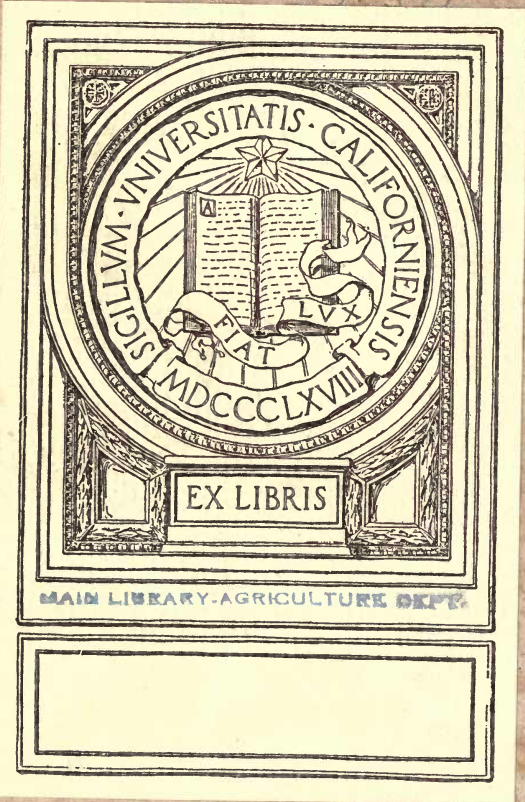


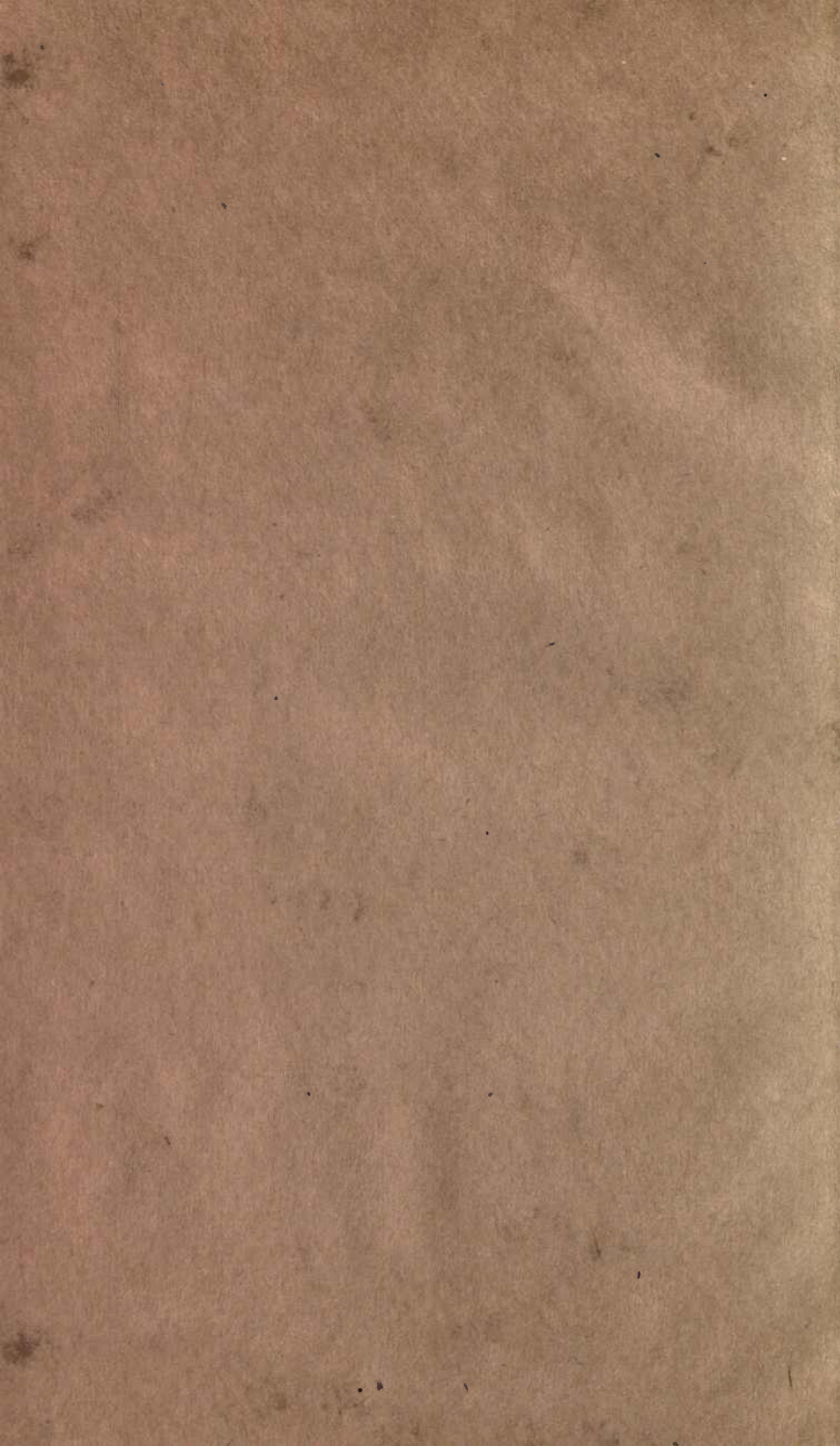
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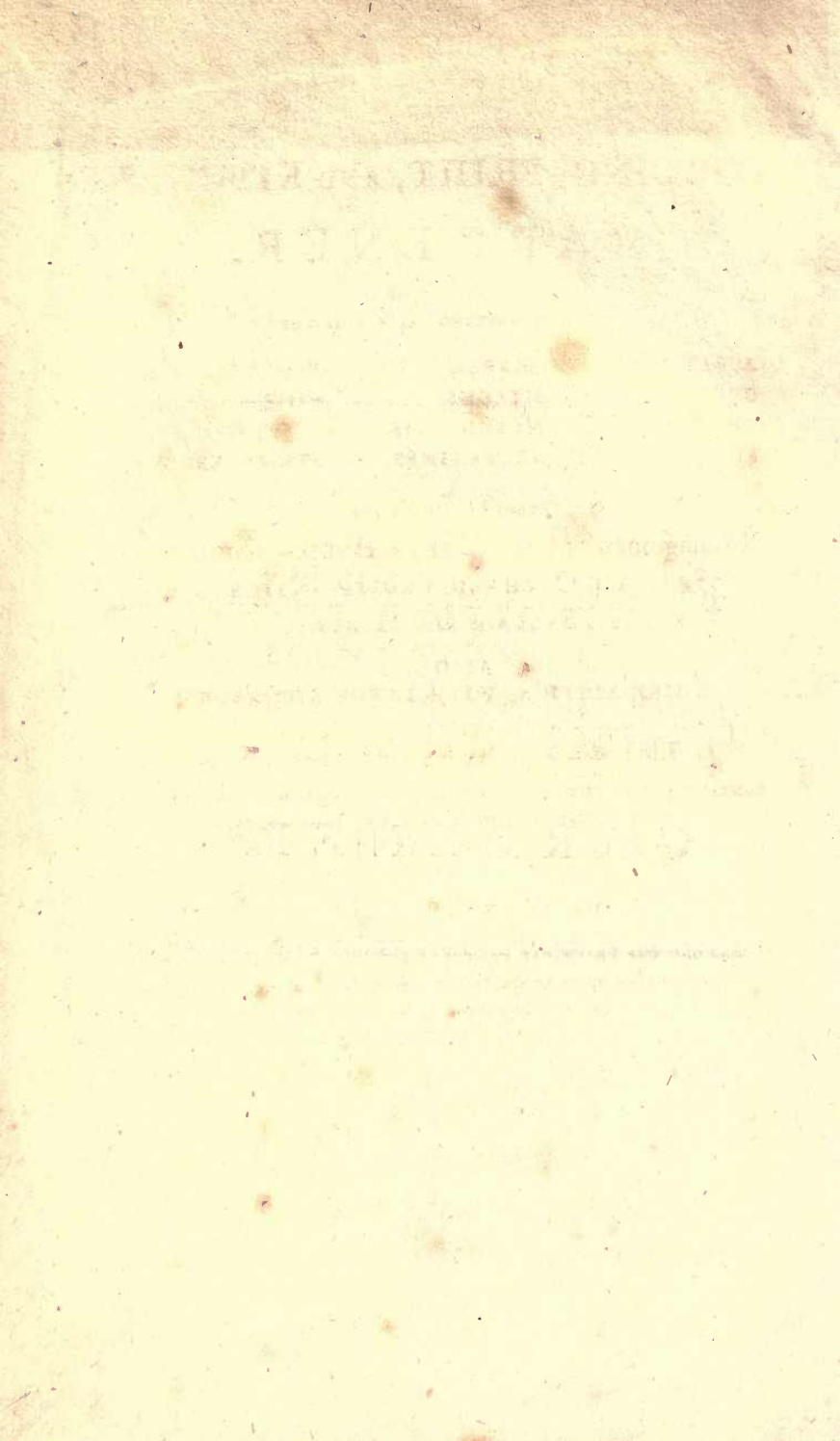
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FORGIVE ME
GARDNER

THE
FORCING, FRUIT,
AND
KITCHEN
GARDENER.



THE
FORCING, FRUIT, AND KITCHEN
GARDENER:

COMPREHENDING THE FORCING OF

ASPARAGUS,	GRAPES,	PEACHES,
CUCUMBERS,	MELONS,	PINE APPLES,
CHERRIES,	MUSHROOMS,	AND
FIGS,	NECTARINES,	STRAWBERRIES.

TOGETHER WITH THE

Management of the GREEN-HOUSE—Culture of
WALL and ORCHARD FRUITS—KITCHEN VE-
GETABLES, SALLADS and HERBS.

THIRD EDITION, WITH LARGE ADDITIONS.

Illustrated with SIX NEW COPPERPLATES;

CONTAINING TEN DIFFERENT DESIGNS OF HOT-HOUSES, HOT-WALLS, &c.
ON THE NEWEST AND MOST IMPROVED CONSTRUCTIONS.

