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Illustrated

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Tomato Culture for Amateurs.

A GUIDE TO ITS SUCCESSFUL CULTIVATION
UNDER GLASS AND IN THE OPEN AIR. . .

By B. C. RAVENSCROFT

(Author of "*Carnation Culture for Amateurs*," "*Greenhouse Construction and Heating*," &c.).


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PREFACE.

IN the list of economic horticultural products the Tomato holds an almost unique position. Having leaped—so to speak—into popular favour and demand at a single bound, comparatively little time for gaining experience of its character and cultivation has been afforded. Without doubt, therefore, the nature and requirements of the plant have so far been very imperfectly understood; and it is with the object of diffusing a wider and more correct knowledge of the peculiarities of, and treatment proper to, this now highly important fruit-vegetable, that this little work has been written. It is not perfect—nothing sublunary is; but the contents of its pages are, at any rate, the result of practical experience and close personal observation. I trust that the work may fulfil its mission, and enable the amateur or professional Tomato-grower to secure better results in the future than have been obtained in the past. If this object be accomplished, I shall rest satisfied that my labour has not been in vain.

B. C. RAVENSCROFT.

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TOMATO CULTURE FOR AMATEURS.

CHAPTER I.

INTRODUCTION.

Origin of the Tomato.—In common with most other members of the large *Solanum* family, the Tomato is a native of America, and probably originated in Peru, where it is found plentifully growing wild by the seashore. It is now also found in a wild state in Brazil, and also on the coast of Mexico and the Western States nearly as far north as California; but here it is supposed to have escaped from gardens and become naturalised. That it came originally from Peru is evident from the names of *Mala peruviana*, *Pomi del Peru*, &c., by which it is mentioned in the works of old horticultural writers.

It seems to be uncertain at what date the Tomato was introduced into this country; but an old number of the "Transactions of the Horticultural Society" mentions that some plants grown in 1818 averaged about 20lb. of fruit per plant, and some as much as 40lb., so that its cultivation in this country probably dates from the latter part of the eighteenth century.

Value of the Tomato.—Probably no other vegetable production has ever made such rapid and wonderful strides in popular favour and demand as the Tomato, or from a position of entire insignificance attained one of so much importance in so short a time. But a very few years ago, the fruit was practically unknown to the general public, and plants were only to be found in a few private gardens, where, as a rule, they were grown more for curiosity or ornament than for actual use. Now the demand is almost unlimited, and immensely as the production, in this country alone, has increased during the last few years, the consumption has quite kept pace with it. However, in some seasons the supply has been simply enormous and altogether unprecedented. As a natural consequence, at such times prices of both home-grown and foreign fruit have fallen to a lower point than had been known previously, and in too many cases an unremunerative one as well, so that it may fairly

be said that the climax has been reached at last. But in a matter of this kind the laws of supply and demand invariably adjust themselves sooner or later, and I do not by any means intend to imply that the growth of the Tomato is, or is likely soon to be, on the wane—far from it; the probability is that it will continue to increase for some time to come.

The importance of the subject is unquestionable; for, not to mention the produce of amateur and private growers, there are now few nurseries in which the Tomato is not grown to a greater or lesser extent; while in some parts of the country, extensive ranges of glass are wholly devoted to the culture of this popular and eminently wholesome fruit, the entire produce finding for the most part a ready sale, at good, if not highly remunerative, prices. Beyond this, many thousands of tons are annually imported from France and elsewhere, while another not inconsiderable source of supply are the Channel Islands, where numbers of large establishments for the cultivation of this and a few similar products under glass are to be found for the most part in a flourishing condition. This Jersey or Guernsey fruit, though grown under glass, and otherwise of a superior quality, is, however, somewhat inferior to good home-grown samples when placed on our markets, partly on account of the fruit having to be gathered before

it is quite ripe, and partly as a result of the journey by sea and rail. The French and other "foreign" fruit is even inferior to that of the Channel Islands, and from very much the same causes intensified; though, as regards quality, there has been a very decided improvement recently. Owing to the low price at which it is retailed, however (often as little as 1d. or 1½d. per lb.), it not only sells readily, but of course goes to swell the available supply and reduce the average price.

Though, as we have seen, a highly important industry, and one that will probably become a still larger, if not a more profitable, one in the future, it is at the same time a comparatively new one, and the cultivation of the plant, therefore, is perhaps not quite as perfectly understood as it might or should be. Though a decidedly vigorous subject under suitable conditions, the Tomato requires somewhat peculiar treatment to insure the best results; in fact, its proper management differs considerably from that of almost any other plant, while its unfortunate liability to several destructive forms of disease renders it a still more difficult crop with which to deal with any degree of certainty. Therefore, it is not surprising that many who are excellent growers of other things should, in many cases, either fail altogether, or obtain but indifferent results with Tomatoes, and thus find the crop

an unprofitable one—at any rate, until they have grasped the nature and requirements of the plant. Many successes have of course been accomplished by chance, as it were, and under only ordinary “rule of thumb” culture good results may be, and often are, obtained; but it is when anything goes wrong and a failure occurs that the want of knowledge is felt. What might have been a good crop has many a time been lost for want of a little good advice, or a few simple precautions taken in time.

Productiveness of the Tomato.—I have been frequently asked the question, “What weight of fruit may I expect from a given number of plants?” Now, like a great many other things in gardening, this depends upon circumstances to so great an extent, that an exact, or even definite, answer is almost impossible. If set out in good time, say in April, under glass, plants of a good variety, well cultivated, and trained on the single stem system, ought to yield at least from 5lb. to 10lb. of fruit apiece by the end of the season, if a fairly favourable one. More than this would be a good crop, and less would be counted a poor one; but a great deal depends not only upon the variety grown, and the skill of the grower, but upon the character of the season, the length of time the plants remain in bearing condition (and the longer the better, of course), the nature of the soil, and—what is very

important—the situation and local climate; for the more free light and direct sunshine the plants receive, the heavier will the crop be, *pari passu*, and I fancy that the results are never so good as when the plants are within smell, if not sight, of the “salt sea waves.” As much as 20lb. to 25lb. of fruit per plant is occasionally obtained by a very skilful grower, under favourable conditions, but such a heavy yield as this is quite the exception. A still greater weight of fruit per plant is, of course, obtainable by the extension or many-stemmed principle, but then these require more room, and there is no *pro rata* gain.

The quality of the water employed is a very important point in the successful culture of the Tomato, and many otherwise unaccountable failures may be traced to the use of an impure supply. Rain-water is always safe and good, of course, but that from a well or spring, if containing a high percentage of certain mineral matters—certain forms of lime, iron, &c., especially—is very injurious, and should be avoided.

CHAPTER II,

PROPAGATION.

From Seed.—Seed-sowing affords the readiest and, under ordinary circumstances, the best means of obtaining a stock of Tomato plants; and though in some cases cuttings are made use of, by far the greater number of plants grown are raised from seed. There is of course always a certain amount of variation among seedlings, but if the seed is carefully saved, as it should be, from selected plants, isolated as far as possible from other varieties, there will be but very few departures from the type; in short, the plants may be said to come practically true from seed. This method will therefore be considered first, premising that some seed of a really dependable character has been secured, for plenty of almost worthless Tomato seed is sold every year, and one cannot be too careful as to the source from which one's stock is obtained. The labour and trouble bestowed upon inferior seed is to a great extent

thrown away. Seedling plants, as a rule, possess more vigour than those raised from cuttings, and are nearly, if not quite, as fruitful, and should therefore, as a rule, receive the preference.

The proper time for sowing the seed depends, first, upon when ripe fruit is required, and secondly, upon the conveniences that exist for raising the plants and growing them on. With a good steady heat of 60deg. to 65deg., or certainly never less than 55deg., at command, such as that of a propagating-house or pit, a stove, or the like, a start may be made soon after Christmas—that is, where the air is pure and light abundant; but in or near large towns nothing is gained by sowing until towards the end of January. In the absence of any higher temperature than that of a greenhouse, or without plenty of room to keep the plants moving on properly, and to plant them out or get them into the fruiting-pots as soon as they are ready, it will be useless to sow before the end of February, or early part of March, and even then the seed ought to have a little extra warmth to start it.

The seed may be raised in an ordinary hot-bed-frame at any convenient time, and the plants removed to the greenhouse when a little advanced; but I do not consider this a good plan, both heat and moisture being apt to be excessive in hotbeds formed of manure, &c.; still, it may

be managed with care. The intending grower must be guided to a great extent by circumstances in matters of this kind, doing the best he can with the means at his disposal. Suffice it to say that seed sown during the first week in January will produce plants that, under favourable conditions, will commence fruiting towards the end of April, or in the early part of May. That started a month later should yield ripe fruit towards the end of May (all under glass, of course); and if not sown until March, fruit cannot be expected before the middle of June at the earliest. As the season advances, the progress becomes more rapid, but, as a rule, fruit cannot be looked for in much less than four months from the time of sowing the seed, though a great deal naturally depends upon the amount of heat available, the skill of the cultivator, the amount of sunshine experienced, and so forth.

For very early fruiting, seed may be sown in good time in the autumn—from the middle to the end of September being perhaps the best time. Sow in a gentle heat, and grow the plants on with moderate ventilation, near the glass, to keep them sturdy, and in a genial temperature. Get them into 3in. pots as soon as possible, and in these they will winter well in a light house at 45deg. to 55deg. or 60deg. If placed in the fruiting-pots

about the turn of the year, or very shortly afterwards, and well attended to, they should commence fruiting some time in March or April.

In every case the seed should be sown thinly in well-drained pots, pans, or boxes of light, rich soil. I usually employ the shallow boxes so largely used by market-growers, and known as "propagating-trays," which run about 14in. by 10in. and 2in. deep, placing a thin layer of rough, fresh coal-ashes or burnt ballast in the bottom, then a little spent hops or rough siftings, and fill up with a mixture of equal parts of loam and leaf-mould run through a $\frac{1}{2}$ in. sieve, with a little cocconut-fibre to insure porosity, and a good dash of coarse sand. If only a few plants are required, sow in 5in. or 6in. pots, placing from twenty to fifty seeds of one variety in each. These must be filled nearly half-full of drainage, with a little hops or rough stuff over, and then 2in. or 3in. of soil, as above. Press the soil gently together, and cover the seed with about an eighth of an inch of fine light soil.

If possible, plunge the pots, pans, or boxes, in a hotbed of 65deg. to 70deg., with top heat of 5deg. less; but the seed will germinate just as well, though somewhat more slowly, if placed in any house or pit where a temperature of not less than 60deg. is maintained; 55deg. at night occasionally will not hurt the young plants, but

60deg. should be taken as the minimum. Directly the seedlings appear, place them on a shelf near the glass, so as to keep them as short and sturdy as possible from the first. As soon as one pair of proper or "rough" leaves (other than the cotyledons or seed-leaves) have been formed, lift the little plants carefully, and prick them out 2in. or 3in. apart (sinking them a good deal deeper than they were before, or nearly up to the seed-leaves) in boxes prepared as directed for sowing the seed, but preferably a little deeper; or they may be placed singly in small pots 2½in. to 3in. in diameter (small "sixties"). Theoretically, the latter plan would be the best; but in practice I find the plants to grow quite as well, and more quickly, in the boxes, as well as requiring less trouble in watering, &c., therefore give the first method the preference. Still maintain a genial temperature, with a nice moist and growing, but by no means saturated, atmosphere. Keep the plants as near the glass as possible, give all the room you can (if in pots), and never let them become really dry at the roots, though the foliage should be dry for a considerable part of each day.

When fit, give the plants in the 3in. pots a shift into the 5in. size ("forty-eights"), taking care to do this before they get into anything like a pot-bound condition; and as soon as those in the boxes begin to touch each other,

they should be carefully lifted and placed singly in 3½ in. pots (large "sixties") or the 4 in. size ("fifty-fours"), from which they may be again shifted subsequently into 6 in. pots ("thirty-twos"), or, all being in readiness, be planted out directly from the smaller size. For this potting a somewhat stronger soil should be used—say three or four parts (according to quality) of good loam to one of leaf-soil or very old flaky hotbed manure and a little sand. Drain moderately, put a small handful of half-decayed spent hops over the crocks, and pot fairly firm. From any of the sizes referred to (viz., the 4 in., 5 in., or 6 in.) the plants may be set or planted out, preferring the larger sizes, but bearing in mind that in a suitable temperature they will grow faster after being planted out than in the pots. If a cold or unheated house only is available—in which case it will generally not be safe to plant before the beginning of May, or last few days of April at the earliest—or if from any cause the permanent quarters are not ready, the plants should be shifted into larger pots and kept growing on in a sturdy manner. In such cases, a few doses of liquid manure of some kind will be found useful in maintaining the vigour of the plants.

In all cases avoid starving the young plants into blossom in small pots, as some recommend.

The practice is a thoroughly bad one, and the fact is that they cannot be grown too strongly (in reason), so long as the growth made is properly solidified by full exposure to all the light and sunshine available, with a free yet judicious admission of air according to the weather outside, and sufficient room to allow the plants to stand clear of each other. Plants that are placed too closely together, or are grown at a distance from the glass, or in a high temperature and close atmosphere, are certain to become drawn and weak, and will never make the stout, short-jointed, and fruitful growth of those that were well treated from the first.

In planting, do not break the ball of soil or disturb the roots much; merely remove the drainage material and a little of the surface soil, and loosen a few of the roots if these are very much matted. The top of the ball may be buried to a depth of about 2in., but not more, as a rule. Press or tread the soil rather firmly round each plant, and, lastly, water it in moderately. Drawn or "long-legged" plants may be greatly reduced in height and improved in appearance by laying a portion of the stem down: start with the ball some little distance away, and cover the stem with 2in. or 3in. of soil, bringing the point up where the plant should stand, about 6in. below the first truss of blossom. The buried portion will root out along

its entire length, and greatly strengthen the plant. The most suitable soil consists chiefly of sound turfy or fibrous loam, mixed with a very small proportion of sweet and well-decayed manure. Where the plants have to be grown in ridges or mounds of soil, and the root-run is therefore limited, it may be made slightly richer than if they enjoyed an almost unlimited root-run; but in any case the use of much manure should be avoided, as it promotes a soft and rank or coarse growth, that is not only comparatively unfruitful, but greatly predisposed to disease. A little Clay's Fertiliser, bone-meal, or good blood and bone manure, may be added; but on the whole there is nothing to equal good loam, and fertilisers or stimulants of any description can be supplied to any extent afterwards in a liquid form.

The proper distance between the plants will be treated further on, but I may here state that a single row of cordon, or single-stem, plants set out in a ridge of soil along the back of a bed or stage next the glass should be placed quite 12in. apart. I have seen them placed closer than this—9in. or 10in.; but if they grow at all strongly this is too close, and I do not think that anything is gained. When the plants are set out in a bed of soil, and one or more rows are placed inside the first or outer one, they must be placed farther apart, so as to

admit light to the inner rows; in such cases, 1½ft. should be allowed, and the same distance may be given between the rows, or, if there is room, 2ft. would be better. The plants should be placed alternately in the different rows, or so as to form diagonal lines. In large and lofty houses, if 2ft. can be allowed between the plants each way, so much the better, especially when planting such strong-growing varieties as Perfection, &c. The outer row is of course to be trained to wires stretched transversely or horizontally along the roof where this is low. These should be not less than 8in. from the glass, nor more than 1ft. apart. To each plant in the inner rows a neat but stout stake should be placed, reaching right up to the roof, and as a rule as soon as the plant has nearly gained the top of this, it should be stopped. In lofty houses, such as existed in the Royal Horticultural Society's Gardens at Chiswick, in which splendid crops of Tomatoes were on many occasions grown, all the plants were trained to upright stakes, and some reached a height of 12ft. to 14ft. by the end of the season.

Where a large space has to be filled, and there are not sufficient plants to train them on the single-stem principle, they may be placed further apart, and allowed two, three, or four stems apiece; but this plan cannot be recommended,

as so great a weight of fruit in the aggregate will not ultimately be obtained, nor will gathering commence so early. Plants with two stems should be allowed 20in. or 21in. apart; those with three, 2ft. 6in.; and those with four leaders, 3ft. at the very least. Of course, they must be kept strictly to the number of stems started with, and not allowed to branch again under any circumstances.

After the plants are set out, they must be well watered in, and the house be kept close for a week or two to give them a start. If there are any hot-water pipes, a little heat turned on will be very advantageous, unless the weather be very warm, when it would be unnecessary. But do not shade them in any way—this is of the utmost importance. As soon as they are seen to have “got hold” of the fresh soil, and are again making growth, air should be admitted, more or less, according to the season and prevailing weather, giving it cautiously at first, and after a few days more and more freely. After the first watering, keep the plants somewhat dry at the root until the first truss or two on each is set and swelling, when more may be given; but do not overdo this, for if too dry the blossoms will drop instead of setting. In bright, dry weather, the syringe may generally be used freely over and among the plants in the forenoon. If judiciously carried out, this will

strengthen the plants, tend to keep them clean, and aid the fruit in setting freely and kindly; but an over-moist atmosphere, especially in dull weather, must be carefully guarded against. A good deal also depends upon whether the house be naturally damp or dry. It is almost needless to say that if any signs of aphides are found on the plants the latter should be thoroughly fumigated two or three times before being planted out.

