

Market Nursery Work Series

VOL. II.

SPECIAL GLASSHOUSE CROPS

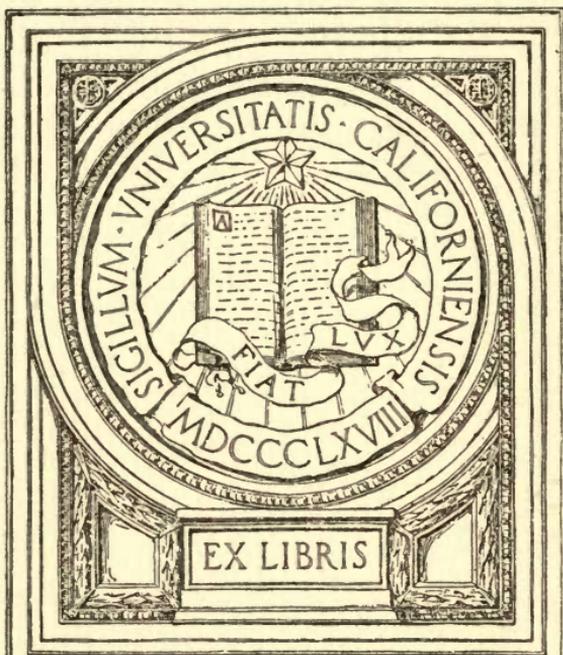
F. J. FLETCHER, F.R.H.S.

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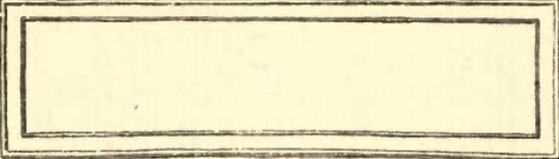
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MARKET NURSERY WORK

THE UNIVERSITY OF CHICAGO



MARKET NURSERY WORK

A SERIES OF SIX BOOKS
ON THE CULTIVATION
OF CROPS FOR MARKET

BY
F. J. FLETCHER, F.R.H.S.

VOLUME II.
SPECIAL GLASSHOUSE CROPS

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MARKET NURSERY WORK

VOL. II.

GLASSHOUSE CROPS

CHAPTER I.

TOMATOES

It would be exceedingly difficult to overrate the importance of the tomato crop to English growers. During many years of practical experience we have been closely identified with the industry, both as growers and in association with specialists. Our first experience of it dates back to a dim past, in the early seventies, when a few plants were grown against a wall in the kitchen garden, and the weekly requirements of a "big house" were half a dozen fruits a week just to flavour soups. Compare this with the demands of to-day and the thousands of tons annually produced and you will get a very fair idea of the stupendous growth of this industry within the lifetime of one generation. If any ocular demonstration is yet needed, we advise a pilgrimage around the northern outskirts of London, Worthing, and Guernsey, and if that does not impress, then we fear that no words of ours can.

In the course of our experiences, we have seen perhaps the best the world can show in tomato culture, and, unfortunately, we have seen some ghastly failures. It is the fervent hope that we may be able to help prevent the latter which influences all we may here have to write.

The native habitat of the tomato is the hot, dry regions of Central America, and this fact ought to be ever in the mind of the grower. We cannot reproduce those conditions here, but we should do our utmost to approximate them. We can produce the heat, we can regulate the moisture, but try as we may we cannot avoid unfavourable days which sometimes lengthen themselves out to weeks. Unfavourable climatic



FIG. 1.—A Well-grown Tomato, "Knaresborough Wonder"

conditions are the bugbear, for it is during spells of cold, dull weather that all the ills the tomato is subject to, and they are many, gather their forces together for the attack. Only those plants which are in perfect health can successfully resist them.

We lay it down as an axiom that from its very earliest days a tomato plant should be studied and treated with a view to making it disease-resisting. In other words, it should be fortified by rude health, not gross, but sturdily vigorous, short-jointed, tough in fibre, healthy of root. Never a weakling should be planted, and the grower, when planting, should be perfectly ruthless in rejecting any plants that are not absolutely "top hole." Yes, we know that the tomato possesses remarkable

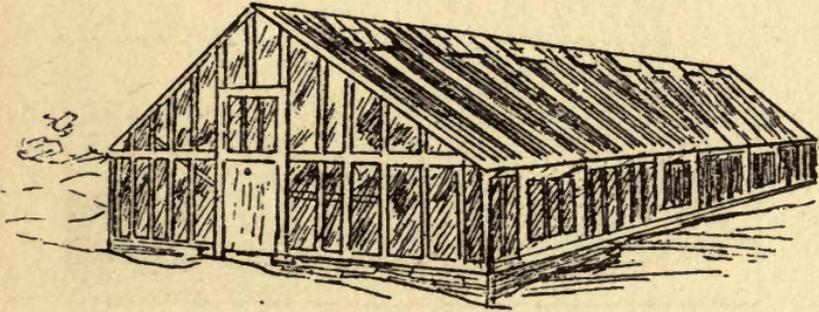


FIG. 2.—A Good Type of Tomato House

powers of recovery, that even the weakest of plants may eventually develop a strong growth, but we are out to take no risks, and there will remain an inherent weakness which may develop when the plant has reached a critical stage, and spoil it.

In this respect, plants are very like human beings; we can draw a very close analogy without trespassing on the imagination. Have we not known in our time more than one young person who, a victim to tuberculosis and apparently destined to an early death, has almost by a miracle suddenly blossomed into health and taken his place in the world? We have seen him put on flesh and inches, his countenance ruddy with seeming health, and then all at once these appearances have proved but counterfeit behind which the insidious disease has pursued its deadly work.

Considering, then, how little it costs to raise a plant, surely we can afford to scrap every one that is not up to our desired standard and pin our faith only to the best, and none but the best. The grower who raises his own plants can do this, but there are some to whom it is not convenient to raise their early plants, and these have to depend upon others. This certainly is a handicap, but in these days of keen enterprise there are plenty of reputable houses which lay themselves out to supply this need at reasonable rates, though it is a mistake to look for them among those whose prices are the lowest. We may be prejudiced, but we confess to doubts concerning "cheap offers," for we have lived long enough to know that we usually get what we pay for, but not a ha'pennyworth more. No prudent man

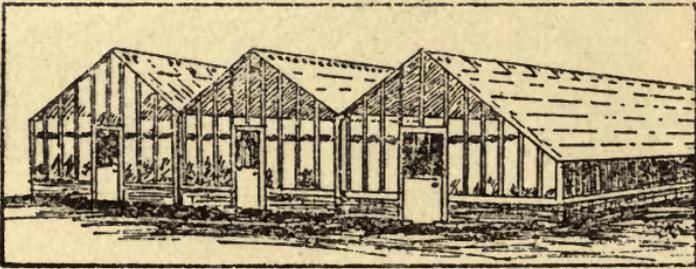


FIG. 3.—Three-span Tomato House

will risk the possible loss of pounds upon his crops for the sake of the few shillings extra he may have to pay for carefully grown plants.

This careful selection of plants is a point we feel as a bounden duty to press well home. It is the foundation of success—the whole structure depends upon it. We do not say that it is impossible to obtain good crops from what were weakly plants—indeed, we have done it ourselves—but this is not sure, and it is taking unnecessary risks, savouring more of the spirit of a gamble than of a well-reasoned business transaction.

Having already in Vol. I dealt with the raising of plants up to planting size, we do not feel called upon here to repeat ourselves, but go on to treat of tomatoes growing from the time of planting.

PREPARATION OF THE SOIL

No sane and practical writer will dogmatise at any length about soils. He would probably expound his theory as to what constitutes an ideal soil for his purpose, but he would at once see how futile it would be to tell a grower of Waltham Cross that he ought to have the sand of Cobo, or to tell a grower at Cobo that he ought to have the clay of Waltham Cross. The majority of the tomato growers in Guernsey possess a soil whose principal constituent is disintegrated granite, and this is the very opposite to the alluvial loam of Berkshire and the Thames Valley; yet in each of these localities, and others equally dissimilar, stretching up to the rocky shallow soils in parts of Scotland, crops of equal weight and quality are grown regularly year after year. How, then, is it possible to dogmatise? Is it not rather more useful if we lay down what we consider the ideal, and leave it to the man who understands his own soil best to work it and improve it along that line? Yet even that in some instances is suggesting too much. The sand of Cobo, heavily dressed with *vraic* (sea-weed), the only obtainable commodity for the purpose, does not approach one step nearer to the Berkshire loam because of that dressing. We cannot ask the Waltham Cross grower to dig trenches in his clay, carry hundreds of loads of it away and replace with top spit of the Hertfordshire pastures. The cost would be prohibitive. Yet without taking such an extreme step something might still be done.

We must first and foremost regard the soil as a medium, possessing certain mechanical qualities which provide favourable conditions for the ramifications of myriads of roots. It obviously must not be a medium which can harden down like bricks and become impervious to roots. It must not be of that consistency which prevents the draining away of unnecessary moisture. It must not be so light as to offer no solid hold to the roots, or to induce excessive evaporation. It may or may not be a complete compost, carrying within itself those chemical elements which go to build up healthy plants, but as these can always easily be added in correct proportions, they need not be made a matter of the first consideration.

Having grown tomatoes on a large scale in eight counties and overseas, we can claim to have tested a variety of soils, and if we had to choose the one we best liked (a very difficult task) we should choose a sandy loam on chalk, and dress it with burnt refuse and old leaves. Friability in soils, especially in tomato soils, is much to be desired, for this makes it susceptible to air and heat and is non-retentive of superfluous moisture.

Drainage is a matter of the very first importance. It is one of the principal factors in successful tomato culture, and nothing we could say could possibly exaggerate its importance. The root system is the life of the plant; the soil is the life of the root system, and here we are up against a fundamental principle which nothing can alter.

HEAVY SOILS

It is not often given to us to choose our own sites and soils, and so we must perforce make the best use of what we have. Supposing, then, we have the heavy clays of Essex or Devon, what ought we to do to convert them to our uses? First and most important, drain them. Next, mix in fairly heavy dressings of burnt earth, also road sweepings where they can be found free from petrol, or otherwise freed from that noxious element by burning. Then add well-rotted leaves and light stable manure, and dig the whole over to the depth of 18 inches.

Where drainage is difficult and the soil not amenable to treatment, dig trenches 18 inches wide and 18 inches deep. Put 3 inches of rubble, brickbats, sherds, or any hard material in the bottom of the trench, and on this put a further 3 inches of manure or leaves. Fill in the trench with prepared compost and firm it down. The 2 or 3 inches remaining after the soil has settled down are very useful when, later on, top dressing has to be given.

POOR SOILS

If you have a light, porous, poor and stony soil, dig in clay or turf, and some cowshed manure if you can possibly procure it; but if not, then dig trenches as recommended above;

omit the drainage, because in such soils there is a sufficient natural drainage, and fill up with compost as in the case of clay. Use little or no leaves unless you can counterbalance them with heavy stuff, and substitute cow or pig manure for the stable manure, which is too light.

Probably no soil can be too poor to produce good tomato crops, provided that manures are constantly fed to them. Even crude sand, without a particle of humus, can be made productive in this way, but we consider it a dangerous way, as a regime of chemicals which would entirely supplant natural manures may, as in some cases we have seen, render the plants more susceptible to disease.

SANDY LOAM

This is a soil which we consider ideal. It needs well breaking up and dressing with leaves and farmyard manures. As a rule it possesses a natural drainage, but to avoid danger break it up deeply—2 feet by preference. Even such good soil as this is rendered none the worse by a further addition of sand or grit, because tomatoes do love a sharp and quickly draining soil. And, by the way, when at this stage we refer to manures, we would have it plainly understood that they must be used very sparingly until the plants have opened their first trusses of bloom. Young tomatoes should not be grown grossly and brought up bloated and coarse, but should be given only sufficient manure to make them sturdy and healthy without superfluous sap. Please note, however, that we have no word to say in favour of starving the plants. We have heard some very rabid advocates of even that system, but could never quite follow their logic, believing as we do that either extreme, gross feeding or starvation, must be bad for the plant. We repeat, then, give but light dressings of manure, sufficient to supply a modicum of food and to add a very suitable and valuable ingredient to the texture of the soil.

PLANTING

Assuming that we have our beds ready, the digging well and truly done, the disintegration thorough, it only remains to firm the soil down by treading, much or little, as the case may require.

If new compost has been put into trenches it will need consolidating ; if the ground has been dug all over it will need a little pressing. Light, spongy soil will need treading most ; heavy soils none at all, only firming around the plants as they are planted. If really heavy ground was trodden, the soil would become so hard that it would be impervious to young roots. That we must always avoid. Let judgment be exercised in this as in all other operations, remembering there is no fixed rule.

The plants, grown in 60's as advised in Vol. I, should be about 9 inches high, short of joint, firm stalk, and deep green foliage (see Fig. 4). In turning them out of their pots do not break the ball or in any way disturb the roots, except to take away the crock. Make a hole in the soil, either with your hand or a trowel, large enough to take the ball with something to spare, insert same, and press the soil well around the roots.

The distance at which the plants are placed apart is variable, according to the soil and the predilection of the grower, but taking an average, we suggest that 18 inches apart in the rows and 24 inches from row to row is a very safe and convenient distance. In Guernsey we have seen thousands planted only 1 foot apart

in the rows, the rows being in pairs at less than 1 foot apart, and 18 inches between the sets of rows, but we have solid grounds for preferring the more liberal allowance of space. Where they are too crowded the knife has to be in constant use among the dense foliage, and this frequent and often rough surgery must of necessity weaken the plant and interfere with its proper functioning, so that its working life is somewhat shortened. Were we content with the old-time average of 5 lb. per plant, then we could not object



FIG. 4.
Tomato Ready for Planting.

to close planting, but in these days we ought not to be content with less than double that weight, and if we expect double, then space must be given in which the plants can do the extra work.

The distance we have recommended is meant for plants grown with a single stem, and that is the approved method of culture. There is a system of growing with double leaders, and this is a good system for short-season crops, though not so reliable when expected to carry a good crop through a long season. We consider that a well-grown tomato, producing from 12 lb. to 20 lb. of fruit on a single stem, can use up all the energies of an entire root system. (See Fig. 1.)

TREATMENT

After planting, keep the ventilators of the houses closed for a time. Do not water the plants heavily, nor go beyond a mere sprinkling just to keep them fresh. (We assume that the soil was not dry at planting time.) This method depends very largely upon the weather, and the plants themselves will tell you quickly enough if they lack moisture. We have on occasion had to let plants go a whole month without watering beyond a sprinkle, and, on the other hand, have also had to water within three days. Here again, as often happens, we are up against a matter which intelligence alone can handle.

