seeds, as Carraway and Nutmeg; in fact, our first division includes every vegetable substance which has a pleasing fragrance, like some dried flowers. Perfumers grind these several bodies to powder, then mix them in various proportions; the results are, the various SACHET POWDERS in such universal use.

Examples of which are to be found upon the show table.

CLASS II. are those Perfumes which are procured by Distillation. This is the first step to separate the odorous principle from the material which contains it. As soon as the Greeks and the Romans learned the use of the Almembic or Still, which was an invention imported by them from Egypt, they quickly adapted it to the separation of the odorous principle from the numerous fragrance-bearing plants which are indigenous to Greece and Italy. An essential oil or otto thus procured from orange-flowers

bears in commerce to this day the name of Neroly, supposed to be so named after the Emperor Nero. Long before that time, however, fragrant waters were in use in Arabia, as all may learn who read the Arabian Nights.

Odour-bearing plants contain the fragrant principle in minute glands or sacs; these are found sometimes in the rind of the Fruit, as the Lemon and Orange; in others, it is in the Leaves, as Sage, Mint, and Thyme; in Wood, as Rosewood and Santal-wood; in the Bark, as Cassia and Cinnamon; in Seeds, as Caraway and Nutmeg. These glands or bags of fragrance may be plainly seen in a thin cut stratum of orange-peel, from which the otto may be easily pressed out on to paper, as we may here see, thus, by pressing the rind; so also in a Bay leaf, if it be held up to the sunlight, all the otto cells may be seen like specks. All these fragrant-bearing substances yield by distillation an otto peculiar to each; thus is procured otto of Patchouly from the leaves of the Patchouly plant, *Pogostemon patchouly*, a native of Burmah; otto of Caraway, from the Caraway seed; otto of Geranium, from the leaves of the *Geranium rosa*; otto of Lemon, from Lemon-peel; and a hundred of others of more infinite variety.

All the various ottos are very slightly soluble in water, so that in the process of distillation the water which comes over is always fragrant. Thus, Elder water, Rose water, Orange water, Dill water are, as it were, the residue of the distillation for obtaining the several ottos. A variety of these fragrant waters will be found here. We may distil so much of the plant with water, as is just sufficient to render the water fragrant without any otto floating upon it; this is the practice when the water alone is the object of distillation. The process of distillation is very simple; the fragrant part of the plant is put

into the still and covered with water, and when the water is made to boil, the ottos rise along with the steam, and are condensed with it in the pipe, and remain floating on the water, from which they are easily separated by decanting. Models of the Still are here shown, and on the wall we have a sectional diagram of this wonderful instrument. In this way 100 pounds of Orange, Lemon, or Bergamot fruit peel will yield about 10 ounces of the fragrant otto; 100 pounds of Cedar wood will give about 15 ounces of otto of Cedar; 100 pounds of Nutmeg will yield 60 to 70 ounces of otto of Nutmeg; 100 pounds of Geranium leaves will yield 2 ounces of otto.

A simple mode of procuring the ottos from Orange, Lemon, and Bergamot is practised in Italy and Sicily. The fruit is rasped, the pulp produced is then pressed, the odours of the fruit thus procured are much finer than those obtained by distillation.

Every fragrant substance varies in yield of essential otto. The variety of ottos are as numerous as fragrant plants; but there are a certain relationship among odours as among tints. The lemon-like odours are the most numerous, such as Verbena, Lemon, Bergamot, Orange, Citron, Citronella; then the almond-like odours, such as Heliotrope, Vanilla, Violet; then spice odours, Cloves, Cinnamon, Cassia. The whole may be classified into twelve well-defined groups. All these ottos are very soluble in alcohol, in fat, butter, and fixed oils. They also mix with soap, snuff, starch, sugar, chalk, and other bodies, to which they impart their fragrance. And it is thus that we are enabled to transfer the odorous principle from the plant that produces it to an inodorous body, wanting fragrance alone to make it of commercial value.

The principal consumption of the various fragrant

ottos is for scenting soap. Windsor soap, almond soap, rose soap, and a great variety of others, consist of various soaps made of oil and tallow, perfumed while in a melted state with the several named ottos or mixtures of them.