It is by no means a difficult matter to obtain seed from the Tomato, and one advantage of saving your own is that, if carefully done, you know at any rate what you have, which is unfortunately not always the case with bought seed. It is of course waste of time and trouble to save seed from inferior types, or weak or sickly plants, while none should ever be taken from any plants affected with disease, as this would be extremely likely to reproduce itself. It is always advisable to preserve anything really good in the way of Tomatoes, by means of either seed or cuttings, or both; for occasionally a plant or two in a batch will turn out greatly superior to the rest, and by seeding from these a vastly-improved type may be obtained. Fruit of moderate size only, but well-formed and perfect in every way, should be chosen to afford seed. Reject both the very small and the largest ones; the latter often contain very little seed.

It is not actually necessary to fertilise the blossoms to obtain seed fruit, at any rate in the height of the season—say during June, July, and August; but it is safer and better to do so, and thus insure plenty of seed, and this of good germinating power. It is easily done with a small camel-hair brush, working the pollen from one plant to another (of the same kind and type) as much as possible. If it be desired to cross one variety with another, the blossoms of the seed-parent must be denuded of their anthers before the pollen becomes liberated, in order to avoid any possibility of self-fertilisation. In all cases the flowers or trusses operated on should, of course, be carefully marked, and any particulars jotted down in the note-book.

Leave the fruit upon the plants until thoroughly ripe, and then cut and place it on a sunny shelf for a few days to become perfectly matured, but do not let it become scalded by hot sun. Also take care not to let it remain too long, or it will become soft and watery, and the seeds will then begin to sprout *in* the fruit, when they are of course ruined: I have lost more than one batch of valuable seed in this way myself, before I learnt better.

When fully ripe and getting a little soft, cut the fruit open, scrape out the pulp containing the seeds, and wash them clean in a fine sieve placed under the water tap, then dry and store away in paper bags. Or they may be rubbed

out in dry silver sand, but the first is the better method. The only way to save seed that has once sprouted is to sow it at once, and keep the plants over the winter.

From Cuttings.—Some excellent growers of the Tomato prefer to employ plants raised from cuttings rather than seedlings, for the following reasons:—First, because the plants commence fruiting earlier than seedlings, and at a distance of only a few inches above the soil; secondly, because they come absolutely true to the parent plants, instead of varying, as seedlings always do to some extent; and thirdly, because they do not make such rank or strong growth as some seedlings, and often fruit more freely in proportion. For fruiting in winter and early spring, cutting plants are frequently employed.

Cuttings of Tomatoes strike freely in a gentle warmth, in sandy soil, at almost any season. Either the growing tops, with three or four leaves, or stubby side-shoots taken off with a heel, may be employed; but though the former commence fruiting immediately, I give preference on the whole to the latter. Good strong cuttings should be inserted singly in 3in. pots ("sixties"), well drained, and filled with a mixture of fine loam, leaf-mould, and coarse sand, in nearly equal parts, with a little cocoanut fibre if the loam is heavy or close. In a close, moist warmth of 60deg. to 70deg.

they will emit roots in a few days, and will soon be fit for a shift into larger pots. I have seen excellent results obtained by the use of Tomatoes from cuttings: under good cultivation they fruit very freely, though they require rather more care and skill than is the case with seedlings, which naturally possess a greater amount of vigour.

For very early forcing, plants raised from cuttings are employed. The cuttings, taken from any old plants of suitable varieties that have been fruiting throughout the summer and autumn, are struck in September or the early part of October, potted on into 5in. or 6in. sizes when fit, and kept slowly growing in a temperature somewhat higher than that of an ordinary greenhouse throughout the winter; a shelf near the glass in a very light and sunny structure at 50deg. to 60deg. being much the best place for them. Although great care must be taken to prevent the plants from getting chilled or checked in any way, yet too high a temperature should be carefully avoided, this having the effect of greatly weakening them.

About the turn of the year, or in January at the latest, the plants should be shifted into the fruiting-pots, which may range from 8in. to 10in. across. Drain them well, and pot the plants in good loam, with nothing but a very little leaf-mould and bone-meal

or Clay's Fertiliser added. Ram the soil down firmly around the plant, especially towards the upper part, with a blunt rammer or potting-stick. The best position for this batch is a sunny lean-to or three-quarter span house, facing full south, the plants being placed along the front stage, and trained to wires stretched near the glass.

A temperature of 60deg. at night (though 55deg. in very severe weather will not hurt them), rising to 65deg. or 70deg. by day, with a further rise when the sun shines strongly, will be found most suitable. A too rich soil must be avoided, as it causes a rank, soft, and fruitless growth, and predisposes the plants to disease. Little but good loam is required, extra nourishment being supplied when necessary by means of liquid manure.

Near London and other large towns great difficulty is often experienced in preserving young cuttings or seedling plants in health through the winter, a kind of shanking or collapse of the stem just above the soil often appearing without any apparent cause, and sweeping off the entire stock in a short time. The only preventive is to keep them sturdy, by potting them in sound material, affording them every ray of light available, with plenty of room, a sweet, airy atmosphere, and a moderate temperature.

CHAPTER III.

CULTIVATION UNDER GLASS.

Hardiness of the Tomato.—Though by no means of so tender a nature as many natives of tropical climates—as, for instance, the Cucumber—the Tomato is one of those heat- and sun-loving subjects that thrive best under the shelter of a glass roof in our moist and too often cold and sunless climate, even in the summer-time. When the season is fine and warm, a fair, and sometimes a heavy, crop of fruit of moderately good quality may be obtained from plants grown in a suitable position in the open air; but our summers are so short that, where unsheltered, the fruit is often only just beginning to ripen when the cold weather returns and checks the growth, even if no actual injury is done, rendering it necessary to gather the fruit and finish it under glass, which does not by any means tend to improve its quality. Then under no circumstances is outdoor fruit equal in either quality or appearance to that grown

under glass; while a spell of wet and cold or stormy weather is very liable to induce a bad attack of one of the diseases (*Phytophthora infestans*, for instance) to which the plants are unfortunately only too liable; and lastly, when the season proves wet and stormy, such as that of 1888, the crop fails entirely. Even in 1889, when the early part of the summer was gloriously fine and warm, though a fair crop was secured here and there, the result was in many cases a complete failure, chiefly owing to the effect of disease induced by the wet and sunless weather of July and August. By setting out the plants against warm walls much better results are obtained, and wherever possible this should be done.

Under these circumstances, it will readily be seen that wherever possible the Tomato should be grown in a greenhouse, or glass structure of some kind. In this way, not only can the plants be set out earlier, and ripe fruit consequently be obtained much sooner, but the heat of the sun is utilised and conserved to the utmost, the plants are protected from wet and stormy weather, a drier atmosphere is maintained at will—this is often highly desirable—and the plants are kept on growing and fruiting until later in the autumn, thus lengthening the season considerably, and at both ends. Add to the above considerations the decidedly superior quality and value of the fruit,

and the advantages of indoor culture are unquestionable.

Best Form of House.—For very early work there is nothing superior to a good lean-to—or, better still, a three-quarter span or hip-roofed house—facing as nearly as possible due south, and the wider the panes of glass are the better. But during the summer and autumn a roomy span-roofed structure, running by preference north and south, is most suitable, light being naturally so much more abundant in this than in any other form of house. Very low structures of small cubic content are not as a rule so suitable as those of larger dimensions, although good crops may sometimes be seen in such; but the plants appear to succeed better in a comparatively wide and lofty structure. A span-roofed Tomato-house should be at least 10ft., or preferably 12ft. wide, and not less than 7ft. to the ridge (inside). This will allow room for a bed $3\frac{1}{2}$ ft. or 4ft. wide on each side, to take three rows of plants apiece, and also give sufficient head-room to stand up in the house comfortably, even when the plants have grown right up to the ridge. Where any considerable quantity of fruit is wanted, a house from 18ft. to 25ft. wide is preferable, with a double pathway and central bed. The height of such a structure to the eaves on each side may be from 3ft. to

6ft., and to the central ridge from 10ft. to 15ft., according to the width.

The beds should be solid, and much the finest results are to be obtained by draining them well and filling them with 1½ft. or 2ft. of sound, loamy soil of moderate richness, in which to set the plants out. It is almost a matter of indifference whether the beds are raised above the level of the pathways or not, though on the whole I think that slightly-raised beds are preferable, as affording more perfect drainage, and bringing the plants up more into the light. In the large structure at Chiswick that used to be devoted to Tomatoes, as also in some other instances that have come under my notice, the beds were quite level with the pathways, and better results could hardly be desired. Many of the growers for market, however, build their houses for Tomatoes on the level ground, and simply dig this up well to the depth of one or two spades, adding at the same time a little manure; they set the plants out directly in this, and often thus obtain splendid crops.

When the houses are low, it is usual to sink the pathways a foot or more, throwing the earth thus obtained on to the beds, and keeping the sides up by means of some rough brickwork or stout boards.

Many men—even good practical growers—have an idea that Tomatoes only require a

small quantity of soil to grow in; but this is a mistake, for though the soil should not be very rich, yet plants with a good root-run invariably yield finer crops than such as are starved or cramped in any way, and continue in bearing longer. But they must be kept in check and not be allowed to run wild, which they are always naturally inclined to do. Half-starved plants grow less freely, and perhaps blossom more abundantly; but they either cannot set half of it, or if they do, are totally unable to swell the fruit up to its full size.

The principal requisites of the Tomato being, as I have previously stated, light and air, the panes of glass used in the construction of a house built especially for this subject should be large and wide, the rafters and woodwork as light as possible consistent with the required degree of strength, and the ventilators of large size and plentifully provided. Some houses are constructed entirely of sliding lights or sashes, and where such is the case, air can be given to any extent in fine weather; but a serious objection to this plan is that, when it rains, the wet comes in if the sashes are pulled down even a little way. For this reason lifting ventilators are to be preferred. In a single-pathway, span-roofed structure of 10ft. or 12ft. in width, a roof ventilator of about 3ft. in length by 1½ft. to 2ft. wide should be placed at every 8ft.

or 9ft. of roof-run on each side, arranging them alternately, so that each may be opposite the interval on the other side. If the sides of the house are glazed to a depth of from 1ft. to 3ft., every alternate light at least should be arranged to open, and hinged to the upper plate. Should the sides consist of brickwork, or boards only, a good-sized wooden flap or sliding panel should be placed at frequent intervals along both sides, for a Tomato-house to which side air cannot be freely admitted is decidedly faulty. All the roof-ventilators should be glazed, though one frequently sees them made merely of some pieces of board; but it should be borne in mind that we want every ray of light that can be obtained, especially early and late in the season, to do the Tomato justice.

Drainage is an important matter, for if water lies about in the pathways or near the houses, diseases like Mildew, and damping are certain to be troublesome; and if the soil is in the least naturally damp, or the situation low, even if each bed is not properly drained like a vine border (which would be undoubtedly advantageous), a drain should be placed down the centre of the house, just below the pathway, to carry off all superfluous moisture.

I do not consider sunk houses suitable as a rule for the growth of Tomatoes (though on a gravelly—and consequently well-drained—

subsoil, and especially in elevated positions, this is not a matter of any great consequence): they should be built entirely above the surface of the ground, such structures being always drier than even partially-sunk houses, and generally more airy as well. The sides should, if possible, be constructed of brick: good 9in. work, put together with the best mortar, or better still with Portland cement, is preferable to anything else. The sides need not be high, 2ft. to 3ft. being ample, as the outside row of plants can be, and indeed usually is, trained on wires up the glass. For summer crops it is, however, by no means necessary to go to the expense of brickwork: I have seen excellent houses with the sides composed of nothing but a few 1in. boards nailed on to posts sunk 2ft. or 3ft. in the ground, and the "plate" (or piece of quartering forming the eaves) mortised on to these. In this way, and by making use of light bars and cheap glass, a good and thoroughly useful structure can be erected for a very small sum per foot run—considerably under 10s., which is a moderate estimate for an ordinary house of about 12ft. in width.

Artificial Heat.—Although some means of applying artificial heat in the Tomato-house is highly desirable, it is by no means absolutely necessary. As a rule, an excellent crop of fruit may be obtained during July, August, September,

and perhaps October as well, in a totally unheated structure. The plants should in any case be raised in heat—indeed, if they are to commence fruiting before the end of the summer, this must be done; but a comparatively small place, even an ordinary garden-frame set over a mild hot-bed, would suffice for this purpose. The mere protection and increased warmth afforded by a glass roof will at all times make a wonderful difference in the productiveness of the plants, as well as in the earliness and excellence of the crop. Any spare sashes or frame-lights may be utilised to great advantage in this way, especially if the plants are against or near a wall, though something of the kind may often be done in the open as well. But this part of the subject will be dealt with more fully further on.

A few rows of hot-water pipes will allow of the plants being set out much earlier—in March, or the early part of April, and perhaps earlier still, instead of in May; then they can be brought on somewhat more rapidly, a circulation of air can be kept up in damp or dull weather, and the fruit ripened more rapidly and perfectly, as well as both earlier and later in the season than could otherwise be done. Indeed, by the aid of a very moderate amount of fire-heat, Tomatoes may be had in fruit from April until the end of the year with very little difficulty.

An ordinary hip-roofed or lean-to house, of roft.

or 12ft. in width, and intended for very early work, should have six rows of piping at least—say a couple of rows of 2in. pipes along the front next the glass, to prevent frost from striking through it and injuring the plants, two or three rows of 4in. in the pathway, and a couple more rows at the back of the house. If fruit is not wanted before May, a 4in. flow and return on each side of a span-roofed house 10ft. or 12ft. wide, will afford ample heat; while for late or summer work—if the plants are not set out until the end of April or May—no artificial heat whatever is really necessary, though a 3in. or 4in. pipe running round the outside of the house will not only give the plants a better start, especially if the weather be cold, but will assist them greatly in dull or wet weather, and enable a lot of fruit to be ripened late in the autumn that would otherwise not colour at all.

Wider structures should of course be provided with more rows in proportion; but in all cases it is well to allow plenty of piping, as this need not then be made very hot at any time: overheated pipes are very injurious, and should be avoided whenever possible.

On the whole I should prefer for the main crop either a good roomy, span-roofed house, from 12ft. to 14ft. in width and 7ft. to 8ft. high, with a single pathway up the centre; or

else, for growing on a large scale, one of larger dimensions—say 18ft. to 25ft. wide, with a central and two narrower side beds, and two pathways. These wide houses are of course loftier than those with a single pathway, and more suitable for the growth of the Perfection and other tall varieties. Side glass I do not much care about, and if provided every alternate sash at least should be made to open and admit air; but as a rule a brick or concrete wall from 2ft. to 3ft. high forms the simplest and best side for a house, if only abundant provision of some kind is made for admitting air at this point. In this case the beds should be raised 1ft. or 1½ft. above the level of the pathway, so that the plants in the outside row may have their heads near to the glass from the first.

In a house of this description a 3in. or 4in. flow pipe along the back of the bed near the glass, and a return of the same size along the path on each side, will, if properly heated, afford plenty of warmth for all ordinary purposes. I like the plan of placing the flow outside, as then a current of warm air is constantly passing up the glass, and this effectually excludes frost or extreme cold under any circumstances.

Methods of Growing Plants.—As regards the disposition of plants in the house, there are several methods to choose from, all of which

will afford good results, if carried out in a judicious manner. Growing the plants in pots is not a profitable method, in my experience, and, except for very early crops, or under quite exceptional circumstances, should not be adopted. Where solid raised beds of ashes, &c., exist, as in many ordinary plant-houses, a single row of plants is usually set out in small mounds of soil placed along the back of the beds; or a continuous ridge may be substituted for the mounds. In either case, a foot apart will be found a suitable distance for the plants, when grown upon the single-stem or cordon principle. In some cases, one or more extra rows are set out inside the first, and the plants trained to upright stakes. If the house is otherwise unoccupied, a greater yield is thus obtained from it; but if this be done, in neither the outer nor inner rows should the plants stand less than 18in. apart. If the bed consists of good soil (not over rich), ashes, or "ballast" (burnt clay), the roots may be allowed to strike down into it with advantage; but if composed of clay or other unwholesome material, slates should be laid down first, or a sharp spade run beneath the ridges or mounds from time to time.

The illustration (Fig. 1) shows a single row of Tomatoes planted out in a ridge of soil on the raised stages of an ordinary plant-house, and trained up near the glass. The heating-pipes

are shown, but bottom heat is by no means necessary, and they will seldom need to be used.

I have also seen excellent crops of Tomatoes grown in large boxes, such as those in which eggs and oranges are imported. Some rough stuff is placed in the bottom for drainage, and

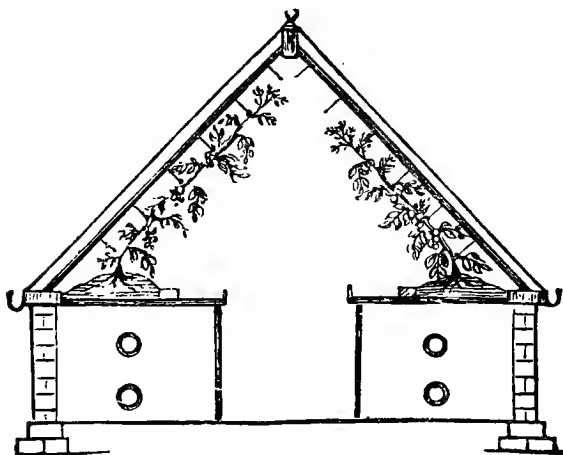


Fig. 1. Cultivation in Ordinary Plant House.

the boxes filled with any good soil, mixed with a little manure. This is best done by degrees, setting out the plants in small mounds first, and adding more soil from time to time as they seem to require it.