By WALTER NICOL,

Author of "THE PRACTICAL PLANTER," and of an "ESSAY ON GARDEN-
ING," drawn up by Desire, and for Consideration of the Board of
Agriculture; and Corresponding Member of the Natural
History Society of Edinburgh.

EDINBURGH:

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P R E F A C E

TO THE THIRD EDITION.

SINCE the publication of the Second Edition of this Work, in March 1798, many important Discoveries have been made in Gardening. The Author, in a pretty extensive practice, as a Designer of Gardens, Hot-Houses, &c., has had an opportunity of minutely observing, and has carefully attended to, every valuable improvement ; whether in the construction of Hot-Houses, &c., or in the Culture of the different Plants treated of. He therefore submits this Edition to the Public, enlarged and greatly improved ; with the hope that it will, like the two former, be favourably received.

LEITH-WALK, }
Feb. 10. 1802. }

PREFACE

TO THE THIRD EDITION.

THE publication of the second edition of this work in March 1868, was a great success. It has been widely read and highly valued. The Author, in a very extensive practice, as a Designer of Machinery, has had an opportunity of personally observing, and has accordingly endeavored to every valuable improvement which has been in the construction of the various parts of the machinery of the steam engine, and has therefore endeavored to bring the work up to the latest and most improved state, and to give it a new and more complete form, which will be found to be a great improvement upon the first edition. It is now published in a new and more complete form, which will be found to be a great improvement upon the first edition. It is now published in a new and more complete form, which will be found to be a great improvement upon the first edition.

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BOOK FIRST.

THE
FORCING GARDENER.

INTRODUCTION.

THIS branch of Gardening certainly favours more of luxury than any other; at the same time it must be allowed to be a most rational amusement, profit and pleasure being in some measure blended together.

Hereby, not only the most rare European plants, but also those of Africa, Asia, and America, are cultivated and brought to very considerable perfection, and to the intimate acquaintance of the Botanist, who, otherwise, would be obliged to place implicit confidence in the authors of distant countries, or take expensive voyages to enable him fully to pursue his studies.

A

Hereby,

Hereby, also, the finest fruits of France, Spain, Italy, Persia, and the West Indies, are cultivated and brought to early perfection in our Northern Clime, which, otherwise, would only be known by name.

What are reckoned luxuries when first introduced, are by use converted into necessaries. Witness coffee, tea, sugar, &c. which, although lately introduced, were they prohibited, would not only be missed, but even longed for by the lowest classes of the community.

May not the wealthy eat a melon, peach, bunch of grapes, or pine-apple, with as much propriety as drink a bottle of port, claret, champaign, or madeira? Are these not, if well ripened, equally wholesome? Have they not the most rational amusement in the production of them? And does it not, to the contemplative mind, afford a source of real pleasure? We are certainly justified in thinking so, by recollection of the many extensive additions and improvements which have lately taken place in this elegant branch of horticulture.

Nevertheless, there is still ample room for improvement, which, in a science so complicated,

complicated, must necessarily happen for a considerable length of time after introduction. It is even probable, that this branch, in respect of improvement, is but in a state of infancy. And this supposition arises, by considering the *many* opinions and ideas entertained by professional men on this subject; for until *those* of *any* science are agreed, respecting points of the first consequence, perfection cannot be supposed near.

A settled plan of constructing hot-houses, &c. is by no means yet fixed, most gardeners and hot-house builders differing in some point or other. This is an article of importance, and there are extremes which should be avoided. But it would appear, that the failure of success in this species of horticulture is less in consequence of improper construction of the house, than in the preparation of proper soil, and the general management; since in some instances we find excellent crops produced in houses very indifferently constructed; and in others, very indifferent crops, in houses well constructed.

Situation is also a material point. Every hot-house should be placed, if not in a sheltered, at least in a dry one, or which is capable of being rendered so, by draining.

It is also of importance to have a perfect command of fire-heat. For this purpose, respect must be had to proportioning the *content* of the house, to the power of the furnace or furnaces, and that, too, according to the purpose for which it is appropriated, as whether it be a Pinery, Vine-ry, or Peach-house, and if either of the latter, whether it be intended for early or late forcing.

But there are those who lay more than sufficient stress on this subject: Thinking, perhaps, to demonstrate, that by building a capacious house, with a furnace less than another would advise, or which in the end is found necessary, how great a saving there might be of fuel.

Of this, however, experience has convinced me, that by allotting space which a furnace cannot *well* command, instead of being a saving, is a great waste of fuel. Nor will the gardener ever have success, but with much difficulty.

For

For instance, if a furnace shall be placed at one end of a capacious house, which with difficulty can be raised to the degree required on a scale hung in the middle, will not the end of the house whereat the furnace is placed, be over-heated? and will the other end ever rise to the degree required, before all other parts of the house be over-heated? Is not this both a waste of fuel, and a thwarting of intention?

And what saving is there in the first onset? or rather, what *waste* is there by *rending* the furnace and flue with immoderate heat? Is there an inch of flue *less*? — There is, to be sure, a grate and furnace *more*, which may cost some forty or fifty shillings; but which will, in one season, be repaid by the saving in fuel. Nor will either flue or furnace require any repair for many years afterwards.