Though snuff is by no means so popular an article in the reign of Victoria as it was in Anne's time, yet the increased population, and still more increased exports to colonies, cause a positive increased production in scented snuff now than fifty years past; snuff perfumed with Bergamot is especially in demand in the fur countries of Northern Canada. There is a large consumption of fragrant essential oils in the manufacture of toilet powders; under the various names of rose powder, violet powder, &c., a mixture of starch and orris root powdered differently scented, is in general demand for drying the skin after the bath.

More than 200,000 pounds-weight of various ottos were imported into Britain in 1860, and valued at over £180,000; to this must be added at least one-third as much again distilled in England. Of the imported articles enumerated, oils of Lemon and Bergamot, from the Two Sicilies, reached 128,809 pounds, valued at £57,054.

Samples of various ottos are to be seen here, and so far as is practicable you will find also the living plant or dried specimen, from which the odour is derived.

We now pass to CLASS III.—These are the perfumes proper, such as are used for perfuming handkerchiefs. It will have been observed, that hitherto I have not spoken of the fragrance from any Flower! but only of those odours which are derived from either the leaves, the wood, the fruit, the root, or the seed of the plant. What we have now to say refers more particularly to the perfumes derived from flowers. Contrary to the general belief, nearly all the perfumes derived from flowers are not made by distillation,

but by the processes of *enfleurage* or inflowering and by maceration or infusion.

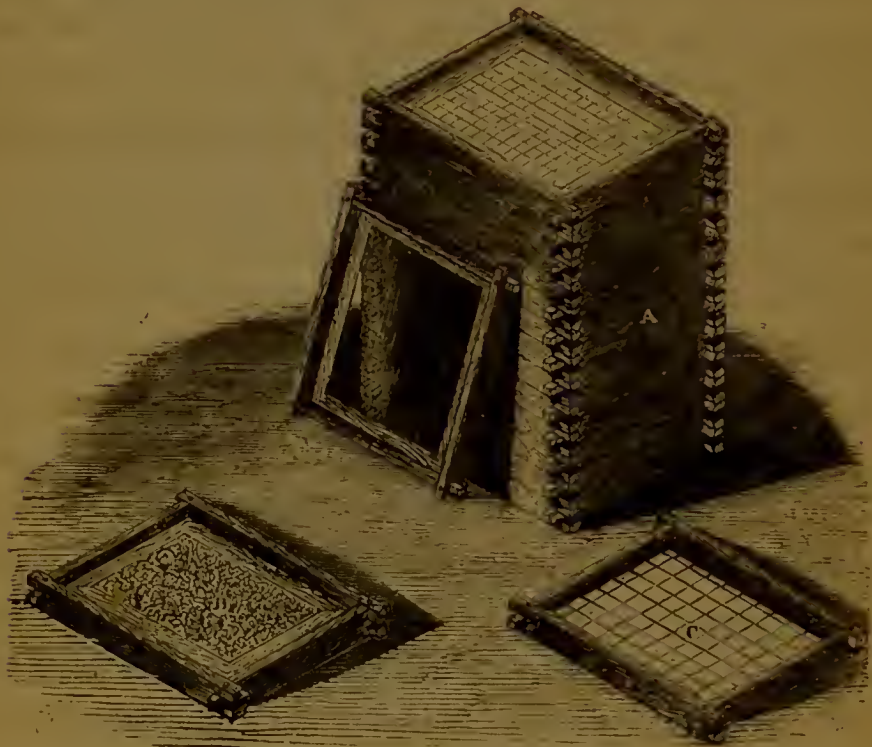
The odours of flowers do not, as a general rule, exist in them as a store or in a gland, but they are developed as an exhalation. While the flower breathes it yields fragrance, but kill the flower, and fragrance ceases. It has not been ascertained when the discovery was made of condensing, as it were, the breath of the flower during life; what we know now is, that if a living flower be placed near to butter, grease, animal fat, or oil, these bodies absorb the odour given off by the blossom, and in turn themselves become fragrant. If we spread fresh unsalted butter upon the inside of two dessert-plates, and then fill one of the plates with gathered fragrant blossoms of clematis, covering them over with the second greased plate, we shall find that after twenty-four hours the grease has become fragrant. The blossoms, though separated from the parent stem, do not die for some time, but live and exhale odour; which is absorbed by the fat. To remove the odour from the fat, the fat must be scraped off the plates and put into alcohol; the odour then leaves the grease and enters into the spirit, which thus becomes 'scent,' and the grease again becomes odourless.