The tomato house should be light and airy; any attempt to grow a crop in a dark, close house being foredoomed to failure. If given too little ventilation the plants grow "weedy" with attenuated foliage and soft, thin stalks. On the other hand, cold blasts of fresh air striking the tender foliage will speedily bring about that much dreaded "stripe" disease and check growth. The skilful and considered manipulation of the ventilating gear is nowhere more necessary than in a newly-planted tomato house, or one where the young plants are establishing themselves, especially in February and March. The atmosphere must not stagnate, it must be given motion, and no matter how slight it may be, so that it really *is* motion, it will suffice. To ensure this, sometimes one ventilator, sometimes another, may be opened a little, followed later by two or three, due regard

being paid to the direction of the wind. As the days lengthen and the sun strengthens, so must the ventilation be increased till a veritable wind blows about the plants—though not a cold one. That brisk air is charged with properties which carry to the plants more than half their sustenance. It is a tonic, imparting vitality and strength, and if we could only understand the language of plants we should hear their grateful thanks. As it is, their appreciation is expressed in the deepening colour of the foliage, the glistening of the stalks and the vigour and joy of life showing in every line, for as truly as the flushed and glowing cheeks of youth proclaim enjoyment and rude health, so do their counterparts in the plants proclaim the same happy condition. Those who make a study of their plants and *know* them will endorse this, but those whose interest in them is perfunctory will probably smile. Well, let them!

One final word as to watering. Whenever this is done let it be well done. If the plant needs water let it be watered thoroughly, and unless it needs it leave it till it does. More plants have succumbed to overwatering than to lack of water.

IN POTS

Many thousands of tomatoes are grown in pots, but this, sometimes a mere matter of convenience, is more generally the case where there are soil troubles too pronounced to be economically corrected. For example, in Guernsey much of the soil has become infested with "club root"—we mention the fact here without discussing it—and growers have been put to enormous expense in providing No. 8 pots and uncontaminated soil to fill their houses. They have had, in effect, practically to repurchase their land, for an acre of pots and enough clean soil to fill them cost, we should imagine, as much as the ground upon which they stand.

Where pot culture is necessary, the points of vital importance to be remembered are: (1) see that the compost is a good one; (2) see that the pots are well drained; (3) see that the soil is rammed firmly in the pots. These are an indispensable trinity of points and must be strictly adhered to. When potting, finish off with the pots only two-thirds full of soil, and thus

leave room for substantial top dressings always so necessary later on. With continuous and copious waterings the original compost must be deprived of some of its ingredients, and if no space is left in the pots for top dressings with new soil, the consequence is a wholesale falling off of the flowers.

The general treatment of plants in pots is identical henceforth with that of the plantations, so that from now onward our remarks will apply equally to both.

SUPPORTS

Directly the plants have established themselves they break into a rapid growth, and, unless supported soon, either by stakes or strings, become top-heavy and fall over. It is well to forestall this by adding the supports directly active growth begins. Stakes being cumbersome and expensive, string is the most generally used medium for this. An overhead wire is run parallel with the rows at a height of from 6 to 8 feet, to which a string per plant is fastened, the other ends being loosely fastened around the plant near to its base. No tying is necessary except in the case of a refractory growth, all that is necessary being to twist the plant occasionally around the string as growth proceeds.

Where the plants are growing as a catch crop in small houses, with a row planted near the wall on either side of the house, the strings are run up just below the sash-bars and fastened to nails or a wire high up the bars. These plants, grown up in the full light and quite near to the glass, will give remarkable crops of from 20 lb. to 30 lb., and this they must, of course, do to be profitable, seeing how few plants go to fill such a house. We have often had single trusses weighing from 7 lb. to 9 lb., though these were exceptional, the great weight per plant being due to the shortness of joint and the closeness of the trusses to each other. Twelve trusses on a 6-foot vine are not unusual.

DISBUDDING AND TRIMMING

When the side shoots begin to grow, as they will do while the plants are yet young, they must be rigorously pinched out. Never allow them to remain long enough to need cutting out, for every side shoot that develops must of necessity use up a

portion of the energy which the main growth needs. This should be followed up regularly through even the busiest part of the season and is well worth the doing, concentrating, as it does, every atom of strength into the fruit-producing parts. (See Fig. 5.)

There used to be a system practised in the old days of stopping

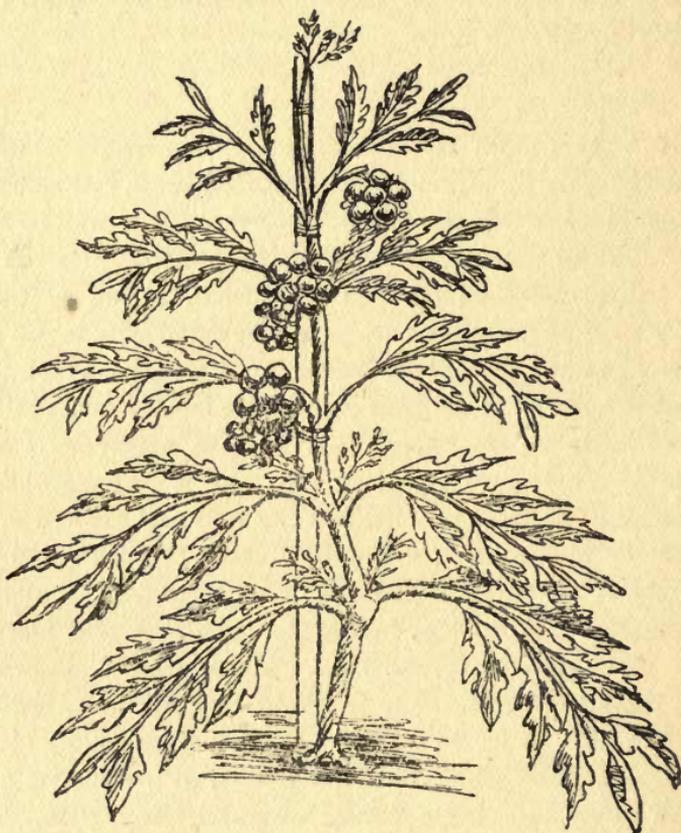


FIG. 5.—Disbudding. Side Shoots marked thus X to be taken out

the growth one leaf above the truss, running the resultant top break up as the leader until that in due course produced a truss, repeating the process well on till late in the season. This practice, we believe, died out with the advent of improved and free setting varieties. This much can be said for it, that there was rhyme and reason in the doing of it, though in these days it is no longer necessary nor even helpful.

Trimming.—The moderate trimming and, at times, even the heavy trimming of the foliage is very essential. We disagree with the wholesale defoliation of plants almost before they have reached middle age, for it appears to us always as unnecessarily cruel. We agree that some thinning of the dense foliage is quite necessary to allow sunshine to penetrate throughout the plantation—that is reasonable enough—but if the health of the plant is of any consideration whatever, and of course it is, then the thinning should be a gradual process, and not done at one fell swoop. It is not fair to the plant. The healthier the foliage the more tentatively should it be pruned, and instead of removing entire leaves at once, why not shorten them by one-half?

When the plant can dispense with any particular leaf, or rather, when any leaf has ceased to function and becomes useless, it turns yellow, and can be removed altogether without injury to the plant; also when badly infested with *cladosporium* it is advisable to remove it entirely, but so long as the leaf is functioning healthily and is helping the plant to carry on its work, so long should it be preserved in part, if not intact. A really heavy crop constitutes a great strain upon roots and foliage, and unless these can be depended upon to carry on their respective functions, the crops must suffer. It stands to reason that a healthy leaf cannot be removed with impunity, and we advise those who think differently to seriously study the functions of the leaves and be guided by what they learn. We will leave it at that.

FEEDING

Until the first truss of fruit has set the soil will supply all the plant requires in the way of food. It is but little that they need, for they should no more be fattened in their early days than a breeding sow or laying hens; all they ask is to be kept sturdy and healthful. But with the setting of that truss a certain strain begins, gently at first, but afterwards increasing from day to day as the fruits swell and the active growth proceeds. We, of course, understand that the first business of any plant is to produce and perfect its fruit, and it throws its chief energies

into that task. Here it is that Art steps in, that "Art which is itself Nature," and begins to supplement the natural foods of the soil, and thus add to its efficacy. This reasoning suggests that at first the feeding must be very tentative, increasing only as the rapid production of trusses increases the demand.

As yet, strong stimulants such as nitrates must not be used, for these volatile foods have other objectives than the swelling of the fruit. Rushing into the foliage and to the extremities of the plant, they force what is not now our principal object—growth—and that often at the expense of fruit. Have we not



FIG. 6.—A Good Truss on a Fed Plant

seen them, when unwisely used, force growth at such a pace as to prevent the development of trusses beyond the incipient stage?

The safest method for the first feeding is by a thin top dressing of rich soil in which the "golden tripod," phosphates, potash, and nitrogen, are fairly balanced in rigidly controlled quantities and proportions. After the third truss has set, there comes the demand for another fillip, and this is usually administered in the form of a spoonful per plant of concentrated manures, such as guano, fertiliser or some approved and complete proprietary preparation, followed a little later by what we consider the principal top dressing, 2 inches thick, of rich compost specially

prepared. Our own favourite mixture consists of equal parts chopped loam and cow manure, with bone meal. We love to watch the young white roots stealing up like a silent army and taking possession of this new soil ; they embrace it, they devour it with gusto, and the sight is ocular demonstration of the fact that the plants are thriving—a veritable signal of “ all’s well.”

But even with this, such are the demands that there comes a time when distress signals are hung out and the plants show signs of exhaustion, so that it is necessary to resort to some more drastic effort to maintain their dwindling energies. This can best be done by **MULCHING**. Good fat cow manure or pig manure are both excellent, containing salts which, conveyed by watering to the roots, impart new vigour and vitality, sustaining the productive capacities of the plants right up to the limit of their growth and age.

OVERFEEDING

Overfeeding constitutes a very real danger at every stage of the growth. It is more pronounced in its effects for evil than semi-starvation. An underfed plant may remain in perfect health, produce quite a number of well-set trusses of very excellent fruit of improved flavour, but short of avoirdupois. Quite a large number of the fruits would be undersized, and, since tomatoes are sold entirely by weight, this would be a defect, fatal as regards profits. But an overfed plant will not set freely—it drops many of its flowers, its energy is too great and rushes past the trusses without assisting them. Its grossness makes it susceptible to every disease and causes it to escape none. It occupies inordinate space, and from first to last is an unprofitable proposition.

Further, overfeeding has a distinctly adverse influence on quality and flavour. Overfed fruit is just a puffed-out bag of watery matter, insipid to a degree, too soft to travel, abhorred by the intelligent consumer. The most promising sample ever grown would be spoilt in a week by overfeeding. But the fruit of a semi-starved plant is solid and sugary, more a dessert fruit than a salad or cooking vegetable. It is small, sweet, and delicious, with very few seeds and practically no core.

Quality tells. Buyers, especially professional buyers for the trade, are vastly discriminating. They will look neither at the puffed-out bags of insipidity nor the small sweet fruit. What they are after and are prepared to buy is a sample of fruit beyond question, firm enough to travel well and handle safely, of good medium size, averaging 2 oz. each, with a clear, firm and attractive skin.

Too much water is one form of overfeeding. The tomato does not like its feet in water—it is rather a dry subject in so far as it abhors superfluous moisture. Its umbrageous foliage uses up and evaporates a lot of moisture, but it thrives best when its roots are healthily warm and dry after drinking. That is one reason why we have again and again insisted upon a perfect drainage.

DISEASE AND ITS PREVENTION

With the intense cultivation given to the tomato and the unnatural conditions under which this is necessarily carried on, it is small wonder that it is subjected to the attack of various diseases, nor that as its cultivation intensifies and increases new diseases appear. We could find much to say anent these diseases and their cure, but we hold that we may render more valuable and effective service in directing our principal remarks towards "how best to prevent them." We believe, and our belief is backed up by our experience, that it is quite possible even in these days of congestion to ward off many attacks and prevent malignant diseases from obtaining foothold in our houses; that by taking proper precautions, conditions may be established that are inimical to the spread of diseases, more especially those of a fungoid character.

We recommend a simple, hygienic regime to which every detail of cultivation should be attuned. We allude to cleanliness, air, careful watering, equable temperature, and the use of preventives. Conditions that are best described as wholesome and healthful should obtain from the roots of the plants to the very ridge board of the house. When the night temperature rises in the spring there should be a small vent open somewhere in the house all night, and when full summer conditions are

established the air must circulate freely night and day. This free circulation of air is a potent factor in maintaining healthy conditions. It is so for animals, it is more so for plants. To shut a house close down after a hot day is to impregnate the atmosphere with warm moisture, and there is no known condition more calculated to spread fungoid diseases. We have passed through houses apparently free from disease in the evening, which the following morning were not only infested, but badly so, and this we know to be a thing of common occurrence, even though to the least observant the inference is so palpable.

We included the use of preventives as consistent with hygienic principles. We might almost say that "preventives" are at the foundation of hygiene, for is not the science one of the prevention of diseases? Our deliberate opinion is that we horticulturists do not give it that attention which it merits, and we fail to keep before us as a guiding principle the close analogy between the animal and vegetable worlds. Many of us are acquainted with the startling results of the investigations and experiments of Prof. Bhowe, and without passing judgment on an incomplete work, we have learnt several facts quite new to science which adds to our knowledge of plant life. This knowledge is useless to us unless we apply it, or at the very least permit our conduct to be influenced by such facts as have already been established.

Though preventives are not generally resorted to, our own experience has amply demonstrated their value. For fungoid diseases we use two concurrently, viz., slaked lime and flowers of sulphur. The former we scatter frequently about the houses, that is, on the beds and paths. Incidentally this is often of help to the plants. The flowers of sulphur call for more elaborate and careful handling. Taking a small quantity, say about a thimbleful at a time, we put it on a sheet of paper, then, passing through the houses, we blow this gently into space, not aiming at the plants, but permitting it to settle where it will. A house 100 feet long by about 16 feet would require a dozen thimblefuls. The film of sulphur thus created is so thin as to be almost invisible, and in addition to this we place small lots on the

rafters or any unoccupied spot that catches the full rays of the sun, taking care not to overdo it. The fumes are imperceptible to us, but they are sufficient to set up a barrage which no fungus can pass alive. The process should be frequently repeated. We submit that both these preventives are exceedingly simple, they are clean, they are easily handled, yet by their use we have completely banished the cladosporium, the black spot, and even "stripe" from houses which for years had been badly infected.

But fungoid diseases are not the only ones from which the tomato suffers, for there are a legion others equally inimical to its well-being. The worst of them attack the roots, and their presence is only detected when the leaves are hanging limp and disconsolate. Of this nature is "club root," a most baneful disease, caused by a minute worm which, penetrating the root, causes a swelling into large nodules, completely preventing its function of feeding the plant so entirely dependent upon it. Nor is it easy to trace the cause of it with any degree of certainty. The worm itself is an effect and not a cause, for it is produced by conditions which favour it, though what those conditions are we cannot determine. We only know that "club root" may be found in rich soils as well as in poor soils; in light land as in heavy; in heated houses, in cold houses, and in the open air.