But, laying all consideration of expence aside, if it is found that a hot-house may be more steadily worked with two furnaces than with one, Why not erect two? Does the trifling sum of a few shillings in any measure weigh with the insurance of success, in the production of good crops?

I do not here presume, that for *every* hot-house, there are to be two furnaces erected. I would be understood, as speaking of *large* houses, that is, grape and pine houses above forty feet in length, and peach houses above fifty, &c. But for a full explanation of my ideas on this subject, I beg to refer the reader to the accompanying plates, and their explanations.

Forcing, that is, producing flowers and fruits in hot-houses at an untimely season, is attended with more or less success, according to the nearness we approach nature in the process.

Hence the necessity of introducing the imposed climate, as it were by stealth, admitting air freely, unless of an impure nature, and making artificial dews and showers to nourish and refresh, not only the root, but also the foliage :

Also, as the plants are forced out of their natural inclinations in a great measure, do not perspire so copiously, nor have an opportunity of imbibing nutritive matter from the natural atmosphere in such quantity as if they were growing in the open air, of composing a richer and deeper body

dy of soil, for the support of vegetable life, than otherwise might be required.

In the cultivation of exotic plants and fruits in hot-houses, regard must be had to the climate of their nativity; and the best endeavours should be used to imitate it in the hot-house; introducing the natural changes of the seasons with equal care.

This, however, is done with considerable difficulty, as may be conceived, by considering the difference of latitude, and the variation of the sun's altitude throughout the season, which is greater as we approach the pole.

Hence the difference of trouble attending early and late forcing. And hence, also, the difference of injury done the plants in the operation; and, that they may sustain the less, the necessity of a more moderate treatment in the one than the other. The one is *striving*, the other *striving hard* against the stream.

Sudden checks of any kind are to be avoided, particularly while the bloom or fruit is in a tender and infant state, otherwise disappointments may be apprehended. This is to be more particularly attended

to in the forcing of *stone*, than other fruits; these being more impatient of sudden changes in the climate, particularly while *setting* and *stoning*.

For the production of fruits in a high state of flavour and perfection, a large and free circulation of fresh air, as they approach maturity, is essential. Also denying, in a great measure, the quantity of water the plants may seem to crave, that the fruit be not rendered insipid by the plants imbibing too much of that element; which, however, at all other times, should be freely bestowed according to the nature of the plant in question.

Finally, forcing of any kind being an outrage done nature, the more we avoid it the greater will be our success. She should be kindly assisted, nor spurred, nor thwarted, when it can be avoided.

Hence the necessity of the nicest observation in discovering the natural inclinations of the different plants, which should be kindly treated and encouraged, on all occasions.

THE
FORCING GARDENER.

CHAPTER I.

ASPARAGUS.

THIS delicious and wholesome vegetable being required in most families at an early season, the forcing of it is pretty generally understood; yet, for the sake of those who may not have had an opportunity of seeing the common methods practised, and on account of some successful experiments, made in this branch of forcing, I hope what I have to advance on the subject will be acceptable and useful to my readers.

WHERE there is not the conveniency of a forcing pit, (See Plate I. Fig. 1.) a frame and lights, such as is used for melons, must be employed: but I have found by experience, that a flued pit is much to be preferred; as in it the grass may be produced

ced of a much better colour, and higher flavour, than on a dung hot-bed.

It frequently occurs, particularly in large families, and where much company is kept, that the gardener is put to a nonplus, by not being timely advised that such articles are wanted. The conveniency of having a pit, will be found a great relief in this respect; as it is much easier, by aid of the flues, to forward or protract the growth of the plants here, than in a common hot-bed: on the one hand, if the plants are advancing too rapidly, there is a necessity for cooling the bed in a certain degree; and, on the other, if they are not advancing so fast as could be wished, the application of linings becomes necessary, which is attended with much trouble and loss of time.

A pit, twenty-five or thirty feet long, and six wide, and which one fire can perfectly command, is sufficient to force Asparagus to serve a large family from November to May, in a constant and regular succession: after which, it may be advantageously employed in raising a late crop of melons or cucumbers, or in striking young

young pine-apple plants, &c.—But, as many may not have the conveniency of a pit, I shall first treat of the method of forcing Asparagus on a dung hot-bed, and then in flued pits, according to my mode of practice.

First, let it be presumed, that a good stock of roots, not younger than four years, nor older than seven or eight, are provided; which, by being covered with litter, &c. access may be had to, in case of frost, at any time; and also, that it is required Asparagus may be on the table against a certain day, suppose the 1st of December*.

About the 1st of November, let a sufficient quantity of *stable-dung* be thrown together

* It may be new to some, that, by cutting over all the stalks of Asparagus, about the end of May, or beginning of June, it will put forth fine grass in Autumn; which, if the season happens to be fine, will continue till the middle or latter end of November. This is the reason I have fixed on the 1st of December for forced Asparagus, being required as above: but I do not mean this to be considered as a rule. Sometimes

gether to heat and sweeten, for a three light box; and after it has lain six or eight days, let it be turned over, and shaken well up a second time; in which state let it lie four or five days more. A moderate degree of heat is required, and consequently the dung should be carefully fermented, by turning the outsides or littery parts of the heap into the middle, one, two, or three times, at intervals of a few days each, as circumstances shall direct.