The flower farmers of the Var* follow precisely this method on a very large scale, with but a little practical

* The Var is an Arrondissement or County of France, in the extreme south, bordering upon Italy. It takes its name from a river which has its source in the Maritime Alps, and which enters the blue waters of the Mediterranean about four miles west of Nice. The district of the Flower Farms, that is where flowers are cultivated by hundreds of acres, is situated in the Valley of the Var, that is from NICE to CANNES, both on the shores of the tideless sea, rising up to GRASSE, which is twelve miles from the coast. This area comprises about 115,200 acres. The country is rugged and the soil various, but the climate, as an average, is exquisite, never very cold, though in July and August almost tropical, but yet tempered by the adjacent sea. All Flowers, the Olive and the Vine, thrive here to perfection.

variation, with the following flowers—Rose, Orange, Acacia, Violet, Jasmine, Tuberose, and Jonquil. The process is termed, as said before, *enfleurage* or inflowering. In the valley of the Var, there are acres of Jasmine, of Tuberose, of Violets, and the other flowers named; in due season the air is laden with fragrance, the flower harvest is at hand. Women and children gather the blossoms which they place in little panniers like fishermen's baskets hung over the shoulders. They are then carried to the laboratory of flowers and weighed. In the laboratory, the harvest of flowers has been anticipated. During the previous winter great quantities of grease, lard, and beef-suet have been collected, melted, washed, and clarified. The great success of this process depends on the absolute purity of the grease employed and no pains are spared to this end. In each laboratory there are several thousand *chassis* (sashes), or framed glasses, upon which the grease to be scented is spread, and upon this grease the blossoms are sprinkled or laid. The *chasse en verre* is, in fact, a frame with a glass in it as near as possible like a window-sash only that the frame is two inches thicker, so that when one *châsse* is placed on another, there is a space of four inches between every two glasses, thus allowing room for blossoms. Every *chasse*, or sash, is about two feet long by eighteen inches broad, as here seen. The flower blossoms are changed every day, or every other day, as is convenient in regard to the general work of the laboratory or flowering of the plants. The same grease, however, remains in the *châsse* so long as the particular plant being used yields blossoms. Each time the fresh flowers are put on, the grease is 'worked'—that is, serrated with a knife—so as to offer a fresh surface of grease to absorb odour. The grease being inflowered in this way for three weeks or more—in fact, so

long as the plants produce blossoms—is at last scraped off the ch^âsse, melted, strained, and poured into tin canisters, and is now fit for exportation. We have here specimens of fat thus inflored, Jasmine fat, Orange fat, Tuberoze fat, Violet fat, Rose fat, &c.



A represents a pile of Glass Sashes.
 B represents a Sash with Lard and Flowers upon it.
 C represents a Wire Sash for the enfleurage of Oil upon a Cotton Fabric.

In every moderate-sized flower laboratory there are employed from two to three thousand sashes.

Fat or oil is perfumed with these same flowers by the process of maceration ; that is, infusion of the flowers in oil or melted fat. For this end, purified fat is melted in a *bain marie*, or warm bath, and the fresh blossoms are infused in it for several hours. Fresh flowers being procured, the spent blossoms are strained away, and new flowers added repeatedly, so long as they can be procured. The *bain marie* is used in order to prevent the grease becoming too hot from exposure to the naked fire ; so long as the grease is fluid, it is warm enough. Oil does not require to be

warmed, but improved results are obtained when it is slightly heated.

We have upon the wall here a sketch showing the water bath for melting the fat or warming the oil.

Jasmine and Tuberose produce best perfumed grease by enfleurage, but Rose, Orange, and Acacia give more satisfactory products by maceration; while Violet and Jonquil grease is best obtained by the joint processes—enfleurage followed by maceration.

We have here a *chasse en Fer*, this is for the enfleurage of oil. In the place of glass, the space is filled with a wire net; on which is laid a *molleton*, or thick cotton fabric—moleskin, soaked with Olive oil; on this the flowers are laid, just as with solid grease. In due time—that is, after repeated changing the flowers—the oil becomes fragrant, and it is then pressed out of the moleskin cloth. Oil of Jasmine, Tuberose, &c., are prepared in this way, of which we have specimens here.

