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GROUP OF CAMELLIA FLOWERS.

PRACTICAL CAMELLIA CULTURE:
A TREATISE
ON
THE PROPAGATION AND CULTURE
OF THE
CAMELLIA JAPONICA.

BY
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BALTIMORE, MARYLAND.

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PREFACE.

IN the following pages are embodied the results of

ERRATA.

Page 56, line 12.—For use of drainage, read, *use drainage*

Page 86, line 5.—In heading of chapter for My Process, read, An Ancient Process.

Page 98.—Figure 41 should have no number.

Page 104.—For figure 42, read figure 41.

Page 122.—For figure 43, read figure 42.

held concerning the propagation and treatment of the Camellia, and, as long and patient observation and labor have enabled me to become one of its most successful cultivators, I do not doubt that the present work will be in some degree acceptable.

I do not write for the instruction of experienced cultivators, who are already familiar with the propagation of this plant, but for those of limited experience, amateur gardeners, owners of small conservatories, and for all who desire practical knowledge on this subject.

I have frequently been solicited for information on the culture of the Camellia, and more especially for the process of growing *alba plena* successfully from cuttings; for this process is new even to many large growers, who are thoroughly acquainted with all the methods of inarching,

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PREFACE.

IN the following pages are embodied the results of more than twenty years' experience in the propagation and culture of the *Camellia Japonica*.

Though much has been written concerning the cultivation of this greatly admired plant, I do not think that any has been published in England or America which is devoted exclusively to it. A great variety of opinions are held concerning the propagation and treatment of the *Camellia*, and, as long and patient observation and labor have enabled me to become one of its most successful cultivators, I do not doubt that the present work will be in some degree acceptable.

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grafting, or growing the single and double red from cuttings.

In the following pages it is my endeavor to present all the knowledge which I possess on the subject, in the plain language of a practical Camellia grower, and I hope those desiring information may find some profit and instruction in their perusal.

R. J. HALLIDAY.

BALTIMORE CITY, Md., April, 1880.

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INTRODUCTION.

THE CAMELLIA belongs to a natural order (the *Camelliaceæ*) of exogenous plants and shrubs which are widely distributed over the globe, and include several genera and species of great economic value. Among these are the tea plant (*Camellia Bohea* and *viridis*), also the English holly, and on this continent the Loblolly bays and Stuartias.

The Camellias proper are all natives of India, China and Japan, and receive their generic name of *Camellia* from George Joseph Kamel, D.D., a German Jesuit missionary to Luzon, who, like many of his confraternity, was a botanist. He brought them to Europe in 1739. There are many species, all marked by like texture of leaf and shrub-like growth, but not all bearing fine flowers. Some have seeds yielding a valuable oil (*C. oleifera*) regarded as equal to that of the olive. The two species most admired for their flowers are *Camellia Japonica* and *Camellia reticulata*. There are also some hybrids of these two, greatly prized for their beauty. The *Camellia Japonica* has its specific name from Japan, where it is largely cultivated, but it is probably indigenous in both China and Japan. The plant, in its wild state, bears red and single flowers, and is grown both in China and Japan from the seed, which is often one year in vegetating. The Chinese

and Japanese have many skillful florists, and they have produced numerous varieties and sub-species, and of varied and beautiful colors and combinations of colors. Since their introduction into Europe and America, new varieties of exquisite beauty have been constantly produced by the eminent English, Dutch, German, French, Italian and American florists, who have devoted much time and labor to its propagation. Twenty-five years ago, there were forty-five standard varieties recognized, but the genius of European and American Camellia growers have annually increased the number, till there are now more than two hundred. The Camellia has all the beauty of the rose, though it lacks its fragrance, and blooming as it does during the late autumn, winter, and early spring, it supplies what would otherwise be a most serious lack in the floral world.

In this work is given the first thorough and complete treatise on the cultivation of the *Camellia Japonica*, and one not borrowed from other works, but from my own careful study and observation of more than twenty years. It will, I have no doubt, be hailed with delight by every true lover of the "Rose of Japan."

ROBT. J. HALLIDAY.

CAMELLIA CULTURE.

CHAPTER I.

WHY I DO NOT GROW SINGLE STOCK.—THE BEST WHITE CAMELLIAS, AND HOW THEY ARE GROWN BY MANY FLORISTS.

THE single red *Camellia Japonica*, whose flower is represented by the colored plate, is generally used by florists as the "stock" on which to "work" the double varieties by inarching or grafting.

Fig. 1.

Cutting from a single eye.

Inarched or grafted plants are usually spoken of by florists as the "worked" plants.

The single red is generally propagated by cuttings of well-ripened wood placed in the sand-bed during the month of November.

Fig. 1 represents the cutting from a single eye or joint. Cuttings of this variety will root freely in from two to three months, but it will be three years before they are fit to use

as stocks on which to work the double varieties by either inarching or grafting.

I prefer grafting to inarching the Camellia, although I seldom use either process, as, for the past ten years, my mode of propagating all varieties of this plant has been from cuttings.

As all the double varieties are just as easily grown from cuttings, and the single red is only used as a "stock," I do not grow it at all, having no use for it.

The cuttings, as I take them, root freely, and grow equally as well as though they were inarched or grafted, and with only one-half the labor and expense. They will also make the handsomest shaped plants.

Alba plena (old double white) is in my estimation the best white variety, although we have many new varieties, and are constantly adding to our catalogues. It has the preference with all large growers.

Nearly all florists propagate this variety, and increase their stock by growing the single stock and working the double kinds by inarching or grafting.

Fifteen years ago, grafting was the new method of working the Camellias, and is the only method used by many of the growers at the present time, and we must all admit it is a much better and quicker mode than the old style of inarching. However, at the present day, the process of growing successfully all the double red varieties, and *alba plena* also, from cuttings, excels grafting, inarching, and all other methods, as you will find explained in the following chapters.

CHAPTER II.

DISADVANTAGES OF THE OLD METHOD OF GROWING OF ALBA PLENA AND ALL DOUBLE VARIETIES, AND SUPERIOR PROFITABLENESS OF THE NEW.

Fig. 2.
Single Camellia
Stock, three
years old.

It requires three years to grow good single stocks before they are in condition to inarch or graft, and two years more for the inarch or graft to grow, making the plant five years old before it is a salable double variety. During all these years much labor must be expended, and considerable space occupied in the various processes of their growth. Inarching requires a great amount of room for staging, and for grafting a frame is needed inside the house.

All persons are not successful in the processes of inarching or grafting, the slightest relaxation of care producing disastrous results.

Simple as grafting may appear, I have seen on my place, from one thousand grafted Camellias only two hundred living plants, the remaining eight hundred, both stock and graft, being dead. This failure was caused by neglecting to air and keep the frame cool.

Fig. 2 represents a well-grown single stock three years old, and is worth only ten dollars per hundred.

My way of growing the double varieties from cuttings, makes the plants salable in three years. They are from twelve to fifteen inches high, with from two to three buds. Many of them when two years old, are from eight to ten inches high, with from one to two buds on each plant.

Alba plena, three years old, with no more extra labor to grow than the single stock grown by the old method, is worth, with flower buds, forty dollars per hundred, and at two years old, with buds, is worth twenty dollars per hundred.

From the above information you can easily calculate which is the best and most profitable method of growing this plant.

CHAPTER III.

THE WHOLESALE AND RETAIL PRICE OF THE SINGLE RED CAMELLIA, ALSO OF THE ALBA PLENA, GROWN FROM CUTTINGS, ONE, TWO AND THREE YEARS OLD.

THE single Camellia stock, when in flower, three years old, will rarely bring, at retail price, twenty-five cents apiece, and in fact there are but few persons who will have it at any price. *Alba plena* Camellias, grown from cuttings at three years old, with from two to four buds, are worth, at retail price, seventy-five cents to one dollar apiece. A two-year-old *alba plena*, with one and two buds, retail at fifty cents. A one-year-old *alba plena*, without buds, is worth more than a single stock at three years old.

The present price, wholesale, for *alba plena* without buds, one year old, is ten dollars per hundred.

Single stock, three years old (all this time to grow), is only worth ten dollars per hundred.

Alba plena (old double white) will take longer to root than the red varieties. See Chapter IX.

My experience has taught me to grow all Camellias from cuttings.

Many growers will say that *alba plena* will not do as well on their own roots as if they were inarched or grafted.

They are mistaken in this. Perhaps they cannot root them, or they have never seen them grown in this way.

All such persons I cordially invite to visit my establishment, where thousands of all sizes can be seen at any time.

I prefer growing from cuttings, and I think the majority of the trade will also, as soon as they learn the quick and profitable modes of increasing them.

Thirty years ago we were taught that the double red varieties could not be grown from cuttings; and such a thing as rooting *alba plena* as easily as the common single red was not thought of.

To many thousands of those in the trade at the present time it is something new.

I believe that in the course of from five to ten years all the double varieties will be grown altogether from cuttings by Camellia growers, just as the rose is growing now. Inarching and grafting will be with the past.

CHAPTER IV.

HOW TO PROPAGATE ALBA PLENA CAMELLIAS.—WHAT IS NEEDED FOR THE CUTTING BED.—KIND OF SAND TO USE.—ENGRAVING SHOWING FIVE THOUSAND ALBA PLENA CUTTINGS FIVE EYES LONG.—ENGRAVING OF BOX OF CUTTINGS TWO EYES LONG.—TIME TO TAKE CUTTINGS FROM THE PLANT.—CUTTINGS FROM YOUNG WOOD.

MOST florists have a house or bench which they use for the propagation of cuttings.

Place Camellia cuttings in the coolest part of the house.

They require a longer time to root than almost any other cutting, therefore put them on that portion of the bench where they will not be likely to be disturbed.

For the propagating bench use good sharp sand, from either a bank or river, white, brown or black. There is no virtue in the color of it, although many persons believe there is something to be gained by using a particular color.

The success in propagation depends more on the person in charge than anything else.

Sand is very frequently blamed when it is not in fault.

Use a sieve for separating the sand from gravel and and clay. It is not necessary to wash the sand, as is so often recommended, for the cutting bed.

Fig. 3. Represents five thousand *alba plena* cuttings in sand-bed. —Month of November.

Fig. 3 shows my Camellia cutting bench, forty feet long by four feet wide. It contains five thousand *alba plena* cuttings in sand.

Have heat underneath this bench, so as to give gentle bottom heat when required.

On this bed there are three inches of sand. The cuttings are two feet from the glass.

I would advise all those who do not grow Camellias very extensively to use, for propagation, wooden boxes fourteen inches square, three inches deep with sand. For a sketch of this box, see Fig. 4.

Fig. 4. Fourteen-inch square box of cuttings. Two eyes.

The cuttings will require very little heat until they are one month or six weeks in the sand.

By using boxes for the cuttings, they can be moved easily to the heated part of the house, and where they can get the benefit of bottom heat.

I prefer to take cuttings during the month of November. The wood at this time is well ripened, and we can tell which shoots will produce flower buds.

I take off all shoots that are not showing buds.

Camellias generally form their buds during July and August. The buds are as large as peas by the time we take the cuttings.

They seldom or never form buds after the above-named months.

It will not be a difficult matter to distinguish a wood bud from a flower bud.

The cuttings can be rooted at any time from June to January.

I recommend placing cuttings in the sand-bed during the month of November, to avoid using wood, which is going to produce flowers. Earlier than the month mentioned, it would be impossible for many to distinguish the wood bud from the flower bud.

Cuttings of the young wood will root freely and in one-half the time of ripened wood, but double the amount of care and attention will be necessary for them.

Sometimes I grow from young wood, but ripened wood makes the most healthy and vigorous plants.

Cutting the young wood from plants in the spring, for propagation, will often force the parent plant to make what I call a second growth. The result of this will be no flowers the coming fall and winter, therefore I would advise all Camellia growers to adopt the hard wood system and November propagation.

CHAPTER V.

LENGTH AND SIZE OF CUTTINGS.—ENGRAVING SHOWING CUTTING FIVE EYES LONG; ALSO, ENGRAVING SHOWING CUTTING TWO EYES LONG.—THE BEST CUTTING FOR AMATEURS AND THOSE OF LIMITED EXPERIENCE TO ADOPT.

THE house sand-bed or box being ready to accommodate the cuttings, a question of great importance is to

Fig. 5.
Cutting five eyes long.

be considered, which will be the best length of cutting to use? Having wood for cuttings in great abundance, I can, without any sacrifice, cut branches from four to five eyes long. (Fig. 5 represents a cutting five eyes long.)

By using this length cutting, I have gained one year's growth at the time of placing the cutting in the sand.