Those who grow the fruit on a large scale, usually set out the plants directly in the soil

of which the floor of the house is composed, without any more preparation than digging it up and adding a little manure. Where the soil is of a suitable description and well drained, this is a simple and excellent plan, affording abundant crops of fruit with a minimum of trouble. But if the natural soil is unsuitable, the best way is to make up proper beds for the plants, which may usually be slightly raised with advantage. Such beds should be well drained with a layer of broken bricks or clinkers in the bottom, covering these with some turf-sods, grass side down. The soil may consist of any nice fibrous or turfy loam; if the loam cannot be obtained, good garden soil will do, mixed with a small proportion (only) of decayed manure and leaf-mould, and a sprinkling of bone-meal, soot, &c., if at hand. The soil itself need not exceed 10in. or 12in. in depth at most, though it may be more, and even less will do; but it must be made and kept firm. This method I regard as the best of all, and wherever possible it should be adopted.

Points to be observed.—Before proceeding further, I will briefly mention that the most important points in the successful cultivation of the Tomato are: (1) abundance of light, with all the sunshine available in our none too sunny climate; (2) a genial but moderate degree of warmth from first to last, with a buoyant or con-

stantly moving and moderately dry atmosphere around the plants; (3) free ventilation at all times (this is most important, a stagnant atmosphere being fatal to success); (4) a firm root-run in only moderately good soil at first, but with plenty of liquid manure and rich top-dressings after the plants have commenced to fruit; and (5) to keep the plants strictly to one, or in some cases two or three, main stems, all lateral growths being rigorously removed, and the strength of the plants thus concentrated in the trusses of fruit, and not wasted in superfluous growth.

Plants to Fruit in Pots.—These should be raised as described previously, but instead of planting them out, simply shift them into pots two or three sizes larger. A 7½ in. or 8 in. pot will carry a good single-stemmed plant for some time in the early part of the season, with the aid of plenty of liquid manure, but I prefer the 9 in. size ("sixteens"). Later on a rather larger size is desirable, especially for strong-growing varieties, such as Perfection, Mikado, &c.; but a 10 in. or 11 in. pot will carry a good plant of any kind, though if three or more stems are wanted, the 12 in. size at least must be used. Unless the pots are large, it is an excellent plan to let the plants root through into a mass of something that will afford extra nourishment, or, what is perhaps better, act as

a storehouse for liquid manure, &c. A layer of short stable manure is sometimes thus laid beneath the pots, but I prefer 6in. or so of burnt ballast. A good-sized square of turf, cut thick, and laid grass side down beneath each pot, is good; or they may root through into a bed of good soil beneath them.

Ventilation.—After filling a house with plants, whether they are set out in beds or placed in boxes or pots to fruit, it is usual to keep it close for a short time—from a week to a fortnight—in order to give them a good start. In the early part of the season, or if the weather is cold or stormy, this is naturally of more importance than during a warm spell in May or June. The practice must not, however, be continued too long, for in a confined atmosphere the growth will soon become weak, and the stems long and slender: it is therefore advisable to commence giving air, more or less according to circumstances, directly the plants show signs of having “got hold” of the fresh material and begun to grow again.

The proper amount of ventilation is a matter for the judgment of the cultivator to decide, and varies according to the time of year, the prevailing weather, the power of the heating apparatus, &c.; but, as a rule, it is better to err on the side of liberality, the best results being obtained by giving air freely by means of both

the top and the side ventilators whenever possible, and to a certain extent at night as well as during the day, unless very cold. In cool weather it is better to put on a little fire-heat to maintain the necessary temperature, and keep the ventilators open, than to close the house to conserve warmth. A free circulation of air after the plants have become established keeps them sturdy and short-jointed until the first truss or two have set and begun to swell, after which they do not appear to be so much inclined to "run away," and may, if necessary, be pushed on rather more with comparative safety.

It must be understood that the plants may, if required, be brought along more quickly, and be induced to develop and ripen their fruit rather more rapidly, by means of a moderately close and warm atmosphere, with plenty of moisture and stimulating manures, than under the "cool" system; and when anything like an early crop is wanted, something of the kind must be done, for the Tomato is too heat-loving a subject to succeed under ordinary greenhouse treatment during the early spring—say previous to the month of May. Such treatment is, however, at all times dangerous, being almost sure to weaken the plants to some extent, and very liable to induce an attack of disease. In fact, without abundant light, judicious ventilation, and a fair share of sunshine, the plants are speedily ruined

by anything in the nature of "forcing": the growth becomes weak and spindly, the trusses are small and unable to set, and the entire plant is greatly debilitated. A liberal supply of fresh air is therefore at all times a necessity, and the freer it is, so long as the progress of the plants is not checked thereby, the better in every way. When the cool nights and shorter days of autumn return, the outer air must not be admitted so freely, but a change of atmosphere should, if practicable, still be afforded daily.

Watering.—This is another most important matter, and much depends upon hitting the right medium between the extremes of wet and dryness. Though when in health a vigorous and strong-rooting subject, the Tomato possesses somewhat fine and delicate, or rather sensitive, roots, and if the soil gets at any time into a sodden or sour condition, the plants are apt to become unhealthy. At the same time, a sufficient supply of moisture to keep the roots in an active condition should always, or nearly always, be present, or they will perish to some extent.

After being set out, the whole of the plants should be watered in the usual way; but after that, it is best to keep the soil rather dry for some time, especially where the roots have a good run. If in the least over-watered, the plants will make too much growth; whereas if

moderately dry, their progress will be steady, and they will be firm, sturdy and fruitful from the first. This treatment must not, however, be carried to excess, or the plants will wilt (which must never occur), and drop their blossoms, instead of setting them, besides affording encouragement to green-fly. Dropping of the blossoms is generally attributable to dryness at the root, and when it occurs, a good watering is consequently the obvious remedy; though it may occur in very hot and dry weather from an excess of atmospheric dryness, when the syringe may be freely used among the plants once if not twice daily. A good overhead syringing on every bright morning will usually benefit the plants, and especially during the earlier stages; but the quantity and frequency of the water-supply depend greatly upon the position, &c., of the house, as well as upon its character—whether naturally damp or dry.

Giving water by dribblets is a very bad practice in dealing with the Tomato. By far the best plan is to allow the soil to become dry, or nearly so, before affording a fresh supply; then to give a thorough soaking, sufficient to reach every fibre of the roots and particle of soil through to the bottom of the bed, and after that no more until it again becomes really necessary. This will insure the soil remaining in a sweet and wholesome condition, and will

keep the plants healthy and vigorous. Much more water is naturally required during hot weather in July and August than at other times: the lower the temperature, the less water should be given; and it is really surprising how little is required, at any rate when the plants are growing in a good bed of soil, during the short days of November, December, and onwards, even when a little artificial warmth is used: indeed, under such circumstances, the less water is given, the better, in reason. Withholding water will also, to a certain extent, cause the fruit to ripen more quickly by checking its full development, and this is generally practised in some degree towards the end of the season, in order, as far as possible, to divert the energies of the plant from making further growth to perfecting and ripening off the fruit already formed. As a general rule, however, excessive dryness proves in the end a bad policy, for a plant in full vigour will always bring its fruit to greater size and weight than a starved one would.

The use of manures, liquid and otherwise, after the fruit has set and commenced to swell, is highly beneficial, and indeed indispensable; but this part of the subject will be dealt with separately.

Training.—No plant in cultivation in our gardens, not even excepting the Cucumber,

demands such constant care and attention in training as the Tomato. If this matter is neglected or improperly performed, no good results can possibly be attained, even from the finest varieties and with the best of treatment in other respects. The plant may be described as such a rampant subject, with so strong an inherent tendency to go wrong and bring forth fruitless branches and barren leaves rather than fruit, that unless constantly pruned, trained, and checked at all points, it will speedily become comparatively fruitless. To speak more plainly, from the axil of every leaf, from first to last, as well as directly from the main stem immediately below each truss of blossom, a lateral growth or side-shoot is produced; and these, if not cut or pinched out as soon as seen, will one and all continue to extend, again branching in their turn, and in the end will result in a perfect thicket of shoots and foliage, fruitless, or nearly so. Nay, more: from the points of the trusses themselves, and even from the very leaves, especially where these are cut or shortened back, other growths will frequently push, and these also must be rigorously removed. It therefore becomes necessary to go over the plants once a week at least, or preferably even twice while in full growth, pinching out every one of these robbers as soon as seen, and at the same time tying up

the legitimate stems to the wires, sticks, or whatever may be placed to support them, removing all the exhausted or superabundant foliage, and gathering the ripe fruit.

My experience has proved most conclusively that the single-stem method of training the plants is by far the best; and I most strongly recommend its adoption wherever possible, whether indoors or out, in preference to any other. Under this system the fruit is produced and ripened earlier, as well as being finer and more plentifully produced, than by any method of extension-training. If the number of plants be insufficient to fill up the desired space, they may be grown with two or three stems each with good results; but the cordon system (explained on pages 63 and 64) should always receive the preference, the best results, without a shadow of doubt, being invariably obtained in this way. It appears to me that a Tomato-plant with one stem, carrying three or four trusses of fruit, each of one, two or more pounds weight, has quite enough to do to swell and ripen these perfectly. Again, plants with three or four stems have more growing to do before any fruit is formed, so that there is a saving effected in point of time by adopting the single-stem system, as well as again in the gross weight of fruit produced.

After the plants have run a few feet, and

become somewhat bare at the bottom, both of leaves and trusses, they will usually, if healthy, push out some young shoots from the base, and these, if allowed to extend, will in time bear fruit in their turn. As long as the plants continue to do well at the top, little or nothing will be gained by encouraging these to fruit, for whatever is obtained below will be at the expense of the trusses above; but if the tops begin to fail, or cannot extend further for want of room, and the plants are desired to continue in bearing, it is a good plan to take up one (or two at most) of these growths and encourage it to bear in turn. When the old stem ceases to be productive, it should be cut away, and a young one trained up in its place, encouraging this, by means of a top-dressing of rich material or a dose or two of some stimulating liquid, to make a strong and fruitful growth. Such a second crop often comes in very useful in the autumn or winter, and I have known the same plants to be kept going for two or three years by a repetition of this process.

The only alternative to the above plan, where it is desired to keep a house in bearing for a considerable period, is to set out a number of young plants between the old ones as soon as the latter begin to show signs of exhaustion, and when the young ones commence fruiting, to cut or pull the first lot out. But, on the whole, I

should prefer to cut back the old plants, if vigorous and healthy, and start them again, especially for late autumn or winter fruiting.

Stopping.—During the last few years there has been much discussion as to the advisability of taking out the points of the plants when two or three trusses have been formed. This proceeding undoubtedly throws more strength into the trusses below, and not only hastens their development, but increases their size and weight as well; while there is no difficulty whatever in getting a fresh growth to start from the axil of the highest leaf, which will in a very short time commence throwing trusses in its turn, and thus maintain the succession. But, on the other hand, vigorous and healthy plants will not only swell off and ripen their lower trusses as fast as these are formed, but will continue to develop others as they advance without any adventitious aids of this nature; so that, as a rule, it is quite unnecessary to do anything of the kind. Some growers have even advocated stopping the plants just above each truss; but this is simply absurd, and results in loss of both space and time, for a lateral will not throw a fresh truss so soon, as regards either time or length, as the main stem would do, if allowed to extend. I have, however, sometimes found it advisable to stop weakly plants with heavy trusses set on the

lower part of their stems at a certain point, in order to enable them to swell and ripen the fruit already formed, and when this is off to let them go again. Again, plants trained to upright stakes and constituting the inner rows in wide houses, should be stopped as soon as, or rather just before they reach the glass. This throws the strength into the trusses below, and as a further increase in length is not permissible, stopping is indeed actually necessary. If desired, one or two lateral growths from the base may be allowed to become developed upon each plant, and throw one or more trusses apiece in succession to those on the main stem.

Reducing Foliage.—The practice of removing a part of the foliage is condemned by some, and at first sight it certainly appears to be contrary to the accepted principles of good cultivation; but I have found it decidedly beneficial when carried out in a judicious manner and to a moderate extent, not only in admitting more light to inner or secondary rows of plants, as also to any pot-stuff that may be growing beneath a single outer row, but also allowing a freer circulation of light and air among the Tomato-plants themselves, and thus checking the tendency to exuberant growth often exhibited by seedlings. It is not, however, advisable to commence it too soon: the plants should be let alone and allowed to strengthen

as much as possible for a time, but as soon as the foliage begins to get crowded, and to shut out light and air from the trusses or from inner rows of plants, it is time to shorten back all the lower leaves to two, or in some cases to only one, pair of leaflets or pinnæ. These, with a few entire leaves at the top, are quite sufficient to keep the plants in perfect health and vigour. But in any case I never shorten a leaf until at least five or six full-sized ones have been formed, and never cut one away altogether unless it is either exhausted, diseased, or affected with insect pests. Strong-growing varieties, such as Mikado, Perfection, &c., more particularly require to have their foliage reduced in this manner. Towards the end of the season it is also generally very desirable to shorten the leaves considerably, or in some cases to remove them altogether. After a certain point the plants are not required to make any further growth, and they will swell and ripen the fruit already set just as well, if not actually better, without any leaves, or nearly so, than with them; while denuding them of their leaves actually aids the fruit to ripen off, by enabling sunshine and air to act more directly upon it, and is thus undoubtedly beneficial. These remarks apply to plants both indoors and outside.

It is only fair to add, that in the large house in which Tomatoes were grown at Chis-

wick, as well as in some other instances that have come under my notice, the leaves were left entire throughout, and a finer crop of fruit, as regards both quantity and quality, could not be desired. At Chiswick the house, however, was a very roomy one, and the plants were allowed plenty of space, which makes a good deal of difference. On the other hand, I have many times seen a houseful of splendid plants greatly crippled or entirely destroyed by disease induced solely by allowing the foliage to become unduly crowded, thereby blocking the circulation of air.

Liquid and other Manures, &c.—However good the soil may be in itself—and remember that in no case must it be made very rich in the first place, or more harm than good will result—and however excellent the treatment in other respects, Tomatoes cannot be grown to perfection, and a maximum yield obtained, without the aid of stimulants. These may be applied in either a solid or a liquid form, or both together; but on the whole I think the chief dependence should be placed upon the liquids. The plant is in fact of so hungry a nature, and the demand made upon the roots by one or more stems well laden with fruit so great, that the aid of fertilising and stimulating principles in some form is a *sine quâ non*; and it will not be found an easy matter to

overfeed—in reason, of course—vigorous and healthy plants, carrying heavy crops, and more particularly where the roots are in any way confined.

As soon as three or four trusses of fruit have become well set, and are in various stages of development, a Tomato-plant will take almost anything in the way of liquid manure, &c., and soon evince its gratitude in a very practical manner. The liquid from a stable (consisting chiefly of urine, &c.), diluted with three or four times its bulk of water; or that obtained by steeping the dung of horses, cows, or sheep (always preferring the latter); sewage of almost any kind; an infusion of soot or guano; weak solutions of nitrate of soda and sulphate of ammonia; even house-slops, soap-suds, &c.—all these are useful; and it will be found that a variety of such stimulants given alternately will afford better results than the constant use of one or two agents only. Plants in pots, especially if these are small, must be liberally fed if they are to do any good at all; and even where the root-run is extensive, an occasional soaking with one or other of the liquids above mentioned is indispensable, either with or without two or three rich top-dressings as well during the season.

Surface-dressings of guano, bone-dust, fish or blood-and-bone manures, &c., applied at intervals, are also extremely useful, the fertilising

principles they contain being carried down to the roots by subsequent waterings, with the result of increased root-action, more vigorous growth, and an enhanced production of fruit. It is, however, advisable to add an inch or so of good loamy soil at the time of, or soon after, every such top dressing, when the stimulus imparted to the roots quickly causes them to run into the fresh material. I have experienced quite surprising results from a sprinkling of Ichthemic Guano (Colchester's) on the surface of the soil in which plants were growing in pots or boxes, pricking it lightly in, and then giving a good watering. In a very few days the plants exhibit a greatly increased degree of vigour, the fruit setting much more freely, and the crop being considerably augmented. It is a good plan, if possible, to add a thin layer of soil over the guano, or whatever is employed, either at the time, or shortly afterwards.

Another plan, and on the whole a better one, where practicable, is to mix any such artificial manure with some good fresh loamy soil, and apply an inch or so of the compost from time to time as a top-dressing, spreading it evenly as far as the roots extend. A 6in. or 7in. pot full of the Ichthemic Guano mixed with each barrow of loam, and spread over the roots to the depth of 1in. or 1½in., will then be found to have a

remarkable effect on the vigour and productiveness of the plants.