There is certainly something inscrutable to an Englishman about Olive oil—he only knows it, as it were, with a lamp-like odour; but the olive oil that is pressed from the native fruit of the Valley of the Var has less taste and less odour than the finest Aylesbury fresh butter. Such oil therefore is admirably adapted for inflowering, for it is obvious that bodies which have no odour of their own, are more easily perfumed than those in which the original odour has to be overcome before they smell of the substance with which they are odorated.

In order now to obtain the perfume of these flowers in the form used for scenting handkerchiefs, we have to infuse the scented fat or oil, made by any of the above methods, in strong alcohol, that is rectified Spirits of Wine.

In extracting the odour from solid fat it has to be chopped up fine as suet is chopped, or melted, and then put into the spirit, and left to infuse for about a month. In the case of scented oil it has to be repeatedly agitated with the spirit. The result is, that the spirit extracts all the odour from the fatty body, becoming itself 'perfume,' while the grease again becomes odourless; thus is procured the Essence of Jasmine, Essence of Orange flowers, Essence of Violets, and others already named, Rose, Tuberose, Acacia, and Jonquil. Several specimens are here shown.

It is remarkable that these flowers yield perfumes which, either separate or mixed in various proportions, are the types of nearly all flower odours; thus, when Jasmine and Orange flowers are blended, the scent produced is like Sweet-pea; when Jasmine and Tuberose are mixed the perfume is that of the Hyacinth. We will practically exemplify this; thus, all the various bouquets and nose-gays, such as 'Frangipanni,' 'White Roses,' 'Sweet Daphne,' are made upon this principle.

The commercial importance of this branch of perfumes may be indicated by the quantity of flowers annually grown in the district of Cannes. Flower harvest: Orange blossoms, 1,475,000 lbs.; Roses, 530,000 lbs.; Jasmine, 100,000 lbs.; Violets, 75,000 lbs.; Acacia, 45,000 lbs.; Geranium, 30,000 lbs.; Tuberose, 24,000 lbs.; Jonquil, 5000 lbs. The quantity produced at Nice I have been unable to ascertain; with Violets and Orange there are more, but with Cassie less than here stated.

We now pass more particularly to the farming operations.

In growing flowers for perfumery the item of wages is of course important. In the Valley of the Var, the

summer wages are two shillings and four-pence a day for those men who do the heavy work of the fields, and thirteen-pence a day for the women who attend to the flowers. In winter, which is but of short duration, the wages are two shillings a day for men, and ten-pence for women.

Nothing can be simpler or more primitive than the farming operations. ROSES for example: the field is first scantily manured—especially with the refuse matter left after the distillation of various plants; it is then ploughed with oxen at the yoke; young plants of Roses, procured from layers in the usual way by tongueing and laying at a joint, or the offshoots from the mother plant are taken away and planted in rows two feet from each other, each row being about five feet asunder. Each root before planting should be cut down to within two or three buds, and Nature does the rest. The Cabbage Provence Rose is the kind cultivated. In the second year a considerable quantity of flowers appear, but it is not until the fourth year that they are fully developed. A plantation of Roses well tended will last from six to eight years; but for this the land must be well drained. It requires about seven thousand Rose-plants to cover an acre, and this acre will produce, in an average season, five thousand pounds' weight of Roses of the value of one penny to three-halfpence per pound, yielding, say £30 an acre.

For CASSIE (*Acacia farnesiana*.) The young plants are raised from seed, which is sown in beds. The best plants are left, the doubtful ones removed. In the third year they have generally a height of two or three feet, and are then planted out in fields, each tree requiring about twelve feet square. Before planting the Cassie the ground should be well dressed with manure, and dug to the depth of four or six