It will take a cutting of two eyes one year to make the extra three eyes. Fig. 3 represents a bed of five thousand *alba plena* five eyes long.

The cutting of five eyes long will not root any better than the two eye. Your gain will evidently be made in the size of the plant when it is ready for potting.

One great advantage to be derived from the five-eyed cutting is, that when the plant is rooted and ready for potting it will, in all probability, have three shoots, each shoot being one inch in length. The plant will be of a very good size, while the two-eyed cutting will only make one shoot.

Fig. 6.

Cuttings two eyes long.

When the wood of *alba plena* is not very abundant, it would be much the better plan to adopt the cutting of two eyes, as shown in Fig. 6. At the top of the cutting there is one eye with a leaf. The lower eye with the leaf cut off is where the roots will form. Where the wood is scarce, this cutting will be best and most profitable for use by amateurs and those of limited experience in Camellia growing.

Alba plena should always be made in this way, as well as all plants of the hard wood kind.

CHAPTER VI.

ENGRAVING SHOWING THE KIND OF CUTTING FOR THE SINGLE STOCK, OR THE DOUBLE RED VARIETIES.—ADVANTAGES OF LONG CUTTINGS.—NUMBER OF CUTTINGS YOU WILL GET FROM A MODERATE SIZED PLANT.

FIGURE 7 represents the propagation of the Camellia from a single eye. From this system a greater number

Fig. 7.

Cutting from a single eye.

of cuttings can be obtained than from any other way. The process of growing from a single eye will do very well for the single and double red varieties. But I do not recommend it for *alba plena*, which will root and grow, but not until it has remained a long time in the sand-bed. And after they are rooted, three-fourths of them will have what is generally termed by growers blind eyes, or the eyes

have rotted and fallen out. (See Chapter X, on this defect after being rooted.)

For all varieties of Camellias, should you have plenty of wood to cut from, adopt the cuttings as represented by Figs. 5 and 6. It will take the one-jointed cutting, as shown in Fig. 7, twelve months' from the time it is put in the sand-bed, to grow to the size of Fig. 5 cuttings.

Camellias do not grow and make wood as fast as the soft-wooded class of plants ; therefore judgment and care must necessarily be used in taking the cuttings from the parent plant

Suppose a person who has twelve Camellia plants, and for which he has paid twelve dollars. He would not be able to get over two cuttings of the five-jointed kinds from each of the twelve plants, in November, without taking branches which have flower buds on.

The twelve plants would only produce twenty-four cuttings of Fig. 5. Fifty cuttings will be produced by the two-jointed system, as represented in Fig. 6 ; and by the one-jointed system, as Fig. 7 represents, one hundred or more cuttings will be obtained.

The wood of this plant is valuable on account of its slow growth.

CHAPTER VII.

THE KIND OF WOOD TO USE.—HOW TO PREPARE THE SAND-BED.—ENGRAVING SHOWING TWO HUNDRED CUTTINGS ONE EYE LONG.—DIRECTIONS FOR WATERING THE SAND-BED, &C.

THE wood best adapted for cuttings is that of the present season's growth. That is, shoots which have been made in the spring, can be used for cuttings in the fall.

In taking cuttings from the parent plant, allow one or two eyes of this season's growth to remain, to produce new wood and flowering shoots for the next year.

All unripened wood should be discarded. Use none but good, healthy, strong shoots for cuttings.

Never take wood from a sickly plant; for one unhealthy cutting often ruins the whole stock in the sand-bed. See that the cuttings are free from all pests, such as red spider, mealy bug, scale, &c.

Many persons fail to root cuttings by neglecting the very important matter of having the sand solid and firm on the bench.

If the directions have been followed, to have the sand pressed solid and firm, it will be necessary to draw a line across the bed, to make an opening for the cuttings; after placing them in this opening, press, with the finger, the sand firmly around the cuttings.

The firmer and more solid the sand is made, the

earlier the wound will heal, and cause the cutting to cal-
lus ; from this callus the roots proceed. Water the sand
thoroughly, after it is put on the bench and pressed firm-
ly.

Figure 8 shows a box, fourteen inches square, with
two hundred cuttings, one eye long. Put the stem down
in the sand about $1\frac{1}{2}$ inches, press the cutting firmly with
your finger. Water again. Do not be afraid of watering
too freely.

When the cuttings have just been stuck in the sand,
they will absorb a good quantity of water without any in-
jury to the cutting. More hard wood cuttings die for the
want of water than from any other cause. Camellia cut-

Fig. 8.

Box 14 by 14 inches. Two Hundred Cuttings. One Eye.

tings will not thrive if the sand is allowed to become dry.
If watering is neglected two or three times, the leaves

will fall off, the bark shrivel, and you may as well, at once, throw them on the rubbish heap, clearing the bench of this worthless material caused by positive neglect. After this failure, should you want to keep up a succession of plants, your only resource will be to use young wood cuttings, taken off in June and July.

CHAPTER VIII.

TIME TO PUT CUTTINGS IN THE SAND-BED.—QUANTITY OF HEAT REQUIRED.—THE AMOUNT OF KNOWLEDGE REQUISITE TO GROW THEM.—CLEANLINESS OF BED, &C.

PLACE the cuttings in the sand during the month of November, about one inch apart. For the first six weeks, keep both house and cutting bed cool, at forty-five degrees ; during the time that the cuttings are kept at this low temperature, it is not probable that they will require watering oftener than twice a week. I cannot give any stated rule for watering ; watch the sand-bed, and do not allow it to become in the least dry.

During the six weeks that the house is kept at this low temperature, the cuttings will need to be syringed three times a week. At the end of the sixth week, give them gentle bottom heat, with but little top heat, or, using plain terms, feet warm and head cool. Keep the cuttings at the temperature of fifty-five degrees until March. During this time they will need more water than when the temperature was low. After the month of March, gradually take all artificial heat from them.

In watering, have the sand-bed wet thoroughly to the bottom. A few pieces of broken pots, oyster shells, &c., would be advisable to use, as drainage, in the bottom of the bench or box.

Camellia cuttings are not difficult to root, but they do require time in the sand-bed.

I have much more trouble rooting soft wooded plants.

Cuttings have life in them, and, of necessity, require attention at the proper time.

While the cuttings are in the sand-bed, and are receiving artificial heat, they will be more subject to pests than at any other time.

At this particular time, syringing twice a day, morning and night, will be positively necessary for the cuttings, and will greatly help to destroy the insects.

To aid in keeping the sand-bed clean, all dead leaves should be removed, as they are often the nests of vermin.

Cleanliness in the sand-bed or bench, is absolutely necessary for the health of the cuttings.

Do not force the cuttings to root quickly by giving them extra heat. You will gain nothing by it, but will cause them to lose most of their shoots or eyes.

They will root, but it will, in all probability, take twelve months for many of them to make another shoot or eye. (See special chapter of rooted cuttings with no eyes or shoots.)

For propagating, it does not require a man of so much experience and skill as very many growers suppose.

The best propagator that I ever had in my establishment, was a lad only seventeen years old, and who was with me only six months previous to taking charge of this department.

Having but little experience and knowledge, I can only attribute his success in propagating, to the great care

and attention paid in watering, shading, airing, syringing, and keeping his house and beds clean and in perfect order, also to the great fondness which he manifested for this particular branch of the business.

I have had in my employ, at different times, men who called themselves regular propagators, and who had worked at this branch of the business twenty years. They could place double the quantity of cuttings in the sand-bed, in the same time that the lad to whom I referred could, but, in the work of bringing the plants, rooted, from the cutting-bed, he far surpassed those propagators of long experience.

From the above statement, you will readily perceive that propagation does not depend as much on skill and knowledge as it does on the attention and care given to the cuttings.

CHAPTER IX.

HOW LONG TO LEAVE CUTTINGS IN THE SAND.—LENGTH OF TIME IN ROOTING.—I DO NOT ALLOW CUTTINGS TO MAKE BUT ONE GROWTH.—ENGRAVING OF ALBA PLENA EIGHT MONTHS IN SAND-BED.—THE SIZE OF POT REQUIRED FOR CUTTINGS.—TREATMENT AFTER BEING TAKEN FROM THE SAND-BED.

IN November, I take all Camellia cuttings and place them in the sand-bed, allowing them to remain until the following June.

The single and double red varieties should be well rooted by the first of March. *Alba plena* will take from two to three months longer to make roots.

I allow all varieties to remain in the sand-bed until June, when at this time our spring sales are over, and we have ample room in the houses to accommodate all cuttings when potted. Camellia cuttings will remain a longer time in the sand-bed, without injury to their roots, than any other plant. If permitted to remain in the sand until June, they will have made their growth for the season, and the wood will be ripened, as will be seen by Fig. 9, which is a cutting in June before being removed from the sand-bed to a pot.

Potting can be done this month with perfect safety to the newly rooted cutting. Keep the glass slightly darkened, or just sufficient to exclude the strong rays of the sun. The glass can be washed over with lime or white-

ning to prevent the rays of the sun from beaming too strongly on the plants.

All cuttings require light.

If the cuttings are left in the sand-bed until the time

Fig. 9.

November cutting rooted the June following.

before stated, their roots will be of such a size as will require from two to three-inch pots to accommodate them.

The smaller the pot, the better the cuttings will thrive. Care should be taken not to break the roots.

A good position will now be necessary for the potted cuttings, with the glass a little more shaded than when in the sand-bed.

This kind of treatment will only be necessary for a few weeks. When potted, place them

on the bench or frame in the greenhouse. Keep them rather close for a few days, to encourage them to adhere to the fresh soil. After this give plenty of air, keeping them cool.

Do not force them to make another growth the same

season. Many of them will, in spite of all that can be done.

It is of much more importance to encourage them to make roots, which will be of more value to the cuttings than the extra growth.

See chapter on the kind of soil to use.

The cuttings in pots, for the present season, will require nothing further than to water them when dry, not forgetting to syringe daily with clean water.

CHAPTER X.

ENGRAVING OF ALBA PLENA WELL ROOTED, BUT WITHOUT EYES OR SHOOTS.—HOW TO CARE FOR THEM, AND HAVE THEM FORM NEW EYES.

MANY of the *alba plena* cuttings, when taken from the sand-bed, have no shoots or eyes. These have fallen out, as will be seen in Fig. 10. This plant is well rooted, but

Fig. 10.

Cutting well rooted, with shoots or eyes dropped off or dead.

it has dropped its shoots, in all probability from being kept too warm. I find that the *alba plena* comes more frequently from the sand-bed in this way than the red varieties.

Follow instructions in regard to heat, and you will obviate this trouble.

I have not the least doubt that many growers would throw away these cuttings after they are rooted, as being worthless.

I threw them away until experience taught me better.

The cutting shown in Fig. 10 is of five eyes, twelve months old; every eye and joint is dead, but it is well rooted.

CAMELLIA ALBA PLENA.

Pot all of these ; they will make plants and form new shoots.

It will pay to keep such cuttings twelve months after being potted. If, at the expiration of twelve months, no shoots are shown, place them where they will get good bottom heat, and they will show shoots or eyes in less than six weeks.

CHAPTER XI.

ENGRAVING SHOWING ALBA PLENA CUTTING WHEN POTTED IN JUNE, ALL EYES DEAD; APRIL FOLLOWING MAKING ONE SHOOT.

FIG. 11 shows *alba plena* cutting which has been eight months in the sand-bed, and ten months in a pot, before showing any sign of growth.

Fig. 11.

Alba plena eighteen months old, showing one shoot.

The plant is now eighteen months old, and has made a growth of one inch from the top-eye.

There are two more eyes on this plant, which are dormant.

The one which has started growing will make rapid progress, and will be sufficient to make the plant.

Give this plant one size larger pot and fresh soil. The following fall take one or two eyes off the top shoot of this plant, being careful not to cut below the growth that has been made the present season. This will cause the plant to break below, and make side shoots. In the fall

of the fourth year this plant should be in a four-inch pot, with two or three buds.

This plant has lost one year's growth by having blind eyes. If all the eyes had been perfect when taken from the sand-bed, it would have been salable at three years old.

CHAPTER XII.

ENGRAVING OF ALBA PLENA CUTTING OF TWO EYES.—
EIGHT MONTHS IN THE SAND-BED.—NEWLY POTTED
JUNE THE FIRST.

FIGURE 12 shows *alba plena* cutting from two eyes, which was placed in the sand-bed during the month of November.

Fig. 12.

Alba plena cutting
from two eyes.

The following June, the cutting being rooted, it is placed in a two-inch pot.