With's Carbon Manure, again, is excellent for Tomatoes. It should be mixed with fresh loamy soil at the rate of 10lb. to each cwt. of the latter, and applied, as above, as a top-dressing about an inch in thickness. This dressing may be repeated several times during the season—as often, in fact, as the roots work through on to the surface again. The "Liquid Plant Food," of the same maker, is also very effectual, and may be used in conjunction with the former with the best results.

Sulphate of ammonia and nitrate of soda are best applied in a liquid form: begin with half an ounce to the gallon, and gradually increase it to an ounce to the same quantity of water when the plants are in full bearing. The sulphate I have found to be one of the finest of all fertilisers for the Tomato. Its action is that of a stimulant rather than a food, but one or two applications will often exercise an almost magical effect upon weakly, sluggish, or over-laden plants; and when judiciously employed, it is almost invaluable for imparting health and vigour to the growths, and swelling up the fruit rapidly to a large size.

These powerful chemical manures must, however, be used with great care, as if given too strong or too frequently they have a tendency

to exhaust the plants and wear out the soil, so that no permanent gain is effected by over-liberal applications; and it must also be borne in mind that much better results are obtained by using them in conjunction or alternately with other manures of a more substantial character. Once a week is indeed if anything too often to give even a weak solution of either of the last-named salts—certainly if continued regularly throughout the season, and in between each dose some liquid stable or sheep's manure, soot, or the like, should always be administered. One or two waterings, for instance, of the sulphate will often stimulate the roots to such an extent as to bring thousands of the little white feeders on to the surface all over the bed; if an inch or two of well-decayed manure be then spread over the surface and covered with a sprinkling of fine loam, or a slight top-dressing of any rich compost be given, the roots will get hold of it at once, to the great benefit of the plants.

In the open ground a mulch, some inches in depth, of nearly fresh or partially-decayed stable manure placed over the ground, if hot dry weather prevails in July or August, will be found highly beneficial, not only in supplying nourishment, but by keeping the roots comparatively cool and moist. Under glass something of the kind may also be done under certain circumstances with good effect. But bear in

mind that anything of a rank nature, especially when used to plants under glass, is apt to engender a sour and unwholesome state of the soil, and this is of course detrimental. Consequently a dressing of good turfy loam, mixed perhaps with a fair proportion of sweet flaky hotbed stuff and a little bone-meal, should usually receive the preference. In such material as this the roots will be much more healthy, if not more active also, and a shorter and more fruitful description of growth will be promoted; while any further nourishment required subsequently can be supplied by means of the various liquids before mentioned.

Generally speaking, where the soil is deep and good, top or surface dressings are not required, or not to nearly the same extent; but for shallow beds they are almost indispensable.

Plants in pots are often surfaced with a few handfuls of short stable manure, the nourishment contained in which is washed down to the roots by the frequent waterings required; but for my own part, I prefer to supply this in a liquid form, and thus keep the surface clean and sweet. The artificial manures already mentioned are also invaluable in the culture of Tomatoes in pots.

Early Crops.—To obtain ripe Tomatoes early in the year, say from January until the beginning of May, somewhat special treatment is required;

and the best of appliances, the command of plenty of heat, a light and sunny aspect, and a considerable degree of skill and care on the part of the grower are also necessary. Plants for very early fruiting are usually grown in pots,

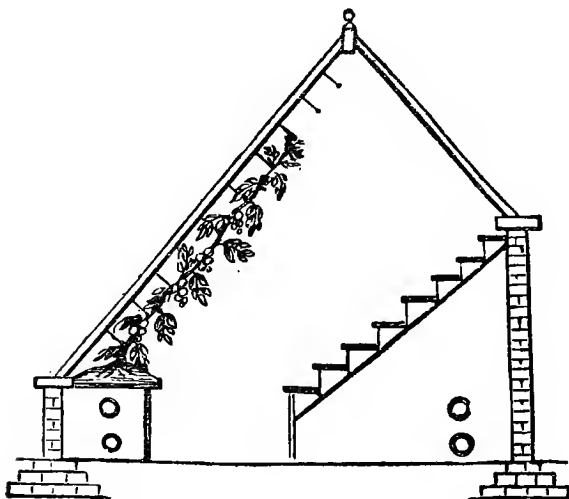


Fig. 2. Cultivation in Three-quarter-span Plant House.

those gin. or 1oin. in diameter being most suitable: they should be raised early the preceding autumn, either from seed or cuttings, and grown on as already directed in Chapter II.; or they may be set out on a ridge of soil placed on a stage of slates or boards, this

being kept in position by a few loose bricks. Treat them as previously advised, keeping the stems close to the glass, so that they may receive the benefit of all the light obtainable, and maintain a genial atmosphere and nice growing temperature, avoiding extremes of either heat or cold, damp or dryness. Fig. 2 shows a row of plants for early fruiting set out on the front stage of a three quarter span or hip-roofed plant house with south aspect. A good deal of judgment and experience are requisite to grow early Tomatoes well, especially in the control of the ventilation, temperature, and moisture. On the one hand, a too close, moist, and warm atmosphere must be avoided, as weakening the plants and likely to induce disease; while, although air must be given whenever possible, excessive ventilation or too low a temperature will check the growth, and so do harm in that way. Again, an over-moist atmosphere promotes a rank and comparatively fruitless growth, while excessive aridity induces attacks of insects, and may cause the blossoms to fall instead of setting.

Artificial fertilisation of the flowers is an absolute necessity during the early months of the year. This is easily done with a small camel-hair pencil or brush, such as may be bought anywhere for a penny. Break open (with the point of a penknife or a pin) a few of the annular congregations (rings) of anthers that will be found

surrounding the pistil in the centre of every expanded flower, fill the brush with pollen taken from the inner surface of these, and apply it gently yet thoroughly to the stigmas of all the blossoms that are open; or the same object may be attained more simply by merely "flicking" all the expanded blossoms lightly with the forefinger or a slight hazel rod. If there is any free pollen at all, this will answer the purpose quite as well. To be effectual, this operation should be performed in the forenoon of every bright day, from 11 to 12 a.m. being about the best time; this should be repeated as often as possible, but it will be found comparatively useless unless the sun is actually shining and the atmosphere of the house is dry at the time.

Late Crops.—By means of a little management, and in a suitable temperature, healthy plants may be induced to continue producing fruit until quite the end of the year, if not later; and even if the fruit does not ripen freely upon the plants, it is certain to do so, provided it is full grown, if hung up in a warm place, or laid on a sunny shelf in a stove or forcing-house; but, at the same time, its quality and flavour are greatly superior when it is ripened on the plants. Where ripe Tomatoes are required during the months of December, January, and February at least, it will be more easily accomplished with

old plants than young ones. Even if towards the autumn the plants are found to have reached their limit, as far as the main stems are concerned, if still healthy and vigorous they may be cut down to within a few inches of the ground, and from the stumps one or more young growths will start almost directly, even if they do not already exist. The best of these should be selected and trained up in place of the old stems, and if the bed or ridge of soil be cleaned over, top-dressed if necessary, and a little extra heat afforded, these will advance rapidly, and, with the aid of a little liquid manure, &c., soon commence fruiting again, and continue to do so more or less freely during the greater part of the winter, in a temperature ranging from 60deg. to 70deg., or a little more when the sun shines strongly. The more open the position, and the more light and sunny the house itself is, the better will the results be during the winter season. I have known the same plants to be kept in fruiting condition almost constantly for two or three years by the method just described. For winter fruiting a good strain of the old Large Red is still one of the very best varieties, being a sure setter and possessing an excellent constitution. Early Ruby is also a very suitable kind for early or late cropping.

CHAPTER IV.

CULTIVATION IN THE OPEN AIR.

Effect of Climate.—Although our English climate, from the uncertain character of its summers, is not nearly so favourable for the growth of Tomatoes in the open air as that of more favoured countries—America or France, for instance—yet in most years a more or less profitable crop is obtained from plants in a suitable position, and now and then there is a very heavy yield, to the great benefit of the grower. The principal points in securing a good crop are, first, a warm and sunny situation or aspect for the plants, sheltered as far as possible on the north and east, and sloping warmly to the south or south-west; and, secondly, to commence early, and thus get forward, strong, and well-hardened examples fit to plant or turn out without the least danger of a check by the middle or end of May.

Planting Out.—In order to make the most of the season, and secure as heavy a crop as

possible, the plants when put out should be at least 18in. to 2ft. or 3ft. in height, growing in not less than 5in. or 6in. pots—if in 7in. or 8in. sizes, so much the better—and not only already well in blossom, but having actually set and commenced to swell at least one or two trusses of fruit.

The time at which it becomes safe to plant out varies considerably in different districts. In sheltered spots along the south and south-west coasts, as also on some warm borders with a southern aspect or slope, and well protected on the north and east by a wall, fence, or close hedge, and in many parts of the more southern counties, it is often safe to transfer thoroughly hardened plants to the open air the first or second week in May, though the cultivator in this matter must be guided to a great extent by circumstances. As a rule, it is, however, not advisable to plant out until from the middle to the end of the month mentioned, while in exposed and northern localities, or in a backward season, the first or second week in June may be quite early enough to trust the plants to the mercy of the elements.

As plants for open-air culture must not be pushed on too rapidly, for fear of weakening them in any way, it will be best to start in good time, and bring them on slowly, but surely. Sow the seed, then, in the manner described in Chapter II., either during the last week in

February or in the early part of March, according to the means at hand, &c. Bring the plants along steadily, not starving or allowing them to become in any way checked by a too low temperature, &c., at any time; yet, on the other hand, by no means inducing a weak spindly growth to occur in an over-warm and close atmosphere. Free light, plenty of room, and a fair share of both air and warmth, are the golden rules for raising sturdy and short-jointed Tomato-plants. Give them their final shift as soon as possible, potting them firmly in sound fibrous or turfy loam, with a little leaf-mould or old flaky hotbed manure. When well established, reduce the amount of artificial heat, ventilate freely, afford each plant all the space possible, keeping the tops as near the glass as it is safe to do; and if from any cause they cannot be planted out at the intended date, do not allow them to starve, but keep the roots moist, and give a little liquid manure once or twice a week, to maintain their vigour.

As soon as it is considered safe to expose them, the plants should be turned out of the pots and set out at the proper distance: disturb the ball, or roots, as little as possible, burying it to a depth of not more than 2in. or 3in., and making the soil quite firm about the roots. The right distance for single-stemmed plants is from 2ft. to 2½ft. apart in the rows, more or less,

according to the variety, the character of the soil, &c.; with a distance of 3ft. to 4ft. between the rows, preferring the latter, both for the greater convenience of working between the lines of plants, and in order that they may receive the maximum of light and sunshine. Plants with two stems should be placed $2\frac{1}{2}$ ft. to 3ft. apart in the rows, and those with three leaders not less than 4ft. from one to the other. In all cases a stout stake, 5ft. or 6ft. long, must be placed to *each* shoot or stem, and these should be disposed in a single row. Let ties be neat and very strong, but not tight. The best results are obtained when the rows run north and south; or the plants may be set out diagonally—that is, in rows running from north-east to south-west, and from north-west to south-east—at a distance of 3ft. apart, with good effect. Allowing for a wider alley here and there, up which a cart may be taken, either mode will require about 4000 plants to the acre.

Where the soil is rich—as, for instance, where a row or two of plants are to be grown among other vegetables—a good plan is to plunge the plants as they are in the pots, without disturbing them at all. Wherever pots are plentiful and cheap, and especially if the plants have been placed in those of a good size (6in. to 8in. or 9in. across), this may be done with advantage. In this way no check whatever is experienced,

and the roots, though kept at home to a certain extent, will very soon find their way out through the drainage holes and over the rims of the pots, which should be sunk about 3in. below the surface. Fairly large pots being employed, the plants may be lifted bodily—pots and all—on the first indications of frost in the autumn, and if brought into a moderately warm house and attended to with water as required, they will in this way ripen off the whole of the fruit remaining on them at the time. Under this system they may require rather more water, &c., at first, until the roots penetrate outside the pots, than by the planting-out process, but that will be a matter of no great consequence unless a large number be grown.

Another good plan is to grow the plants on in any roughly-constructed boxes of moderate size, and to plant them out in these, boxes and all, without disturbance. Ordinary herring-boxes are very suitable, as, being light and loosely constructed, the roots soon find their way out between the joints. The plants should be transferred to these boxes from those into which they were pricked off from the seed-pan or box, as soon as they are sufficiently strong.

Prepare the boxes by placing some rough ashes or broken bricks in the bottom for drainage, then a couple of handfuls of rough siftings or spent hops, and fill up with any fairly light loamy soil of moderate richness.

Place two plants in each box, at 3in. or 4in. from either end, grow them on thus exactly as if in pots, harden off, and at the proper time plant out box and all, burying the rim about 3in. deep, as before. The roots will soon push out through the joints and over the tops of the boxes into the fresh soil, and the plants will grow without the least check or delay. This plan saves expense and often a good deal of breakage.

The subsequent treatment of plants outside consists in keeping all laterals or side shoots constantly pinched out as soon as seen, the legitimate stems securely yet loosely fastened to the stakes, and a sufficient supply of water given to the roots when necessary, especially until the plants get a good hold of the ground, with a soaking of liquid manure subsequently whenever it may be advisable to afford it. A plentiful supply of moisture at the roots will aid in the development of a heavy crop of large fruit, but this will not ripen so quickly as if the soil were maintained in a drier condition. In a dry, hot season, an occasional watering is almost an absolute necessity, though the labour which this necessitates may be avoided, and the roots kept in a comparatively cool and moist condition, by applying a moderately heavy mulch of littery manure from a stable when the hot weather first sets in, according

to a practice very common in our vegetable gardens.

If the foliage appears to grow too luxuriantly, it may be shortened back moderately at any time after the plants become established, in the same manner as described on page 46. Towards the end of the summer, when the power of the sun becomes less, and from four to six weeks before the first frosts may be expected, it is advisable to shorten back all the foliage severely—in fact, to cut away the greater part of it—and at the same time to cut or pinch back the top of the plant to the last expanded truss of flowers: this will have the effect of concentrating the entire energies of the plant upon perfecting and ripening the fruit already formed. Any farther advance in growth being undesirable and useless, and any fruit set after this time standing no chance of becoming matured, this will be found the wisest course to pursue. The removal of the foliage will also enable what sunshine there is to act more directly upon the trusses.

Training.—As in the case of plants grown under glass, the cordon or single-stem system is much the best, and should be adopted whenever possible, whether the plants are to be grown in the open, or against a wall, fence, or trellis. If the number of plants is insufficient, however, to fill the required space by this method, they may

be grown with two, three, or even four main stems each; but in all cases they must be kept strictly to the number of leaders determined upon, and all laterals must be rigorously pinched out from the first. I have seen plants in the open doing fairly well when allowed to grow almost at "their own sweet will": they produced plenty of fruit, but it was small and poor. The restrictive or one-stem system is undoubtedly the best, the stem being trained upright to a stake of sufficient length and strength. In the open air the plants make a considerably sturdier and shorter-jointed growth than under glass, and thus seldom attain a height of more than 4ft. or 5ft., and very rarely as much as 6ft., before it becomes necessary to stop them and concentrate all their energies upon the fruit already set. The trusses, however, attain a very large size, and it is by no means uncommon for well-grown plants with single stems to be seen carrying ten, fifteen, or, in some cases, twenty pounds weight of fruit at one time.

Gathering the Fruit.—A maximum yield being the first consideration, all the fruit should be gathered directly it shows signs of turning colour, and finished off in a warm place under glass. If, on the other hand, quality and a full development of flavour are of more importance, it will be better to allow the fruit to remain on the plants until nearly or quite ripe, though, unless the

weather be unusually fine, it will take on a better finish under glass than if left in the open till the last. In the autumn, before the plants are touched by the first frost, take care to gather all the fruits, large or small, coloured or green, and take them indoors to ripen, as a very few degrees of frost will altogether ruin them. All those that have attained a fair size will, in time, ripen in a warm greenhouse, or on a shelf in the kitchen; while the small, green fruits, though they cannot be expected to colour, make most delicious pickles, if treated the same as Gherkins, &c.

Another way is to pull the plants up bodily, and hang them up in a warm greenhouse or shed: and, if practicable, this is probably the better method, as the fruit then receives the benefit of all the sap still remaining in the plant. Plants that were plunged in the pots, as previously recommended, may be taken up bodily, and if stood in a moderately warm house for a short time, with plenty of water for a few days at first, they will ripen nearly all they carry.

From an economical point of view, it is better to gather all fruit, whether grown indoors or out, directly the colouring process commences, simply because the removal of each one relieves the plant to a certain extent, and enables it to swell up more promptly those that are left. As soon as the turning-point is reached, the fruit will ripen nearly as well in any warm place as on the

plants; but it should not be exposed to very hot sunshine, or it will assume a scalded appearance, become soft, and never take on the proper colour. To develop the full flavour however, the fruit should remain on the plant until fully coloured and ripe, as already stated.

Varieties.—In order to obtain the best results from outdoor culture, suitable varieties should be chosen. Any of the hardier kinds, or those of a sturdy and productive character, are found to succeed in the open air: a dwarf habit is also desirable, if only as reducing the expense of stakes, &c., to a minimum. The following are perhaps most suitable, taking them as nearly as possible in the order of merit; one or other of those first named is usually selected by those who grow the fruit on a large scale for market: Large Red, Early Evesham, Laxton's Open Air, Dwarf Orangefield (syn. Early Dwarf, Little Gem, &c.), Hackwood Park, Abundance (Sutton's), Golden Nugget, Maincrop, Earliest of All, Trophy, and Horsford's Prelude—the last, though not cultivated to any great extent, being perhaps one of the very best for this purpose, chiefly owing to its excellent setting qualities.