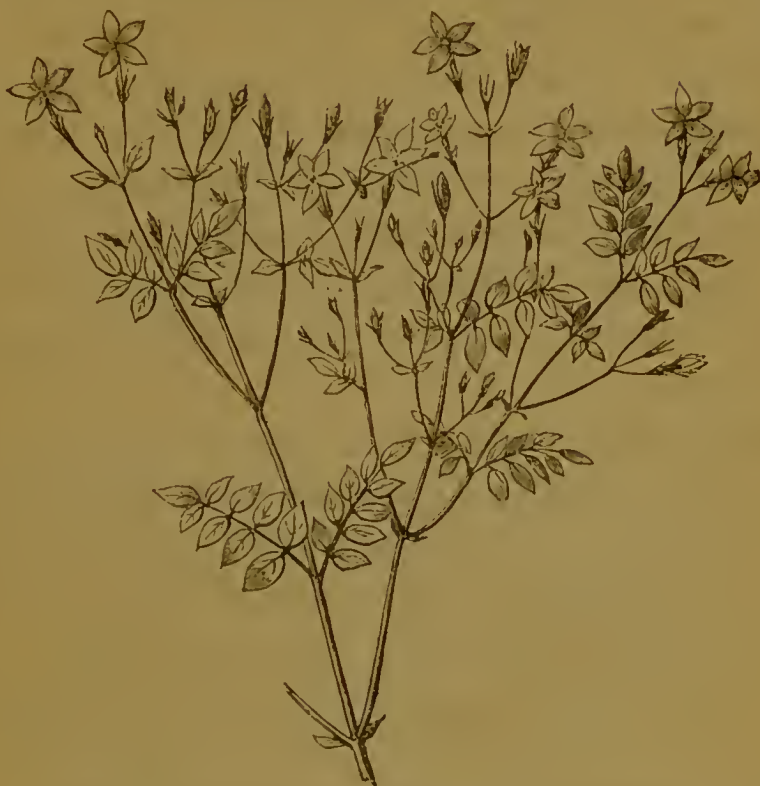
feet, and in such situations as are well exposed to the sun. The blossoms of the Cassie are successive, some being ready for plucking, while the others are scarcely formed. This is immensely useful to the farmer, one lot of blossoms being gathered and passed through the laboratory before it is time to gather the others. After the third year the tree produces flowers, growing at the same time till they attain maturity, when they reach a height of ten or twelve feet, with branches six feet long, and a stem as thick as a man's wrist. Each full-grown tree will produce about two pounds' weight of flowers, value from three to four-pence per pound, say £30 to £40 per acre.



The illustration of Cassie here given more impressively shows what we mean by "successive" flowering. Flowers, however fragrant, are not of much practical use in the perfumer's laboratory unless they grow "successive," because if the flowers come altogether there is not sufficient time for the grease to be inflored. It is found that better results are obtained by *repeating* a small quantity of flowers over grease, rather than infloreding a large quantity of blossoms at one time.

The JASMINE is cultivated by slips of the wild Jasmine,

(that which is seen in our English gardens,) grafted at the end of two years with the Spanish Jasmine



(*Jasmina grandiflora.*)

This produces a blossom the size of a shilling, of intense fragrance. Jasmine requires a moist soil, or so situated that it can be irrigated. The distance of planting out the Jasmine is the same as for the Rose; it must be very liberally pruned every year. The flowers of the Jasmine are produced from July to the end of October, but those of August and September are the most fragrant. About fifty days, or fifty successive inflowering of fresh blossoms, produces the finest Jasmine fat. It requires about eight thousand plants to stock an acre; and they are not in full bearing till the second year after grafting; but when mature, every thousand plants yield about sixty pounds' weight of flowers annually. They are planted in rows, horizontal poles being thrust between them for support, the branches being woven in and out, somewhat as the Raspberry

canes are arranged by the Chiswick gardeners. Every August—the Jasmine season—the fields are alive with women, old and young, and children, each having a little basket at her side suspended by a strap across her shoulders, both hands actively engaged in picking the flowers, and filling the baskets. As each basket is filled it is conveyed to the shaded laboratory and there weighed. An acre of land will yield about five hundred pounds' weight of Jasmine blossoms. The value of the blossoms varies from 1s. to 1s. 6d. per pound.

The TUBEROSE needs more care than any other flower of the farm. It is the most difficult to rear, but the best worth rearing ; a good plantation on a good soil will last for seven or eight years. The Tuberose requires a moist soil, or be so planted that it can be freely irrigated. It is a bulbous plant, and propagates as they do ; it throws out a stem like a Hyacinth, covered with fleshy flowers. And oh ! what a fragrance breathes from it ! what a bouquet, snatching perfumes from every flower with a superb eclecticism !

The Tuberose, with her silv'ry light,
 That in the garden of Malay
 Is called the mistress of the night,
 So like a bride, scented and bright,
 She comes out when the sun's away.—MOORE.

This last line of the poet's refers to the marked exhalation of odour after sundown ; very many flowers have not only a special time of opening their blossoms, but a particular time when they breathe fragrance, as observed : the Jasmine is more fragrant in August than it is in July and September. There are but few persons who have not noticed the increased fragrance of a garden at evening's close.