When the dung is judged to be in a proper condition, proceed to build the bed. This must be done, in the common way, to the height of four feet in the back, and three in front, and about a foot larger than the frame all round. Level it well; and cover the whole with squares of turf, cut so as to join again exactly; which lay green side down, and smooth with the back of the spade.

Sometimes it may be required much sooner, and sometimes not till Christmas.—I beg to observe here, that, where there is a great stock of Asparagus, it is a good way to cut over a *part* in May or June, to come in in Autumn: but let not the gardener expect any more good from the grass so cut, *as some pretend*;—it is a species of forcing, and consequently must exhaust nature.

spade. By aid of turfs carefully placed in this manner, a rank steam is effectually prevented, which is of no small importance in the forcing of Asparagus; the steam arising from rank dung of this description, not only discolouring the grass, but tainting its flavour. Place on the frame: It should be thirty inches deep in the back, and twenty in front: Let dry, well-reduced old tan, to the thickness of six or eight inches be laid in it; which level and smooth with the spade.

The roots being ready, (which should be taken up with great care), proceed to lay them, crowns up, as close as they will lie together; endeavouring to keep them as level as possible, and divesting them of all the old hulm and rotten roots. Cover the whole with old tan as above, to the thickness of three inches; and put on the lights.

The bed will begin to *beat* in twenty-four hours; and must then have air admitted, to pass off any steam that may rise, which will, however, be inconsiderable, I presume. Indeed, the only cause for turfing the surface is to prevent steam; which, if carefully done, will have the desired effect;

fect; yet, it sometimes happens that a little will rise, especially if the dung did not undergo a proper fermentation: but, until the grafs begin to appear, it is not material if there is a little steam in the frame; nor, provided there is not much steam, whether it has any air admitted or not. But, from the moment the buds begin to appear, the greatest attention must be paid to prevent, or to draw off the steam; which is sure to give the grafs a very disagreeable flavour and bad colour.

In order to prevent the grafs from drawing up weakly, a large portion of air must be admitted every day, if the weather be not stormy; and a little air should also be left at night, while a rank heat prevails in the bed. Fahrenheit's thermometer should not stand above 50° at any time, unless in sun-shine, and even then, not above 60° . By this rule, it will be seen whether matting at night is necessary, and to what extent; therefore, it may be unnecessary to say more on that head: but the article *steam* must be farther considered, and indeed kept in view till it is entirely suppressed. If, then, by leaving a little air at each

each *light* in the night, does not completely draw off the steam and damp, recourse must be had to *boring* the bed; which is done by thrusting a large stick such as the handle of a pitch-fork, &c. into the sides and ends, in six or eight places, less or more, according to the heat of the bed. The holes ought to be kept open, by probing them every day, so long as any steam remains; and then should be closed, to prevent it from cooling too much.

I have seldom found it necessary to *line* Asparagus beds; yet sometimes, in stormy weather, it is requisite. This should be done with caution; and never more than one side of the bed should be lined at a time. Let the dung for this purpose be prepared in the same manner as for the bed, at first; then cut, with a sharp spade or dung-knife, the part to be lined, perpendicularly by the side of the frame: reject the tan and turf, and the rest may be used along with the new dung, unless very much wasted. From twenty-four to thirty inches will be a sufficient breadth for the lining; raising it to about six inches above the bottom of the frame, observing to tread it well

well towards the old dung, and to give it a considerable slope on the outside, which naturally makes it lean that way.

If the lining should raise too great a heat in the bed, or cause any steam, it must be drawn off, as directed above; and, when it has done subsiding, let it be turfed in the same manner the bed was at first.

Water has not yet been spoken of; and I can truly, though frivolously, assert, that I have frequently produced a whole crop of *Asparagus* without "either earth or water." This, however, is not always the case, nor is it desirable; as, if a little water is not required, the dung must be in too moist a state, and consequently, too much noxious vapour must have attended the whole process. It will be advisable, however, to be sparing in the use of that element; as, at this season of the year, and in this country, we have but too much cause to lament the absence of that luminary which is the very essence of vegetation.

When the buds have advanced to the height of three inches above the surface, they are then fit to be cut, as, by that time, they

they will be six inches in length: and this operation must be performed with great care, as the buds will be found to rise very thick. The tan being of a loose nature, there is no difficulty in thrusting down the finger and thumb to the crown of the root; and, as forced roots are of no use afterwards, I prefer twisting off the bud to cutting it, lest the others that are rising be injured.

A three-light frame (which is generally ten or twelve feet long, and five or six broad) will contain a number of roots; and, after it is fairly begun to produce, will yield an ordinary dish every day, for fifteen or twenty days. If, therefore, a succession of grass is required, it will be necessary to make up a second bed about eight or ten days after the first, and a third about three weeks after the second; which last time will be a good medium for each successive bed: but of this, the operator will be the best judge; as much depends on the strength and quality of the roots, and on the consumpt of the family.