Frogmore Selected is not only a fine-looking Tomato, but one of the best for outdoor cultivation. It boasts alike good form, free-cropping qualities, brilliant colour, and first-class flavour. A worthy companion to it in the

yellow-fruited section is Veitch's Golden Jubilee, that was raised a few years ago in the Royal Gardens, Windsor.

Sutton's Open Air is a corrugated variety, of capital flavour, and a great cropper, and may well be regarded as amongst the best of Tomatoes for outside work. Early Evesham can also be strongly recommended for this purpose. The improved form of this last-mentioned on page 107 is decidedly the best and most productive Tomato I have ever grown in the open air.

Protecting Plants in the Open Air.—The means of protecting plants growing in the open air in some way from rain, &c., is often of great importance, and frequently results in saving a heavy and valuable crop from decay and total loss, or in preventing a bad attack of disease. This is the case particularly when a spell of wet weather sets in towards the autumn, or end of the season, after a fine summer. This has been of frequent occurrence during the last few years; and when the rain comes just when the plants are well laden with fruit, and at their best, unless protected by some means the whole will probably be spoilt and lost. I have repeatedly seen plants that at the middle or end of August were carrying heavy crops of fine fruit completely ruined by a fortnight or so of wet weather,

and the fruit lying about and rotting on the ground by bushels, which a simple covering of some kind, just to throw off the rain, would have saved.

Any old, odd, or unused frame- or pit-lights may be utilised in this way with the best results, especially where the plants are growing on a comparatively narrow border in front of a wall of moderate height, when all that is necessary is to rest the upper or back ends of the sashes on the top of the wall (or on a piece of quartering secured to its face, at a suitable height), and the front or lower ones on a similar piece of scantling, or rough "plate," supported on stout posts, a few feet from the ground. This will throw off all rain, &c., as well as ward off a few degrees of frost, and enable the fruit to mature and ripen instead of falling a prey to disease. The front may be left open, and, indeed, this should be done, so as to admit air freely to the plants.

Where only a single row of plants is set out and trained up close to the wall, an ordinary coping fixed above them will keep them comparatively dry, and make a vast difference in wet weather in both their health and productiveness. Such a coping should be from 18in. to 2ft. in width, at least, and may consist by preference of glass (fixed in a suitable framework), or of wood (two or three

widths of ordinary boards, tongued and grooved together, or of simple weather - boarding, answering the purpose sufficiently well). Such copings are usually supported by means of iron brackets, which should be fixed permanently to the wall, but the coping itself had better be made movable, as at times it is not required, and is indeed better out of the way.

In some cases the copings are fitted with movable or sliding lights in front of the plants, these being fixed vertically, or inclining inwards slightly towards the top. This forms a kind of miniature green- or plant-house against the wall, and in this Tomatoes may be grown with great success, care being taken to admit air freely both at the top and bottom of the erection whenever the sun shines in anything like warm or mild weather. This is important, for if neglected the internal atmosphere will quickly become very hot and stuffy, and then the plants will suffer.

Remember that *anything* that will just throw off the rain when wet weather sets in will answer the purpose, and prove extremely useful. I would rather cover the plants with sheets of galvanised iron (for a short time only, of course) than leave them exposed to more than two or three days' heavy rain; but something of a transparent nature would be better, naturally.

Glazed sashes of any kind, even old window-sashes—whether large or small—may be thus utilised to great advantage. In the case of a bed of plants in the open, some spare frame-lights may be fixed over the latter by leaning them together at the top, in the form of a span-roofed greenhouse, and resting the bottoms on a couple of lengths of quartering, which may, if necessary, be elevated a few feet above the ground by means of a few stout posts. The lights should, of course, be secured in place by means of a few long nails or screws.

The Travelling Greenhouses (Pickering's Patent) will be found of great value for protecting breadths of Tomatoes in the open air by those who grow them on a large scale for market. On the advent of wet weather, all that is necessary is to run the house over on to the hitherto unprotected plot, and the crop is at once rendered practically safe.

Culture in Pits and Frames.—Tomato plants may also be successfully cultivated in any low pits (built of brick or other material), or in ordinary garden frames of moderate dimensions. In this way the plants may be put out considerably earlier than in the open air—especially if the glass is covered with mats on cold nights—and the ripe fruit be obtained correspondingly soon also, while the plants are easily protected from heavy rains or slight frosts by placing the

lights over them. In fine, warm weather these should be removed altogether, when the plants will grow much as if in the open air.

The method I usually adopt is to put low mounds of prepared soil, or compost, along the front or bottom of the frame (or pit), setting out one plant in each. Three plants may be put out under each light, if these are of the usual width (4ft.) or only slightly less; but if much narrower two will be found sufficient. Each plant should be kept strictly to a single stem, and this is trained to a light hazel or other rod fixed from the front to the back of the frame, 6in. or 8in. from the glass, or to a stout wire strained in the same position. Some place the plants at the *back* of the frame or pit, and lead the stems downwards to the front. It does not greatly matter which plan is adopted, though I think that, except perhaps where the frames face full south, the former method possesses certain advantages.

Plenty of air should be given, tilting the lights well at the back on wet days, and removing them altogether when fine. Stop the plants when the limit is reached, and with ordinary care in watering, &c., a good crop can hardly fail to be secured.



CHAPTER V.

VEGETABLE AND ANIMAL PESTS.

THE Tomato, though an exceptionally vigorous and strong-growing subject, is unfortunately liable to the attacks of several malignant diseases, these being chiefly of a fungoid character, and therefore extremely difficult to deal with. During unusually dull, cold, and wet seasons the majority of the crops grown in this country are more or less affected with one or other of these diseases, in many cases so severely as to render the crop a whole or a partial failure, and to ruin many small growers who depend upon it, and have no resources to fall back upon. In Guernsey, one season, a grower, who planted seven houses, of between 200ft. and 300ft. in length each, hardly cut a pound's worth of fruit; another man, one of the best growers of Tomatoes I ever knew, whose nursery was situated a few miles south-east of London, had the plants in ten long houses so crippled by the dreaded *Cladosporium fulvum*,

that he only obtained two, or at most three, trusses from each plant, instead of six, eight, or ten as usual. Again, in Mr. Ladd's huge fruit nursery at Swanley, where no less than thirty-two houses of 200ft. each were planted with Tomatoes, besides three others 500ft. long and 30ft. wide, the whole were so badly affected with the same disease as to have produced not more than half a crop. A very unpleasant peculiarity of these fungoid diseases is that after having once appeared in a house, they are almost certain to recur the next season, and in all probability with much greater severity, unless preventive measures are taken to render the plants immune. This has been demonstrated beyond the shadow of a doubt to be practicable by the judicious employment of a solution of sulphate of copper from the seedling stage. Mr. George Masee, the eminent authority on plant diseases, has experimented in this direction, and the result of his efforts cannot be too widely known. In an able paper that he contributed to the "Journal of the Royal Horticultural Society" (Vol. 28) he fully discusses this important question, and his method of treatment is thus summed up: When the plants are a fortnight old, commence by watering them every third day with a solution of pure sulphate of copper (1oz. to 50 gallons of rain-water). Continue this for six weeks, when water every

fourth day with a slightly stronger solution (1oz. to 35 gallons of rain-water).

We will now take the several diseases and pests in alphabetical order, commencing with

Aphides.—Both Green and Black Fly infest Tomatoes. Should either of these Aphides attack the young plants while still in pots, they should be dipped in a moderately-strong decoction of tobacco; or an infusion of quassia chips and soft soap will be found equally efficacious. Boil 1lb. of quassia chips and 1lb. of soft soap in three gallons of water for three hours. Add to the preparation a further three gallons of rain-water and apply warm. If the insects appear after the plants have been set out, fumigation with one of the vapourising insecticides, so long as the plants are not in flower, should be resorted to. After the plants are fairly in blossom, the foliage may be syringed with Abol, as made by White, of Paddock Wood, Kent. This is quite one of the safest and most effectual of all preparations against Aphides generally. Get the syringe to act upon the under side of the leaves as much as possible. Where, however, Tomato plants are kept in a healthy and growing condition, there will not be much trouble from this source.

Bacteriosis; Tomato Wilt (*Bacillus solanicola*).—On the Continent and elsewhere abroad this disease has proved very destructive, while this

country has also suffered from slight visitations. Plants that are attacked wilt and turn quite black. In the Queensland *Agricultural Journal* for July, 1903, this puzzling disease is dealt with. A discoloration of the pith has been observed, and on the stem are formed warty spots, and these exude driplets of a dirty white fluid full of bacteria. The disease is stated to be spread by inoculation due to the biting of insects, while it is further said to be associated with the ground fungus *Rhizoctonia solani*. By way of treatment the plants must first be sprayed with a combined insecticide and fungicide to prevent the insects responsible for the trouble migrating from plant to plant, and also to stay the progress of the fungus. As a further precautionary measure all attacked plants should be burnt. The combined insecticide and fungicide recommended is 1oz. of Paris Green to 10 gallons of Bordeaux Mixture.

Black Spot; Black Rot (*Macrosporium tomato*, Cooke).—An extremely common and very well characterised disease described by Dr. Plowright in the *Gardeners' Chronicle* as long ago as 1881. Popularly it is thought to be restricted to the fruits; but this is a fallacy: stem and foliage sometimes participate. Black Spot, as it is sometimes called, manifests itself either in the decaying style or in its vicinity, gaining an entrance thereto by small surface wounds. Generally it is first noticed when the fruits are about

half grown; but it quickly spreads through the interior of the fruit, completely spoiling it. By the time the fruit is ripe nearly the whole of the interior as well as the lower surface has become a mass of decayed matter of a jet-black colour, and usually more or less hard. Outside the surface has a wrinkled appearance due to the decay of the cells in the interior. Curiously enough, the first fruits that set on a truss—the superior ones—are always those affected the worst. This disease attacks all varieties indiscriminately and under every method of cultivation. Preventive measures against Black Spot are to employ the sulphate of copper solution from the first, as elsewhere suggested; to maintain the plants in perfect health and vigour; to keep everything about the plants scrupulously neat and clean; to ventilate freely, and promote a constantly buoyant atmosphere by the application of a gentle heat in dull or cold weather. All affected fruits and plants should also be burnt. This disease was unusually prevalent during the seasons of 1888 and 1889, thus showing that a damp and stagnant atmosphere and want of sun favour the increase of the fungus. The Spindle Mould that attacks Potatoes often co-exists with Black Spot fungus. Its scientific name is *Fusarium solani*, a near relative of the pest responsible for the Sleeping Disease of Tomatoes to be hereafter considered.

Droops, Falls, or Sleeping Disease (*Fusarium Lycopersici*, Sacc.).—During recent years this disease has been the cause of heavy losses among Tomato growers; while for a time it was puzzling to even the most experienced. In Guernsey, in particular, it has proved very disastrous. The symptoms are as follow:—A plant, to all appearance healthy, will on some bright sunny day be seen to flag slightly, two or three leaves only being usually affected at first. If dull or rainy weather succeeds it may seem to be all right again; but the next bright day the leaves will droop worse than before, be dull as to colour, and the evil increases daily until the plant collapses. If the stem immediately above the soil be examined there will be noticed a very fine white mould. As a rule, it is the most forward plants that are thus affected, and the principal time for the appearance of the disease is just as the first fruits have been formed, and are beginning to swell. Should the crop ripen up, as is sometimes the case, on no account should seed be used therefrom.

Fungicides are useless against this disease. Directly the grower has correctly diagnosed the disease he should remove and burn any infested plant or plants. Mr. Masee also advises removing all the soil and mixing with it quick-lime, and drenching the walls, staging, &c., with a solution of iron sulphate.

At the same time I have excellent reasons for believing—in fact, I may go as far as to say that I am certain—that *many* cases of supposed (and apparent) “flagging” are caused by no disease whatever, but from the continued use of impure water, or rather, perhaps, of that of a quality unsuitable for this subject. I am quite aware that in making this statement I am laying myself open to a large amount of unfavourable criticism, but a further experience of some years has so far confirmed my first rough theory on this point as to render it an actual certainty. The Tomato is undoubtedly more sensitive as regards the quality of the water supplied to it than any other plant I am acquainted with, and there are certain descriptions of water—especially those from wells or springs, and heavily charged with mineral matters—that, if regularly used, will have a very bad effect on the plants, and cause precisely the same appearances as I have described above.

Leaf Mould ; Leaf Rust ; Yellow Spot (*Cladosporium fulvum*, Cooke.).—One of the commonest, as well as one of the most destructive, of all the diseases affecting Tomatoes. Though it has been known in the United States for twenty-two years, it is only about eighteen since it was first recorded here. The onset of this disease is marked by the development of brown, felted patches on the underside of the leaves.

These rapidly increase in size and number. At the same time the upper surface has a yellow spotted appearance. As the disease progresses, the spots turn to blackish-brown. Very soon after the first appearance of this, the leaves commence to shrivel and die. Stems are also affected, and are darkly striped. In some cases after a time it affects the fruit, though this does not by any means invariably occur. Indeed, when once fairly set and commencing to swell, the fruit itself generally escapes; though once the disease has obtained a good hold, the fungus affects the blossoms, and prevents the formation of any more fruit.

“If a portion of one of the mildewed spots be examined with a quarter-inch objective, it will be seen to consist of a dense bed of flocci, a good deal matted and interwoven. If, however, a good view can be obtained, the fruit-bearing hyphæ are seen to be brownish in colour, septate towards the base, and about 150mk. to 200mk. long by about 8mk. in diameter. They are rather narrower above than below, and towards the base of a darker brown. The spores are borne in short chains, and, like all the *Cladosporii*, variable in shape—oval, elliptical, or even sub-cylindrical, and curved. Normally they are uniseptate, and measure from 10mk. to 15mk. in length by 5mk. to 7mk. in width: in colour they are pale brown. They germinate with great facility,

insomuch that a large proportion of the spores from the specimen I examined had already begun to do so. This process consists in the protrusion of a germ-tube from one end of the spore, which soon grows to double or treble the length of the spore. In some cases the germ-tube is emitted from the middle of the spore near the septum" (*Gardeners' Chronicle*, 29th Oct., 1887).

As far as I have seen, this disease is far commoner than any other affecting the Tomato, and has caused enormous losses to growers alike in Europe and the United States. Should it appear, a solution of sulphide of potassium (1oz. to three gallons of water) should be tried at intervals of a few days. First dissolve the sulphur in a quart of warm water, and afterwards make up to the desired strength. Remove and burn infested foliage wherever possible; while in the case of a badly-infested plant it should be burnt in its entirety. Moreover, there is not the least shadow of doubt that this disease, if not actually induced by a close atmosphere—or, in other words, by insufficient ventilation, with in some cases too great a degree of warmth and moisture—is greatly aggravated thereby. The Tomato is eminently an air-loving, as well as a heat-loving subject, and in a stagnant atmosphere invariably goes wrong sooner or later. A plain proof of the above is

found in the following facts:—The only really clean and successful crops of Tomatoes I saw in the disastrous season of 1888 were three in number, one being the collection at the Royal Horticultural Society's Gardens at Chiswick—than which, in spite of the unfavourable season, nothing better could be desired; another, my own lot, growing in four span-roofed houses, averaging about 5ft. each; and the third belonging to a friend near Blackheath, who had an equally clean and satisfactory batch. In each of these cases the treatment, as far as I have been able to ascertain, was the same; the leading features being abundant ventilation, the roof ventilators being never, or at any rate very seldom, completely closed day or night, and plenty of side air being given as well on all fine days; liberal treatment from first to last, with plenty of liquid manure while the plants were in full bearing, and a little fire heat in dull or cold weather.

Wherever the shutting-up system was practised, there the disease was invariably present, and more or less rampant also. On one occasion one of my houses—a small, low, span-roofed and rather damp structure—remained closed, or nearly so, from early on the Saturday afternoon till the following Monday morning, a dense wet fog prevailing on both nights and during part of the day. On entering the house on the Monday, the plants were not only dripping with moisture,

but in several instances I noticed small patches of the Cladosporium, evidently of quite recent formation, on the under-side of the leaves. After the house had been freely ventilated, however, for a time, and a little heat turned on, these almost disappeared; but the loss of so much of the foliage crippled the plants for the rest of the season.

Potato Disease (*Phytophthora infestans*).— This disease at times attacks Tomatoes, both in the open air and under glass, with disastrous results. As with the Potato, the disease first appears in the stems and foliage, and in severe cases subsequently spreads to the roots, when the plants speedily succumb to its effects. It may be easily identified by the peculiar unpleasant odour that is always noticeable. The indications are the appearance of brown, or in severe cases nearly black, marks in streaks and patches upon the foliage and stems, causing a shrivelled or burnt appearance. These may spread rapidly, crippling the trusses and disfiguring any fruit that may be set; and if the disease extends to the roots, the consequences are generally fatal. It is most troublesome in damp, cold weather; and when this has prevailed I have seen plants that were green and apparently healthy at night quite blackened and spoiled by the morning.