The ORANGE is cultivated from seed or pips; at the third year they are grafted, either with the sweet Portugal or bitter Bigaradier; at the fifth year they should be planted into their final resting place.

Before planting the Orange, a tree which attains great age, the soil upon which it is to live must be well prepared, otherwise the after life of the tree will not be of that thriving condition which we could desire. The soil should be trenched at least four feet deep and well manured, and the care bestowed upon the infant plant will be seen fifty years, nay, even a century afterwards. A tree requires fifteen years to reach maturity, but will produce both flowers and fruit in four or five years. When in full vigour each tree yields an average of twenty-five pounds' weight of blossoms annually. Many plantations of Orange-trees at Nice are more than one hundred years old. At Fontainbleau there are now to be seen Orange-trees planted by an ancestor of mine two hundred years ago. There is a public market for Orange-blossoms during the season at Nice: the bitter Orange-flowers fetch 3d. per lb., the sweet about 2d.

The market season for Orange-flowers at Nice lasts for more than a month, as an average, and during that time there are sold about fifteen to eighteen tons of flowers daily!!! and a ton of flowers will yield more than a kilogramme of otto, say forty ounces, worth £20 sterling; and the residuary water, highly saturated with odour, worth another £10 note.

The Orange-tree yields not only the exquisite odour of the flowers by the enfleurage process, of which there are several examples here, but also the otto from the flowers by distillation, termed Neroly; there is also quite a different smelling otto from the epidermis of the fruit, termed Por-

tugal, as here shown, and also a very fine otto from the leaves, named Petit Grain.

The bitter Orange yield the best Neroly—the sweet Orange gives the best Portugal. The otto of the Orange fruit or peel is procured mostly in December and January, by rubbing the Oranges in a metal cup covered with spikes. This causes the otto to flow from the otto glands of very pure quality. The fruit, after the otto is obtained, is cut up and mixed with bran, and given to cows for food. Cows fed thus yield very fine milk.

No tree is so profitable to the flower farmer as the Orange, and Emigrants to any of our warm colonies should make a note of this, and fix on their memory that the leaves of Orange yield an otto worth 3s. an ounce, that the flowers yield an otto worth 10s. an ounce, that the blossom also yields, by inflowering, a fat worth 8s. per pound; that the rind of the fruit yields an otto worth 12s. to 16s. per pound. That the fruit, if it cannot be sold by the score in the market, is a relished food for cattle.

There is a very fine ORANGERY near Sydney, the property of Richard Hill, Esq., J.P., so that we may soon expect in the markets of Britain the produce of this plant from our antipodean colony. Queensland, Western Australia, Southern New Zealand, and Jamaica, may wisely take the hint.

With us the VIOLET grows any where, and almost anyhow; but the terrible sun of Nice, during July and August, is but ill borne by the Violet. Consequently, on the farms they are planted under the green shade of the Orange and Lemon trees, or close to walls and houses. The method of propagation is division of the roots. After the young plants are set out and well rooted, they must have a good dressing of liquid manure, and which should

be repeated every year, about two months before they throw blossoms. If the plants are on a very dry soil they must be irrigated every fortnight during the summer. They are planted so as to grow in tufts or clusters about a foot apart all round ; and this space enables the growers to gather the flowers without treading on them. The old plants should be removed every fifth or sixth year and young roots substituted. A surface of land, equalling an acre of planting, yields one hundred and eighty to two hundred pounds' weight of flowers, valued as an average at two francs the pound. Violets may always be looked upon as an extra crop, growing as they do under the Orange and Lemon trees. The kind grown is the double Parma. About twenty-five tons weight of Violet blossoms are produced annually at Nice.

Oak or rose-leaf GERANIUMS are grown for the sake of the rose-like odour extracted by distillation from the leaves. A ton of leaves will yield about a kilogramme, or rather less, of otto. The Geranium is propagated by cuttings made in September, which are planted out in the spring ; if the land has been well manured and if the season be very dry, the plants are well irrigated ; they grow to a height of three to four feet, yielding an abundance of foliage, which is easily gathered by the sickle.

ROSEMARY, LAVENDER and THYME are also grown to a vast extent. One can hardly say " cultivated," since they grow like brooms and heaths on the wild wolds of Yorkshire. Any quantity may be found on the high regions of the maritime Alps. Those persons who seek for the ottos of these plants carry the distilling apparatus up the hills upon the backs of mules, while they encamp themselves in tents near to some snow-stream.