This plant has made its growth for the season in the sand-bed, of one and a half inches, before being placed in a pot.

This is the best kind of cutting to use where the wood is scarce, or for those of limited experience in *Camellia* growing. And, furthermore, I find that the eyes are not so apt to fall from the cutting, from an irregular temperature of the house or from improper treatment, as those of the five-eye kinds.

This style of cutting will be four years old before it will be salable with buds.

CHAPTER XIII.

ENGRAVING OF ALBA PLENA CUTTING FIVE EYES, ONE YEAR OLD, IN A POT.—HOW TO CARE FOR THEM.—WHEN TO RE-POT.

FIGURE 13 shows *alba plena* cutting which was taken from the sand-bed, well rooted, and placed in a pot during the month of June.

The engraving also presents the appearance of the cutting the following November, which makes it one year old.

This cutting is made from five eyes or joints.

All the cuttings, when taken from the sand-bed, will not be in such a good condition as the one repre-

Fig. 13.

Cutting of five eyes, plant one year old. Three-fourths of them should, if directions for growing them have been strictly followed. The balance of cuttings should be similar in appearance to the one represented in Fig. 9.

You will readily perceive the difference between the two and the five-eye cutting, both in the height of plant and style of growth; and you will at once discern the advantage to be gained by growing from the five-eye system.

This cutting of one year old is in what I call a two-inch pot; the following January it will require re-potting again.

If the cutting has been properly cared for, it will make a growth in March or April.

The following fall it may produce one or two buds.

This plant being only two years old, it would be advisable to take all the buds off, and wait until the third year before allowing it to show buds.

After the plant is three years old, adhere strictly to the practice of re-potting only once a year, and during the months of January and February.

Previous to this age (three years), you can re-pot once or twice a year, or as often as you find the roots extending to the sides of the pot.

The growing of Camellia cuttings from one eye or joint, also from two eyes, together with inarching and grafting, has been the way in which I increased my stock until within the past few years.

I will only recommend this particular system of growing for those who have not a large supply of wood for cuttings. As soon as the wood becomes plentiful by growing from one and two eyes, and from inarching and grafting, follow at once the method which I practice of increasing this plant at the present day, which

Fig. 14.
Cutting of five eyes.

is of the five-eye system.

Fig. 14 represents a cutting of five eyes, and which I grow exclusively, believing it to be the best and most profitable.

I advise all growers to adopt this particular method of propagation, when the wood is so plentiful that this size cutting can be taken from the parent plant without injuring it.

CHAPTER XIV.

ENGRAVING SHOWING ALBA PLENA TWO YEARS OLD,
FROM A CUTTING OF TWO EYES, WITH ONE BUD.

FIGURE 15 represents *alba plena* two years old, from a cutting of two eyes. This two-year old plant, which is in a three-inch pot, is four inches high, with one bud. This bud will come to maturity and open a good flower, but it will evidently weaken the plant very much.

Fig. 15.

Alba plena, two years old, with
one bud.

I advise all flower buds to be rubbed off of plants so young, and also rub or cut the top eye out, which will cause the plant to break and bush.

Do all within your knowledge to make the plant grow strong and bushy for the fall of the third and fourth year, when it can be allowed to produce buds and flowers without any injury to the plant.

CHAPTER XV.

ENGRAVING SHOWING ALBA PLENA TWO YEARS OLD,
FROM FIVE-EYE CUTTING, WITHOUT FLOWER BUDS.

FIGURE 16 represents a plant of *alba plena* two years old in November.

Fig. 16.

Alba plena, two years old,
without buds, from a cutting of five eyes.

This cutting was made from the five-eye system.

If properly cared for, all the plants should average this size that are made from this system.

This plant, when it was taken from the sand-bed, had made a growth of one or two inches. This growth was only from one of the top eyes ; the balance of the eyes remain dormant.

The second year it makes a growth of the two spreading shoots. as will be seen in the engraving. The average height of this plant should be from six to eight inches.

The fall of this year rub both of the prominent *wood* buds off, to cause the plant to break again, so as to form a low bushy plant for the fall of the third year.

Plants of this age will be in a four-inch pot, with two or three buds.

The plant is now of a salable size, all averaging in height from ten to fifteen inches.

CHAPTER XVI.

ENGRAVING OF ALBA PLENA THREE YEARS OLD FROM A CUTTING.—ALSO ENGRAVING SHOWING THE SAME PLANT CUT BACK TO FORM A BUSHY PLANT FOR THE FOURTH SEASON.—DIRECTIONS FOR TREATING THE SAME.

Fig. 17.

Alba plena, three years old,
of five eyes.

THE third year most of the plants will be of a size to require four-inch pots.

Figure 17 represents this age plant with three buds.

I would advise re-potting now to be done only during the months of January and February.

At any other time of the year the re-potting might, in all probability, cause the plant to have no flower buds.

By re-potting at the time specified, they will make a growth in April or May, after which they

will harden their wood and form buds during July and August.

Perhaps only three-fourths of your stock will produce buds this season ; some of the plants will have from two to four buds.

Do not encourage young plants to bud before the fourth year. It will be more profitable to allow them to get stronger and more healthy, and to grow low and bushy.

At this age the plants will want room on the benches.

Camellias will not stand being crowded as well as many other plants.

Do not keep them too close together.

Most of the plants will be from twelve to fifteen inches high, with perhaps only two to three branches, as the engraving shows.

This plant is strong and shapely for its age, but if allowed to grow without topping, it would become long and straggling.

Figure 18 represents *alba plena* three years old, with from two to three inches of the top taken off.

These tops are used for cuttings.

In topping, always cut back to a good prominent eye of the past season's growth.

In this way, you will soon get wood enough for cuttings, and the stock of *alba plena* will increase.

The plant for the fourth year will be bushy and well budded.

Fig. 18.

Three-year old *alba plena*
with top cut off.

Topping or cutting young Camellias back is an important matter.

I have seen among Camellia growers sticks used as a means of support to young plants.

I do not approve of this practice at all.

If my directions are followed carefully, they will be strong, and will not need support of any kind.

CAMELLIA SARAH FROST.

CHAPTER XVII.

ENGRAVING SHOWING DOUBLE RED, THREE YEARS OLD.—

HOW MANY OF THE RED VARIETIES TO GROW IN PROPORTION TO THE WHITE.—WHEN I RESORT TO GRAFTING.

Fig. 19.

Double red, three years old,
from a cutting of five eyes.

FIGURE 19 represents a well grown three-year old double red plant from a cutting of five eyes.

This plant has from eight to ten buds, and is somewhat stronger than *alba plena* of the same age, but in value, when sold in large quantities, and to the trade, is only worth half as much as the white varieties. When sold at retail, both command the same price.

Although the flowers of many of the red varieties are very beautiful, they are in value only worth half as much as the white kind.

In propagating, I always grow nine hundred white to one hundred red.

Alba plena, with or without buds, are always in demand.

The red varieties sell very slowly and in very limited quantities.

Grow the white varieties for profit.

The only time that I now resort to grafting is when my stock of double reds accumulate, and having no sale for them, I work *alba plena* on them, instead of using the single red stock.

The engraving shown in this chapter is a variety of Camellia named Sarah Frost. From this plant the flower is taken which is shown in the colored plate.

CHAPTER XVIII.

ENGRAVING SHOWING ALBA PLENA FOUR YEARS OLD,
FROM CUTTING OF FIVE EYES.—PRESENT PRICE OF
THIS SIZE.

Fig. 20. *Alba plena*, four years from cutting—five eyes.

IF the plants of *alba plena* have been properly grown in the fall of the fourth year they will be in five-inch pots.

Figure 20 shows a plant from twenty inches to two feet high, with from six to eight buds.

At present, the wholesale price is seventy-five dollars per hundred; retail price one dollar to one dollar and fifty cents each.

Give plenty of room at this time to plants on the benches, so that they may furnish well grown and vigorous stems.

The next re-potting this size plant requires use of drainage.

Re-pot in January and February and only those plants whose roots have grown to the sides of the pots.

Others which have not grown so well, reduce ball of earth, give fresh soil, and place back in the same size pot.

Syringe as directed in previous chapters.

CHAPTER XIX.

ALBA PLENA PLANTED OUT IN GREENHOUSE.—ENGRAVING OF MY DOUBLE-PITCH CAMELLIA HOUSE, ONE HUNDRED FEET LONG BY THIRTY-TWO FEET WIDE.—ENGRAVING OF MY LEAN-TO HOUSE, SEVENTY-FIVE FEET LONG BY SIXTEEN FEET WIDE.—THE WAY TO GROW CAMELLIA FLOWERS FOR PROFIT.

If you want *alba plena* for flowers or for the wood, plant them in beds in a house exclusively by themselves.

Figure 21 represents my camellia house with span roof, one hundred feet long by thirty-two feet wide.

The center bed is planted with *alba plena*, varying in age from twenty to forty years old.

The side benches are used for the same plants in pots.

If you want good, healthy-looking plants, adopt the system of planting them in beds in greenhouse.

The foliage will have a different appearance; the plants will have double the quantity of flowers, and will also make twice the growth in one season of those planted in pots or tubs.

Plants grown in this way will need very little attention, and from these you will have plenty of wood for cuttings.

Camellias need a cool and moist houses, not allowing the thermometer to get above from fifty to fifty-five degrees F. in winter.

In summer give to the plants all the air that is possible.

Fig. 21. My Span Roof House, 100 feet long by 30 feet wide.

Have the house so arranged that it can be aired from the sides as well as from the top.

I find that airing in this way adds considerably to the number of buds on the plants.

During the summer have the glass partly shaded, and in very warm weather water the pathways in mid-day, to create a moisture which will help keep the house cool.

Figure 22 represents my lean-to house, seventy-five feet long by sixteen feet wide.

The bed for planting out being only nine feet wide, the bench three feet wide for plants in pots.

Plants in this house grow rather one-sided, and are not at all shapely; those which are grown in my span roof or double-pitch house are well shaped, being uniform on all sides.

I would not advise Camellias to be grown in a lean-to house.

Fig. 22. My Lean-to House, seventy-five feet long, by sixteen feet wide.

CHAPTER XX.

PLANTS IN POTS AND TUBS.—WHEN THEY REQUIRE REPOTTING, TOP DRESSING, ETC.

I FIND that *alba plena*, in pots or tubs, after they are fifteen or twenty years old, are more difficult to manage than those planted in the ground.

Fig. 23 is a representation of a plant in a tub, thirty years old, in a fine flourishing condition, with over four hundred buds.

Plants of this size will not need re-potting every season.

Many of them will stand from three to five years, and even longer, in the same size pot or tub.

Judgment must be used in regard to those plants that require removing.

Those that do need removing will have an unhealthy appearance, the foliage will be of a yellowish hue, and they will have made but little growth the previous year. The flower buds will not come to maturity. Such a plant should be taken from the pot or tub, all the loose and sour ground taken from the ball one inch all around, or until good sound roots are seen, then place back into the same size or a smaller pot. Encourage it to make roots, and the top will soon begin to grow.

All Camellias over eight or ten years old, would be very much improved by drainage.

Fig. 23. *Alba plena* in tub. Thirty years old.

Any hard material, such as broken pots or oyster shells, that will allow the water to run off, will do.

I would recommend putting a little moss over the drainage to prevent the soil from mixing with it.

When the plants want re-potting, give them but one size larger pot, they will do much better than if they have too much room.

A very good plan, and one which I consider quite necessary, is to go through the houses or stock three times a year and remove about half an inch of the ground from the top of the soil, which is generally part moss, caused by the dampness of the house. Renew the same with fresh soil.

Plants often get so covered with this moss that it is almost impossible to tell when they require water.

This is what is termed by growers top-dressing the plant.

CHAPTER XXI.

HOW TO WATER PLANTS.—THE QUANTITY OF WATER REQUIRED.—THREE IMPORTANT MATTERS IN GROWING CAMELLIAS.—HOW TO HAVE FINE FLOWERS.

FROM the first of November to the first of March, my houses are examined every day, and my large plants in the ground are watered about once in two weeks.

Those in pots and tubs, once in three days.

The soil of all plants will tell when they require water.

During the months of March, April and May, the plants will be growing, and will need much more water than at any other time of the year.

The plants must be watered thoroughly.

The top may have a damp appearance and yet the roots be dry.

I have frequently seen plants twenty years old receive about one quart of water, or enough to wet the surface.

This manner of watering is very injurious, and if repeated often it will, in a short time, prove fatal to the plant.

A plant of this size will not require water every day, but when it does, give it from six to eight gallons at one watering.