All that can be done is to cut away the affected parts and burn them, give more air, and promote its circulation by means of a gentle

heat in the pipes; and one or two waterings with a solution of sulphate of ammonia and a little soot will be advisable, as affording a stimulant and perhaps enabling the plants to outgrow the disease. This treatment is desirable in case of an attack of either this or *Cladosporium fulvum*. Though a positive remedy for the Potato Disease has yet to be found, Bordeaux Mixture is the most likely to prove effectual.

Professor Galloway, of the United States Department of Agriculture, gives simple but very minute directions for the preparation of Bordeaux Mixture as follows: In a barrel place 25 gallons of water. Weigh out 6lb. of copper sulphate, then tie the same in a piece of coarse sacking, and suspend it just beneath the surface of the water. By tying the bag to a stick, laid across the barrel, no further attention need be given. In another vessel slack 4lb. of lime, taking care to form a paste free from grits or lumps; this is best done by placing the lime in an ordinary water-pail, and adding at first, say, from 1 quart to 3 pints. When the lime begins to crack and crumble, and the water to disappear, another quart or more of water should be added, taking care that at no time the lime gets too dry. Towards last a considerable quantity of water will be required; but if added slowly by degrees, a perfectly smooth paste will result, if the lime used be of good quality.

When the lime is slacked, add sufficient water to bring the whole up to 25 gallons. When the copper sulphate is entirely dissolved and the lime cool, the lime-milk and copper sulphate solution should be poured slowly together into a barrel holding 50 gallons, first thoroughly mixing the lime-milk. A final stirring for a few minutes with a broad wooden paddle completes the process.

To determine whether the preparation is safe to apply to tender foliage, Professor Galloway recommends the following test: Insert the blade of a penknife in the mixture, allowing it to remain for at least one minute. If the polished steel assumes the colour of copper-plate, the mixture is unsafe, and more lime must be added. If, however, the blade remains unchanged, the mixture has been correctly prepared.

If the Bordeaux Mixture cannot all be used after preparation, extra care will be necessary on its employment subsequently to see that it is well stirred. After a time the useful constituents are precipitated, leaving a clear liquid of no value as a fungicide. Paris Green is sometimes added to the Bordeaux Mixture with a view to combining an insecticide with a fungicide.

Root-Knot Disease.—A well characterised disease in Tomatoes (and also in Cucumbers) is known by this name. It is due to the attacks

of a species of Eelworm (*Heterodera radicum*). Though far too minute to be seen by the unaided eye, yet there is no mistaking its presence, which is betrayed by the "yellowing" of the foliage, followed by a collapse of the stem and finally of the whole plant. An examination of the roots of Tomatoes so affected is almost certain to reveal the very numerous and variable-sized excrescences studding all parts of the roots; the largest will probably measure $\frac{1}{4}$ in. or even more across. Once Eelworms have attacked plants in this way remedial measures are useless: the plants must be burnt and the soil removed and treated to a germicide. For this latter purpose carbolic acid in solution (1 part acid to 20 parts water) should be employed three times at intervals of a fortnight, taking care that it is thoroughly saturated. Where the soil in a house is infected this should all be carefully removed outside and treated as just advised. All the woodwork should also be washed with a stronger solution of carbolic (1 in 8).

It is useless to remove affected plants and to insert fresh ones in the old soil; such is certain to contain the creatures, awaiting a suitable host on which to prey. Soil that has been treated to carbolic should not be employed for six months. Gas-lime freely used in the soil has also proved effectual; in that case, too, a period of six months should elapse before the soil is again employed.

Snowy Fly (*Aleyrodes vaporariorum*).—Like the Aphides, to which this creature is allied, it causes considerable injury to Tomato plants by sucking the sap therefrom. It is a prolific pest, and in the nymph stage is fastened to its host-plant. Though to judge by appearance a somewhat delicate insect, it is able successfully to withstand tobacco fumigation. Soft soap, 1 lb. to ten gallons of water, might be tried; as also might the preparation known as Abol. Fir-tree oil has also been recommended, but is somewhat expensive comparatively. Some cultivators of the Tomato have obtained relief by coating the hot-water pipes with sulphur made to a workable consistence with skim-milk, and then closing the house in the evening. A week of such treatment will usually oust the pest.

CHAPTER VI.

VARIETIES—GRADING, PACKING, AND MARKETING.

THE number of varieties of the Tomato now in cultivation is very great; and though many of them are so nearly alike as to be almost if not quite identical, yet the variation in the size, form, colour, and flavour of the fruit, as well as in the habit and foliage, is so great as to be well-nigh incredible to anyone who is not thoroughly acquainted with the subject.

A few years ago, before the Tomato had attained the popularity it now enjoys, the list of named varieties was a very brief one, consisting of some eight or nine only—namely, the Large Red, the Large Yellow, the Early Red, the Upright or Tree Tomato (illustrated at Fig. 3) the Pear-Shaped, the Cherry, the Yellow Cherry, and the (Red) Currant. Later on came the Trophy, Hathaway's Excelsior, and Carter's

Greengage; and these, with Vick's Criterion, appear to have been the first departures, or hybrids, from the original species (*Lycopersicum esculentum*).

In South America, its native home, the Tomato was cultivated on an extensive scale



Fig. 3. The Upright or Tree Tomato.

long before the fruit was known in this country, except as a curiosity. The climate of that part of the world being so much more favourable to the growth of the plant, in the open air especially, than our comparatively moist and sunless one, would to a great extent account

for this, and the desire for cooling fruits and salads engendered by the tropical American summers might also account for something. Several of the leading American varieties have been introduced to this country with excellent results; but, on the other hand, others that are grown largely there are hardly known at all here. The introduction of American Tomatoes into this country has not, on the whole, received the attention it deserves, though a step in the right direction has been made in connection with the trials from time to time instituted at Chiswick. The addition of such a valuable variety as Horsford's Prelude to our list is in itself a matter for congratulation; and that productive and delicious Tomato, Nisbet's Victoria, is now grown here and there, though the small size of its fruit renders it hardly fit for market work. There are also a few others; but taken generally they do not find favour.

Before proceeding to give a briefly descriptive list of all the best known varieties, it may be as well, for the benefit of amateurs, to state a fact well known to all experienced growers—viz., that few plants are so liable to vary in character when raised from seed as the Tomato. Unless the seed be saved with the greatest care, very little dependence can in fact be placed upon it at all. It therefore follows that whenever

it is desired to keep any particular strain or variety as true as possible, the seed should be saved from selected plants only. Moreover, the seed-bearers should be, as far as possible, isolated from any other varieties, so as to prevent all risk of cross-fertilisation.

However carefully harvested, there is always a certain amount of variation among seedling Tomatoes, and one cannot therefore be too particular as to the source from which the seed is purchased. A great deal of the seed offered at a cheap rate by weight is often not worth even the small sum asked for it, or even the trouble of sowing; and I am sorry to say that I have had packets from first-class seed houses, and for which I have paid a good price, that contained not only one, but half-a-dozen distinct varieties at least. There are, fortunately, honourable exceptions, and good seed is to be had if one goes to the right place for it; but where a good and true crop is a matter of importance, as in the case of those grown on a large scale for sale, I should strongly advise actual knowledge of the source of the seed on the part of the purchaser. Where any improvement in the variety or strain is looked for, or even if only the quality is to be maintained, seed should be saved from the finest types alone, alike as regards habit and productiveness, and form, size, and quality of the fruit; for

Tomatoes, in common with most other plants, have a decided tendency to revert to inferior forms, more especially if highly bred.

Under these circumstances, it will be readily understood that a considerable difference in the character of any particular variety or strain may be effected by the manner in which the seed is selected and saved for a few years consecutively. Thus, two growers may start with a certain variety, but in a few years' time the types they have obtained by constant selection may be quite dissimilar, for one grower may have aimed at size and cropping qualities, while the object of the other may have been well-formed fruit or a dwarf habit. In fine, a good selection is of the utmost importance, and a really good type of a slightly inferior variety (originally) may be actually superior to a poor or a carelessly-selected form of a better sort. It is indeed surprising what can be done in the way of changing or improving a variety by constant and careful selection for a few years.

The old Large Red Tomato (Figs. 4 and 5) probably from its having been more extensively cultivated than any other, by reason of its good habit and constitution, and heavy-cropping qualities, varies in character perhaps more than any other variety, and may therefore be taken as a good instance in point. I have both seen and grown an almost worthless type of this variety

—a rank weedy plant, with comparatively small trusses of coarse, ugly, and ill-flavoured fruit; while, on the other hand, at least one experienced grower of my acquaintance, who has been skilfully cultivating and selecting this variety for several years, has secured a really grand type or strain :



Fig. 4. Large Red Tomato (old or inferior type).

such a one as I have not seen equalled elsewhere. It is very vigorous in growth, dwarf, with rather finely-cut foliage (some strains have the leaves almost entire, after the style of those of the Mikado and Main Crop varieties), and throws very large trusses at frequent intervals all up the stem. The fruit is of large size, very slightly ribbed or corrugated, and much more solid and fleshy, as well as of finer flavour, than any other stock of this kind I have ever seen. I merely give these details to show what can be done by careful selection. There is no doubt whatever that an experienced and skilful grower can in a few years alter or improve any given variety in this way to a remarkable extent. Many of the varieties that have been sent out in the past have been little more

than selections from old and well-known varieties. The larger the number of plants grown, the better the chance of obtaining and seeding from specimens of marked excellence.

As far as productiveness goes, it would be difficult to find a Tomato to surpass a good



Fig. 5. Large Red Tomato (Improved type).

strain of the Large Red. It not only possesses an excellent constitution and a good habit, and is therefore well adapted for early forcing, but it naturally commences to fruit early, and with suitable treatment continues in bearing for a long period. As a heavy cropper it may be said to stand unrivalled up to the present, though in the points of form and colour of the fruit, as well as in quality and flavour, it is decidedly inferior to many other varieties. Whether we shall ever get by means of hybridising, &c., one or more varieties combining the productiveness and dwarf habit of the Large Red with the fine form, colour, and flavour of some others, remains to be seen; but it is, I think, very probable.

For quality, the round, smooth-fruited varieties

with solid flesh should receive the preference. One of the best, if not the very best of these, is the Perfection type—a large, round, smooth and handsome fruit of a deep crimson colour when ripe, and with very firm flesh, an absence of pulp and seeds, and a sweet, rich, “cheesy” flavour: its only fault is that it makes a rather long and strong growth, and consequently requires plenty of room. But when of a good type and well grown, this variety produces an almost equal quantity of fruit with the Large Red; and as its superior quality commands a better price when grown for sale, it is, I believe, quite as profitable a variety to grow—besides which, from its greater solidity, it “weighs out” better.

Other good round-fruited varieties of high quality are the old Hathaway’s Excelsior, Dedham Favourite, Ham Green Favourite (illustrated at Fig. 6), Abundance, Frogmore Selected, Chiswick Peach, and Sutton’s Perfection. The old Acme and Hackwood Park are both good; and though the former has a rather delicate constitution, the latter is a very heavy cropper, and being of good general quality, may be taken as one of the very best varieties for all-round cultivation, indoors or outside.

The flavour of the different varieties also varies considerably. That of Perfection, as I have said, with Mikado, Dedham Favourite, Cardinal, Excel-

sior, and two or three others, is rich, "cheesy," and rather sweet; Trophy, Hackwood Park, and others, also partake of these qualities in a lesser degree. On the other hand, Carter's Greengage, Criterion (Vick's), Sutton's Golden Nugget, and a few others, possess a peculiar piquant sub-

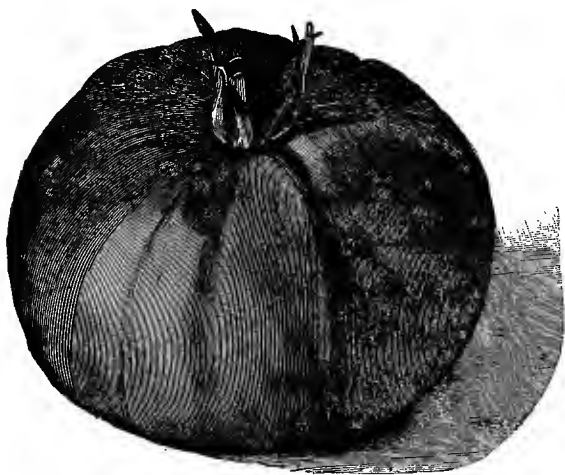


Fig. 6. Ham Green Favourite Tomato.

acid flavour, which is more acceptable to some palates than the other. The Blenheim Orange or Apricot Tomato (Carter's) is considered to be one of the finest-flavoured varieties in cultivation, affording a happy combination of sweet and acid qualities. The sweetest variety with

which I am acquainted is Horsford's Prelude ; the Chiswick Hybrid, or "Conference" Tomato, the result of a cross between Perfection and Prelude, is also very delicious. The most disagreeably flavoured of all is King Humbert or Chiswick Red, and Tennis Ball is not much better.

Few or none of the very small-fruited kinds, such as the Currant (Fig. 7), Cherry, and Grape Tomatoes, possess any excellence at all, as regards either substance or flavour. They are, in fact, almost worthless except from an ornamental point of view ; but when well grown in 8in. to 10in. or 11in. pots, kept to a single stem, and covered with their long drooping trusses or racemes of



Fig. 7. The Currant Tomato.

bright scarlet or golden fruit, they form very attractive objects, and may with advantage be employed as decorative subjects for the conservatory, &c. Prelude, Tennis Ball, and Sutton's Golden Nugget are also very suitable for this purpose, and when well grown become really beautiful objects.

The only quite small-fruited Tomato I know that possesses anything like a good flavour is the productive and pretty little pear-shaped Nisbet's Victoria, and the fruit of this is really delicious, whether eaten raw or in any other way.

A considerable amount of fuss was made about the so-called self-supporting or bush varieties of the Tomato (Fig. 8); but from what I have seen and heard of these, they are, though of a comparatively dwarf habit, by no means equal to the description, and inferior in other points to the ordinary varieties. I do not believe we shall get anything of this kind—at any rate, for some time to come.

In spite of the long list of varieties, a really perfect Tomato—one that is excellent in all respects—has yet to be produced. Golden Jubilee, Frogmore Selected, Perfection, and one or two others, however, approach the ideal variety. Frogmore Selected may be truthfully described as the best scarlet Tomato; while in the yellow-fruited section it would be difficult to point to a more taking, finer flavoured, or more solid variety than

Golden Jubilee, a product of the Royal Gardens at Windsor. What the shopkeepers want, in London at any rate, is smooth round fruit, moderate and even in size, weighing not less than 2oz. nor more than 4oz. apiece, of a rich



Fig. 8. Self-supporting, or Bush Tomato.

bright colour, and with firm, solid flesh, few seeds, and an agreeable flavour. Add to these points a dwarf and sturdy habit, a good constitution, and a prolific and early-fruited character, and we have the perfect Tomato—or shall have when we get it.

List of Varieties.

A 1 (Sutton).—A free-cropping, attractive variety, with round fruit of a bright crimson colour. Its chief faults are its long habit of growth and a lack of solidity in the fruit.

Abundance (Harrison).—A form of the *Large Red*.

Abundance (Sutton).—This is quite distinct from the other variety of this name. It is a sturdy and compact-habited variety, bearing clusters of medium-sized, smooth, round fruit, of a bright crimson colour and good flavour. It is an early and good market variety, and very suitable for small greenhouses; or it may be grown in the open air.

Acme (J. Veitch).—An old variety with round fruit of a purplish-red colour, and not very popular now, as it neither possesses solidity of flesh nor good flavour. Brookwood A 1, Early Essex, Livingstone's Acme, Livingstone's Beauty, No. 2 (Banstead), Pomegranate, and Rochester are synonymous with this.

Advancer (Barr).—A round, small-fruited variety, of a deep scarlet colour, of the same type as Horsford's Prelude or Tennis Ball.

Apricot.—A synonym of *Blenheim Orange*.

Belle of Massy (Perdrigeon).—An early vigorous variety, producing long bunches of fruit of a bright red colour, firm flesh, and a smooth

and resistant skin. It both keeps and travels well.

Best of All (Sutton).—A useful and productive Tomato, sturdy and short-jointed in growth, and with rather large round fruit of a deep scarlet colour. It is of good form and very solid. As a market variety it has an established reputation.

Blenheim Orange (Carter); also known as the Apricot Tomato.—The fruit of this variety is of a deep yellow colour, slightly shaded and flaked with red; it is of moderate size, quite round and smooth, and besides possessing a very attractive appearance, has a luscious and brisk juicy flavour. Blenheim Orange is said to be the result of a cross between Dedham Favourite and Greengage, so that it could scarcely fail to be remarkable for excellence of flavour.

Brookwood A 1 (Lloyd).—A synonym of *Acme*.

Bunn's Superlative (Bunn).—A useful short-jointed variety, bearing heavy crops of deep-round, dark-red, handsome, solid-fleshed fruit.

Canada Victor.—A synonym of *Large Red*.

Cardinal.—An American variety, so named on account of its colour—brilliant cardinal red. The fruit is quite round and smooth, slightly flattened, nearly as large as that of *Perfection*, and of excellent texture and flavour. The name *Cardinal* is also applied to *Perfection*.