For our purpose, the *immediate* cause is this tiny eel-worm, which, being an insect, cannot be invulnerable. It should be and undoubtedly is susceptible to treatment by the right form of soil insecticides. There are several preparations on the market advertised to prevent or to kill "club root," but we will not undertake to say that there is no room for their further improvement. Doubtless, further research and further experiment will furnish us with a weapon whose efficacy is beyond doubt. Our own method is to use one of these preparations, then heap some new soil about the affected plants, and do all we can to induce them to make new roots from the collar as quickly as possible.

Then we have the "sleeping disease," the results of which are so similar to "club root." This is caused by an enemy microbe,

and though we relieve the affected plant by removing foliage and also resorting to the encouragement of new roots, we cannot claim to have made much headway against it.

In such a work as this we cannot follow so minutely as we would like the causes and cures of diseases; the reader must read special literature on the subject. Every day brings to light some further facts as the chemist pursues his investigations, and every new step in advance renders more obsolete the discoveries of the past. But we have a most robust belief that science will in the end prevail; that where we now stand more or less impotent, we shall become strong; and where we stand bewildered in the twilight of to-day, we shall in due course rejoice in the full light of the sun.

INSECT PESTS

In addition to these various diseases, the tomato is attacked by insect pests, both of the air and of the soil. Their name is "legion." Millipedes and wireworm, leather-jackets and woodlice attack the roots or the stems of the plants, and "white fly," the worst plague of all, attacks the upper growths.

The crawling things, those that attack the roots and the stems, may be trapped with pieces of carrot or potato, an old-fashioned method; or they may be, as they should be, routed by treatment of the soil. Such powerful and pungent remedies as fresh lime, vaporite, gasonite, naphthalene and some other proprietary preparations, carefully used and repeated from time to time, will go a long way towards exterminating them, or at least keeping them in check. As to the white fly, increasing year by year, it is fast becoming as thick and threatening as the Egyptian plague of flies. So persistent are its attacks, so extraordinary is its rate of increase, that though you may kill millions in a single night, millions will yet remain; and though every living fly may be exterminated, in a week or two the new generation is as numerous as were the old.

It cannot be fought and conquered once and for all in one pitched battle, so the fight against it must be persistent and followed up for weeks, or if needs be, for months. We have used gasonite fumes and killed so many that the floor of the

house has been white in the morning as with tiny snowflakes and we had to sweep them out—and yet as many remained active. For several nights in succession the same application gave off effective fumes and killed many flies, but such fumes cannot be retained too long or the health of the plants would be affected. We have cyanided night after night till the plants have suffered and the flowers have fallen, and we have had to seriously ask ourselves whether we can afford to ruin our crop in order to kill the flies. We have had the same experience with ordinary fumigants and vaporisers, and nothing we have tried can be said to be entirely satisfactory.

Palpably, the thing is to never allow this pest to get a strong foothold; to try every known deterrent without awaiting its actual appearance, and if it still comes, to wage relentless and unceasing war upon it from the moment it is first seen. We must never be lulled into a false security, but err, if we err at all, on the side of safety, and as a final measure, when the crop is finished and while the plants are still standing, burn enough brimstone in the house to kill every living thing in it, after which—burn the plants.

We have given so much space to the tomato because, as we said at the outset, it has become to many the most important crop of all. Though so much has been said, there remains much more that should be said, but which we regretfully have to leave unsaid.

The question of marketing is one we have not now to deal with, though in importance it is a close second to cultivation. We have to content ourselves by advising every grower to keep himself *au courant* with market news and opinions, for by doing so much may be learned that it is essential to know. This particular question will, however, be treated at length in volume 5, which deals with fruit generally.

CHAPTER II.

CUCUMBERS

THE man who can grow cucumbers on a large scale and grow them well can grow anything. In their remarkably rapid growth they soon prove themselves to be either a great success or a great failure. In experienced hands the crop may be said to be perfectly safe, but in the hands of a novice one would not care to say as much. It demands certain hard and fast conditions, given which its cultivation, though exacting, is fairly simple.

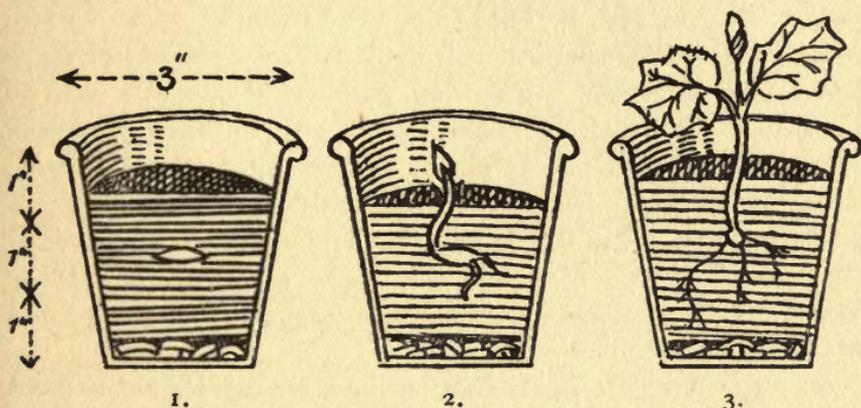


FIG. 7.—Cucumber Seed.

1. Just Sown ; 2. After a Week ; 3. After Three Weeks.

We are not here writing of the casual growing of a few plants as a catch crop in the frames on rule-of-thumb principles or lack of principles, but of growing for market on a large scale, where the difference between success and failure is a very serious one.

It is claimed that cucumber growing can be made as profitable as the growing of tomatoes, and though our own experience does not dispose us to contradict this, we cannot accept it without reservation. It is possible at times to reach the limit of the demand for cucumbers even at very low prices, but in the case of tomatoes it is much less possible.

The essential conditions for cucumber growing are : (1) a good rooting medium, well drained yet retentive of moisture and heat ; (2) a high equable temperature ; (3) an abundance of

moisture. The most intensive methods of cultivation preclude the admission of fresh air, the direct force of the sun being counteracted by the density of the atmosphere within the house and the consequent film of moisture on the glass which arrests and partly disperses the rays ; but whether the system adopted be intensive or otherwise, the three essentials remain absolutely imperative.

The cucumber grower raises his own plants and it is best that he should do so. His earliest sowing is made with the new year, and the seedlings are raised in a temperature never falling below 60°, springing to 70° during the day. Where the difference is greater, sinking, say, at times to 50° and rising at others to 75°, we find the seedlings germinate irregularly and a proportion come deformed and useless. In sowing, we usually allot one seed to a small 60 pot which we only half fill with soil, and plunge in the warm fibre of the propagating pit (see Fig. 7). At the time of sowing we water heavily, after which no further watering is necessary until germination has taken place seven to fourteen days later. If the seeds do not show signs of life at the expiration of the longer period there is something wrong and they should be thrown out.

For a few days after germination the seedlings should be kept in the same warm position, and only when they are well up and beginning to show the first rough leaf they may be transferred to the open stage in the same house, where they will enjoy the benefit of the light and nearly the same temperature as before.

While the plants are developing, the house or houses should be in course of preparation for them. We prefer that this house should be narrow rather than broad, to accommodate a single row of plants each side, which, as they grow, will be trained up near to the glass. In wide houses it is usual to have two additional rows equidistant from the centre of the house, but as the plants get up, the two outer rows exclude the light from the inner rows, so that after a certain stage not more than half a crop can be taken from them.

Light plays an important part in their culture, for it alone can counteract the tendency to weak and elongated growth set up by moisture, heat and but little air. The number of

fruits per plant bear a very definite proportion to the number of joints, and the importance of keeping these as short as possible is apparent, and that is one reason why we prefer narrow houses and a single row up either side whereby every plant receives its full share of light.

The prepared bed in which the plants are to grow must be of an open character, and yet retain heat and moisture. Let the drainage receive the first consideration, for where waterings are copious nothing but really efficient drainage can keep the soil alive. The chief details of the compost should be leaf mould, manure and old turf, and these must not be sifted but used coarse.

The plants are usually set on slight mounds, but the roots soon run freely throughout the bed, and if they cannot there find ample nourishment the fact is soon reflected in the growth of the plant and in its reproductive capabilities. The reasons for planting on slight mounds is to prevent rotting or cankering of the stem at its point of contact with the soil, a contingency not unlikely to happen when a soft stem like that of the cucumber is in constant contact with soil charged with an excess of moisture. The mound acts as a protector by throwing off water, passing it down to the bed where the roots of the plants are ready to receive it. Incidentally, by reason of being warmed through more quickly than the bed, the mound gives a quicker "send off" to the newly-planted cucumber.

Rapid, unchecked growth is the secret of producing heavy crops of first-quality cucumbers, and from the very beginning this has to be kept in view; and not growth merely, but *strength*. The vine must not be allowed to run up several feet without being stopped, for it soon becomes thin and weak and past producing good lateral growths low down. If these latter have not developed, the time to stop the leader is generally indicated by the appearance of the rudimentary fruit, but in any case a foot and a half should be the limit, many of our most successful growers stopping at less than 1 foot, with very satisfactory results.

And while we are on this subject of "stopping" or "pinching" it may be as well to deal more fully with it, because it is paramount and governs the system of cultivation which we advocate.

Every side shoot, every lateral, every sub-lateral, *ad infinitum*, must be "stopped" at one leaf beyond the rudimentary fruit, if a full crop is to be secured, for the more methodically this is carried out the more numerous will be the fruits. Sometimes these rudimentary fruits show in pairs (see Fig. 8), and this is so much to the good providing the roots are fed in proportion to what the plant has to do. The old-fashioned extension system of allowing the vines to run till all available space is covered and taking the crops the gods are good enough to send, has long since died out, and given place to this intensive system whereby the crop is more entirely under the control of the grower, who is able to estimate almost exactly the number of cucumbers he is likely to cut from a given space—that is, as far as accuracy may be assured when Nature has to have a voice in the matter.

GENERAL TREATMENT

Watering, syringing, training, stopping, feeding, cleaning, pruning, these are the heads comprising the routine work of the cucumber grower. The maintenance of a satisfactory temperature should be under the direct supervision of the practical grower, even though he does not do the actual stoking, but the duties coming under these heads are his alone. Let us glance at them.

Watering.—Much as the cucumber demands plenty of moisture let it be distinctly understood that it is not an aquatic. Its feet must not stand in water; the bed in which it grows must only be healthily moist, not "wet." Stagnant water would speedily rot the roots, and in this connection refer back to our dictum—"the bed must be well drained." We insist upon that again. Water standing about the roots would, for one thing,



FIG. 8.—Brace of Cucumbers from 1 Joint

cause a coldness at the feet which would be as uncomfortable and unhealthy for the plant as cold feet are uncomfortable and unhealthy for us. With a root temperature at 50° or 55° , and a head temperature at 80° , it would be difficult to imagine less hygienic conditions or conditions more likely to bring disease; therefore, though copious waterings are necessary, they must not be given at all times and seasons but only when needed, and the drainage must be able to carry away all that is over and above the actual needs of the soil and the plants.

We trust we have put this into such clear and simple language that there can be no misapprehension. No rule can be laid down, but let this be some guide: stagnant water is poison, it sours and poisons the soil, it rots the roots. The soil must be watched and the grower must exercise judgment as to when it requires water and how much to give it.

Syringing.—This is a simpler matter and is done once, twice, or even thrice a day, according to the season and the sun.

Cucumbers thrive only in humidity, for immediately they are subjected to arid conditions they are at once attacked by red spider, which spring from nowhere in whole battalions. A dry cucumber leaf seems of all leaves to be the most unnaturally dry to the touch, and in such condition cannot function.

The water used for syringing should be as nearly as possible of the same temperature as the house and should be used not merely for the purpose of damping the foliage, but of really wetting it as by a shower-bath. The operation should not take place too late in the day when the thermometer is sinking to its night temperature, but early enough to leave only a dampness by the time the day is done. During the winter months a syringing once a day in the forenoon will probably suffice, and in really bad weather a slight steaming from wetting the hot-water pipes may be safer still. The neglect of this daily damping, even in the winter, will infallibly result in the attacks of thrip and red spider, which once having found a lodgment will only with great difficulty be destroyed.

Training.—This consists of tying up the new growths and fixing them in such position as shall ensure for each one its due proportion of space and light. The weight of a cucumber is

such that it would dislocate any growth upon which it found itself if support was not given, so that the tie answers the double purpose of fixing the growth and supporting the fruit.

Training calls for deftness and judgment, but might be entrusted to partly skilled hands, for but little practice is needed to give the necessary experience. Where plants are grown, say, 4 feet apart, they begin to overlap long before they have finished their growth and the crossing and re-crossing of each other cannot be avoided; but they need never be jumbled together in a mass, as a careful trainer will spread them out into a network, with every growth keeping its own direction and procuring its share of light. If every square foot is to yield its due quota of fruit it must be made to do so by the proper training of the vines.

Feeding.—The cucumber is a gross feeder and will quickly use up the virtues of the compost in which it is growing. Even if it did not, the copious waterings wash away many of the salts contained in the soil and necessitates replenishment. Organic manures up to a certain point are distinctly the best, but the application of this in a natural form would soon be overdone, and when the point of repletion is reached a little nitrate of soda or some other such quick acting agent should be used.

A mulching of manure should be given directly the first flush of fruit has been cut, and unless this is attended to the plant will show signs of exhaustion by producing stunted or ill-shaped fruits which are almost without value. When this happens, the faulty fruit should be removed, a light dressing of nitrate be used, and the plants nursed back to health and vigour. It is best not to allow the vines to be damaged in such a way, and this can only be prevented by timely mulching or other feeding.

There comes a time when feeding has no further effect, but that is only when the natural vigour and vitality has finally departed and the plant has done its work. Its end has come, and henceforth it will only cumber the ground.

Pruning.—The pruning consists (apart from the pinching) of cutting out any exhausted wood to make room for younger growths which are already starting, or which it is thought the

plants may be induced to make if they have sufficient energy to do so. Judiciously done from time to time, the life and productivity of a plant may be more than once renewed. It should be done by degrees; that is, the exhausted portion should be removed directly it is noticed, so as not to make one huge surgical operation defeat the very object you have in view.

The trimming, which may be considered as part of the pruning, means the removal of old and spent foliage which, directly it begins to turn yellow, becomes a danger to the plant and therefore must be removed. Where there is a succession of growths, as with the cucumber, there must of necessity be a certain quantity of old foliage, and as this becomes spent, its removal admits the light which is so essential to the younger foliage coming on, so that in cutting it away a danger is removed and light is admitted. But so long as it remains green and healthy it is doing useful work and cannot be spared.