Those planted in the ground will require twice this quantity of water if really dry, and it will do the plants no harm; a great quantity of water is here lost in the beds.

Camellias are not at all difficult to manage, although they are not always to be seen in a satisfactory condition.

The reasons why cultivators are not successful are:

First. They keep them too warm, and do not pay enough attention to airing the plants.

Secondly. There is very seldom sufficient water put on them to wet the roots.

Thirdly. A very important matter is syringing or dampening the foliage, which is very often neglected.

I do not find that syringing the plants when they are in flower spoils the bloom; in fact I find it quite the reverse.

When the plants are in perfection, which is generally in December and January, the weather is the coldest, and the fires are rather stronger than in November.

The foliage will not, during this time, have that bright glossy look it had a few months previous. And the flowers, when cut, will be of a flimsy texture if the syringe is not used constantly.

Generally about the holidays, when Camellias are in great demand for the trade, as well as for our retail business, and we wish a good bloom and firm flowers for the next day, we syringe thoroughly the night before, not being afraid of bud, flower or foliage.

The water loosens the bud and causes it to expand to a fine fresh flower, and in greater abundance than if syringing should be neglected.

They will carry, packed in cotton, for three days, while others that have not been syringed, will not carry half the distance, nor will they be as satisfactory to the purchaser.

CHAPTER XXII.

TIME TO RE-POT LARGE CAMELLIAS.

THE best time to re-pot large Camellia plants is during the months of January and February. At this time the plants will be nearly through flowering, and many of them will be preparing to make their new growth of wood, which is to form the buds for the coming fall and winter's flowers.

Many growers give as a reason for objecting to re-potting at this time, that, by handling the plant, many of the flowers remaining on the plant will be spoiled.

I consider that fresh soil is needed just before the plants begin to grow.

The young growth needs nourishment.

I advise all re-potting to be done during the months named. The flowers at this time are but of little importance compared with the advantage the young growth will gain by having fresh soil.

Many more plants will require fresh drainage than will need larger pots or tubs.

Do not disturb good healthy-looking plants until you are sure that the roots have extended to the sides of the tub or pot.

It may be difficult, in only using one size larger pot, to get the soil well around the ball and leave no air holes.

Use a stick which is square at the end for working the soil down around the roots of the plant.

After re-potting, water thoroughly.

The fresh soil at this time will absorb a great quantity of water without injury to the plants.

CHAPTER XXIII.

THE REMEDY FOR ALBA PLENA FLOWERS WHEN THEY OPEN OF A YELLOWISH COLOR.—PUTTING PLANTS OUTSIDE IN SUMMER.—THE KIND OF A DAY THAT CAMELLIAS SHOULD BE PUT OUT IN THE OPEN AIR.

I FREQUENTLY find my white varieties when about to open their flowers have rather a yellowish tinge. This has been caused by the dampness of the house.

I obviate this trouble by giving the plants a little fire about the middle of October, and then only during the day, allowing the fire to go out about dusk.

Have plenty of air circulating through the house while you have the fire going.

The fire is merely to dry off the extra moisture, and will only be necessary for two or three days.

Do not allow the thermometer to get below forty degrees in the house during the month of October.

By giving a little heat during this month, the buds will be prevented from showering off the plants, which they are apt to do.

They will stand more cold after the first of December without injury to the buds, than they will in the early fall.

The question is often asked me: Shall I put my Camellias outside in summer?

If the house has been kept at the temperature recommended for Camellias alone, put the red kinds out, the white varieties keep in the house.

If a variety of plants have been grown in the same house, adopt the plan for amateur culture.

My plan is to put out all the large red varieties, about the middle of May, putting the pots in the ground up to the rim, to prevent the sun from acting on the roots.

When these plants are taken from the house, let it be done on a dark, rainy day. This is a matter of great importance, and you will find they will stand the strong rays of the sun without their foliage burning.

I prefer keeping the white varieties in the greenhouse all the season. Moving all the large red varieties outside, gives me more space for the white kinds, which have been crowded during the winter.

They will be greatly improved before fall, by having this extra space and light.

All large plants are improved by being turned once or twice in a year, to keep them in shape.

This turning the plants can be done in the spring after the red varieties are put outside, and again in the fall when returning them to the house for the winter.

CHAPTER XXIV.

WILL CAMELLIAS STAND FORCING?—PROPER TIME FOR THEM TO FLOWER.—PROPER TREATMENT.—THE NUMBER OF FLOWERS I CUT FROM THE FIFTEENTH OF DECEMBER TO THE MIDDLE OF JANUARY.—TREATMENT WHILE GROWING, PRUNING, ETC.

WILL Camellias stand forcing? They will, for a few years only; at the end of that time the foliage will have a yellowish appearance, and the plants will only make about half the growth they should.

In the course of five years, or even less time, they will only be fit for the rubbish heap.

I have often forced large plants for their early bloom. This is done by giving them extra heat in early spring.

By forcing them to make an early growth you will get the wood hardened by the middle of April, they will then form buds by the last of May, and will begin to bloom the first part of September.

These plants will come into bloom about the same time every year. The flowers will not be as good as those on the plants which have received the proper treatment.

Without this forcing, the plants should come into flower about the tenth of November, and bloom well until March.

There is nothing gained by giving Camellias extra heat.

The forced flowers will be easily detected. They

have a greenish center, with only half the number of petals that they should have.

My plants generally begin blooming about the first of November, and from the fifteenth of December until the middle of January, they are at their height and in perfection.

At this time I cut from three to six hundred daily. I usually have two thousand for Christmas and two thousand for New Year's. Many of these are sent west, to those in the trade, at prices according to the quantity blooming at this time. (See Chapter XXXV.) Most of my *alba plenæ* are done flowering by the middle of February or the first of March. At this time they begin growing; many of them still have buds, but very few open well after this.

The plant is now in a growing state, and casts the remaining buds.

Give the plants a little more heat and plenty of water while growing, but as soon as their growth is made, give them the usual quantity of air.

Do not allow them to make the second growth.

Use the knife freely in pruning; cut away all the dead branches, and those that are not in a healthy condition. Also top the long straggling shoots.

This pruning should be done before the plants begin to form new wood, in order to get the plants in a shapely form.

CHAPTER XXV.

ON CAMELLIA CANDIDISSIMA.—ENGRAVING SHOWING THE
FLOWERING VARIETY.

Fig. 24. *Candidissima*. The
flowering variety.

Of this famous variety of Camellia, named *candidissima*, there are two distinct kinds. They are similar in foliage, but in habit of growth they are decidedly different.

This variety generally begins flowering about the middle of February, and takes the place of *alba plena*, which is nearly through blooming by this time.

This kind will continue to bloom until May or June.

It is decidedly the best late double white that is grown, and should be in every collection where late flowers are needed.

Fig. 24 represents the flowering variety.

It has strong erect shoots and is covered with flower buds.

When purchasing be sure to get the flowering kind.

This plant is four years old and grown from a cutting of five eyes.

It will require the same treatment in propagation as the *alba plena*, but it is of a quicker growth and will root more freely.

CHAPTER XXVI.

ON THE WORTHLESS KIND OF CANDIDISSIMA.—THE VARIETY THAT NEVER BLOOMS.

Fig. 25. *Candidissima*. The worthless variety.

FIG. 25 represents the variety of *candidissima* that never flowers.

This plant resembles the one represented in Fig. 24 only in foliage, but not in its habit of growth.

This plant, that never blooms, has a great many short joints and shoots, and is very weak and not at all like the flowering variety, which is very strong and erect.

I have grown this kind myself for twenty years, and they have never produced bud or flower.

They are well known among Camellia growers.

I think this plant was first propagated near Philadelphia, but it is now pretty well scattered over

the whole country. I do not consider it worth the room which it occupies on the benches, being only fit for a stock on which to work the double varieties.

This, like the blooming kind, will root very freely. It is always offered at a very low figure, and the purchaser is of the belief that he is buying a profitable flowering variety.

CHAPTER XXVII.

DESIGN OF HOUSE FOR AMATEURS; THE COST OF ERECTING IT.—HOW TO GROW CAMELLIAS WITH OTHER PLANTS.—HOW TO TREAT THEM DURING THE SUMMER MONTHS.

FOR amateurs who have a house devoted exclusively to the cultivation of Camellias, former chapters will give all necessary information.

Fig. 26 represents a house sixty feet long by twenty feet wide and ten feet high.

Fig. 26. "Camellia" House, for amateurs and others.

The cost of erecting such a house at present prices (1879) would be about seven hundred dollars, built of the best material and in the most substantial manner, with brick foundation, and heated with boiler and hot water pipes.

This house is particularly suitable for the growth of the Camellia, on account of having both top and side ventilation.

Should the collection of Camellias be small, other plants can be grown in the same house, if the Camellias are kept together in the coolest part.

I have seldom seen Camellias in a good condition when grown with other plants.

Their general appearance usually indicates that they had not had the proper treatment, the foliage is scanty and has a sickly yellowish look, instead of that fine luxuriant and glossy appearance, which the plants should have, if the proper treatment had been given them.

The buds are few, and have a dry and parched look.

I attribute this failure to too much heat.

My opinion is, that this could be remedied, to a great extent, by carefully syringing the foliage and dampening the pathways, in that portion of the house occupied by the Camellias.

This syringing should be attended to morning and evening, as long as the plants are receiving artificial heat.

Syringing once a day will be all that is necessary when there is no heat.

As a general thing they bloom much earlier, when in a house with other plants, on account of the temperature being higher than is needed for them.

Many of the buds will fall off.

I would advise leaving only one bud on each terminal shoot; rub all others off in September, or when they grow to the size of a pea. Those buds that are left on the plant will usually mature good flowers.

Very often there are three or four buds joined in one

cluster, and they would all bloom if they had a house by themselves; but when in a house with other plants, the heat which is required to keep these plants in health, causes the buds from the Camellias to fall off.

I do not recommend setting white Camellias out in summer, except when they have been grown in a house with other plants, and at a higher temperature than they really require. All such plants, if put out during the summer months, will be very much benefited by the change.

Put them out as early as practicable, or as soon as the wood is hardened, and there is no danger of frost.

Plunge them in the ground up to the rim of the pot, on a wet day.

Keep them in a cool, shady situation, but not under trees.

They had better have the strong rays of the sun, than to be under a drip.

There is no danger of the sun burning the foliage, if the precautions are taken, which have been already given. The foliage will become hardened before the sun strikes them.

If put out while the sun is shining, the leaves will burn, and most of them fall off, and the plant will not be fit for the greenhouse, the coming fall.

Do not allow the plants to remain outside later than September. See that they are free from insects. Also give a top dressing of fresh soil to each plant before returning them to the greenhouse.

Camellias which have been grown with a variety of plants, will require the knife to be used very freely just before they begin to make their growth.

Many branches will be found with dormant or dead eyes, which have been caused by too much heat. All such eyes should be cut away; they are only robbing the good shoots of the nourishment they need.

The prominent eyes will give sufficient bloom. For potting, shading, etc., see former chapters and calendar for the months.

Let me sum up, then, briefly, the errors to be avoided by amateurs in Camellia culture:

1st. Do not attempt to mix your Camellias with other plants in your greenhouse or conservatory. If you cannot have a separate house for them, put them by themselves in the coolest place in your greenhouse.

2d. Do not let them have too much heat. As much as other plants need will be fatal to them, except in February, March and April, when they are making new wood. The temperature should not be higher than from forty to fifty degrees. During those months it may gradually be brought up to sixty-eight or seventy degrees, and as gradually reduced to the old temperature.

3d. Don't let them bud or blossom too soon, nor too much. If a two year old *alba plena* ventures to put out one or two flower buds, pick them off without hesitation. If a three year old plant puts out many buds, it is better to sacrifice all, or nearly all of them, in order to have strong, healthy plants.

4th. Don't force them to produce a second growth in June or July. The result of this second growth would be no buds or flowers for the coming winter, and your plants will eventually become sickly and die.

5th. Do not omit the daily syringing and the thorough watering when your plants are dry. You wash your face every day, but you do not ordinarily take a full bath oftener than once a week. Treat your Camellias as you treat yourself, and they will be the better for it.

6th. Keep your *alba plena* Camellias in the house during the summer, if they can be properly cared for there, unless they have been crowded through the winter and spring months, then they will be the better for having more room.

7th. If you do put them out, let it be done on a rainy day; prune them carefully first; plunge them up to the rim of the pot; do not put them too near together; put them out after the last frost in the spring, and take them up before there is a possibility of frost in the fall.

8th. Be careful to keep all insect pests from them, red spider, scale, mealy bug, etc., etc., following the directions given elsewhere in this book.