In many places, it is probable, there may not be such a thing as old tan: as a sub-

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stitute, I would recommend light, sandy, mixed with a fourth part of vegetable mould. Indeed I am convinced, that entire vegetable mould produced from decayed tree leaves, would be the best for forcing Asparagus in: but this I do not know from practice; as I have ever found *that article* too precious an ingredient for more valuable purposes, to lavish it on the forcing of Asparagus. But, to waive this consideration, I do not think it is very material in what kind of mould Asparagus be forced, provided it be light enough; as I am convinced, from long observation, that the roots draw little nourishment from the mould, a small degree of moisture being all that is necessary to the production of their buds, after which the roots perish. My only reason for using old tan was, the scarcity of light, or vegetable mould, and the plenty of the former (otherwise almost useless) article. But this much I can affirm, that, by the use of tan, the grass may be produced five or six days sooner, in as high perfection, and with a better colour, (provided it be used perfectly dry,) than with mould of any kind.

I come now to the forcing of Asparagus in flued pits; which, in my opinion, is the most eligible method. I would not wish to infer from this, that any gentleman ought to be at the expence of erecting a pit solely for the forcing of this article. A pit, such as is represented by Fig. 1. Plate I. will completely answer this, and many other purposes: and the trifling consumpt of fuel, even where that article is most valuable, should not deter any, who are lovers of gardening, have fine gardens and hot-houses, and require Asparagus, French beans, fallads, &c. at an early season, from building so useful a compartment in the forcing garden. Farther, if a scrupulous attention is paid to the design in general, particularly to the construction of the fire-place and flues, I can with confidence presume, that it will give more satisfaction to the gardener than any hot-bed whatever, and in the end will be found a saving to the proprietor*.

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* In the construction of this pit, as will be seen by the plate, the first course of the flue runs along the front, the bottom of which is about the ground-level; and, as the

The pit (see the plan) is about four feet in the back, and three in front, deeper than the bottom of the flues : which great depth is made on the presumption that it may be frequently used in raising of pineapple plants ; but, were it intended for Asparagus alone, half this depth would be sufficient.

It is immaterial whether the pit be entirely filled with tan or not : I have frequently used three-fourths stable-dung, prepared in the same manner as for a hot-bed, with equal success : but have always found that the dung is more difficult to manage than the tan, being liable to heat violently : besides, from the nature of the building,

the outer wall of the flue is only a brick on bed, it is obvious, that early celery, carrots, lettuce, radish, cauliflower, &c. &c. sown on a well-prepared border about two feet broad, immediately adjoining the breast of the pit, would reap infinite advantage from the flue. At the time of any operation within the pit, a broad plank, supported by bricks, &c. would defend the crop on the border from injury. This hint is not from speculation ; I have practised it for many years ; and would seriously advise every gardener to do so on all occasions, where it will answer. I have always found the plants so raised, to be preferable to those raised on hot-beds.

ing, there is no possibility of drawing off the rank heat, as in a hot-bed: for which reason, if dung alone is to be used, it ought to be more carefully fermented.

A small degree of bottom heat is sufficient for the purpose; and, if the pit has been previously employed in the culture of young pines, it will require no preparation whatever for the reception of the Asparagus roots, excepting to level and put a few inches of well-reduced tan on the surface. But, if melons were the last article produced in the pit, it will be necessary to trench the bed about two feet deep, and add a little new tan or dung; then level the surface with old rotten tan, as before. In either case, let the surface be levelled in a sloping manner, to the sun, and about six inches above the bottom of the flues, allowing for the tan settling so much; then let the roots be placed and covered, as directed for the common hot-bed.

If the pit is from twenty to thirty feet long, one half will be sufficient to be filled at a time; and, to keep a constant succession of grass, fill the other half with roots

in fifteen or twenty days, which will begin to produce before the first is all used; after which, once a month or six weeks, according to the size of the pit and consumption of the family, will be sufficient, till grass be fit for cutting in the open ground.

Make no fires, if the thermometer stand so high as from 48° to 50° ; and, if necessary, cover with mats at night; also, admit air freely through the day, if the weather will permit. When it is necessary to make fires, let it be done with caution: A small fire made in the evening will generally serve the whole night; and it will be unnecessary to make any fires in the morning, unless the weather be stormy. I have sometimes, however, found it convenient to make a small fire in the morning, that I might have it in my power to admit air, and at the same time keep up a proper degree of heat.

Water will be required in a more plentiful degree than has been recommended for the hot-bed, as the fire heat will absorb the moisture considerably. Let a due observation of the state of the tan, the health of
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the buds, and the discretion of the gardener, always determine this matter.

In filling the first end of the pit *a second time* with fresh roots, it will be unnecessary to stir up the tan, &c. and perhaps may be so, even the third filling; but, by keeping a thermometer plunged in the bed, or watch-sticks, this matter may be determined. At all events, there will not be a necessity of adding fresh materials. I have generally found, that trenching the bed to the depth of two feet, or so, has answered the purpose for the whole season.