PESTS AND DISEASES

As we have already intimated, insect enemies attack cucumbers to an alarming extent. Green aphid, red spider, and thrip are between them quite capable of destroying a crop. We have frequently seen cucumbers exposed for sale at the greengrocers simply swarming with thrip, and we have wondered what the ignorant buyers and consumers would say if they were told what monsters they were eating. "Where ignorance is bliss," etc. No reputable grower would produce, much less sell, fruits in such condition.

Apart from the constant and regular syringing we have recommended as a preventive of these pests, the only way to exterminate them when they have established themselves is by fumigation or cyaniding. The former is not dangerous and has stood the test of time; the latter is the latest scientific method, efficacious, but demands very careful handling. Either method can only be adopted when the plants have been specially allowed to become dry about their foliage.

The fungoid diseases are a more serious proposition. They are usually referred to as "spot" diseases, and though quite

distinct fungi, their effect is not dissimilar to that of the cladosporium on the tomato, taking into consideration the difference in the foliage. These fungi attack both foliage and fruit, and we have ourselves had to deal with plants so badly attacked that scarce a leaf was left undisfigured and the whole had to be rooted up.

This is not the place to enter upon a scientific dissertation on the disease, especially as there are special text books devoted to the subject, and we purposely limit ourselves to the strictly practical. We say at once that from the beginning steps should be taken to prevent disease by using every known precaution. Unfortunately, the moist conditions essential to successful cucumber growing are also favourable to the rapid propagation of the fungi, so that whatever steps are taken must accept the humid atmosphere as a *sine quâ non*. We have regularly sprayed with permanganate of potash and have avoided disease, but we are unable to say whether we should have been equally immune had we not so sprayed. We have also coated the hot-water pipes with sulphur, and though we think we have grounds for believing that this had a deleterious effect on the fungi we would not venture to suggest that it was altogether good for the plants themselves.

We rather place considerable reliance upon a remedy we once copied from the *Fruitgrower*, and this we have consistently used as a deterrent and as an attempted cure, not without a fair measure of success. This consisted of a powder made up of eighty parts green sulphur and twenty parts Burgundy mixture, and up to date we have found nothing better. If ever we find a leaf showing the least sign of "spot" we cut it off if it can be spared, or if not, we cut out the portion containing the spot.

Our deliberate opinion is that our road to safety lies in the raising of new and immune varieties, for if it is possible to raise potatoes immune to certain fungoid diseases it ought to be equally possible with the cucumber. The efforts of our raisers might be concentrated on this point with lasting benefit to growers.

CHAPTER III.

MELONS

THERE are several reasons why the melon is not so universally grown for market as the cucumber, but the principal one is that the demand for it is comparatively limited. Those who have cultivated the taste for English-grown melons are mostly those who have been in a position either to grow their own or have them grown for them, and those who have not so cultivated the taste are those who, in the main, cannot appreciate their vast superiority over the plebeian, low-priced water melons imported so freely from Spain. The cost of production places them beyond the reach of the great body of the public, but even so, the numbers sent to Covent Garden and other large markets during the season are very large and represent a very considerable value.

Our earliest melons come from Guernsey, where probably a half dozen or so growers specialise in them. The very early crops are produced by plants extremely short-lived and doing their work very quickly. Their cultivation is in single pots in great heat, the plants being permitted to grow one or two fruits at the most. It is one of the most intensively cultivated crops we know of, profitable, of course, but by no means offering that *El Dorado* that might be imagined. A slight mishap, a touch of disease, an eelworm, will quickly obliterate the only chance a plant has at a time when it is impossible to replace, for it is essential to the successful working of this method that the whole of the crop shall ripen together, or as nearly so as is possible.

The question as to whether the plants should be limited to one fruit each or to be encouraged to carry two is still a moot point. The solitary fruit comes larger, finer, and quicker, and can be looked upon as "specials." Where the pair of fruits per plant are allowed, there is a distinct falling off in size and quality, and they take slightly longer to mature. The question is, which pays the better, having due regard to the time they occupy the house? We have heard the matter argued by those who favour either method, but have never yet been able

to find that anything very positive has been decided as to the relative advantages of either.

There is not much of this ultra-intensive cultivation of the melon done in England, for we are quite content on the whole if our first crop ripens in May. Neither do we limit our plants to the one or two fruits each. Nor do we often grow them in pots except under exceptional circumstances, preferring to give the plants a less restricted root run for the production of a larger number of fruits. We prefer to grow on banks or mounds of prepared compost placed upon stages not far removed from the glass and where it can be thoroughly warmed. Our melon houses do not call for large spans, seeing that the growth of the plants is more or less restricted. Long rafters would neither be economic of space nor of heat, for this crop is not allowed to grow on and on like the cucumber. Indeed, so far as our experience goes, a low house with movable lights, a sunk path and raised benches make the most economical structure for melon growing, providing ample provision is made for light, warmth and drainage. These three form the tripod on which successful melon growing is based, whether it be in the hothouse, the intermediate house, or the pit—*Light, warmth, drainage.*

For earliest work the seed should be sown with the new year, one seed in a small pot, plunged in a temperature of 60°. Cover it with glass until the seedling comes through the soil. It will be a month before the young plant can be potted on into a large 60 or a 54, after which it should stand a few more days in the propagating pit. The last week in February should see it standing on the open stage, hardening and strengthening itself preparatory to being planted out. Meanwhile the bank of compost has been prepared, composed chiefly of chopped, turfy loam, with well-rotted cow manure and leaf soil added to it in minor proportions. Efficient drainage has, of course, been provided. The compost must be well firmed and the top of the bank must show no saucer-like depression, but be at its highest around the stem of the plant, for there is such a thing as "rotting at the collar." This is an important point. Water must be encouraged to retreat from the stem of the plant quickly. When planting observe that point. Turn the plants out of their

pots without disturbing the roots and plant firmly. Practically all fruiting plants like a firm soil. A very suitable distance from plant to plant is 4 feet—much better than being nearer, yet plenty wide enough to afford each plant ample room for development if grown on the partly restricted system such as we describe, and which allows for an equal distribution of fruits.

The temperature of the early melon house must be maintained at 60°, but the atmosphere must not be unduly saturated as in the cucumber houses. Indeed, the reverse is advisable, for though the plants must be systematically syringed to keep the red spider in check, the drier the atmosphere, short of aridity, the better. Air must be manipulated to draw off the superfluous moisture.

It is the custom of many good growers to “nip” the young plants even before they put out more than a pair of leaves, while other equally good growers stop their plants at the fourth leaf. We have tried both ways with equally good results, but we are dead against allowing the plants to make a longer growth before stopping them. We do not want a “strawy” vine, for this cannot make for strength, so the nearer the roots that we can encourage the lateral growths the better it is for the plants.

How many fruits per plant? Well, we cannot encourage the fecundity of the cucumber in our melon plants, because the fruits make greater demands upon them and they hang to ripen, which is a terribly exhausting process for the plants. To secure quite a limited number it is necessary to conserve the strength of the plant by any and every means, cutting away any weak growths and leaving only the strongest. The first fruits to set are not necessarily retained, but when half a dozen on a plant, evenly distributed, are set, then those are secured, and others, either more forward or backward, are taken off. After this, we keep stopping further growth beyond what is necessary for the well-being of the plant, thus throwing back to the roots all surplus energy, to be by them thrown up into the swelling fruit.

The advantage of securing a full crop of equally developed fruits is that they may ripen together with the plant, and being cut within a day or two, the old plant may be taken out, new soil

put in position, and a new plant planted. As the melons attain full size, the watering of the plant must be greatly modified, and only enough given to keep the foliage from suffering. When the foot stalks of the fruits show signs of leaving the parent, by cracking all round, it is nearly time to cut them and place them on a shelf in the fruit-room to mellow, or pack them straight away to market.

The melon is not without its enemies. Too aridly grown it quickly falls a prey to those twin pests, red spider and thrip, and these once established are extremely difficult to eradicate. The fact is, they must not be permitted to come, for once established they will stand as much syringing as the plants. They can be prevented by systematic syringing, mostly with clean water and occasionally with an insecticide. Really there is no excuse for their appearance save faulty treatment. Too much water is an enemy—it causes root rot. The melon has not the huge area of water-using foliage that the cucumber has to carry off the unwanted moisture—it is not a bog plant, but a good, honest, healthy, warm-growing subject, demanding a certain amount of moisture but abhorring too much. Watch that, then, most carefully.

It loves a certain supply of warm fresh air ; see that it gets it.

A wireworm will kill a plant in a night. Be as sure as you can be that your soil is free from this destructive maggot ; but make assurance doubly sure by setting traps to catch it. Portions of potato and carrot are very good traps.

Club root is another terrible bane which ought to be forestalled by sterilisation of the soil before being brought into the house. Follow this up by the use of a soil insecticide—there are plenty of them. Also trap millipedes and woodlice, destructive beggars working like thieves in the night. Do not consider any precaution too trivial or unimportant, for after raising and growing the plants on, it is terribly wasteful to lose them afterwards for lack of effort to secure their safety.

Feed your plants when the fruits are about one-third grown and afterwards. It is almost incredible the amount of energy these fruits use up which the roots alone can supply. The size and quality will be greatly enhanced if judiciously fed. For

this, we are no great advocates of preparations of any kind, pinning ourselves to the use of natural manures as liquid and as mulching. No feeding is necessary when the melons have attained full size—they ripen better without it; but we do emphatically insist upon feeding throughout the swelling period.

We make no choice of varieties. They come and go. The favourites of this season are probably obsolete two seasons hence, and with melons, as with other things, no object can be served in making any selection. Standard varieties always speak for themselves—like good wine, “they need no bush,” and it is usually a good plan to pin our faith to them.

CHAPTER IV.

GRAPES

THE huge quantities of cheap grapes imported every year from the Continent threaten the prospects of the English grower of this "queen of fruits," yet such is the superiority of the home product in every detail that matters, that the best trade will always belong to it. Placed side by side, the veriest novice would mark the difference between the very best the Continent can send us and a well-finished home-grown bunch of, say, Gros Colmar. We make the foreigner a concession in naming that variety, which is peculiarly his own. Even such an easily grown and well-coloured variety as Black Hambro', which might be thought to do well anywhere, puts on a deeper hue and intenser bloom under English skies than it does in Belgium, for whether it be Hambro's or Alicantes, black or white Muscats, Colmars, or Madresfield Courts, the incontestable superiority of the English fruit is evidence to the suitability of our climate and the skill of our growers. We, of course, refer to our high-grade fruit, for it must, alas! be admitted that there are plenty of English grapes no whit better, but in many instances worse, than the Belgian or Dutchman would send over. Such fruit not only does not pay the grower, but the placing of it on the market is prejudicial to the highest trade interests and a distinct disservice to the profession.

We do not recommend grape growing to the ordinary market grower. It is not a good subject for the "'prentice hand," but rather for the specialist, the man with an expert and intimate knowledge of it, for it is exceedingly exacting. Even with knowledge, those who have not special facilities for its cultivation had better leave it alone. The man who undertakes to grow it must be very sure as to his capabilities, for, unlike annual crops, it ties the house or houses up for a term of years, during which it claims a special treatment, whether the crop is a paying one or not, because neglect during any one season has a direct effect upon the succeeding season's crop.

From the time the buds begin to swell until the pruning season again comes round, the grower's care must never be off

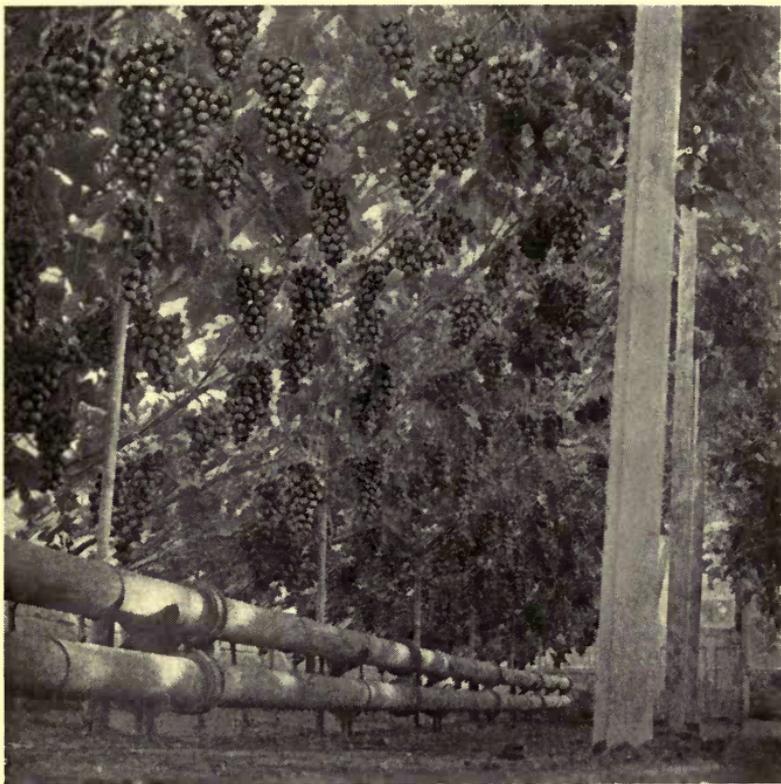
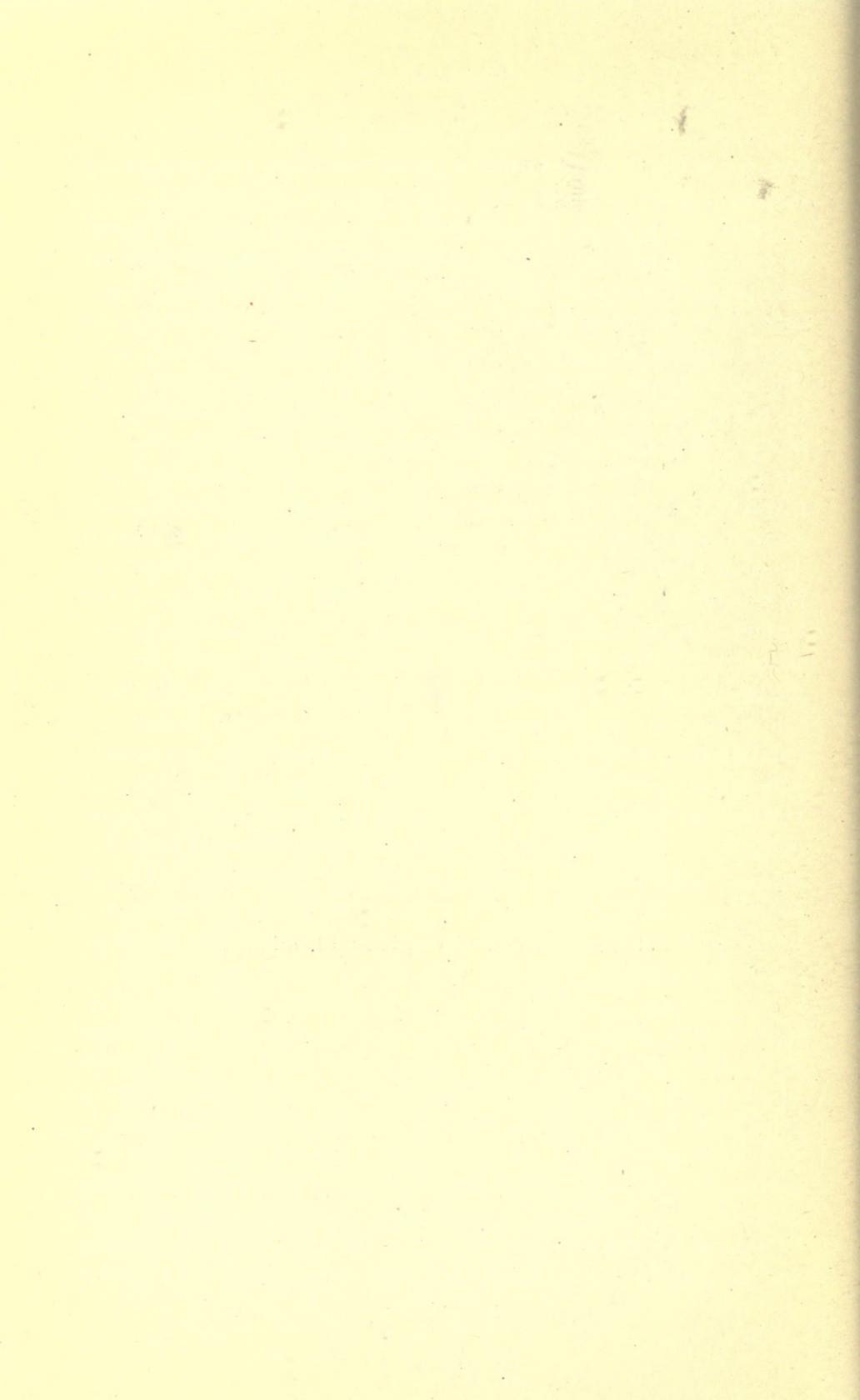


FIG. 9.—Section of Vinery, in Full Bearing



his vines ; but these several disadvantages are not all to the bad, for without them so many people would be growing grapes that as a market commodity all profits would vanish.