9th. When they are in the greenhouse, air them freely as directed.

10th. Don't try experiments with them; you will lose too much if you do. Leave that to the men who have thousands of them growing.

CHAPTER XXVIII.

ON GRAFTING.—FIVE ENGRAVINGS SHOWING SINGLE STOCK.—SINGLE STOCK GRAFTED.—THE BEST MODE OF GRAFTING.—THE FRAME TO RECEIVE THE GRAFTS.—GRAFTED PLANT, ONE YEAR OLD.—GRAFTED PLANT, TWO YEARS OLD.

Fig. 27.

Single stock, with openings to receive the grafts.

For the benefit of those who still practice grafting, I will here endeavor to give the best means by which it can be accomplished.

Of late years, grafting has been more practiced by growers than inarching.

It is much less labor, and where two grafts are inserted in the stock, makes decidedly a more shapely plant.

Fig. 27 represents a single stock with openings to receive the grafts of the double kind.

The grafts should be of only one eye long, and will be seen on the plant represented in the engraving.

This graft is pared or sliced on both sides, and made to fit the cuts in the stock as accurately as possible.

I place two grafts in the stock, but most growers only use one.

By adopting this plan of using two grafts, you are always sure of bringing one out of the frame alive, and should the two live, you will have a much better plant in the same length of time.

In grafting, first cut the stock one-quarter of the way through, and about a half of an inch down, then insert the graft which has been sliced on both sides, tie with cord or bass matting to keep the graft in position, as represented in Fig. 28.

Fig. 28.

Grafts inserted and tied to the stock,

After being tied, use a little clay around the grafts to keep the drip and moisture which will form in the frame from entering into the newly-made wound.

Take a few inches of the wood from the top of the single stock, and it will be of great benefit to the grafts.

A close frame will be necessary for this operation inside of the greenhouse, to receive the plants after they have been grafted.

Fig. 29 represents the kind of frame which is used for this purpose.

Lay the plants on their sides, as shown in the engraving.

Grafting can be done very successfully during July and August.

Have the frame placed in the cool-

est part of the house, with the temperature kept as low as possible.

In two months the graft will be firmly united to the stock, and can be removed from the frame to the bench in the greenhouse.

Fig. 29. Frame to receive the grafted plants.

Grafting can be done in January, but not with so much success attending it as during July and August.

I would advise that it be done during the summer months.

If grafting is done in January, keep the grafts in the frame at a temperature of about fifty degrees, then gradually increase the heat to sixty or seventy degrees.

Keep the temperature about the same for three weeks. At the end of this time you will find them firmly united, and many of them beginning to grow.

When you find them starting their young growth, gradually get them back to lower temperature.

January grafts take about six weeks to unite.

August grafts two months.

When the grafts have united, the cords with which they have been tied will need loosening, as the stock at this time will be swelling.

Remove the cord and tie again more loosely.

This is done only to keep the graft from being broken by careless handling, etc.

Fig. 30.

Alba plena, one year
from grafts.

Do not encourage January grafts to make but the one growth, and they will have made this before taking them out of the frame.

The stocks, two or three weeks after being grafted, will have a tendency to grow, and show shoots below the graft; these should be taken off.

Do not allow any portion to grow but the newly-inserted graft.

One man will be able to graft three hundred, putting two grafts in each stock, tie and clay the same in one day.

For those who have had experience in growing Camellias, I would advise grafting.

For others, they had better adopt the slower process of inarching.

Fig. 30 represents *alba plena* one year old from graft; both grafts are growing.

This is what is called a four-year old grafted plant; the stock being three years old before it was grafted.

Growing *alba plena* from cuttings at four years old, will be much larger and with flower buds, none of the extra labor required, as for grafting.

If growing for profit, adopt the plan of growing from cuttings.

In four years the plants will be salable with buds.

Fig. 31.

Alba plena, two years from grafts. duce new shoots or eyes.

This grafted plant will require to be two years old from graft, or five years old from cuttings, before it is salable, with buds, and it will not be the size of the four-year-old *alba plena* from a cutting.

Fig. 31 represents a plant two years old from the graft, or five years from cutting, with buds on.

In grafting, many of the eyes will fall out from the graft.

Give all such plants a little extra heat the following March, and they will pro-

CHAPTER XXIX.

ON GRAFTING FOR AMATEURS, OR FOR THOSE WHO HAVE A SMALL COLLECTION OF CAMELLIAS.—ENGRAVING SHOWING HOW SINGLE PLANTS CAN BE GRAFTED SUCCESSFULLY, WITH COMPARATIVELY LITTLE LABOR.—ALSO ENGRAVING OF ^{AN ANCIENT} ~~MY~~ PROCESS OF INARCHING.

FORMER chapters of this book tell how grafting ought to be done, and the kind of wood to be used; also the time it takes to perform this work.

I have often seen in amateur collections many single and semi-double varieties, which are of very little value for their flowers.

These can be made of some value by grafting them with some good double kind.

One great advantage which is to be gained in grafting old plants is, that in two years, the plant will be as large as it was before it was cut down for grafting.

The growth the first season will probably be from six to twelve inches.

The second season it will bud and bloom with perhaps one dozen flowers.

Fig. 32 represents a semi-double plant, cut back and grafted.

Hyacinth glasses are used here to cover and protect the grafts.

Use a little moss to fill in the opening of the glasses to keep them partly air-tight.

This grafting can be done in any portion of the greenhouse, conservatory or pit.

Fig. 32.

Grafting for amateurs.

The graft at this time should be firmly united to the stock.

Shade the plant well for a few days after removing the glass.

When hyacinth glasses are used, no frame is required.

Shade the glass with paper in the middle of the day for two weeks, then this extra shading can be dispensed with.

At the expiration of three weeks, pull a portion of the moss from the mouth of the glass, in order to give the graft a little more air, as it should be uniting by this time.

At the end of the fifth week remove all the moss from the glass, still allowing the glass to remain over the graft for one or two weeks longer.

At the end of the seventh or eighth week, take the glass off altogether.

Fig. 33.
Grafting with bell
glass.

Fig. oo.
Inarching for ama-
teurs.

For small plants, adopt the plan which is represented in Fig. 33 of a bell glass, in which six plants can be grafted at one time.

Be sure at all times to give a little air at the bottom of the glass; this will not only give them air, but will tend to dry up the heavy moisture, which is so destructive in grafting.

Do not hurry them to unite, and you will preserve the young shoots of graft, which are so often lost by giving extra heat.

Another mode for working the Camellia is very similar to inarching, and which will be seen represented in Fig. oo.

This engraving shows how the operation is to be performed.

Take a branch of some good variety which you wish to work on the single and semi-double kind, and place it in a bottle of water.

Slice a little piece of wood from the branch which is in the water, and also the same sized piece from the stock, then tie the branch and stock together, as represented in the engraving; by this process they will readily unite in four weeks.

This work can be done at any season of the year, except when the plants are in a growing state.

The water in the bottle will supply nourishment to the branch which is without roots.

Although this is by no means a modern way of working this plant, it will be found to be a very interesting process to amateurs and others who have but few plants.

For information which is wanted on this subject, and which is not contained in this chapter, see chapters XXVIII and XXX.

CHAPTER XXX.

ON INARCHING.—FIVE ENGRAVINGS SHOWING HOW INARCHING SHOULD BE DONE.—ENGRAVING OF A SIX-YEAR-OLD INARCHED PLANT.—ENGRAVING OF A FOUR-YEAR OLD ALBA PLENA GROWN FROM A CUTTING.

Fig. 34. Single stock in condition for inarching.

INARCHING is grafting by uniting a scion to a stock without separating it from its parent plant.

I would advise this mode of working the Camellia for those who have but few plants, or those with limited experience.

Fig. 34 represents the single stock with a small piece of the wood and bark sliced off at the side.

This is where the union of both plants is to be made.

If you want low bushy plants, place the inarch on the stock as low down as possible, as will be seen in the engraving.

July and August are the best months for inarching, as the wood of both plants is generally ripened, and will unite quickly.

Inarching can be done also in February, or just before the plant begins to grow, with the same success as in July or August.

Fig. 35 represents a plant of *alba plena* which is to be inarched on the stock.

The engraving shows a slice of one inch long taken off the double kind just three eyes from the top.

Fig. 35.

Alba plena to be inarched on the stock.

The inarch should never be of more than two to three eyes or joints long.

Make both cuts alike, so as to fit as accurately as possible; join together and tie with cord or bass bark, as represented in Fig. 36.

Inarching can be done in any part of the house, as there is no close frame required.

In watering these newly inarched plants do not allow any of the water to come in contact with the union of the two

plants for three or four days. After this time syringe twice a day.

If done according to the directions given here, in four weeks the plants will be united.

By examining them at the stated time, after they have been inarched, you will find the barks joined firmly together.

All such should be cut half way through, and at the same time cut half of the top from the single stock.

This will cause the inarch to half support itself.

About the sixth week you can cut the inarch off entirely, as Fig. 37 represents, allowing one or two inches of the single stock to remain above the inarch.

Fig. 36.

Plants in an inarched state.

This is merely done for a protection to the inarch, and can be removed at any time after two months.

The bands or cords should be removed as soon as the inarch is cut loose from the parent plant.

Tie again more loosely.

This second tying is very important, as some of the plants may not be as firmly united as they appear to be, and this will hold all such in their place.

If the plants have been properly cared for that were

Fig. 37. The inarch growing.

Fig. 38. Inarched plant, six months old.

inarched in August, they will need re-potting the following January, and will have the appearance of Fig. 38.

This plant will make a young growth, in February or March, of from two to four inches, and, by August, the top of this inarched plant can be used to work the single stock again, or it can be taken off the following fall for a cutting.

This will cause the plant to grow bushy, and the next fall the plant will be well budded.

This is the second year after being inarched, or the fifth year from the cutting; but bear in mind that the stock was three years old when inarched.

Continue this practice and the stock of this plant will increase, but not as fast as if grown from cuttings.

For inarching have good, healthy stocks to work, and not less than three-year-old plants.

To make a success of this work much depends on the health and strength of the stocks.

If the directions are followed strictly for inarching, the loss should not be more than one in one hundred.

The best stock to use is the single red, although any good strong-growing double red will answer.

There is a variety of Camellia named Mary Edmondson, a small double white flower of very rapid growth, which roots very freely.

Plants of this variety are as large at two years old as any of the others are at three.

Fig. 39.

Inarched plant three years old, or six years from a cutting.

I consider this variety the best to grow for a stock to inarch or graft on.

Fig. 39 represents a well-grown inarched plant. This has been inarched three years. The stock is the same age, making the plant from cutting six years old, well budded and of a salable size.

Fig. 40.

Alba plena, four years old, grown from a cutting of five eyes.

At present prices, this plant is worth from seventy-five to one hundred dollars per hundred.

Fig. 40 represents *alba plena* grown from a cutting of five eyes.

This plant is four years old, well grown and finely budded.

Worth, at present prices, seventy-five to one hundred dollars per hundred.

It is equally as good in every respect as the six-year-old inarched plant.

It has grown to this size with half the cost of the inarched plants, and is worth as much at four years old as the inarched plant is at six.

I would advise all that possibly can to follow growing *alba plena* from cuttings.

CHAPTER XXXI.

ON CAMELLIA JAPONICA FOR WINDOW GARDENING, ALSO
FOR BAY WINDOWS AND SMALL CONSERVATORIES.

CAMELLIAS are plants greatly admired by ladies, and are used extensively for windows and parlors.

This plant is recommended by many growers for window gardening.

My opinion is, that perhaps not more than one person in one hundred will succeed in growing this plant.

Time and money might be more profitably spent on plants that do not require such a cool and moist atmosphere as the Camellia.

Dwellings are kept too warm and without any moisture; in such an atmosphere this plant will not thrive. A Camellia brought from a florist in the fall, will perhaps flower what buds are on it; these will probably be the last flowers you will see on this plant.

The next season the plant may show flower buds, but the chances of this are very doubtful, and should it bud, the buds generally fall off soon after being brought into the house.

Many thousand persons have tried to grow them in this way, and many will yet, without any better success.

If you have a bay window which is inclosed to exclude the dry atmosphere of the house from the window, the chances of the plant will be much better.

You can succeed well with them by growing them in pits or frames, and removing them to your dwelling when they are in flower.

The size of boiler is as follows :

Size of Grate.	Height Boiler.	Diam. at Bottom.	Size of Sockets.
9 inches.	2 ft. 10 in.	2 feet.	2¼ in.