Carter's Perfection.—A synonym of *Perfection*.

Challenger.—This much-belauded variety is a capital setter, which is about all that can be said in its favour. The habit is long, the fruit is light or pale-coloured, and lacks both solidity and flavour. After one trial I discarded it, and so did several good growers of my acquaintance.

Champion (Dobbie).—One of the best of the many varieties on the market. It has a globular, shiny, deep-red fruit, solid of flesh, and excellent of flavour. As a cropper it is first-rate, and may be grown for either exhibition or market.

Chemin Rouge.—This fine variety was raised and sent out by Messrs. Vilmorin, of Paris, and is, taken all round, one of the best market varieties extant. I did not care for it much at first, but, like other really good things, it improved on acquaintance. Its only fault is the rather long habit of growth, but beyond this it is a hardy and vigorous variety, and a sure setter, while although the trusses of fruit are not large, the medium-sized fruit is quite round and smooth, very solid, and of excellent quality. So heavy a cropper is it that a grower near London, with just an acre of glass-houses (devoted entirely to Tomatoes), obtained one season (1895) no less than forty tons of fruit from this variety alone.

Cherry (Red), or Cherry-shaped.—This is one of the original varieties. It produces small, round

fruit, the size and shape of a cherry (whence its name); it commences to fruit early, and is a free-setting and very prolific kind. The fruit, however, possesses neither weight nor flavour, so that except for ornament it is almost valueless. There is a yellow-fruited variety, similar to it in every way except colour.

Cherry Ripe.—For the dessert-table this is considered a very handsome variety. The plum-sized fruits are round, bright red, and of good flavour. In the more favoured parts of England it would make a nice outdoor variety.

Chiswick Hybrid.—A synonym of *Conference*.

Chiswick Peach.—A variety having its origin in the gardens of the Royal Horticultural Society, Chiswick. The fruit is of a beautiful lemon-yellow with a peach-like bloom, and the flavour is delicious. As a dessert fruit it has no superior nor must its cropping and long-keeping qualities be lightly regarded, to say nothing of its highly-ornamental appearance. For outside culture, this variety is of no value.

Chiswick Red (also known as King Humbert and Non Plus Ultra).—Fruit of moderate size, but of a peculiar egg-shape, and produced in clusters of fifteen to twenty or twenty-two together; colour deep red. This is a compact-growing and very prolific variety, but is wanting in substance, flavour, and weight. Though liked by a few, its flavour is absolutely nauseous to

most people, and the shape of the fruit is also much against its popularity.

Cluster (Sutton).—A small, round, red-fruited and very prolific variety, after the style of the old Currant or Cluster Tomato, but larger and of better flavour. None of these small-fruited Tomatoes are, however, of much use, except for ornament or curiosity.

Comet.—A synonym of *Hillside Comet*.

Conference.—A variety between Perfection and Horsford's Prelude, raised in the Royal Horticultural Society's Gardens, Chiswick, and combining the fine qualities of both parents. The fruit is somewhat smaller than that of Perfection and larger than Prelude, quite round and smooth, rich bright crimson in colour, firm in flesh, and of a sweet and excellent flavour. It is a fine variety for either inside or outdoor culture, but the fruit is too small for market work. It was originally named Chiswick Hybrid, but was re-christened Conference in 1889.

Conference Improved (Dobbie).—In this improved form of the well-known variety are to be found a number of excellent characteristics, the fruit possessing shapeliness, a nice solid flesh, delicious flavour, and a bright, shiny, red colour. As an outdoor Tomato it would be difficult to excel as a cropper.

Conqueror.—An old variety, of a bright red colour, and fairly early and prolific. The fruit

of a good strain is only slightly ribbed, of moderate size, and very solid. The habit is very compact. It is identical with Earliest of All.

Criterion (Vick).—An old variety, with medium-sized, oval-shaped fruit, of a light and rather pinkish-red colour. It is a free-growing kind, and sets well. The fruit is rather small, but freely produced. Though not up to some of the newer, large-fruited varieties, it possesses some good qualities, and for winter-fruited is one of the best.

Currant (Red).—One of the original kinds, and the smallest-fruited of all, the berries being little larger than a good sample of an ordinary red currant. The trusses, or rather racemes (Fig. 7), are, however, very long, and a well-grown plant is a very ornamental object, though quite unfit for any useful purpose. There is also a yellow-fruited variety, similar in every respect except colour.

Dedham Favourite (Carter).—A good Tomato, raised and sent out by Messrs. Carter, of Holborn. It is evidently of Acme parentage, but superior to that variety. The fruit is of moderate size, smooth, and of a deep purplish-red or crimson colour and nice flavour. Though an old variety, it still has a good following. Ne Plus Ultra is identical with this variety.

De Laye.—A variety of the old Tree Tomato, but not to be confounded with *Cyphomandra*

betacea, also known as the Tree Tomato. It is of a stiff and tree-like growth, and bears large, deeply-sutured red fruit, but is not a prolific variety. It is late, and rather tender.

Dessert (Sutton's).—A pretty and useful kind sent out by the famous Reading firm. The small, plum-shaped fruit, of a bright-red colour, is abundantly produced in numerous long and showy trusses, or racemes, and possesses, moreover, a very superior flavour. A well-grown plant forms a very pretty specimen, while when cut the fruit is also exceedingly ornamental.

Duke of York.—A very handsome variety, of the Perfection type, raised and sent out by Messrs. Jas. Carter & Co., of Holborn, and greatly improved of recent years. The large, smooth, nearly globular fruit is of a rich scarlet colour, very solid and heavy, and fine for exhibition, table, or market. For open-air culture it may be grown, but it does not ripen quickly. As an under-glass variety it is in the first rank, and has received a First Class Certificate of the Royal Horticultural Society.

Dwarf Gem (Sutton).—Delicious as to flavour, and exquisite as to form, may be said of this variety, which bears its pale yellow fruit in clusters.

Dwarf Orangefield.—This is considered to be identical with the old Early Dwarf, and at best it can only be a selection from that variety. As

its name denotes, it is of a dwarf and compact habit; it is also very prolific, but the fruit is somewhat small, rough, and inferior in quality. From its hardiness it is very suitable for outdoor cultivation, and should only be employed for this purpose. It is also known as Early Red, Little Gem, Orangefield, and Orangefield Improved.

Dwarf Prolific (Cooper).—Identical with the old *Large Red*, or at any rate only a selection from it.

Earliest of All.—This is synonymous with *Conqueror*.

Early Dwarf (R. H. S.).—Also called Dwarf Orangefield, Early Red, Little Gem, Livingstone's Favourite, &c. The above name was selected by the Royal Horticultural Society as the proper one for all of this class, none of them being anything more than selections from the original Early or Dwarf Red Tomato.

Early Essex.—A synonym of *Acme*.

Early Evesham.—This variety is very short in growth, hardy, free-setting, and early. Although scarcely suitable for indoor culture (on account of its rather small and more or less corrugated fruit)—except, perhaps, for a very early crop—this variety is a capital outdoor Tomato—decidedly superior, in fact, for this purpose to Hackwood Park, Laxton's Open Air, Earliest of All, or any of that class. The growth is wonderfully robust, short, and stout, and the fruit, of a bright red

colour, is borne in perfect masses only 6in. to 8in. apart all up the stem. This variety never fails to set under *any* conditions, while the fruit is of good quality and flavour, if rather small; further, the plant is not injured in the least by a few degrees of frost. A characteristic of this variety is the entire, or undivided, foliage, like that of Main Crop and Mikado.

By carefully selecting and seeding from the finest types of this variety for a few years, I have succeeded in obtaining a greatly-improved form of this excellent Tomato. Of this, the fruit, when well-grown, runs nearly as large as that of Ruby or Chemin Rouge, the majority being also nearly smooth, or very slightly sutured, and it is produced in numerous huge clusters weighing two or three pounds apiece.

Early Market (Sutton).—Though somewhat corrugated the fruits of this variety are rich as to colour, and abundantly produced. All things considered, it may not be as good as the same firm's Earliest of All, but it is nevertheless an early one for market purposes, and useful for outdoor culture.

Early Ruby.—This fine Tomato is of American origin, and is one of if not the best ever obtained from that source. It is said to have been derived from *Perfection*, but I must confess I can discern no resemblance whatever to that variety or any form of it. It is an

early, vigorous, and very distinct kind, with finely cut foliage, large branching trusses, and a decidedly dwarf and compact habit of growth. The fruit is of medium size and good colour (bright red), and when well selected is also fairly smooth. The quality is decidedly good, and when well grown it is a very heavy cropper; but, unless perfectly healthy, and well supplied with nourishment when the first truss or two have fairly set and begun swelling, it is apt to "run out," the trusses becoming small and poor, or the blossoms dropping. It succeeds equally well under glass and out of doors, and is one of the best for pot culture.

Early Scarlet Tennis Ball.—A dwarf variety, of very prolific habit, the small, round, crimson fruit being produced in large clusters that literally touch one another all up the stem. The fruit is slightly smaller than that of Horsford's Prelude, and the plant is not so tall, otherwise there is a considerable resemblance between the two. Good plants of this variety when in full fruit are bright and really beautiful objects: well grown in gin. or roin. pots they would make admirable specimens for the decoration of the conservatory. The flavour is, however, inferior to that of Perfection, Prelude, and many others. Also known as Tennis Ball.

Eclipse (Sharpe).—A synonym of *Paragon*.

Eclipse (Sutton).—A medium-sized, flattish-round, red-fruited variety, originally sent out under the name of *Excelsior*. It sets well both under glass and outside, and crops well. It received the R. H. S. Award of Merit in 1895.

Empress.—A synonym of *No. 3* (Watkins & Simpson) and *Hackwood Park*.

Excelsior (Hathaway).—A good old variety, with moderate-sized, smooth, round fruit of excellent quality. It grows freely and sets well, and the fruits, which are of a deep orange-red colour, are of fine form and substance, and good flavour. It is now discarded, being superseded by newer varieties.

Faultless Early (Farquhar).—A synonym of *Laxton's Open Air*.

Frogmore Selected (Veitch).—Admittedly one of the finest red-fruited Tomatoes in cultivation for early forcing or outdoor culture. The fruit is of medium size, nearly round, very uniform, smooth, and solid as to flesh. It also sets freely and is a heavy cropper. The Royal Horticultural Society has awarded it a First Class Certificate.

General Grant.—A synonym of *Hackwood Park*.

Glamorgan.—A selection from the *Large Red*.

Golden Drop (Dobbie).—Golden-yellow is the colour of this desirable dessert variety. In all except colour it is practically a facsimile of *Cherry Ripe*.

Golden Jubilee.—This first-class variety was raised in the Royal Gardens, Windsor, and is rightly regarded as one of the finest Tomatoes in cultivation. It is the result of a cross between Golden Princess and Frogmore Selected, and happily combines the best quality of both. In colour it is a clear golden-yellow, with scarlet suffusions. The flesh is solid and of delicious flavour; while further recommendations are the relatively small seed space and the absence of core. The variety, also known as Royal Windsor, has received a First Class Certificate.

Golden Nugget (Sutton).—A variety with rather small round fruit, of handsome appearance, and good quality and flavour. It is dwarf in habit, and produces long trusses or racemes of eight to twelve fruit in each. It comes into bearing early, and is of a deep golden colour. It is suitable alike for under glass and open-air culture. It has obtained a First Class Certificate.

Golden Perfection (Sutton).—Similar in habit, size, &c., to the ordinary red-fruited *Perfection*, but the fruit is of a clear golden-yellow colour, attaining a large size; and being also very smooth and handsome in appearance, fruit of this variety is of considerable value to exhibitors. It is best adapted for growing indoors.

Golden Queen (Sutton).—A good yellow variety, with large, round, slightly corrugated fruit, of excellent flavour, and ripening early.

Golden Sunrise.—A variety that has received a First Class Certificate from the Royal Horticultural Society. The fruits are large, round, smooth, and of a bright golden-yellow, sometimes faintly flushed with crimson. It is of excellent flavour and suited for open-air culture.

Golden Trophy.—A yellow-fruited form of Trophy. It is a heavy cropper, but coarse in quality, and inferior in every respect to the last-mentioned variety.

Greengage (Carter).—An old variety, with rather small, round fruit of a citron-yellow colour when ripe, sometimes tinged with orange or pink. It is a free but long grower and a good setter. The flavour is fine, with an agreeable sub-acid quality, which is very grateful to some palates. One of the earliest of the yellow-fruited section to commend itself to the public.

Hackwood Park.—A hardy, dwarf-habited, and free-fruited variety, suitable for early crops or for outdoor work. It is, however, not first-rate, in colour and flavour, though a good all-round Tomato. It is identical with Empress, General Grant (Farquhar), and Hackwood Park Prolific.

Hackwood Park Prolific.—This is but a synonym of *Hackwood Park*.

Ham Green Favourite.—A fine variety, sent out by Mr. Crocker, of Ham Green, near Bristol. The fruit is fairly large, produced rather freely, nearly round, solid, and of a deep red colour. The plant is, however, rather long jointed.

Hathaway's Excelsior.—See *Excelsior*.

Hillside Comet (Watkins & Simpson).—This variety, better known, perhaps, as Comet, has medium-sized, round, smooth, scarlet fruit, solid, and of fine flavour. Its cropping qualities, both under glass and outside, are excellent. An Award of Merit has been received for it.

Hipper I. (Holmes).—The deep crimson fruits of this variety are produced in fine clusters. They are very shapely, and weigh five or six to the pound. The plant is a free-grower, a good setter, and a heavy cropper.

Holmes's Supreme (Hurst).—In this short-jointed variety the fruit is of medium size, round, and of a deep-red colour, with solid flesh. An all round good variety.

Ifield Gem.—This now well-known Tomato is the result of a cross between Conference and a large-fruited American variety—Lorillard or Empress—and was raised in 1891. It possesses the dwarf, compact habit and free-setting qualities of Conference, but the fruit is decidedly larger, though still of only moderate size, averaging about 4oz. apiece, and seldom exceeding, or even reaching, $\frac{1}{2}$ lb. in weight; it is flattish-round in shape, nearly or quite smooth except when grown very strongly, when the largest fruits are slightly ribbed or sutured near the stalk only. It is of a rich glossy crimson colour, exceptionally solid and weighty, with

comparatively few seeds, while the flavour is probably superior to that of any other variety. This is also a very early Tomato, ripening before almost any other, and very productive also, the trusses, consisting of seven to nine, or occasionally more fruits apiece, being seldom more than 6in. or 8in. apart along the stem, when properly grown. It succeeds admirably in pots or boxes, as well as planted out, and, besides being so good under glass, it is one of the very best for out-door culture.

Invercargill Scarlet (Barr).—An Australian-raised variety of handsome appearance, bearing medium size, glossy, scarlet, flattish-round fruit, with deep flesh and of fine flavour. There is a pink form that in all other respects is identical with this.

Invincible (Blackstock). — This main-crop variety sets very freely and is an excellent bearer. The fruits are smooth-skinned, large, and of a rich crimson; it is solid as to flesh, and fine as to flavour; while both under glass and in the open air it crops well.

Jubilee.—A synonym of *Perfection*.

King Edward VII. (Daniels).—This sturdy, vigorous, short-jointed variety bears abundantly. The fruits, which are almost round and are produced in clusters of ten or a dozen, are very solid as to flesh. Alike under glass and in the open air it has proved of value, and the grower

for market will find the variety one worthy of his attention.

King Humbert.—This is identical with *Chiswick Red*.

Kneller's Prize.—As the name suggests, this variety was raised by Mr. Noah Kneller, of Malshanger Gardens, Basingstoke, and it promises well. It is of good size, perfectly round in form, smooth as to skin, solid as to flesh, and of fine flavour. Added to which it is a vigorous grower, free setter, and prolific.

Large Red.—For ordinary purposes this is still one of the best and most useful of all the older varieties, and it is scarcely to be surpassed in productiveness by any of the newer introductions. When well selected it is indeed hardly equalled, as regards the quantity of fruit produced, by any other variety. As ordinarily met with, the fruit is large, more or less coarse, deeply sutured, and greatly inferior to that of *Perfection* and other smooth, round-fruited kinds, in quality and flavour as well as in form. It is, however, a great favourite with the market-growers, simply on account of its excellent constitution, heavy cropping qualities, and earliness. For forcing it is still one of the best of all Tomatoes. But no other variety in cultivation varies so much as this, probably from its having been so long and so largely grown. A very superior selection of this good old

variety is extensively cultivated, both under glass and in the open air, in and around Worthing, and of this hundreds of tons are annually sent to London and elsewhere from Worthing station alone. The fruit of this variety is nearly smooth, for the most part, or very slightly sutured, and of excellent quality and flavour also.

Large Yellow.—One of the original varieties. Though sufficiently prolific, it is coarse and not now worth growing, being superseded by Golden Perfection, Golden Queen, and one or two others.

Laxton's Open Air.—This variety, also known as Faultless Early (Farquhar), is dwarf, free, and prolific; the coarse and inferior quality of its fruit, however, renders it unworthy of cultivation under glass, but it is a hardy and good outdoor kind.

Lister's Prolific (Lister).—A fine-flavoured variety, having handsome, smooth, red fruit, solid as to flesh. For outside culture this is a capital Tomato, yielding under good treatment a heavy crop.