We firmly hold that there are no grape growers in the world to equal a selection of the best English growers, whether they are private gardeners or trade growers ; and this affords conclusive evidence as to the suitability of the climate. It is also a testimony to great skill, but, be it thoroughly understood, the skill of the market grower is directed to a different end than that of the private grower. Many of the most magnificent bunches of grapes staged at exhibitions by noblemen's gardeners are produced irrespective of cost, and if disposed of in the open market would show a considerable deficit, whereas the market grower, while producing grapes of nearly equal quality, has to do so at a cost which shall show a profit for himself when sold in the market. And if the latter's bunches do not equal the former's in point of size, it is because he has to take a consistently heavier crop from his vines to make quite sure that the credit side of his ledger compares favourably with his debits.

But even apart from that, we should object to taking the exhibition standard as any criterion of successful grape growing. The buying public is not prepared to pay fancy prices for huge berries, and it is possible to have really fine, well-finished bunches of good average-sized berries that will arrest attention in the market, yet fall just short of being fit for exhibition. This is the class of stuff produced by our most successful market men—men who have made their names and their products famous.

PREPARING THE BORDERS

In the preparation of a vine border there are three vital considerations to be kept before us : (1) the drainage must be above suspicion ; (2) the bed must be made with a view to remaining in good heart and condition for a period of years, certainly not less than ten ; (3) it must be so made as to attract the roots towards the surface and not towards the subsoil.

We assume that the borders will be inside rather than outside, for the commercial grower builds his houses too closely together

to admit of wide outside borders such as are to be seen in private establishments. Neither, under the commercial system, is a wide border needed. The private grower makes provision for a run of forty or even fifty years as against the market grower's fifteen or twenty years, a difference which enables the latter to plant his vines more closely together, and by restricting each to a single rod makes it possible for him to adopt intensive methods and take heavier crops.

The border should not be less than 6 feet wide on either side of a centre path; or, what is better still, the path might be dispensed with and the whole floor of the house be made into a continuous border with open wood-work footways to walk on. Take away the soil to a depth of $2\frac{1}{2}$ feet or thereabout, filling in 6 inches of broken brickbats as drainage. We take it for granted that the subsoil has a fair natural drainage, otherwise it would be necessary to create it. Cover these brickbats with flags of good meadow turf cut 2 inches thick, and on this a layer of coarse crushed bones. This leaves practically 2 feet to be filled up with a prepared compost, which must be made of absolutely fresh material of highest quality. Computed on a basis of ten parts, the proportions may be as follows: fibrous pasture loam, 6 parts; well-matured cow manure, 2 parts; old leaf mould, 1 part; burnt garden refuse, $\frac{1}{2}$ part; and the other $\frac{1}{2}$ part compounded of bone meal, mortar rubble, crushed bone, and charcoal. These several ingredients should be thrown in a heap together, broken up, but not finely, turned over three times so that the various elements may be thoroughly incorporated before filling in the bed, and then evenly distributed until the border is made up. It will need firming down by moderate treading, but must not be rendered too solid—let that come by the gradual settling-down process.

The wise grower will give minute attention to this necessary preparatory work, for he knows it is the foundation upon which the future of his vines, and consequently his own, must largely depend. The health, longevity, and productivity of the vines are at stake, to say nothing of the quality of the fruit produced, and any necessary provision neglected now cannot satisfactorily be dealt with at any later stage.

PLANTING

Some growers prefer to plant two-year-old canes so as to get them thoroughly well established and strong before fruiting age. Others prefer three-year-old fruiting canes, though they are not so ill-advised as to permit them to fruit the first year. We ourselves prefer to plant the younger canes and compensate ourselves for the extra year of waiting by utilising the houses for other crops, such as may safely be grown without detriment to the vines. Having determined to limit each vine to a single rod, we plant at 2 feet from vine to vine, having found that this leaves sufficient space for the amount of foliage necessary to the well-being of the vine and the demands of the fruit. We do not favour the extension system, but for the purposes of intensive cultivation prefer that every rod shall have its own independent root system.

The young vines raised from "eyes" have been grown on in pots, and their second year's growth has been in 8-inch pots. In December they are pruned hard back to practically one bud, and, when in late March or early April the unforced growth has well started, they are planted in the border without disturbing the ball of earth beyond what is necessary to remove the crocks and to liberate a few root ends.

There is the alternative of planting them in the autumn when the soil could be shaken away and the roots spread out, but our experience is that the late date at which these can be pruned nullifies any apparent advantage by a palpable weakness in the first year's growth. Relatively this is not important. The planter of three-year-old canes is not under the necessity of cutting them back, and in this respect gains, but having tried both methods quite extensively we repeat we favour the planting of two-year-old vines, though the advantages are not so outstanding as to justify dogmatism on our part.

TREATMENT

During the first year and until the vines are well established copious waterings must be ruled out. Every grower knows that water must be given sparingly to almost all kinds of plants not yet established, whether they be in pots or set out. This

rule applies to grape vines as much as to any, therefore in watering give to the plants as much as they need, but no more. The soil of the bed must be wholesomely moist, but never wet; the atmosphere humid rather than dry. Grapes cannot be successfully grown without the aid of the syringe or its equivalent, quite apart from its enforced use as a deterrent for several insect pests. What is generally known as a "growing" atmosphere is the ideal, approximating that of a warm, moist May morning, when we are accustomed to say, "you can see things grow." But as yet there must be no forcing, and the ventilation must be the safety-valve in that respect. If the atmosphere is too close the growth of the vine will be rapid and weak, the exact opposite of what we want. Palpably, then, we must strike the happy medium and carefully avoid any extreme in the atmospheric conditions.

The first year's growth will probably be not less than 8 feet or 9 feet, and this might be stopped towards the end of August to throw what remains of the diminishing energy into the eyes, too late to excite lateral growth. As the foliage shows signs of ripening water must be almost withheld, but not to such an extent as to reduce the border to dust. Early in December the rod will be headed back to within 6 feet, selecting a good developed bud at which to cut back. At this point the second year's work may be said to have commenced.

SECOND YEAR

The "positive" for the second year is made up of the two "negatives," viz., there must be no forcing and there must be no crop. In March the border must be given its first watering of the season; the young rods must have their ties removed, and be bent well over to check the natural tendency of the rising sap to rush to the extremity of the rod, and so to divert it to the lower eyes until it has started them into growth. When quite sure that these lower growths have made sufficient headway as to command their supplies of sap, straighten the rods and tie them in position, never doubting for a moment that the top eyes will speedily catch up with the lower ones.

Those bare lengths of cane, so often seen, so wasteful and unsightly, are nearly always due to the neglect of this simple precaution.

As growth begins, it will nearly always be found that there are

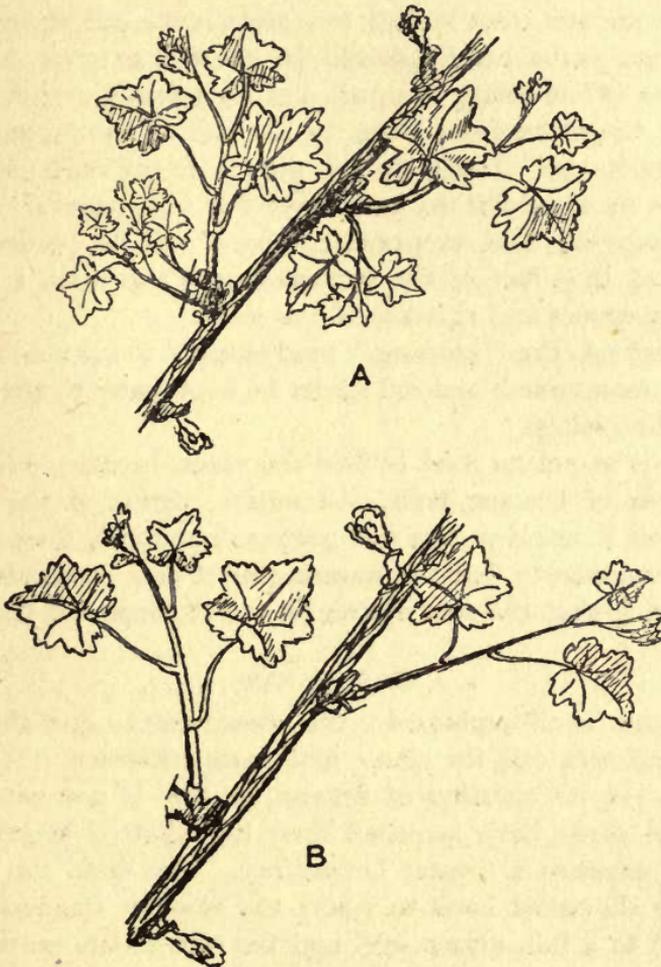


FIG. 10.—A. Natural Breaks. B. Disbudded

two or three breaks at every eye—the main and the subsidiary growths (see Fig. 10). The subsidiary must be rubbed off as soon as the main growth proves satisfactory, but until then it is well to permit one subsidiary to remain in case of accident. Some of these breaks will show for fruit at the third, fourth, or

fifth joint, and the temptation to retain a bunch or two is always great ; but the great consideration for this year is the conservation of energy for the building up of the vine, and even a single bunch of fruit will use up a great deal that ought to be conserved to ensure future productivity.

To ensure sufficient leafage to maintain the full vigour of the vine, these main breaks should be allowed to grow to about 12 inches before being stopped, and all laterals or sub-laterals growing thereafter from them be limited to one, or not more than two leaves. The main top growth is the only exception, and this must be left to grow freely to a considerable length before stopping, and at pruning time it will be headed back, leaving $2\frac{1}{2}$ to 3 feet of the current season's growth, according to the stoutness and ripeness of the wood.

Throughout, the "growing" conditions of the preceding year must be maintained, and red spider be kept away by the regular use of the syringe.

There is as yet no need to feed the vines, because, relieved of the strain of bearing fruit, the native vigour of the plants, finding all it needs in the well-prepared compost, does not call for any stimulant ; but the watering must be a matter for great care, seeing that the root system is as yet somewhat limited.

THIRD YEAR

This year is all-important ; the vines have to give their first fruits and will call for closer and more intensive cultivation. It is as yet no question of forcing, as this is not permissible until the canes have acquired their full allotted length. The pruning assumes a greater importance. The main top growth must be shortened back to where the wood is unquestionably ripe and to a full, plump eye, and the side shoots must be cut hard back to a well-developed eye at their base. This pruning should be done with a sharp knife, for we entertain a strong dislike to the pinching and bruising caused by the ordinary half-blunt *sécateurs*. After pruning, bend the rods over as advised in the second year to ensure an even "break," and as the buds swell rub off all that are superfluous, leaving the best and strongest to grow. Probably every satisfactory break

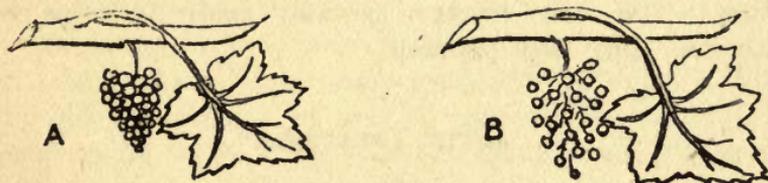
will show for fruit about the fourth leaf, and a selection only of these must be left, otherwise should such young vines be permitted to carry all they produce, the strain would be such that they would inevitably fail and their constitution be ruined. Six or eight bunches should be the limit allowed, and even those would be a heavy tax, calling for some help by feeding the roots. We must not lose sight of the fact that for two more years the chief consideration must be the building up of the vine, so that the crops taken are of quite secondary importance.

As the fruit is setting, a mulching of cow manure should be placed on the bed, and this will prove a great help. More water will be needed this year, the increased root area and the greater amount of foliage using up probably double the amount required during the previous year.

Keep a keen watch on ventilation, and syringe daily when closing the vents.