If you have a porch in the rear of your dwelling, which can be easily converted into a conservatory for the plants, have the sash made to fit it closely between the pillars. This can be removed in the summer and the plants put in the yard.

I would recommend for heating such a conservatory a base-burning boiler, which is represented in the engraving.

This heating apparatus is complete, and can be put up by any plumber. The boiler is made of two double cylinders; the water circulates through both. The inner double cylinder forms the magazine for fuel, while the outer one

forms the fire box, and makes an annular smoke-flue be-

tween the cylinders. When not used as a self-feeder, the inner cylinder becomes a flue, and increases the heating surface. The boiler may be used to heat the room it stands in, and, by circulation of water through pipes, will warm other rooms or a greenhouse at a distance. Fire may be kept twelve hours without attention. This boiler is calculated to heat one hundred and twenty feet of four-inch pipe.

The grate may be shaken or dumped.

This is designed especially to meet the wants of amateur florists for regular conservatories.

Such a boiler, without pipes, is worth thirty dollars.

For heating a bay window, use a coal-oil stove, from which there is no gas or smoke; place a pan of water on the top of the stove to create a moisture.

The price of such a stove is from six to eight dollars, and can be had at any seedsmen.

Camellias grown with so much heat and so little moisture will need the foliage washed often.

I recommend the following wash to be used once a month, with a daily syringing of clear water, as fumigating with tobacco, &c., is very objectionable for either bay window or conservatory.

Receipt for wash to be used by amateur florists for plants infested with insects: Eight gals. of soap suds, one quarter of a pound of flour of sulphur; stir well together, adding a little soft soap.

Dip the plants in this solution, and a soapy gloss will cling to the foliage which will not be objectionable to the eye. Insects will not be apt to infest them soon again.

CHAPTER XXXII.

SOIL FOR CAMELLIAS.

I USE a good fibrous loam, which is broken up thoroughly with the spade, and not sieved, which would take all the fiber from the soil.

Many persons imagine that the success in growing this plant depends altogether upon the kind of soil which is used.

I find that they are not particular as regards the soil.

My heap is made up in July or August, or at any time during the spring, summer or fall, whenever I can get good green sod from the hills, fence corners, or from old pasture land that has not been disturbed for years. Keep away from low bottom and clayey soil.

Cut sods not over two inches thick, place on a pile with grass-side down, and in six weeks this will be ready for use.

Many growers use peat soil, leaf mould, and many other mixtures.

The loam alone is what I use, and is all that is necessary for the growth of this plant.

Never use fertilizers of any kind.

CAMELLIA IMBRICATA.

CHAPTER XXXIII.

NAMES OF CAMELLIAS THAT I GROW FOR PROFIT.—THE FOUR BEST WHITE VARIETIES.

FIRST and foremost,

Alba Plena,

the old double white, and one which I grow principally. There are many other white varieties, but none that equal this in any respect, both plant and flowers always finding ready sale.

Second,

Fimbriata.

The fringed white, in shape and size of flower the same as *alba plena*, but having a fringed edge on each petal of the flower. This is a sport from *alba plena*. I have often seen them both on one plant, one portion of the plant with fringed white, the other with plain *alba plena*.

Third,

Lady Hume's Blush.

A good double blush-white; the flowers are generally smaller in size than *alba plena*. It is a very straggling grower. To keep it in good shape, the knife must be used freely.

Fourth,

Candidissima.

The late blooming double white, is a very compact grower. The plants always have a shapely appearance, and are a very free flowering kind.

See special chapters of this book on the two varieties of *Candidissima*.

CHAPTER XXXIV.

EIGHTEEN OF THE BEST COLORED VARIETIES: SIX DOUBLE RED, SIX DOUBLE ROSE COLOR, SIX DOUBLE STRIPED.

OUR catalogues contain an endless variety of Camellias, many of them being so nearly alike that it is difficult to distinguish them apart.

1. *Imbricata.*

Crimson and white; a strong grower; a very free flowering kind, and easily propagated from cuttings.

See Colored Plate.

2. *Sarah Frost.*

Rosy crimson; a very handsome variety for late blooming. It is free flowering and of easy propagation.

See Colored Plate.

3. *Gilesii.*

Crimson and white, half double.

4. *William Penn.*

Dark crimson, and of good form.

5. *Lowii.*

Dark crimson, very large.

6. *Reine des Fleurs.*

A red, handsome flower.

SIX ROSE COLORED VARIETIES.

1. *Fordii.*

Beautiful waxy rose color, fine form.

2. *Caleb Cope.*

Blush rose color.

3. *Henry La Favre.*

Dark rose, beautifully formed.

4. *Sacco.*

Light rose, a very free flowering variety.

5. *Wilde Rii.*

Bright, rosy pink.

6. *Ellen.*

Rosy red, marked with white.

SIX STRIPED VARIETIES.

1. *Cup of Beauty.*

White, with pink stripes.

2. *Jenny Lind.*

White, striped with rose.

3. *Mary Kurtz.*

White, striped with pink.

4. *Lizzie Jones.*

Pale rose, striped with pink.

5. *Bonomiana.*

White, striped with crimson.

6. *Feast's Perfection.*

Satiny rose, marked with white.

For other varieties, see Camellia Catalogue in this book.

CHAPTER XXXV.

HOW TO BOX AND SHIP CAMELLIAS.—THE CURRENT PRICES FOR THEM.—BY WHOM THEY ARE PRINCIPALLY BOUGHT.

FOR the past five years Camellia flowers have not been in great demand.

The present season I find them coming into popularity again.

Fig. 4. Box for packing Camellia flowers.

Rose buds superseded them for a while, and they do yet, to a great extent; but for large pieces, and where a show is wanted, there is no flower to take the place of the Camellia.

Both plant and flowers are now commanding fair prices.

My Camellia flowers are generally sent west to the trade, a few being sent in other directions.

For shipping, the flowers are packed in wooden boxes, as Fig. 41 represents.

These boxes are lined with cotton, only one layer of flowers being put in a box, which is made to hold twenty-five open flowers, or fifty half blown.

Use plenty of cotton between each flower, putting a good layer on the top, after which, nail the wooden top down.

Wrap each box separately in good strong paper.

Ten of these boxes can be put in one bundle.

If the weather is cold, wrap the lot of boxes in a good coarse blanket, and they will carry safely, if the thermometer is not below zero.

During the past season, from October 20th to November 1st, my price of flowers to the trade has been six dollars a dozen, or forty dollars per hundred.

They are worth to me at the present time much more, for my retail trade.

There is no one desirous of selling the early flowers wholesale, as they command at retail seventy-five cents to one dollar apiece.

From November 1st to December 10th my price is two dollars and forty cents a dozen, or fifteen dollars per hundred.

During the holidays, the prices depend on the quantity in bloom.

This season they bring fifteen dollars per hundred.

I have only sent one thousand Camellias west this

season, and these were ordered before the twenty-first of December.

Between that date and the twenty-seventh of this month, I received orders for over fifteen hundred, which I was compelled to refuse on account of my retail orders, which at this time were large.

I usually have on hand one thousand Camellias for Christmas, and one thousand for New Year's, to supply my home demand.

The prices they are now bringing are fully equal to that of former years.

The prices I have named are for the white varieties.

The red Camellia flower is only worth half as much as the white.

After the holidays the prices are considerably lower, being worth from eight to ten dollars per hundred.

They usually remain at these prices until the first of March.

About this time *alba plena* is becoming scarce.

Although there may be many buds on the bush, very few will come to perfection.

The sap will now be running freely, and the plants will be preparing to make their young growth for the season.

The late-blooming variety, *Candidissima*, will now take the place of *alba plena*, for double white Camellia flowers, and will continue to bloom until May.

The price for the flowers during these months ranges from three to six dollars per dozen.

CHAPTER XXXVI.

HOW LONG CAMELLIA FLOWERS WILL KEEP AFTER BEING CUT FROM THE BUSH.

A QUESTION which is often asked, is how long will Camellia flowers keep after being cut from the bush.

My flowers are cut every morning and laid on damp moss in boxes in a dark place, where the thermometer does not get above fifty degrees.

Some days I only cut fifty flowers, other days from three to five hundred.

Flowers will keep ten days or two weeks, if the directions are followed.

Give the flowers a light sprinkle of clear water at night, this will revive them and strengthen their petals.

Water will not injure the flowers.

Those flowers that I ship to a distance are pulled fresh and packed the same day.

I number and date my boxes when the flowers were cut from the plants, in order to use first those flowers contained in the box of the earliest date.

CHAPTER XXXVII.

FERTILIZERS.—WHAT TO USE.

I NEVER use guano or any other fertilizer for Camellias.

Use lime water three times a year to keep the soil sweet, and kill the worms which are working in it.

This is the cause of so many plants having that yellow and sickly appearance.

To obviate this trouble, take a half a peck of lime, put it in a flour barrel, fill the barrel with water; do not mix the lime up; allow it to stand over night so as to settle; the next day it will be ready for use.

Be sure the plants get a sufficient quantity of water to wet every root and fiber, and it will be only a few minutes before the worms which have not already been killed will come to the top of the soil.

I frequently syringe my Camellias with this water; it kills many of the insects which are on the foliage.

Be careful not to stir the lime up from the bottom of the barrel after it has settled.

It is only the lime water that you want.

The plants do not need to be whitewashed.

CHAPTER XXXVIII.

ON INSECTS AND PESTS TO WHICH CAMELLIAS ARE SUBJECT.—RED SPIDER, MEALY BUG, SCALE, ETC.—WASH FOR THE PIPES, ETC.

WHEN plants which have been grown in a limited quantity have received the proper treatment, they will not often be troubled by any pests.

Where Camellias are grown with other plants, and at a high temperature, these pests will be found.

Red Spider

Is perhaps the worst enemy that Camellias have to contend with.

It is very seldom noticed by the inexperienced, until it has almost destroyed the plant.

It begins its work on the under side of the foliage.

The insect is very small, and resembles or looks like flour.

By using a magnifying glass, you will see thousands of these insects on one leaf.

If allowed to remain in this state, the top portion of the leaf will lose its beautiful green color, and will become red or brown, and in the course of a few months, this insect will get through all the plants, so that their growth and budding will stop, and the plant will eventually die.

To remedy this evil,

Wash every leaf and branch with strong rosin, coal oil or whale oil soap. .

If properly done, one application will be sufficient.

After washing the plant, syringe twice a day, with clear water, night and morning, until the plant shows signs of recovering.

If the directions are followed for syringing, etc., red spider will seldom be seen among the plants.

Mealy Bug

Is an insect to which Camellias are subject.

This bug can be easily detected by its white tracks.

They are generally found most plentifully in the fall of the year, when the plants are in bud, and they are always found in or around the flower buds.

When the collection of plants is small, you will not be bothered with this bug, unless the directions for taking care of the plants have been neglected. Remedy : one drop of coal oil will be all that is necessary to destroy a nest of these bugs.

Scale.

A small but dangerous insect to get among the plants.

They are usually found in about the middle of the leaf, and if allowed to remain, they will soon get over the foliage and stem.

They stick fast to the leaf, and when but a few months old, they imbed themselves firmly in the foliage, and can-

not be removed without taking a portion of the fiber of the leaf.

My remedy for this insect is :

Use water heated to 120 or 130 degrees. Lay the plant on its side, and syringe with this water.

One or two applications may be sufficient.

Small plants which are infested with this insect I throw away.

Another pest.

In the spring when the plants are in a growing state, a black fly will be found, but only on the young growth.

I have never found it really injurious to the plants, but it gives them an unhealthy appearance.

One or two fumigatings with tobacco will destroy these flies.

The following wash

I have used in all my houses for years, to keep insects down :

Use a barrel for slacking one peck of lime (as for whitewash), afterwards add half a pound of flour of sulphur; stir well together. Then whitewash all the pipes and flues.

This will not injure any of the plants.

Mildew will never be seen where this wash is used.

I generally wash my pipes twice during a season.

It is not necessary to whitewash all around the house.

Wash around the furnace, the middle of the house and at the extreme ends.

It is the fumes from the sulphur that is wanted.

CHAPTER XXXIX.

ON HEATING.

ONE of the most important matters now to be considered is the heating of your house.

The best and most economical way is by hot water.

By this means of heating you will escape the gas and smoke which generally rises from smoke flues.

The plants will make stronger growths and bud more freely, and they will also have that fine luxuriant foliage which only a uniform temperature can produce.

Boilers can now be obtained, that will heat 1,400 feet of four-inch pipe, for sixty dollars.

I have these boilers in operation in my houses, and they give me entire satisfaction.