England has always been famous for the production

of Lavender, and farms of it exist at Carshalton and Mitcham, in Surrey; at Hitchin, in Hertfordshire, and at Market Deeping, in Lincolnshire. It requires about 3,500 plants to an acre, and when the plant is in full bearing we can procure from this quantity about six to seven quarts of otto, which, at the present price of 54s. per lb., a good average price of ten years, yield £32 per acre.

Although the mode of obtaining the odours from flowers by enfleurage and maceration has certainly been in practice for two centuries in the valley of the Var, in the south of France, it is only by my publications that the method has been made generally known in England.

The works published relating to Perfumery are very few. In France, where this commerce has risen annually to the value of £3,000,000 sterling, there are no published accounts or statistics by a native author, relating to flower farming. My own little book, "The Art of Perfumery," has recently been translated into French, by Dr. BAVEIL, of Paris, and is published by BALLAIRE. No Cyclopædia, which is more than ten years old, makes even mention of the enflowering process, as a source of entrapping the exquisite odour of flowers, nor do any of the multitude of books, relating to economic gardening, notice this fact.

No wonder, then, that gardeners and horticulturists generally are unacquainted with this simple source of wealth, and, if I interpret right the object of the Council of this Society now, in bringing the subject of the odours of plants before the fellows, it is that young gardeners, aspiring to emigrate to some of the warm British Colonies, may eventually lay there the foundation of a flower farm and perfume laboratory, such as can only now be seen on the banks of the Var.

The following is a List of the Living Plants which were supplied by Mr. BULL, of Chelsea, to illustrate the Lecture.

Myroxylon Peruvianum.—This plant yields the fragrant Balsam of Peru.

Croton Cascarilla.—The bark of Cascarilla is much employed in the manufacture of Incense.

Laurus Cassia.—The outer bark yields the otto of Cassia, the inner bark gives the Cinnamon.

Cedrus Virginiana yields the otto of the fragrant Pencil Cedar.

Anthemum^{um} Feniculum.—This offers the otto of Fennel.

Lavendula Vera.—This gives otto of Lavender.

Citrus Medica, yield the Essence de Cedrat.

Citrus Limonum, affords the otto of Lemon.

Citrus Vulgaris, used to make Curasso.

Citrus Bergamida, affords the fragrant Bergamot.

Citrus Acida.—In Faro and in St. Michael's this fruit is rubbed upon the floors to clean them, and to scent the rooms.

Citrus Bigardia.—This yields the famed otto of Neroli, which is the principal perfume in Eau de Cologne.

Andropogon Schoenanthus.—This gives the otto of Lemon Grass or Ceylon Verbena scent.

Origanum Marjorana offers the otto of Thyme.

Mimulus Mosehatus, the Musk Plant.

Myrtus Communis.—Flowers and leaves yield fragrant otto and perfume named Eau d'Ange.

Pogostemon Patchouly affords the wonderful scent 'Patchouly.'

Rosmarinus Officinale gives the scent Rosemary, the principal perfume of the old scent Hungary Water.

Lavendula ~~*Essica*~~ ^{*Spike*} yields Spike otto.

Thymus, *Vulgaris* yields a fragrant otto.

Anatherum Muricatum.—This affords the perfume called
 Vitivert or Kus-Kus.

Gaultheria Procumbens, yields a powerful otto.

Mentha Viridis, yields an otto extensively used for scenting soap.

Ruta Graveolens, gives a strong otto.

Salvia, otto very potent for soap.

Ananassa Sativa.—Fruit highly odoriferous, but never yet distilled. The otto would be worth a guinea an ounce, and could be procured in abundanoe in the West Indies, by distillation.

Laurus Daphne, yields the perfume 'Sweet Daphne.'

Caryophy, ^{*the Aromatic*} *Mace*.—Flowers exquisitely fragrant.

Heliotrope.— ditto

Pelargonium Fragrans.—Three varieties, all yield sweet ottos from the leaves. A ton of leaves will yield about two pound of otto, worth a five pound note!

Myristica Aromatica, yields the fragrant ottos of Nutmeg and Mace.

Vanilla Aromatica, produces the fragrant Vanilla Bean.

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