THINNING

The next operation of prime importance is that of thinning out the berries. Every healthy truss will produce almost three times as many berries as it can bring to perfection—a self-immolating propensity it is difficult to understand, because if we notice a bunch which has been overlooked and not thinned, we find the berries firmly and immovably jammed, wedged so solidly together that the inner ones rot and communicate the



Natural Bunch

FIG. 11

The same after Thinning

rot to the whole bunch. There is no question as to when the thinning should be taken in hand, which should be first when the berries are the size of a sweet-pea seed, and again when they are the size of a marrow-fat. It is a far more difficult matter to set down in words as to how much they should be thinned,

so difficult that we shall refrain from taking up space in a vain endeavour to do so. It is a lesson which experience alone can teach and must come by practice and an intimate knowledge of the variety. For example, a comparatively small-berried variety like Black Hamburgh would call for less thinning than a monster-berried variety such as Gros Colmar, and the looser attenuated bunch of Muscat of Alexandria less than a crowded Gros Maroc. We give this just to convey the idea which the grower of grapes must really work out for himself ; but there is another guide. The berries are produced on small branchlets, the truss dividing itself up into scores of such. Each of these tiny branchlets (themselves radiating from main branchlets) carries three berries, and it is the terminal berry which is generally the largest, because it has had the great advantage of position. But before removing the side berries, take away first of all those from the interior of the bunch which will involve the snipping off of some branchlets. When these are removed the operator will have a better idea as to how much farther to proceed. Go warily, for a severed berry cannot be replaced. Keep in eye the finished bunch, the size of the berries when fully grown, and make allowances accordingly. It calls for great judgment, and as before said, confidence and skill can only follow practice. Do not touch the berries with the hand, but use a thin-pointed stick to raise the branchlets, just as a barber would use a comb to bring refractory hair into position before cutting. Use also scissors specially made for the work, which are long and pointed.

AFTER TREATMENT

Soon after the thinning comes the time of stoning ; that is, while the berries are forming their stones or seeds. During this critical period, which lasts two or three weeks, the berries are almost at a standstill, and too much watering will cause them to crack. Persevere with the syringing, but give no more water than is necessary to the healthy up-keep of the foliage ; then, as the period passes and the berries are seen to be swelling, revert to the more generous regime and feed with liquid manure.

Admit all the air that is compatible with "growing" conditions, using judgment to prevent any harsh draughts that are likely to bring mildew into the house.

That cold draughts will cause mildew is undoubted, but far oftener it is the lack of moisture at the roots which causes this disease, or a coldness at the root following the use of water at too low a temperature.

"Shanking," that is, a shrivelling of portions or even the whole of a bunch, not in the berries, but first in the stalks, is another disease caused sometimes by lack of root moisture and sometimes by overcropping. It may also be caused through poverty, viz., underfeeding. The experienced grower for market is seldom troubled much by this disease, because he gets to thoroughly understand his vines and the conditions under which they are working, and he also has the complete root system under control.

A sharp look-out must be kept for any appearance of red spider and mealy bug, both of which are most virulent pests. The syringe must keep down the former, for as the period of ripening approaches and drier treatment is meted out, conditions are set up which encourage its attacks. If mealy bug appears it should be fought by hand and washed out.

The wholesome and almost natural conditions under which the vine is generally cultivated, coupled with its great vigour and strength, makes it tolerably easy to keep it clean and healthy, and a filthy cane is seldom to be found save as the result of gross negligence. Mildew is the greatest enemy, and this should be prevented as far as possible by occasional thin films of flowers of sulphur, as well as by judicious watering and ventilation, as before stated. It is a sound practice to reassure oneself as to the efficiency of the drainage at least every alternate year, as the health of the vines is so nearly connected with it.

When the fruit ripens and the bunches are cut, throw open the ventilators night and day, and allow the elements full scope to ripen the wood as no other power can. Nothing is more gratifying than to see the passing foliage clothed with the richest autumn glories, showing that up to the last they

have retained their robust health and, having completed their task, fall gently to the bed. If any of it is tenacious and hangs, shrivelled, to the rod, be sure that something is wrong, and do not rest until you have found out what it is.

The borders will need renovation from time to time, and this should be done after pruning and before Christmas. Take out a portion of the soil without damaging the roots, which, though demanding care, can yet be done, and refill with a compost made up on the formulæ of the original, treading it in firmly, but not watering before March.

CHAPTER V.

SWEET-PEAS UNDER GLASS

EARLY sweet-peas are generally looked upon, and treated, as a catch crop. We do not look upon them in that light, but as a regular routine crop to complete the circuit of the year in the tomato houses. Here is the routine :—

Tomatoes March till October.

Chrysanthemums .. October till December.

Sweet-peas .. October till December, in early stages,
concurrent with 'mums.

„ „ .. December till April. Overlapping
tomatoes through March.

It can scarcely be necessary to remark that no individual house is really full of sweet-peas, but a house 100 feet long by 16 feet can very well accommodate 150 pots (9-inch) without unduly trespassing upon the tomatoes while in their early stage. And from 150 pots of sweet-peas we have, on occasion, cut flowers to the value of £35 !

Of late years it is becoming far easier to grow and force sweet-peas than it was but a short time ago, and this is due to the advent of the early flowering Spencer varieties, the number of which is rapidly increasing. We have throughout this work purposely refrained from specifying by name any varieties of plants we have dealt with on the ground that many introductions so soon become obsolete, and their names would be of no assistance whatever, say, five years hence. Therefore, excellent as are the present set of early-flowering Spencer Sweet-peas, we are not here greatly concerned with their names, but would respectfully refer those interested to the catalogues of any sweet-pea specialists where the best and latest are listed ; but nearly all the colours are represented, and in form and substance they are the equals of the ordinary summer flowering varieties.

The seeds are sown in small 60 pots (3-inch) in late October and germinate on the shelves above chrysanthemums. They remain there until most of the chrysanthemums are cut down

and finished with, when they are potted, without disturbing their roots, into 9-inch pots. Those to whom 9-inch pots are an object to be considered, separate the plants and dibble them singly into conveniently placed rows, and so grow them to the end, but we prefer the pot system ourselves. For one thing, the pot plants flower earlier, and time is the essence of success. For another, we can move pots about if so disposed if they interfere with the tomatoes.

SOIL AND POTTING

The pots must have ample drainage, and though the pea does not ask for nitrogenous manure, a little old cow manure on the crocks has a good mechanical effect in holding moisture where it can do nothing but good. The compost should be a light loam with leaf soil, and sand and crushed bone added. Fill the pots about three-parts full to allow room for top dressing later, and in pressing the soil well down see that it is not rendered hard and impervious.

When the young plants have fairly started they should be supported and encouraged by using some twigs of brushwood until such time as they can be either properly sticked or strung. Though the use of strings immobilises the pots, we are bound to say we prefer them to ordinary pea sticks, because of the extra light and the greater facility in getting amongst them, and also because they are so much neater.

At midwinter great care must be observed in the watering, as the time of year suggests that it is not healthy to make things too wet. Water only when dry, but do not alternate dryness and wetness, or mildew, the greatest enemy to winter peas, will soon make its appearance. Keep the temperature of the house at not more than "temperate" and admit fresh air every day, for nothing is gained by forcing a weak and spindly growth. There is no occasion for excessive haste, for the blooms are not wanted before the beginning of March, at which date we aim for ours to be well in bud. During the ensuing six weeks bunches are cut every day, beginning with very few, but increasing by leaps and bounds as the sunny days come and the plants increase in size. That six weeks

practically exhausts their energies, so that we have little compunction in rooting them up for the benefit of the tomatoes.

It can be seen that the pea gives but little trouble and that quite a modest demand is made upon the heating apparatus. Its floriferousness is proverbial, for the more the flowers are cut the more numerous do they appear to spring into birth. The indoor grown are quite equal to the garden grown in this respect, and it can be recommended to the best consideration of glass-house growers.

CHAPTER VI.

FORCING BULBS

THE growing of cut flowers for market has of late years become a very important branch of our industry. We are not called upon here to put forward and discuss the reasons why its development has been so rapid, obvious though they might be. It is enough for us to accept the accomplished fact and do our share in production.

There are no flowers more welcome or more popular than those of spring-flowering bulbs, generally classed under the heading "Dutch bulbs," even though an important section of them are imported from France; and the reasons why they are grown in such prodigious quantities are: first, because of their popularity and comparative cheapness; and, second, because they are the easiest of all things to grow and to force. Tulips and hyacinths, daffodils, narcissi and freesias are in unlimited demand from Christmas to Easter, and though many broad acres in the Scilly and Channel Islands pour their harvests into our markets, there is yet room for all our forcing houses can produce.

The forcing of bulbs can be done most economically. All their earlier stages are reached under natural conditions and they only occupy valuable hothouse space for a very brief time, so that successive batches follow closely after one another. The one point of importance to remember is that it is worse than useless to introduce them to heat until they have thoroughly established their roots and have made a good start. Any attempt to force top growth when the roots are not sufficiently developed is doomed to failure, utter and irretrievable, for the growths are blind—the flower remains in the heart of the bulb.

HYACINTHS

The Roman Hyacinth is the first to force, and is but a fairy-like miniature of its Dutch brother. It is imported in great quantities from the South of France, and the fields around Marseilles are devoted to their culture. The white variety is the only one worth doing in quantity and is a useful and popular subject

for the florist, who uses it for making up. Its lightness is greatly in its favour, and it finds its place in bouquets and floral designs. The bulbs are only half the size of the Dutch hyacinth, and a 6-inch pot will easily accommodate a half dozen. They reach this country at the beginning of August, and are almost immediately boxed or potted, and stood in the open and covered with ashes.

In boxes the bulbs may be almost touching each other provided there is a sufficient depth of soil in which the roots can run. In less than six weeks the roots will have made considerable headway and top growth will become active, and when the spikes are about an inch high the most forward may be taken into a cool house preparatory for forcing, according to the date at which they are wanted. Bulbs must not be rushed, hence the advisability of having a house in which first to stand them, intermediate between the open air and the forcing house.

Ten days or a fortnight after the first selection has been made, the regular in-taking of relays should be carried on, as nothing is more annoying than a hiatus between the batches when the season has once commenced.

The cultural directions are simple and few. Never allow them to become dry in their growing stage, and also do not let them get into a sodden state. This and a daily syringing are all we need here point out.

The ordinary Dutch hyacinths are massive and columnar compared with the Romans, and are grown early almost exclusively as pot plants. As a cut flower it is at a discount, except that when other flowers are scarce the florist will pick the individual florets and wire them according to his needs. Three or four pips of a good white, wired singly and then together in open order, are quite effective in most designs, but, as stated, the hyacinth is primarily a pot plant when forced. The bulbs are large, and only one can be grown in a 5-inch pot.

When potting, the crown of the bulb should be $\frac{3}{4}$ inch below the level of the rim and just covered with compost. It should be potted firmly. See that the drainage is good, for these soft, fleshy bulbs are very susceptible to the danger of too much moisture, which simply rots them.

The compost used is usually loam, manure, and leaf mould, at least 50 per cent. being the first named. Silver sand is added, and very careful amateur growers see that the bulb rests on a little carpet of this. Carefully crock the pot, fill it about one-third full of the compost, and press well down. Stand the bulbs in the centre and hold it in position while filling in the compost and firming it down with a potting stick. When we use the word "firm" we wish to distinguish from "hard," because when too hard the roots are likely to lift bulb and compost from the pot. Give a good watering, and when well drained plunge the pots in ashes in the open air or in lightless frames, and leave them undisturbed till wanted. This must not be until they are well established and growing.

When they find themselves freed from their coating of ashes and placed in the houses, it helps them considerably if an inverted pot is placed over each, this simple arrangement accelerating the growth of the bloom and the grass. When approaching full growth, the flower spike should be supported by a thin unobtrusive stick, as its soft growth is not strong enough to support the not inconsiderable weight of the head.

TULIPS

Where tulips are grown in quantity they are planted thickly in boxes early in September. A box 15 by 10 by 2½ inches will accommodate from 120 to 144 bulbs, according to variety, which varies in size. The bottoms of the boxes are covered with finely broken crocks, as good drainage is essential. On these a thin layer of manure siftings are placed, and then an inch of compost on which the bulbs are placed in rows, almost touching each other. The soil, shingled between the bulbs, will need pressing home with the fingers, and the whole covered to the depth of ½ inch. Note the difference between the tulip and the hyacinth, for while the latter may have its crown flush with the surface of the soil, the tulip needs burying.

Like other bulbs, it must be stood in the open or some cool place and covered with ashes. Being naturally later than the hyacinth it does not become active so quickly, but the early flowering varieties are ready to start on in December, providing

their roots are healthy and that they have started to grow, so that there only remains the question of a sufficient heat to have them in bloom for Christmas.

When pot plants are required it is not usual to grow them so, but to make up the pots from the boxed stuff what time the flowers are about to open. One can then be certain of having them all in bloom together, which enhances the decorative value of the pot.

In order to induce long stalks the boxes should be stood under the stages or anywhere to exclude the light, but they must not remain there too long or the colours are affected. Some of the Van Thol section would have scarcely any stalk at all if grown in full light and so would be useless for cutting.

The tulip season is fairly long, and the season, which opens with Van Thol, winds up with the Darwin section, the finest of all. These, if forced, must be treated gently and not subjected to high temperature. Where convenient, they ought to be planted *in situ* in a cool house, but as this is not always practicable they can be successfully grown in boxes, which it is advisable to have not less than 3 inches in depth.

We cannot speak too highly of this beautiful flower, but we close on a warning note: it must be well grown if a certain and remunerative sale is to be assured, for we have seen too many on the market of mediocre quality which it has been difficult to sell at any price.

DAFFODILS AND NARCISSI

We have warm words for the tulip, but we have now to deal with what is even more popular—perhaps the most popular of all spring flowers, the daffodil and the narcissi. Not that it is correct to differentiate between them, for they are all narcissi, but merely for the sake of convenience. They are with us in one form or another for a full half of the year, and we can scarcely picture what our gardens would be like without them. So, too, would it be difficult to know what the flower markets would be like in the winter if they happened not to lend themselves so well to forcing, enabling us to keep up a continuous supply from November till March under glass.

In November the Paper White is the first to make its appearance. The earliest bulbs of this variety are, like the Roman Hyacinth, grown in the South of France, those imported from Holland being generally later. In Cornwall and Devon we have seen these flowering freely in the open during November, but in most parts of England it is necessary to finish them under glass.

The bulbs are amongst the largest of the family, and not more than three can be crowded into a 6-inch pot.

The next narcissi in point of earliness is Grand Primo, another polyanthus-flowered variety, white and cream, and this is followed closely by Soliel d'Or. Then the daffodils begin to appear: Obvallaris, Princeps, H. Irving, Golden Spur, Horsfieldi, Barri, Van Sion, Empress, Emperor, keep up the procession for many weeks. Special mention must be made of N. Poeticus Ornatus, the early-flowering pheasant's eye; for this is the prettiest, most useful, and most popular of all. We box 100,000 of these every year, and we are among its comparatively smaller growers. If we had to advise an inexperienced grower we should unhesitatingly urge him to grow as many Poeticus as of all the other varieties put together, looking at it purely from a commercial point of view.

This particular variety needs careful growing. First-sized bulbs only ought to be forced, for they alone produce the first-quality blooms. And in this connection we again venture to repeat ourselves: see that the roots are well developed and the growth active before taking them into heat. We repeat it because it applies with redoubled force to this valuable and most popular of all forcing narcissi.

Practically all the foregoing bulbs require similar treatment, or nearly so. Immediately they are potted or boxed they should be watered, stood on a level bed in the open, and be covered with 2 or 3 inches of ashes. To save this covering and to economise space, some growers stand the boxes one over the other until there is a huge pile, but we cannot recommend this practice, it is fraught with too many dangers—what they are is too obvious to call for comment.