Boiler makers say, that by this system of heating there is a great saving of fuel.

I do not find them correct in this statement.

When the thermometer marks zero outside, and I want extra heat to keep the frost out of my house, I am compelled to use coal freely.

I find it impossible to have heat without using fuel.

I am anxious to procure the boiler I so often hear of, that does so much heating with such a small quantity of fuel.

There will have to be some great improvement in the

system of boiler making before we can get any great amount of heat, without using plenty of fuel.

Economy in this manner of heating is not to be gained in any saving of fuel, but it will be in saving of labor.

One boiler will now do the work that it formerly required six furnaces of the smoke-flue system to perform.

By hot-water heating, when the pipes are full of water, and plenty of fire in the furnace, you have all that is needed to do away with the great anxiety which is so often felt of a cold night. ✓

There is no danger here of flues giving away, and gas escaping, which is so often the case with the smoke flues. ✓

My experience, which has been so dearly bought, teaches me to never use a smoke flue for a greenhouse.

A boiler and hot water pipes will cost but a trifle more, in comparison to the ease and comfort you will enjoy during severe weather, and also the advantage to be gained in the health and vigor of your stock grown by this method of heating. ✓

I will here give the cost for heating a house with boiler and hot water pipes (1879). Dimensions, span roof house, one hundred feet long by thirty feet wide, ten feet in the center, with four rows of pipe on the front and three on the back, making in all seven hundred feet of four inch pipe, with all connections made, twenty cents per foot, or one hundred and forty dollars for pipe. The cost of boiler to heat the same, fifty-five dollars. The cost of boiler, pipes, and everything included, all the work being done in a workmanlike manner, one hundred and ninety-five dollars.

This size boiler is calculated to heat one thousand feet of four-inch pipe.

I have only seven hundred feet of pipe to this small boiler.

Not only during the mild weather, but when it is intensely cold, the draft door is closed to keep the temperature down to sixty degrees.

To heat the same house (1879), at present prices, with smoke flues, it will be necessary to have two furnaces, with flues of one hundred feet long, from each one. The cost, everything included, will be ninety dollars.

Smoke Flues

Have been used by all of us for many years, and many thousands are compelled to use them at the present day, as a matter of economy.

It may be so in the first outlay, but it will only be a short time before the flues will crack and gas escape, destroying more plants than three times the cost of hot water.

My experience with heating by smoke flues has been very unsatisfactory.

I have lost more plants from gas and smoke than it cost me to erect the house in the first place.

In very severe weather, the fires have to be urged to their full extent, and I find that brick and mortar will not stand the intense heat.

The flues crack and give way, allowing the gas to escape, destroying many plants in a short time, and further-

more, by this system there is no regularity of temperature, and plants are generally burned up at or near the furnace, and those at the extreme ends of the house are freezing.

I have used the smoke flues until recently, and I now think they are better adapted for a lime or brick kiln than for a greenhouse

CHAPTER XL.

SYRINGING.

No doubt many would think their plants would be injured by syringing as frequently as I have advised, and they certainly would be if done in the manner that is often practiced, not only by amateur florists, but by growers.

Syringing, as I have said, is only intended for the foliage, and not for the benefit of the roots of the plant when dry.

Soft-wooded plants, which are re-potted and get fresh soil every month or two, can be watered and syringed at the same time, or in any manner you think best for them; but for the Camellia, which is only re-potted once a year, and many of the large plants only once in three or five years, syringing and watering at the same time will not answer.

Many persons, in syringing, use water so freely as to fill the pot with drippings from the foliage.

This is not what I call dampening the foliage.

For this special plant, the work of syringing the foliage and watering the roots should be done at two different times.

Camellias will not flourish where the roots are "slushed" with water every time the foliage is dampened.

Water the roots of your plants only when they require it, and then let it be done thoroughly.

There is nothing in the growing of this plant in which I am so particular as syringing or dampening the foliage.

I consider it of more importance than the kind of soil used to grow the plants.

One of the great secrets of success in having this plant looking in a fine healthy condition is to pay strict attention to syringing.

Few insects will then attack your plants, and they will have that fine glossy green appearance which only healthy Camellias will present.

Many questions have been asked about the temperature of the water.

I use that which comes from our city supply, and just as it is drawn from the pipes, during winter or summer, warm or cold weather.

I never find that the temperature makes any difference.

CHAPTER XLI.

VENTILATING THE CAMELLIA HOUSES.

THIS is another very important matter to be considered in growing this plant, as it seldom receives as much air as is required to make it thrive well.

During the winter my Camellia houses are aired every day that the sun shines on them, whether the thermometer outside denotes freezing or not.

Keep the temperature inside the house low before airing.

Do not allow the temperature, as many do, to run up to eighty or one hundred just before airing.

This is more heat than the plant requires at any time.

You cannot perhaps always regulate the heat from the pipes or flues, having had strong fires during the previous night, but you can regulate the temperature during the day by ventilation.

In ventilating, do not pull the sash half way down on the houses, or throw open all the ventilators as though it were a summer day, as your plants will not stand a draught of air, neither will they thrive if chilled.

Ventilate for plants as you would for your children, if they were kept in a close room.

Open your sash or ventilator according to the temperature you have in the house, not forgetting that even if freezing outside, opening the sash a quarter or half an

inch will be beneficial on a day when the sun is shining on the house.

There are so many dark and dismal days during the winter, when it is necessary to close every hole and crevice, that when it is possible to air your Camellias, you should do so by all means.

Never allow the doors of your houses to be opened for ventilation during the winter. In plain terms, this is a lazy man's way of doing.

During the summer months, open all the doors and windows, so as to give your plants all the air possible.

During the winter months, the atmosphere outside, as well as inside, must act as a guide in regard to the time for ventilating.

As a general rule, I gradually begin airing my houses about 10 A. M., or earlier if necessary, giving a little more air at 12 M.

About 2 P. M. I begin closing the ventilators, in order to have all air off by 4 P. M.

Many may think I have placed too much stress on the question of ventilating. If such persons will observe the condition of plants which are grown in a well and a poorly ventilated house, they will at once agree with me in pronouncing ventilating to be a matter of the greatest consequence.

CHAPTER XLII.

ON SHADING.—TO PREVENT THE FOLIAGE FROM BURNING.

IN a former chapter I recommend whiting and whitewash, believing it to be the best material to use for shading Camellia structures; in fact I have used these articles myself for years.

I have, within a short time, had presented to me a new process, which I think will far surpass the untidy use of whitewash and whiting, and also the very expensive way of shading with canvas and laths.

Whitewash is often used so thick that it casts a gloom over the interior of the house. It also has the appearance of boards being placed over the glass to exclude the strong light.

All such practices are very unsatisfactory.

Our object is to give the interior of the house the appearance of the structure being covered with ground-glass.

This new process, which I am now using for shading, so far surpasses the old way, that I do not think that any one who will adopt it will ever be willing to use the old wash.

Receipt for the wash.—One gallon of turpentine, one pint of boiled linseed oil, well mixed.

This mixture can be put on the glass with an ordinary whitewash brush.

It is possible that the glass will need to be washed twice during the season.

The frost will in all probability clean the glass of this mixture by the middle of November.

At this time shading can be dispensed with, as the plants will now require all the light that it is possible to give them.

CHAPTER XLIII.

ON PACKING PLANTS.

I HAVE referred to the packing and shipment of Camellia flowers.

I will now endeavor to give my mode of packing the plants.

From the first of June until the last of September, I pack in shallow wooden boxes, as represented in Fig. 42.

Fig. 42. Box for summer packing of plants.

This box is twelve inches deep.

Place upright strips of wood in each corner of the box, on which nail a few laths to protect the plants and foliage from careless handling.

Put one or two layers of plants in a box in an upright position, as shown in the engraving.

The plants can be taken from the pots if the ball of earth will hold together.

Put a little dry moss around the ball of earth, then wrap in coarse brown paper.

The plants will carry safely when packed in this way, if the time does not exceed two weeks.

All the directions have been given which are necessary for these months.

For October, November, December, January, February and March, pack in close boxes, which should be lined with a double thickness of coarse paper, then a good layer of meadow hay on the bottom and sides of box. Use moss around the ball of earth and wrap in brown paper both the ball of roots and the foliage.

This paper will keep the buds from being injured; it will also prevent the plants from heating in the boxes.

Begin packing by laying one layer of plants on the bottom of the box, with three inches of hay over them; then another layer of plants, and so on until the box is filled, not forgetting to put an extra layer of hay over the plants before closing the box, so that the plants may not shake about by loose packing.

Pack perfectly solid and there will not be any danger of injury to either the roots or foliage.

Camellia plants packed in this way will keep well for two months.

This manner of packing is far superior to the old way

of placing the plants on the sides of the box, with strips placed against them to keep them in position.

Double the quantity of plants can be put in the same size box by the new system of packing, and they will reach the purchaser in much better condition.

For the months of April and May, I do not recommend shipping Camellia plants, for it is only during these months that they make their growth for the year.

Should this growth be checked, the result will be no flowers the coming fall and winter.

The best months for shipping this plant are September, October and November.

Three important matters in packing and forwarding during the winter months, are:

First. To have the moss perfectly dry which is to be placed around the ball of earth.

Second. Do not water the plants the day they are to be packed, and especially if they are to be sent a long distance. I prefer always to pack moderately dry, for plants packed closely will create a moisture of themselves. It will be much better for the purchaser to receive the plants in a dry condition, for by soaking them in water for a few hours, they will in all probability recover with the loss of only their foliage; but if received in a wet and mouldy condition, there is no remedy within my knowledge that will restore them to their former health. In all probability the majority of them will die.

Thirdly. Always have the plants forwarded by express; it will be found to be the quickest and most reliable, as well as the cheapest way in the end.

I will give one instance of the great advantage to be gained in shipping plants by express over that of freight.

During the latter part of December, a firm in San Francisco ordered from me one hundred Camellia plants, for which they paid thirty dollars, giving instructions to have them sent immediately by freight, which I did.

The freight on the box, weighing less than one hundred pounds, was six dollars.

Six weeks after they were shipped, I received a letter from the firm, saying the plants on their arrival were found to be dead.

The firm acknowledged the packing to have been done in a superior manner, thereby exonerating me from all blame.

The box was on the road six weeks, and in a climate where for days the thermometer stood ten or twenty degrees below zero.

It is impossible to pack for this extreme cold.

The cost of plants and freight was thirty-six dollars.

If sent by express, the plants and express charges would have been something less than fifty dollars, but they would have been received in perfect order.

This loss will not deter the firm from ordering again, but they will have them sent at the proper season by express.

CHAPTER XLIV.

ON PRUNING LARGE PLANTS.

THE best time to do this work is during the months of January and February, when re-potting or when examining the plants; or it can be done just before they begin to make their growth.

As a general thing, the growth of the Camellia plant for one season is only from two to four inches.

A little judgment must be used as to the way to prune, and what to cut away.

In pruning good healthy plants, cut all small and twiggy shoots from the middle of the plant; also all branches that have dead or dormant eyes, cut back to a prominent eye.

Keep in mind that there is nothing so unsightly in a collection of Camellias as a straggling, unshapely plant, with but few leaves, and these on the top shoots, and the plant supported with sticks.

This plant should be grown in such a way that it can support its own wood without the aid of sticks.

For sickly plants use the knife freely, cut well back, not looking for a prominent eye, but for the shape of the plant.

It will be of little consequence should the plant be void of foliage after this pruning.

Give good bottom heat for six weeks, and they will put forth many fine and vigorous shoots.

Pruning, in this chapter, is intended only for plants ten years and older.

I have, in a former chapter, recommended the best way to prune younger plants.

CHAPTER XLV.

THE GREAT NECESSITY FOR USING ONLY THE HEALTHIEST PLANTS FOR CUTTING, GRAFTING AND INARCHING.—NO IMPROVEMENT TO BE REACHED BY FORCING THE PLANTS.

IN looking over the preceding chapters, I find that though I have spoken of the propriety of selecting healthy plants for propagation, either by cuttings, by grafting, or by inarching, I have not insisted upon it perhaps quite as strongly as I should, yet there is hardly anything connected with the propagation of the *Camellia* which is of more importance than this.

In this country, only the single varieties of the *Camellia Japonica*, and but a very small portion of them, are raised from the seed.

All the double and half double varieties, and many of the single ones, are propagated by grafting and inarching, or from cuttings.

This is a necessity, because the full flowering double kinds never perfect seed; and if they did, it would not be true to the parent flower.

These modes of propagation are all artificial, and in this plant, as in almost all others which are propagated by cuttings, there is a strong tendency to deteriorate, as for instance the worthless variety of *candidissima* which never flowers.