If dung alone, or oak-leaves are used, let the bed be turfed, and at least a foot of very rotten tan or light mould be laid on, before the roots are placed.—This precaution is unnecessary when tan *only* is used; in which case, however, not more than an eighth part of *new* tan should be trenched in.

CHAPTER II.

CUCUMBERS.

THIS fruit is in such estimation, particularly about London, that the *early* production of it has become an object of contention amongst gardeners; which has given rise to many experiments for the attainment of their object, viz. to have cucumbers on the table in the months of January and February.

Various are the methods that have been practised in other parts of the country, for attainment of this matter; and a few have been successful, in one or two instances: but, the trouble and expence attending the operation, has generally been found inadequate to the satisfaction of the pursuers of this truly trivial object.

The objections to the *old-fashioned* method of forcing Cucumbers and melons on hot-beds composed entirely of dung, are, that

that the plants are apt to be burnt with too violent a heat, and blanched with the rank steam wherewith these beds abound.— These objections, I confess, are weighty ; and, I believe, but too well-founded in general. But, I have the happiness to say, that I have forced Cucumbers and melons many years, and, twice excepted, have never had my plants injured in the smallest degree by too violent a heat, or too rank a steam ; and, if my mode of practice, which I shall endeavour to explain below, is followed, I presume it will be found to be the least perplexing, the least expensive, and perhaps the most productive, of any yet laid before the public.

It is a subject of regret*, that Mr MacPhial's method has failed of the desired success. Nevertheless, I believe not many gardeners regret it much ; for (the object of trouble aside) it evidently tends to impoverish the kitchen-garden, by depriving it, in a great measure, of its common and necessary resource for manure.

Trials have been made to force these fruits on the old beds of the former year,
by

* For himself.

by the aid of new linings. This has also failed of success; as it hath been found, that the old dung contains a more noxious damp than the new; and the frequent loss of heat in the linings occasions a constant perplexity. The same cause, too rank a heat and steam, gave rise to the trial of this method as the former.

Late crops of Cucumbers and melons may be raised with success in flued pits, (I speak experimentally); but I have ever found that early ones may be much better produced on a dung hot-bed. The cause is obviously, that these plants delight in a mild, moist heat, and are impatient in a dry, fire heat. The latter, however, is of infinite service late in the Autumn, by drying off the external damp, and hastening the maturity of the late fruit.

Where tanner's bark is plenty, and the more valuable material, dung, is scarce; these fruits may be successfully produced by composing the bed of bark, with as much dung or litter as will suffice to build the outsides; or by building retaining walls
of

of brick, stone, turf, &c. and fitting the frame thereto: but care ought to be taken, that the roots of the plants, at no stage of their growth, touch the bark, which never fails to canker them.

It is a practice with many to *sink* their hot-beds, or at least partly; and this is generally done with too little discrimination. I am far from disapproving the practice, provided it can be done with propriety, as, by doing so, a degree of neatness is given to that department of the garden: but this ought to be a secondary consideration; for, if the situation is naturally damp, and if care is not taken to render it perfectly dry, disappointments will doubtless attend the labours of the gardener.

It is customary to prepare seed-beds for Cucumbers about the middle of December, or first of January. The latter time I prefer, but most of all, the first of February; as I have often myself been, and frequently have seen others, put to more trouble and perplexity with a seed-bed at that early season, than with the rest of the framing for the whole season afterwards, and all to

no purpose : for experience shows, that plants,* sown about the first of February will succeed better, and produce fruit sooner, than those sown at any period preceding.

Some raise seedling Cucumbers and melons in pine stoves, dry stoves, early-forcing houses, &c. and transplant them into dung hot-beds. But, it must be confessed, they are not equal to those raised in a seed-bed prepared for the purpose ; as in the one they are but a secondary object, whereas in the other, they are the principal : besides, there is a great disparity of climate.

Cucumbers are often successfully produced in boxes, placed in the pine stove, &c. at an early season : but, as the heat of the stove is not regulated for their sakes, it may be unnecessary to say more on that head, than that they should be placed in the most airy situation, should be filled with rich light compost, and be duly refreshed with water.

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* I wish to be understood as speaking generally ;—there may be many exceptions : I also mean plants of the same sort.

Having premised this much, I proceed to treat on the culture of the Cucumber on a dung hot-bed, supposing the plants being (or rather to be) sown the 1st of February.

On, or about the 20th of January, let a sufficient quantity of the very best mixed stable-dung be thrown together in a heap to sweeten; let it lie for five or six days, and then turn it over, and shake it well up in a second heap: in this condition, it may remain till the 1st of February, when it will be ready for building into a bed; which I shall suppose is for a one-light box of any convenient size.

If the dung is littery, dry, and *fiery*, it will be advisable to pour on a quantity of water, in the process of shaking up, or turning it. This will excite its fermentation, and reduce it sooner into a proper state; on which depends much of the future success.

Proceed to build the bed; observing to keep it a foot larger than the box all round, and to the height of five feet in the back, and four in the front; observing to beat it well with the fork; and, if the dung is
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very littery, to tread it equally once or twice.