If the months of September and October are hot, as they sometimes are, then the hose should be requisitioned to keep

the ashes moist, but no appreciable watering should wet the soil in the boxes until root action is well set up. The ashes will have prevented the evaporation of the moisture from the original watering, which should suffice to start growth, unless the covering has been insufficient.

The soil used for bulbs need not be rich, but it must be wholesome, clean and porous. Any old soil which has been sweetening for a year, with an admixture of loam and leaf mould, or rotted manure, should prove suitable, but those who grow for exhibition must use a stronger soil. Nitrogenous manure is not absolutely necessary, but crushed bones or bone meal, with a little charcoal, will prove a very valuable food.

It remains, then, to examine the different varieties from time to time, and any which are sufficiently advanced may be commenced upon, steps being taken that regular relays are housed to keep up continuous supplies.

FREESIAS

We saw the freesia catalogued once as "the sweetest flower on earth." The man who wrote that was certainly an enthusiast, and though we would scarcely venture upon such a positive assertion, we can appreciate the spirit that dictated it and admit there is much to be said in agreement. For it is sweet, with a sweetness all its own, and it is equally pretty.

Grown in very large quantities in the sandy districts of Guernsey, and by no means difficult to cultivate in England, we believe that we could, with profit to ourselves, grow more than double the quantities we do. Some people do not appear to succeed with it, but we think perhaps the great secret of its successful culture is the complete and thorough ripening of the bulbs after flowering, which can alone spell success the following season. It is not sufficient that the bulbs should be left to themselves immediately the flowers are cut; rather, they should be treated regularly, let down lightly, ripened by degrees, being placed towards the end where they can be hardened and consolidated by the direct rays of the sun.

We cannot plant freesias in the ground as the Guernsey man does, because our soil is not as his soil, neither is our sunshine

quite as persistent as his. Further, it would not fall in with our routine to grow them that way, so we are constrained to grow them in pots, in pans, or small boxes, using a prepared compost, sandy, porous, and warm. The largest-sized bulbs only are really profitable to force; the smaller sizes, though perhaps of flowering size, are not good enough, but should be planted for growing on to be used the following season. Pot or box them early in August—a 32-size pot will easily take a dozen bulbs—and cover them with ashes. By the middle of September they will be in growth, when, removed from the ashes, they should be stood in sunny frames to gain strength before going into heat. In November take them indoors and stand them either on the shelves or on an open stage where nothing obstructs the light. It is light and heat they now require. Water them carefully and keep them only healthily moist. Whether they are in pots or in boxes, as the grass grows it should be supported with twigs, otherwise it falls over and the plants lose half their vigour. Three or four twigs around a pot with a connecting string will suffice, but for a box a little more elaborate support might be given.

It may be had in bloom throughout December and on till March if taken in relays. The yellow variety is not nearly so popular as the white, as it cannot be put to the same uses.

SPANISH IRIS

The orchid-like flowers of this bulbous plant are well known and in considerable demand. It is boxed and grown very much as the tulip is grown, though their seasons do not synchronise. The Spanish Iris is really an early summer flowering plant, so cannot be expected to prove as precocious as the true spring flowering bulbs. It does not force well in the ordinary sense of the word, being impatient of too much heat, but gently helped in a temperature of, say, 55°, it may be had in bloom a month or five weeks earlier than those growing naturally in the open. We said it is "boxed" and grown. That is our practice, but others plant them in the ground in tomato houses in such a way that the planting of the tomatoes is not greatly interfered with. We are not enamoured of the system, neither

do we condemn it or deny that their cultivation, so planted, is profitable, but we would prefer to place no handicap on our tomatoes or adopt any system that would deprive us of the full and unfettered use of the whole of the soil in which we grow them.

The Spanish Iris (*Iris hispanica*) is very inexpensive to buy, and market growers find they can afford to scrap their bulbs and buy a new stock every year. Yet the flowers usually fetch a good price if of the correct colours. Cultivation is comparatively simple. Being boxed, they are covered with ashes, and follow the usual routine, but they are not taken indoors till the days of early spring. Thus they do not clash with the other bulbs.

GLADIOLI COLVILLII

The bulbs of this hardy gladioli are about the size of a crocus bulb; the flowers are produced in long slender sprays of the most approved fashion. It is another of those bulbs of which we could not grow too many, yet it is not taken up very widely. The white variety (*Alba*) is the only one worth taking up on a large scale, and this pays very well as a rule, the sprays being ready sellers. They should be boxed in August or September, covered for a time, and when started, put into a temperate house. When the growths are 2 inches high they might be taken to a warmer house, not too warm, and if attended to in the matter of watering, and perhaps feeding, should bloom from mid-March onward.

Sandy loamy soil suits them, with a little superphosphate added. When indoors they should, like the freesias, be placed in the full light and near to the glass. The foliage will probably need some supporting, but if well grown it is sturdier and stronger than that of the freesia.

After the period of bloom is over, the bulbs must be thoroughly ripened, not neglected, and when quite dry, stored away for planting again in August. The red variety is worth growing, but only in moderate quantity, the treatment and the season being identical with the whites. The salmon-coloured variety will grow in popularity, and should be tried.

CHAPTER VII.

“ LIFTED ” CHRYSANTHEMUMS

FROM October till January the chrysanthemum reigns supreme. Of that there can be no doubt. It comes into the scheme of special glasshouse crops, but we are not here going to treat of it as a pot plant, but as being grown in the open ground throughout the summer and “lifted” into the greenhouses on the approach of frosty weather in October. As a pot plant it will be duly dealt with in a later volume of this work.

The method we are going now to describe is a much more economical way of producing quantities of cut flowers than cultivating them in pots. This latter is too expensive for market work, and current prices demand their production in great quantities at the least possible cost and with the rigid economy of space and labour.

It is not every variety that can adapt itself to this method of culture, and the grower must make his selection from proved varieties. There is no scarcity of these, and new ones are added to them every year. This selection should be limited in number, it being a better policy to grow large quantities of a few leading varieties rather than many varieties in reduced quantities.

The young plants should be propagated and brought on as described in Vol. I, and should be hardened off in pots or boxes in readiness for planting immediately after mid-April. The ground should be dug deeply and manured, the soil open, warm and well drained, so that the young plants may find a congenial and comfortable root run. A good workable distance at which to plant is 1 foot from plant to plant and 2 feet from row to row, except in the case of strong growing varieties, like *Source d'Or*, which requires 18 inches from plant to plant.

Their general cultivation is not exacting if the soil is good, for it consists only of frequent hoeing and sticking, tying and disbudding, with a thinning out of the growths of some of the densely growing sorts.

In a dry summer recourse must be had to watering, and this might be with liquid manure after the buds have formed and been “taken.” For the chrysanthemum is a gross feeder; it amply repays a mulch at least once during the growing season, but not during its earlier stages. No one wants to throw a lot of strength into the foliage, for when that is done the flower bud is starved, and we have often seen this result from feeding too soon. (See Fig. 12.)

The operation of disbudding may begin in August and,

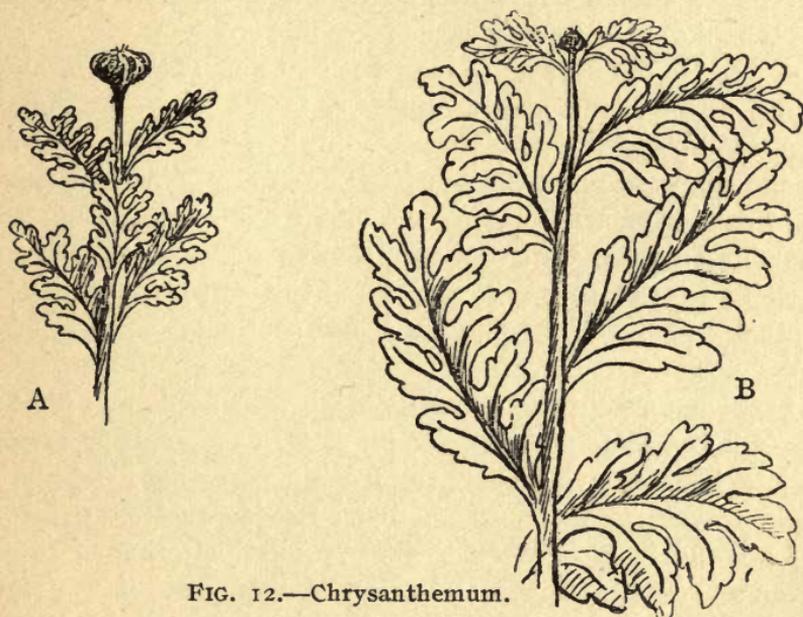


FIG. 12.—Chrysanthemum.

A. Normal B. Results of Overfeeding

according to variety, go on till, and even after, the time for housing. Some of the latest flowering varieties do not develop their buds before the end of October or the beginning of November, but whenever it is done the operator must determine whether to disbud for specimens, half specimens, or sprays. So, too, with the thinning out of the growths. Not more than three of the strongest growths must be retained if “specimen” blooms are required. For “half specimens,” six or even eight may be carried on, while for sprays, the number should be limited to six. If a plant was allowed to carry all its growths,

a great many of the varieties would suffer badly in the quality of its blooms—hence it becomes necessary at an early stage in the growth of the plants to go over them with a knife and remove all superfluous shoots.

We will assume that it is now autumn. Michaelmas Day has passed and gone, and the time for early frosts is upon us. The houses to which the chrysanthemums have to be transferred must be cleared and cleaned, making sacrifice, if need be, of the tomatoes or cucumbers still unfinished. It would be very unwise to expose the whole chrysanthemum crop to disaster for the sake of the tailings of the preceding crops.

A week or ten days ago a man was sent among the chrysanthemums with a spade, and his duty was to cut deeply around each plant, completely severing the spreading roots, and by a movement of the spade to press the soil back upon the plant and leave a solid square mass. Leaving the under roots to carry on with, the plants scarcely felt this operation as a check, but it left the roots in a far better position to stand the transplanting, for new roots are already fastening upon and consolidating the pressed soil.

In lifting, we cut the under roots with the spade and raise the whole body, roots and soil, careful as far as possible to preserve it intact. Barrowing them, and again carefully handling, we replant them in the inside borders, leaving just a little space for air and light between them. A good watering is at once given to consolidate the earth around them, and if the sun is bright and hot a partial shading is given for three days. Only a little air is admitted during that short period, but directly we find that the roots are beginning to move the ventilators are thrown wide open by day and only partly closed at night. It is the aim of the 'mum grower to retard his flowers as long as possible, for as a rule the later they are the more they increase in value.

It is not merely for the purpose of opening their flowers secure from frost that these chrysanthemums are housed, but **to complete their growth**, therefore they must be encouraged to establish themselves and feel quite at home in their new quarters, and this they can never do if they are dumped in as thickly

as possible and sometimes swamped, at others dust dry. They are not to be treated as mere temporary tenants, but as nearly as possible should have reproduced for them the ideal conditions under which they had flourished out of doors. We have again and again seen 'mums lifted from the open without any soil attaching to the roots, crowded into the houses, and within a fortnight the foliage has all been dead. Nothing was left to feed the bloom, and when it opened it was of the poorest quality, and the stalks were little better than dead sticks. What kind of market could such flowers command ?

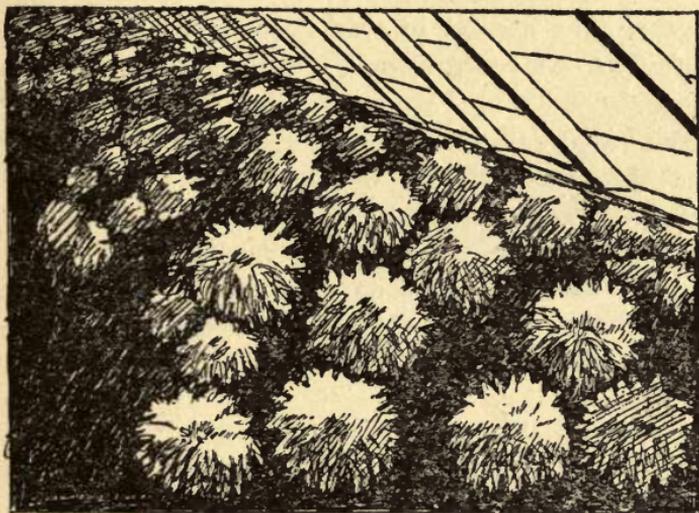


FIG. 13.—“Lifted” Chrysanthemum
Madame R. Oberthur, at Christmas

The value of the bloom is doubled and trebled if the stalk is long and furnished with good, healthy foliage, and this cannot be if the plants are crowded or dry. Where light cannot penetrate there can be no green leaves, hence the need of allowing a little space between the plants. Foliage is often killed through the carelessness of the person watering them, for if water is constantly poured in to the plant through the leaves, they will turn black, just as the lower leaves of a pot chrysanthemum turn black through the same cause. No, the watering pot must be one with a long spout, which must be inserted beneath, and not through, the foliage.

The houses now filled with plants should not be regularly heated until wintry weather demands it. Occasionally the fires might be started if it is foggy and wet, for damp is more injurious to the bloom than any but the sharpest frost, and the manipulation of the ventilators can only counteract it up to a certain point. Beyond this occasional firing, we have frequently gone some way into December before regularly heating the houses, and even then we keep to a moderate temperature with the ventilators still open. If the heat is too great the flowers prematurely burst open, and lose much of their substance and of their lasting qualities. There exists no solid reason why chrysanthemums housed in this way should be anything but little inferior to the pot-grown plants—it is all a matter of careful treatment.

Grown in accordance with the foregoing, the cost of production is remarkably small, our own estimate being at least 50 per cent. in their favour as compared with those grown in pots. It is this low cost of production which has fostered and built up the popular demand for it as cut flowers, by bringing them within reach of myriads who are ready to gratify their tastes so long as they are realisable within the limits of their means.

CHAPTER VIII.

CATCH CROPS

SMALL things are not to be despised—we cannot afford to overlook them. An enterprising and energetic man may thrive where a more lethargic but equally skilled man may fail, and this success will probably be owing to the fact that, if he was a market nurseryman, he appreciated the value of “catch” or “interim” crops and exploited them to the utmost.

Two growers were discussing the point of whether it was worth while growing a catch crop of mustard and cress in a large tomato house, the planting of which could not take place for a month. One, by far the more experienced of the two, held that “the game was not worth the candle,” because it involved a lot of labour and could only yield meagre returns. The other, almost a novice, who was the proprietor of the house in question, thought differently, and as he had something to gain and nothing to lose, he had the courage of his convictions and determined to act accordingly. He therefore removed a few arums and chrysanthemums out of the house, dug the borders, sowed the seed, and sold the crop, realising over £70 at a total cost of £20. That was sufficient justification, and goes to show what an enterprising man will do, that a less enterprising man would leave undone.