The only way to prevent this tendency is to select for the cuttings, grafts and inarchings, only the most perfect and healthy plants.

One diseased plant thus used, and its progeny in turn used for cuttings, may communicate disease and deterioration to others, and thus infect a whole bench.

We value the Camellia for its perfect flowers, coming as they do at a season of the year when other white flowers of equal beauty are not plenty; but a diseased or imperfect plant or cutting can never produce perfect flowers.

Some florists have been either careless or lacking in knowledge on this point, and their neglect has resulted badly for themselves, and has given the impression in some quarters that the Camellia must give place to other flowers.

If the directions I have given, in the preceding chapters are carefully followed, we shall not hear so much about sickly Camellia plants, with no flower buds; but they will improve, and we may yet improve them so much that we may have a constant succession of large double white flowers from October to May, not all of one variety but of several, all blooming at different times.

This must not be attempted by forcing the plants, as I have said before, because that will ruin them in a very few years, but by propagating earlier and later varieties which possess all the best characteristics of the *alba plena* and the free-flowering *candidissima*.

CHAPTER XLVI.

CALENDAR FOR THE MONTHS.

January.

TOWARDS the last of this month begin to re-pot those plants that require it, and top-dress others with fresh soil.

Pick off all the dead buds, branches and yellow leaves. Keep the house and plants as clean as possible.

The fires during this month are generally very strong; syringe three or four times a week.

The more heat in the houses the more moisture will be required to rid the plants of red spider, mealy bug, etc.

Grafting

Can be done this month, but I prefer July and August.

Plants which were inarched last July will now require the twine taken off, for, by this time, the inarch should be firmly united and able to support itself.

Cut away all the single stock down to the inarch, so that it may heal over and not give an unsightly appearance to the plant in after years; re-pot or top-dress, as the plant may require.

Those plants which were grafted last July should be taken out of the pots and the roots examined.

Most of them will need to have a portion of the earth

taken from the ball, and it must be renewed with good fresh soil.

Many of the inarched and grafted plants would be much improved by being topped at this time, if you want low and bushy plants; but by so doing, the plants would not afford a good straight stem to inarch from in July.

I would allow them to go without topping, if I wished to have wood to inarch from again the following July, but if not, I would top them freely.

Alba plena, and other Camellia cuttings which were placed in the sand-bed last November, will require bottom heat this month.

Once during this month water the plants thoroughly with lime water, to kill the worms and other pests.

February.

Finish re-potting all Camellia plants that were not attended to last month.

Pruning should also be done this month; treat the plants the same as for January.

About the last of the month, gradually lower the temperature for the cuttings that were placed in the sand-bed last November, bringing it down to fifty degrees in March.

During this month, the flowers of *alba plena* will be getting scarce, and by the end of the month nearly all will have bloomed that will come to perfection.

The flowers of Camellia *candidissima* will begin to open near the close of this month.

March.

Almost all the white Camellias will be through flowering.

Although the plants have buds on, very few will come to perfection.

The sap is now running freely, and the plants are about ready to make their young growth for the coming season.

Keep them a little warmer just at this time, say sixty to seventy degrees.

Give them plenty of room and all the light that is possible between the plants.

Have the glass shaded with whiting, lime or the new mixture, to prevent the strong rays of the sun from burning the foliage.

Syringe three times a week.

Fumigating with tobacco will be beneficial to the plants during this month.

The plants are now in a growing state, and will require more water than at any other season.

Inarching

Can be done this month, but when there are hundreds to be inarched I prefer the months of July and August.

April.

Many of the plants will be still growing.

Treat the same as for last month.

Syringe with lime water, and also fumigate with tobacco.

I do not recommend any one to buy Camellia plants, particularly *alba plena*, in this month or May, especially if they are to be transported far, as it will be apt to interfere with their young growth.

May.

The plants will now be ripening their wood.

At this time more air is required, and both top and side ventilation is necessary.

Keep the house at the lowest temperature.

Close the ventilators at night.

Set the red varieties outside, and give the space to the white flowering varieties that are going to be housed during the summer.

Where Camellias are grown with other plants, I would advise all to be set outside, both red and white.

Plunge the pots in the earth up to the rim.

Keep them from the drip of trees, etc.

Syringe three times a week.

Take all the plants off the staging.

If possible keep them on the ground floor, and farther from the glass than during the winter months.

June.

The plants will now be forming their buds.

Give them all the air that is possible, both day and night.

Keep the house cool by shading the glass and watering the pathways during the middle of the day.

Syringe as for the month of May.

The Cuttings

Which were put in the sand-bed last November should now be thoroughly rooted, and ready for pots and soil.

July.

The buds will now be formed.

Give the plants the same treatment as for last month.

Inarching and grafting can be done successfully during this month.

Those plants that were inarched last summer will do to "work" on the stock at this time.

If the weather during this month is hot and dry, syringe the Camellias that are out in the open air frequently, and they will be greatly benefited by it.

August.

Shade, air and syringe the same as for last month.

The grafting and inarching, if not completed in July, may be continued this month.

If the white varieties are kept in the greenhouse, they should be carefully watched, for pests are apt to infest them; and syringe daily during this month.

September.

Towards the middle of this month, house those plants which were put out in May.

Keep them up as near the glass as is possible.

Give the white varieties the best positions.

The air must be taken off in the afternoon, and the house closed as if it was cold weather.

Do not let the plants have a check this month.

Water only those plants that are dry.

Use lime water this month.

Wash those which are infected with red spider, mealy bug, etc.

Those plants which were inarched in July will now be ready to be topped and cut from the parent plant.

The grafted plants will be firmly united, and the sash can be taken off—the frame inside the greenhouse.

October.

Remove all shading from the glass.

Allow the plants to have the full rays of the sun from this time until February or March, or until you see the foliage beginning to burn.

A little fire this month, say twice a week, will greatly benefit the plants.

It will keep many of the buds from falling off, and the flowers will be much finer; it will also dry up the dampness which is so frequently found in Camellia houses during this month, which is caused by the heavy syringing during the summer.

Be careful in watering.

Syringe twice a week.

Plenty of air when the day is fine.

November.

Many of the white varieties will begin blooming this month.

Air and syringe as for last month.

Keep temperature of house ranging from fifty to fifty-five degrees.

All Camellia cuttings should be placed in sand-bed or box this month.

December.

Towards the middle or last of this month, the plants, especially *alba plena* and the blush and rose varieties, will be at their height in flowering.

After the fifteenth, the flowers are usually in great demand at high prices.

Air as directed for October and November.

Keep the temperature of the house at between fifty and fifty-five degrees, Fahrenheit.

The weather is usually colder this month, and more artificial heat is required.

Syringe three to four times a week.

CAMELLIA JAPONICA.

CHAPTER XLVII.

CAMELLIA CATALOGUE.

OUR catalogues contain an almost endless list of different varieties of Camellias. Many of them are so near alike that it will be almost impossible to distinguish them apart when in flower.

In a previous chapter I have named twenty-two varieties, which I grow principally, and can recommend them as being amongst the best that are advertised in any catalogue.

Those that I name in the following list, and which I know to be good, I mark thus (*), although there may be others in the list which are equally good, and perhaps better, but I have never seen them in flower to judge of their merits :

- *Alba Plena, old double white.
- *Alexina, blush white, spotted carmine,
Albicans, white.
- *Adrian le Brune, rose.
- *A. J. Downing, satiny rose, marked white.
Americana, blush.
Angelo Cocchi, carnation, striped.
Antoinetta Lomellini, rose and white.
- *Archduchess Augusta, violet crimson.
Aspasia, bright red, marked with white.
Aulica Lodiges, pale rose.

- Barnii, crimson and white.
- *Baron de Vriere, rose, pale center.
- *Baltimorea, crimson and white.
- Belle Romana, rose, striped.
- Benneyi, crimson, white center.
- *Bonomiana, white, striped with crimson.
- *Brooklyana, pink, white spots.
- Caleb Cope, blush rose.
- *Candidissima, white, fine form.
- Candor, white.
- *Carswelliana, dark crimson.
- Centifolia, deep, dark rose.
- Centifolia Carnea, delicate flesh.
- *Chalmerii, perfect bright pink.
- *Chandlerii, dark red.
- *Contessa Lavinia Maggi, white, shaded crimson.
- *Countess of Derby, white, striped rose.
- *Countess of Orkney, white, striped carmine.
- *Cup of Beauty, white, striped pink.
- Delicata, blush.
- *Donklerii, half double, crimson and white.
- *Dunlop's Imbricata, rose and white.
- *Dunlop's New White.
- Elata, violet crimson.
- *Ellen Mackenzie, rose red.
- Emilia Campione, rose carmine.
- Emilia Gavazzi, rose, white, striped.
- *Eximia, deep red.
- *Feast's Perfection, satiny rose.
- *Fimbriata, fringed white.

- **Fordii*, rose.
Giardini Schmitz, rose and white.
- **Gilesii*, crimson and white half double.
General Lafayette, bright rose.
Grahamii, blush white.
- **Henri Le Favre*, dark rose.
- **Helen*, rosy red.
- **Hempsteadii*, crimson.
- **Imbricata*, crimson and white.
- **Iride*, bright rose.
- **Jeffersonii*, bright crimson.
- **Jenny Lind*, white, pink striped.
Jubilee, blush white.
Jupiter, salmon, striped white.
Kingii, white and rose.
- **Lady Hume's Blush*, delicate blush.
Lady Kyle, blush.
- **Landrethii*, pale rose.
- **La Reine*, white, striped with carmine.
La Puce, white, striped red.
- **Lizzie Jones*, rose, striped red.
- **Lowii*, dark red.
Lucullus, deep red.
- **Madam Ambroise Verschaffelt*, white, striped carmine.
Madam Lebois, bright rose.
Madam Beauvois, light rose.
Mammoth, red and white.
Marchioness of Salisbury, red and white, variegated.
- **Maria Teresa*, blush, white spots.
Marie Morren, white, spotted.

- *Mary Kurtz, white, striped pink.
- *Mary Edmondson, white.
Mathotiana, deep red.
Mathotiana Alba, large white.
- *Miniata, dark rose.
- *Miniata Striata, red and white.
- *Miniata Violacea, violet and white.
- *Mrs. Lurman, crimson, spotted pink.
- *Mrs. Abby Wilder, white, striped pink.
- *Mrs. Cope, white, pink stripes.
Mrs. Dombrain, delicate pink.
- *Mrs. Fetters, crimson.
Mrs. Gunnell, white.
Mrs. Ritchie, white and rose.
Miss Percival, white.
Monarch, rich crimson.
- *Myrtifolia, dark rose.
- *Myrtifolia Alba, white.
Napoleon, white, striped red.
Nicholsonii, pink, veined white.
- *Palmer's Perfection, deep red, banded with white.
Picta, pale rose, striped.
- *Prince Albert, white, tipped carmine.
Princess Mathilde, bright rose.
- *Princess Bacciochi, crimson and white. [white.
- *Prince Frederick William, deep crimson, marked with
- *Queen of Denmark, crimson.
- *Queen Victoria, brilliant red striped.
Reine des Beauties, clear rose.
- *Reine des Fleurs, deep red.

Rosea Triumphans, dark violet rose.

Rio Leopold, rose and white.

Rubens, deep rose.

*Sacco, pale rose.

*Sarah Frost, rosy crimson.

*Serratifolia, crimson and white.

*Sherwoodii, dark rose.

*Sovereign (Low's), creamy white.

Spinea, white, pink stripes.

Stella, rosy carmine, striped white.

*Stiles' Perfection, rose striped.

Teutonia, rose and white.

*Tricolor, single white, red striped.

*Variegata, rosy crimson, with white.

*Valderado, crimson and white.

*Virgin di Colle Beato, white, spiral flower.

*Wilderii, bright rosy pink.

*William Penn, dark crimson.

*William IV, fine rose color.

BOOKS ON FLORICULTURE.

I HAVE frequent inquiries as to which are the best books for beginners, and those who are seeking general information as regards Floriculture, etc.

I have read the following works, and have found they contain more practical knowledge and information than any other books that have yet been issued from the American press :

GARDENING FOR PROFIT.

A guide to the successful cultivation of the market and family garden.

By PETER HENDERSON.

GARDENING FOR PLEASURE.

A guide to the amateur in the fruit, vegetable and flower garden, with full directions for the greenhouse, conservatory and window garden.

By PETER HENDERSON.

PRACTICAL FLORICULTURE.

A guide to the successful cultivation of the florist's plants.
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