Little Gem.—A small, red-fruited variety, synonymous with *Dwarf Orangefield* and *Early Dwarf*, &c.

Livingstone's Acme.—A synonym of *Acme*.

Livingstone's Beauty (Farquhar).—A synonym of *Acme*.

Livingstone's Favourite (Dean & Farquhar).—A synonym of *Perfection* and *Early Dwarf*.

Livingstone's Perfection.—A synonym of *Perfection*.

Magnum Bonum (Sutton).—A fine, robust, and prolific variety, suitable alike for under-glass and outdoor culture. The medium-sized, flattish-round, red fruit, almost free from corrugation, is solid as to flesh, and of good flavour. A useful early and free-setting variety.

Main Crop (Sutton).—A very vigorous and large-fruited variety, of dwarf habit, and with robust and nearly entire foliage. The fruit is of a rich glossy-red colour. This is a prolific variety, with a solid flesh of nice flavour. It succeeds both under glass and in the open.

Marvel (Watkins & Simpson).—An open-air variety that crops very freely. The fruits are of medium size, red, solid, and of good flavour, but not very shapely.

Mayflower.—An American variety of moderate excellence. The name is also applied to *Perfection*.

Mikado.—A distinct Tomato, of American origin. It produces fruit of enormous size, of a deep crimson colour slightly tinged with purple. It is a very strong grower, with large foliage, which is nearly entire, and not serrated like that of most Tomatoes. The habit is long. Universal is synonymous with Mikado.

Ne Plus Ultra.—Identical with *Dedham Favourite*.

Nisbet's Victoria.—Two entirely distinct Tomatoes appear to have been sent out under this name. The one distributed by Sharpe is simply a form of the Large Red, but the true variety sent out by Messrs. Veitch and others is a very different thing, being very similar to the Pear-shaped Tomato. The fruit is exactly the shape of a small pear, of a bright red colour, and is produced in such profusion as to render it one of the heaviest-cropping kinds in cultivation. It is not uncommon for a single truss to contain twenty or twenty-five fruits, and though small, these are solid and of excellent flavour, being in this respect superior to any of the other small-fruited Tomatoes. The foliage is entire or undivided, like that of *Main Crop* and *Early Evesham* (while that of the true "Pear-shaped" variety is divided), and the growth moderately robust. Its small size alone renders Nisbet's Victoria unsuitable for growing for market, but it is thoroughly deserving of a place in any private collection, and where fine flavour is appreciated it is sure to be esteemed. This and the yellow form are frequently grown for ornament.

Nimrod (Kelway).—Described as the "earliest, largest, and most productive" extant. Colour, bright scarlet.

No. 1 (Watkins & Simpson).—A synonym of *Early Scarlet Tennis Ball*.

No. 2 (Banstead).—A synonym of *Acme*.

No. 3 (Watkins & Simpson).—A synonym of *Hackwood Park*.

Non Plus Ultra.—A synonym of *Chiswick Red*.

Open Air (Laxton).—A synonym of *Laxton's Open Air*.

Open Air (Sutton).—Early maturity and excellent cropping qualities are the chief recommendations of this useful outdoor Tomato. The fruit is large and somewhat corrugated, but of good flavour. The plant possesses an excellent constitution, and sets freely.

Optimus.—A synonym of *Perfection*.

Orangefield and Orangefield Improved.—Synonyms of *Early Dwarf, Dwarf Orangefield, &c.*

Outdoor Prolific (Smith & Co.).—Where an exceptionally early outdoor Tomato is needed this should "fill the bill." The fruits are slightly corrugated, but are fine as to colour and flavour.

Outdoor Tomato (Carter).—An excellent variety for outdoor work, especially if it can be afforded the warmth of a South wall. It ripens early, and is of good form.

Paragon.—An American variety, similar to *Perfection*. *Eclipse* is another name for it.

Peachblow (Sutton).—A distinct, robust, and productive variety, bearing a profusion of medium-sized fruits of a peculiar shade of light red, with a downy skin. It makes a fine specimen, and succeeds in the open air as well as under glass.

Pear-shaped.—Although the pretty, but small, fruit of this variety is almost exactly similar to that of *Nisbet's Victoria*, yet the foliage is rather finely lacinated instead of entire, and the growth more slender.

Perfection.—This variety is also known as Cardinal, Carter's Perfection, Jubilee, Livingstone's Favourite, Livingstone's Perfection, Mayflower, Optimus, Paragon, President Cleveland, Reading Perfection, Red Tomato from the Sandwich Islands, Stamfordian, Sutton's Perfection, Volunteer, &c. It is a very distinct and desirable kind, and where first-class quality is desired, a really good type of Perfection can hardly be surpassed. The fruit is large, often scaling from half-a-pound to over a pound in weight when well grown; it is also quite smooth, round (though more or less flattened at both the stalk and the eye), of handsome appearance, solid, fleshy, and of good flavour. When fully ripe, the fruit is of a rich deep crimson colour, and a dish of this variety presents a most attractive appearance, owing to its fine colour, large size, smooth and delicate skin, and generally handsome qualities. Though not perhaps quite so prolific as some of the coarser kinds, the fruits weigh heavier, and from their superior quality command a better price: with a good market it thus becomes quite as profitable in the end when grown for sale. Different strains

or selections vary a good deal in productiveness and size, and to a slight extent in colour; but by saving seed from the very best examples only for a few years, a fine strain may be secured.

The only fault of *Perfection* is its long and strong-growing habit, this alone having caused it to be viewed with disfavour by most of the growers for market up to the present: it should therefore be kept well in hand. Confine the plants strictly to a single stem, or at the most to two; and as soon as they have attained considerable size and vigour, shorten the foliage a moderate extent where very thick.

Perfection Improved (Jones).—A very superior strain of this favourite Tomato, the result of careful selection persevered in for several years. The fruit is neither so large nor so coarse as that of many strains of *Perfection*, while the shape is perfectly round and smooth, the flavour good, and the blossoms set well. It is, however, worthy of remark that no form of this Tomato succeeds so well on the South Coast as the Large Red, Ruby, and some others, the abundant and powerful sunshine experienced there (presumably) causing the blossoms to drop rather badly in the height of the summer; but near London and farther north this fault disappears.

Pierremont Prolific (Kent & Brydon).—Good-shaped, medium-sized, round, smooth, deep-red

fruits, solid, and of nice flavour, are yielded by this prolific variety. It is, moreover, a short-jointed, early variety, and a shy seeder.

Plum or Plum-shaped.—An old variety, with small oval fruit resembling a plum, but of no great value. There is a red as well as a yellow form of it.

Polegate (The).—This variety has been very highly praised, and certainly produces very handsome, large, smooth, round fruit. It is a prolific variety.

Pomegranate (Sharpe).—A synonym of *Acme*.

Prelude (Horsford's).—A small, round-fruited, American variety, of dwarf habit, and a capital setter. One of the parents of *Conference*.

President Cleveland.—A synonym of *Perfection*.

Princess of Wales (Sutton).—Another fine variety, the result of a cross between Sutton's *Main Crop* and *Ham Green*. The rather large fruit is quite round and smooth, slightly flattened rather than globular, as well as very solid, of good flavour, and very freely produced. The constitution of the plant is exceptionally robust, and it succeeds equally well out of doors and under glass, and in pots, &c., or planted out. It ripens early.

Queen (The).—A very pretty, yellow-fruited form of the Pear-shaped Tomato.

Reading Perfection.—A synonym of *Perfection*.

Red Cherry.—See *Cherry*.

Red Currant.—See *Currant*.

Red Tomato from the Sandwich Islands.—A synonym of *Perfection*.

Regina (Webb).—A large, handsome Tomato of a rich red or crimson colour; of the *Perfection* type.

Rochester.—A synonym of *Acme*.

Royal Windsor.—A synonym of *Golden Jubilee*.

Sensation (Webb).—A synonym of *Large Red*.

Stamfordian.—A synonym of *Perfection*.

Stirling Castle.—A product from two good types of *Perfection*. The fruit is medium-sized, round, smooth, solid, and of excellent flavour. As a cropper, too, it has much to commend it. An Award of Merit has been bestowed upon it.

Sunbeam (Sutton).—A yellow-fruited variety, with round smooth fruit of delicious flavour, and much appreciated for dessert. The fruit is of a rich transparent amber.

Sunrise (Carter).—An early and prolific variety bearing the hall-mark of the well-known Holborn seedsmen. Its fruit is of medium size, globular, of a nice rich scarlet, and borne in long clusters.

Superb (Kent & Brydon).—A useful second early variety, bearing medium-sized, smooth, round, red fruits, solid as to flesh, and mild as to flavour. It is a fine cropper.

Supreme (Daniels).—Fruits of medium size, round, smooth, and of a bright scarlet; flesh firm and of good flavour.

Sutton's Perfection.—A synonym of *Perfection*.

Tennis Ball.—A synonym of *Early Scarlet Tennis Ball*.

Tree Tomato.—Two distinct plants are distinguished by this name. One is merely a very dwarf and stiff-habited form of the ordinary Tomato (*Solanum Lycopersicum*), requiring scarcely any support. As grown from seed supplied by Lorenz, of Erfurt, this produced very dwarf and robust plants, bearing a few very large and coarse fruit of a deep purplish-crimson hue. The true Tree Tomato (*Cyphomandra betacea*) is, however, entirely distinct. This is a strong-growing and, when in good condition, extremely handsome plant, forming an upright and much-branched bush, often 10ft. to 12ft. in height, and succeeding best in an intermediate temperature. The entire (undivided) foliage is of a deep green colour, and highly ornamental; the purple flowers are freely produced during the summer months, and are followed in the autumn by the numerous moderate-sized, bright crimson fruit, the flavour of which is, however, inferior to that of most of the ordinary varieties.

This plant is easily propagated by means of cuttings, inserted in heat in the spring; when rooted they should be potted on in rich, free, loamy soil until of a sufficiently large size.

Trophy.—A very large variety, with nearly smooth fruit of a deep red colour, coarse, and more or less deeply ribbed or sutured. It is a heavy cropper.

Trophy (Pointing's).—This bears a nice-looking, smooth, round, medium-sized fruit; it is very prolific.

Universal.—A synonym of *Mikado*.

Up-to-Date (Sharpe).—To splendid cropping qualities must be added a nice flat-round, smooth, medium-sized fruit, bright red as to colour, and solid as to flesh.

Vick's Criterion.—See *Criterion*.

Volunteer (Novelty Company).—A synonym of *Perfection*.

Wheeler's Prolific.—A synonym of *Large Red*.

Winter Beauty (Sutton).—This appears to possess the chief characteristic for a winter-fruited variety—an excellent constitution. Added to this the fruit is of good size, deep red colour, fairly smooth, and of fine quality, and the plant crops freely. An Award of Merit has been given to it by the Royal Horticultural Society.

Wonder of Italy (Sutton).—In Italy, this is the variety chiefly employed for winter work. Its small fruits are borne in large clusters.

Worcester Prolific (Smith & Co.).—A short-jointed variety, bearing large trusses of nicely-shaped red fruits of medium size and excellent flavour. As a cropper, too, it is all that could

be desired, and is alike suited for the private and the market-gardener.

Yellow Cherry.—Similar to the Red Cherry except in colour.

Young's Eclipse.—This is a smooth, round-fruited variety, possessing first-class flavour and very free cropping qualities. It is of compact growth.

On Picking, Grading, Packing, and Marketing.

So many cultivators of Tomatoes nowadays wish to grow with a view to profit, that in a manual like this a few hints upon the picking, grading, and marketing of the crop will naturally be looked for. Time was when, so far as this country was concerned, very little consideration was given to these important details. Gradually, however, it has been brought home to the producers, that even the highest cultivated crop may show a loss by being carelessly handled when fit for market. The aim should be to produce the finest possible fruits, and to place them before the prospective purchaser or his agent in the best possible condition.

First, as to finding a market, as this is a very important matter. It should scarcely be necessary to add that anyone growing Tomatoes with a view to profit, must study very minutely the turns of the market. If he find that at one centre

prices are and have been ruling low, the natural inference is that there is a glut, and he must not contribute further to the downward tendency by sending to such a market. Prices reflect the tone of the market, and these must be scanned. Of course, the best of all methods of selling produce is locally, as then the cost of carriage, salesmen's commissions, &c., are dispensed with. When, therefore, a man thinks of making a start in a small way he would do well to consider the chances of selling his produce locally. If he should happen to live in the vicinity of one or two decent-sized towns, possess business tact, and can undertake to furnish regular supplies, he ought not to have much difficulty in obtaining customers. No shopkeeper or salesman cares for irregular consignments; and this must be well borne in mind when making the season's arrangements.

There is a good deal more in the picking of Tomatoes than meets the eye. Fruits that are allowed to approach maturity before being removed are twice as good in flavour as those picked and allowed to "colour" afterwards. Those who have tasted samples of both will at once appreciate the difference. Granted that a little latitude may be allowed in the direction of fruits produced in mid-season, yet taken as a general rule, the fruits should not be picked until nearly ripe, if flavour is to be combined

with good looks. Care must be taken not to bruise any fruit by undue handling, or by dropping, and so to gather them that a small portion of stalk is left on. When picking, handled baskets are best and safest.

Grading must be undertaken before consigning the produce. Tomatoes are sometimes sorted out into as many as four different grades. All smooth varieties should be kept together, and these again sorted out into Firsts and Seconds. Generally speaking, better prices are forthcoming for even-shaped, moderate-sized, uniform samples of a bright colour than for the very large fruits.

For despatching to market the round baskets known as "strikes," and holding 12lb. of fruit, are much employed. Having placed some wood-wool at the bottom, and lined the inside with sufficient "tissue" to afford a covering for the top, the layers of fruit are disposed calyx side down, and finally a piece of paper is tied round the opening to make all secure. For facility of carrying, however, the cross-handled basket is perhaps preferable; while others, again, like lidded baskets or even small shallow boxes. Strong printed labels should be used, and care be exercised that all necessary particulars are inscribed thereon, and also that attention be directed to the "Perishable" nature of the goods so consigned.

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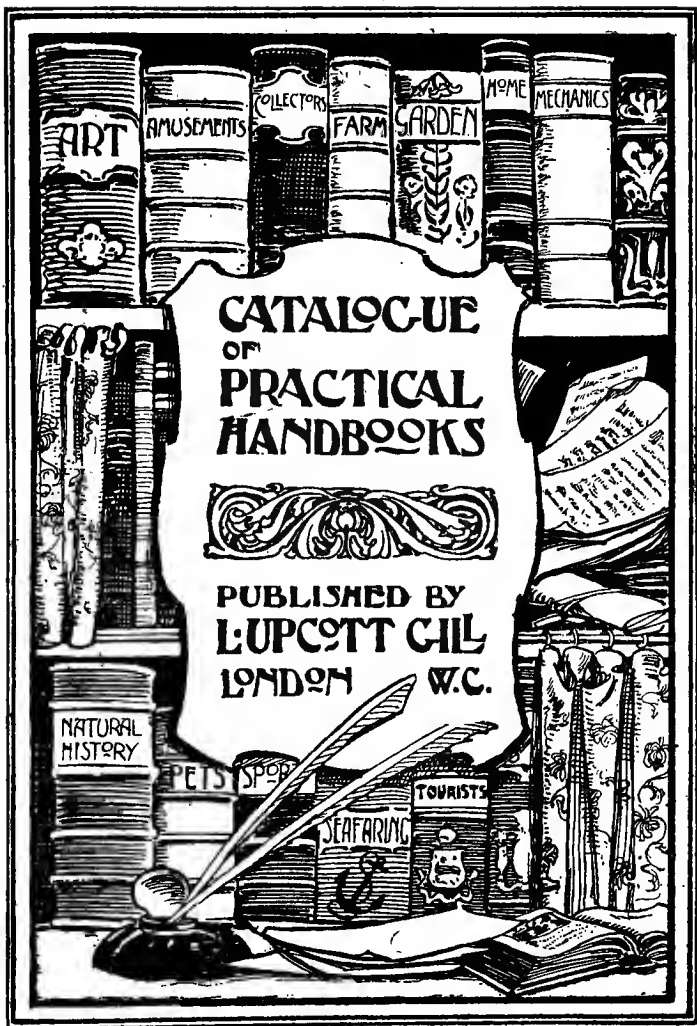
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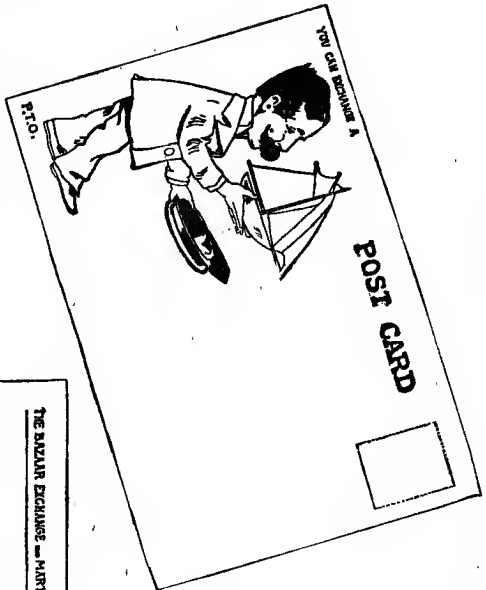
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