This matter of catch crops is, then, worth looking into.

Having decided that, the first consideration is that the selection of subjects must be subservient to the general routine and consist of such crops as will not interfere with it. In the above instance the course was comparatively clear. Chrysanthemums and arums had followed tomatoes, both of which were apparently finished. The house was empty, but catch crops are not taken exclusively from empty houses, some of those permanently cropped offering facilities not to be despised.

From a purely cultural point of view we ought to discourage the growing of any other crop in association with peaches or vines, both of which, to reach highest excellence, should be

grown alone, but some little risks are justifiable to expedience provided the results are sufficient set-off against the premium. We have ourselves consistently accepted such risks. We have almost filled the border in a peach house every December with large clumps of helleborus, denuded of nearly all their foliage, and these occupied the space for from six to eight weeks. During that time they were occasionally sprinkled, but never watered.

Along the edge of the same border we have grown a row of French beans, year after year, sowing them in March when the house was first heated, and finishing them off in June. The treatment necessary to keep the red spider from the peaches served also to keep the beans clean, so that no harm was done that way. At times we have packed the house with boxes of ornatus and daffodils, and though this occupied space but for a short time, it was a more than justifiable use of the house in its results.

In a late vinery we once ventured to grow potatoes, but relinquished that because although the cultivation of the border benefited the vines, we found it impossible to lift the potatoes without damage to the roots at the most critical time of their work. One year we grew a row of green peas in the same vinery, but were warned off this by mildew. We now make use of it first for boxes of tulips and then for boxes of Spanish iris, neither of which stand there for a longer period than six weeks.

One other crop has done well with us in this late vinery, and that is one of Malmaison carnations, for which we rigged up a temporary stage. The vinery is lofty and the conditions appeared to suit the carnation to perfection.

The early vineries have likewise been used to bring forward bulbs, strawberries, ferns, lilioms, arums, rhubarb, seakale, and mustard and cress, so far as we could discover without any detriment to the vines and certainly with advantage to the exchequer. That being so, we cannot lightly condemn practices which we follow ourselves and which we have proved to be profitable. Practical experience has proved them to be at times necessary to the carrying on of the business, for there have been times when upkeep has depended upon the ready money these catch crops brought in.

It may not therefore be out of place if we devote a little space to more particular remarks concerning the culture of these catch crops, and after what we have already said there need be no apology for so doing.

WINTER LETTUCE

The demand for this succulent salad is steady throughout the winter and many thousands are grown in frames. Our markets are always open to take all that can be grown, even though the French growers send over large and regular consignments. We have occasionally taken perfectly satisfactory crops from houses and so have no hesitation whatever in recommending it as a fairly profitable line for those who have the conveniences for growing them indoors.

The variety to grow for the purpose is the dwarf French cabbage lettuce, and this is raised from seeds sown either late in August or early in September. If sown earlier it will probably "bolt." After the remnants of the summer crop of tomatoes or cucumbers have been cleared and the house cleaned down, the borders must be well dug and levelled. If dry, they should be well watered previous to the digging. Then the soil should be lightly trodden and the plants inserted with a dibble in rows, 6 inches from plant to plant and 12 inches from row to row. There must be no question of forcing; indeed, we can scarcely conceive anyone using a heated house for this purpose.

Only if the autumn is dry and hot are the borders likely to need watering, but with occasional sprinklings the soil should be kept healthily moist and warm. The free use of the syringe on a bright day will help to keep down the green fly which prey more readily on the lettuce than on any other salad. Air must circulate freely, and even in frosty weather this must be attended to, though the amount would be modified. This will prevent the leaves from damping off, a thing they are very prone to do if the air is moist and stagnant. Keep the soil well stirred with the hoe, for nothing promotes healthier growth than this. Watch well for slugs, giving a look round for them by candle light if need be, and dust a little soot over the surface of the border between the plants.

From plants put in during October we have been able to pull an appreciable quantity for Christmas, and almost invariably the whole stock was cleared out during January. When ready for market pull them up by the root and pack in light shallows.

ENDIVE

Except for blanching the leaves, endive calls for practically the same treatment as the lettuce, which it so closely resembles. It is such a hardy plant that during a mild winter a regular supply can be obtained from the open air. We cannot, however, trust to that, and so are almost obliged to grow them under cover. When the winter is a hard one, the price of endive makes it quite a profitable proposition, and taking the years on an average, it probably is more profitable than lettuce, though less in demand.

The blanching of the leaves must be attended to. Hold the leaves together with one hand while with the other you draw dry earth around them, then cover with pieces of board or slates, saucers or even inverted pots. If grown on a large scale wooden troughs may be made to invert over them, and this method may effect a great saving of time.

RADISHES

A high-roofed house is not suitable for radishes, for if too far from the light they will develop thick necks and a head of foliage instead of forming bulb. Dig the borders as for lettuce, and make the soil moderately firm by treading. Rake the soil well to make an even seed bed, for the radish is rather particular about this when grown inside. This should be somewhere from the middle of October to the middle of November.

Sow the seeds broadcast, but regularly and thinly. Should the soil be dry, water with a rose after sowing. Germination will take place in a few days if the weather is mild and open, but directly that takes place it is most important that the ventilators should be opened every day. If the seeds come up too thickly in any place, thin them out as speedily as possible, for without ample room there will be no radish to pull.

Light, air and moisture are necessary to produce young, fleshy radishes, and we have never known a satisfactory crop produced without these. Fairly treated, it is a quick crop, and when we have grown them we could always take two crops between October and March.

MINT

The forcing of mint is not so systematically taken up as it might be, and is too often looked upon as a negligible quantity. This should not be, for young green mint is always saleable. Except during its natural season of growth it realises comparatively high prices, and the few growers who do it in quantity seldom have cause for complaint.

To obtain the best results this herb should at the beginning receive more consideration than it does, the aim being to produce strong roots, for none but these should be taken indoors. But perhaps we should describe our own method, which we have proved successful, though it differs somewhat from the ordinary. In March we lift enough roots to fill about 100 boxes and plant them in 3 inches of soil, the boxes being fairly stout. These boxes are stood on ashes in partial shade throughout the summer and watered and syringed every day in dry weather. Nothing is cut from them during the whole time, but after the tops have dried they are cut off, the boxes weeded, and they are ready for carrying indoors at any time.

For cutting at Christmas, we introduce them to a warm house about December 1st, and being well established, with all the summer reserves of strength to work upon, they start growing both strongly and quickly, especially if compared with newly boxed or planted stuff. Although we introduce them in relays, it is several weeks before any box can be said to be exhausted, but when it is we put it out, and if necessary save the best of the roots for making new beds in the open.

The green spear mint is the only one worth forcing. It does best in a moderately light soil, loves moisture and heat, but is a victim to red spider if once it is allowed to get the upper hand. But that will not be unless the syringe is permitted to lie idle on the shelf.

ASPARAGUS

To grow good stout heads of asparagus and get them on the market by the end of February is not a difficult proposition if there is a supply of good four-year or five-year-old roots, a stout stage in a warm greenhouse and suitable soil. The roots themselves must be fleshy and full of vitality and not have been forced before. If they are older roots they are not quite so good and must have been allowed two years' natural growth since their previous forcing.

The roots are best grown at home—they are too expensive to buy in the right quality—and this can be done without the expense and labour involved in making the ordinary asparagus bed. Two years from the seed, the roots may be planted in well-worked soil very much as though they were potatoes, except that they need be no more than 6 inches from root to root. Left there and cultivated, encouraged by frequent hoeing, and leaving their growths intact to conserve their energy, they are capable of making in two years roots that are fit for anything. These are the right age for being forced, and capable of throwing up thicker growths than they will at any later time.

Prepare the stage by placing an inch of leaf soil evenly over it and covering these with a layer of sand or sandy soil. Sea sand will do if conveniently to be had. In lifting the roots, be careful not to injure the crown—then place them closely on the sand or soil. Cover with about 3 inches of light soil, pressing it down between and around the roots with the fingers. The point is to see that the crown is 2 inches below the surface of the soil. If 3 inches of soil appears too heavy for the stage to safely carry, use only 1 inch soil and cover with half-decayed leaves. Sprinkle well, but avoid overwatering, as while they are dormant the roots easily rot if too wet.

If it is found desirable to bleach the stalk, additional leaves or fibre may be used, but we generally find that the depth recommended is sufficient. Do not keep cutting until the plant has exhausted all its energy, but leave it with sufficient to make it worth while planting out, for at some future time it can again be brought into use, when it will be but little inferior to this, its first forcing time.

SEAKALE

This succulent vegetable is held in great esteem by many people, and is as simple to grow as rhubarb. It is a very satisfactory subject for forcing. It is another of those roots the grower must raise for himself, otherwise his profits would be problematical. It is easily raised from cuttings which are made from sections of the roots cut about 4 inches long, cut level at the top and with a long slant at the bottom. These are made in the autumn, heeled in during the winter in boxes of earth or sand, and upon starting in the spring are put into nursery rows, a simple and inexpensive operation.

At two or three years old they are large enough for forcing, when they are lifted, shortened to about 1 foot, and put in deep pots or boxes, the crowns being about level with the soil. When brought into heat the light is kept from them by the use of inverted pots or boxes, or as an alternative, a thick layer of ashes. It may be had ready for sale in November, the sale for it then being slow, but as soon as Brussels sprouts are gone, or when frost has put a stop to other greenstuff, then the demand for, and the price of, seakale soars.

Because it is so easy of propagation we scarcely think it worth our while to save the old roots, but others may find them useful for permanently planting, where in time they will yield a plentiful crop of "sticks" in the open ground if covered in the usual way.

POTATOES

As we suggested earlier, potatoes can be grown in vineries planted on the borders, but this is not to be recommended. We therefore bar that method of growing them. But we can, from satisfactory practical experience, advocate their culture in pots and in boxes and in warm pits. The pots or boxes must be not far removed from the glass, so we have grown ours on shelves especially rigged up.

If it is expected to lift $1\frac{1}{2}$ lb. or 2 lb. from each plant (and nothing less pays) they must not be forced too quickly, and the temperature should be about 55° , except the natural rise caused by the sun, which will sometimes be at 70° .

The seed tubers are put in the warm to sprout some time in December. In January they are ready for planting, one "set" to a pot or box. The soil must be retentive of heat and of moisture, but with a good drainage to carry away all that is superfluous.

When the young plants are pushing up, steps must be taken to induce strong rather than rapid growth, and a little fresh air daily will conduce to that. New "earthing-up" soil will be added as growth proceeds, for which space will have been reserved at time of planting. Whatever is possible in the way of providing the outside conditions of May and bringing them to bear in the greenhouse in February should be attempted, and these conditions are moderate warmth, moisture, light, and a genial air. Can these be reproduced? We say yes, by means of the fire-heat, the syringe, and the ventilators.

It will be found that the tops will grow too rapidly to support themselves in an upright position and will gradually fall over the pots or the boxes, but that matters little so long as they remain healthy and active. It is, however, always well to select a dwarf growing variety for forcing.

There need be no fear of disease under the spring-like conditions we have secured, and if the treatment has been what it should, every pot and every box should be pregnant with 2 lb. weight of fine shiny, clear-skinned tubers, without a mark upon them, and ready for lifting by Lady Day. Their cultivation in pits is a matter of routine and need not be described here, as it is not a catch crop in our sense of the word.

FRENCH BEANS

As an alternative main crop to cucumbers, the climbing French bean is in considerable favour with many growers. It is also sometimes used as an "interim" crop if the cucumber crop has given out before its time. But it is the dwarf bean that is principally used for a catch crop, and which we have many times used ourselves. We have grown it along the edge of the early peach border, also in pots or boxes in the vinery or elsewhere, and have nearly always had satisfactory results. One point in its favour is that it does its work quickly.

It is a mistake to sow the seed too thickly, for along the border there should be 4 inches between the plants, and not more than three plants should be put in an 8-inch pot. It likes moisture at the root and at the head, thriving in a humid atmosphere where it may be syringed twice a day.

We do not recommend sowing too early in the season for ordinary purposes, because the crop would be so very much lighter and the prices not very much apart. March is early enough, and if sown at the beginning of the month the first beans should be ready late in April. As an 8-inch pot with three plants would not yield more than 1 lb. of beans, it would be unprofitable to grow them unless they realised 2s. per lb. The price, however, is usually in excess of that.

MUSTARD AND CRESS

We must not despise this popular old salad and consider it too insignificant for us to notice; because, if there is a local market for it, there is no salad which pays better for the growing. A crop can be grown and cleared within a fortnight of sowing, and this, repeated half a dozen times, amounts to a considerable sum if done on a fairly large scale.

It may be forced on beds or in boxes, and though it involves more labour, we prefer the latter because it is cleaner and easier to clear out for re-sowing.

Fill the boxes, after draining them, with moderately good soil and press down firmly and evenly with a flat piece of wood. Then water well. After the water has well drained away sow the seed thickly, but do not cover with soil. Stand it where it has to be grown and darken for three days, by which time, if the heat is sufficient, the seeds will have germinated. Remove the coverings and sprinkle. In less than another week the crop may be cut.

STRAWBERRIES

The strawberry is a fine "catch crop" fruit if there are any vacant shelves or any spare piece of staging where it may be grown without taking up space wanted for regular crops. Still, there is, in our opinion, more glamour than profit about it.

It may or it may not pay well. To grow it for certain profit, it should be made a main or routine crop of, so that sufficient quantities may be produced to make it worth while sending to market. As a "catch crop," grown in odd places, all that can be looked for is two or three punnets at a time which sell at fancy prices. But after all said and done, there is no reason why a grower should not make a £5 note for himself with little trouble.

For forcing, the young runners, from maidens, should be pegged down into small pots early in July. At the end of August they should be lifted, and without disturbing the roots, potted into 6-inch pots and stood on a bed of ashes in the full sunshine. Water and syringe to keep off red spider and nip off any incipient runners. Every plant will, so grown, make a good crown, strong enough to produce a really fine truss of bloom, after which the fruit comes as a matter of course with proper care.

When sharp weather comes, they should be stowed in frames or a cold house until time to take them in to heat, which probably will not be till the beginning of February. Then they must be set on shelves near the glass, to enjoy the full benefit of the light. Soon the crowns burst, new leaves and afterwards the bloom appears, and, setting, forms the fruit. A sharp look-out must be kept for that omnipotent enemy the red spider, which can only be kept in check by the syringe.

Support must be given to the truss, and as the fruit swells a watering with liquid manure or a dressing of a suitable fertiliser will materially assist it. The plants must never want for water or the swelling of the fruit will be checked and a poor sample of fruit the result. Ordinarily, half a dozen medium-sized fruit from each plant constitutes a crop.

Directly the crop on any plant is finished, it may be consigned to the rubbish heap, for if kept in the house and neglected, red spider will find it and make of it a home.

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