Some tread in all cases, and others tread none in any case; but the propriety of treading the bed once or twice in the time of building, provided the dung be rank and littery, may not be disputed; as, by treading, it is seen where the bed is *lean*, or otherwise. And that the whole settle equally, is of consequence to the welfare of the plants, particularly in the *ridging-bed*; for, if the dung fall in holes, the mould will unavoidably crack, to the evident injury of the tender roots.

When at the proper height, let it be carefully *turfed* in the same manner as directed for the asparagus bed: place on the frame; in which lay sea or pit sand of the finest quality, previously rendered perfectly dry, in a sloping manner, corresponding with the *light*, and to within six inches of it: over this lay two inches of light sandy loam: then, in a garden pot or pan, about six inches in diameter, being filled with entire vegetable mould* from decayed

* The method of preparing this mould will be treated of in another part of this work.

ed tree-leaves, sow the feeds, and cover them with half an inch of the same: Plunge the pot or pan to the brim, in the centre of the bed the one way, and at a foot from the back, the other: Put on the light; and cover at night with a double mat.

The feeds should be carefully guarded from mice, an animal too frequently found about hot-beds at this early season, by placing a pot on that in which the feeds were sown, whose brim or margin coincides with it, having a hole at bottom, too small for admitting the enemy. This cover should be removed in the morning, and replaced in the evening, until the feeds germinate, and the plants are an inch high. These vermin commit their depredations chiefly in the night; and it is necessary that the plants enjoy the full sun.

The bed will begin to heat in twenty-four hours, and must then have a little air admitted by tilting the back of the light an inch or so; and the front half as much*,
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* This rule ought always to be observed, unless the severity of frosty wind renders it hurtful to the plants.

in order to pass off any noxious vapour that may have arisen. Let the frame be matted every night at sun-set, and uncovered by eight in the morning, or sooner, if the state of the weather will permit; and, from the moment the plants begin to appear, as due attention ought to be paid to this article as that of air and water. Every gardener has to lament, that, in this country, and at this season of the year, our days are not only short, but dull and hazy, to a degree that is but little known on the Continent; and it follows, that the least neglect in admitting the rays of light, which is so necessary to the health and vigour of the plants, is, strictly speaking, unpardonable. Even the glasses should be frequently washed, wiped, and at all times kept clean of dust or litter, that the rays of light, or the sun-beams, may not be obstructed.

A little kindly steam in the morning is a good symptom; but this should never be encouraged to any great extent: more than what entirely disappears with the first hour after the frame has been uncovered, is not desirable.

desirable*. Examine the bottom of the pot or pan frequently. If the heat should rise too violently, raise it a little, to prevent the young fibres from being scorched; if necessary, place it entirely on the surface; and, if requisite, give a little water, which, however, should have stood in the frame, or any other place of equal temperature, for several hours before.

It is not a common practice to work by the thermometer in hot-beds, but it is certainly as eligible here as in the stove, &c. The air of the seed-bed should raise the mercury on Fahrenheit's scale to 65° on a medium, allowing 5° of a fall or rise for the changeableness of the weather at this season. By this, also, it will be seen to what extent matting is necessary.

When the plants have arrived to the height of about an inch, they will be fit to prick out, into nursing pots, which should be about four inches in diameter, and the

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* In treating of the cultivation of asparagus on a dung hot-bed, I have given directions for drawing off the rank steam; which I hope will suffice the reader for that operation, when necessary, in hot-beds, at any time.

same in depth. Put them into the same kind of mould they were sown in, and three or four in a pot; placing them as far apart in the pot as possible. They should not be dibbled, or pressed into the mould with the finger, a practice too common; but the pot should first be filled one-half, or two-thirds, according to the size of the plants; which should then be placed against the side of the pot, so as that their leaflets may be just above its margin, and that the covering of (sifted) mould may be laid on loosely, to the level of the brim. Settle the whole with a little water. Plunge them, to the brim, in the bed again; which should previously be worked over to the depth of the sand, and about two inches of the same sandy loam should be laid on the surface, as at first. Attend to them in the articles of air, steam, and water, duly, while they remain here, according to the state of the weather; and frequently examine the bottom of the pots, lest their roots should be scorched.

If a rank steam prevail in the bed, it may be advisable to leave half an inch of *tilt* in the night, over which the end of the
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the mat should hang, that the air may, as it were, sift through it. The lap, however, should not be let hang so low as to embrace the lining of the bed, lest steam from without be induced, instead of that from within escaping. In the day, admit a moderate quantity of air, at front and back, in order to clear the bed of steam or damp; taking advantage of sun-shine, and frequently stir the surface of the sand, &c., which in this case has a good effect, in purifying the internal air of the bed. Little water will be required, perhaps only once in three or four days; but at each application, it should be given in quantity sufficient to reach the extremities of the roots.

If the weather is severe, it may be found expedient to line one or more sides of the bed. This should be seen to in time, that the plants may not experience a check: but proceed with caution in this matter: they are also liable to injury by sudden or violent heat.

In the mean time, let dung be in preparation for a one, two, or three light frame, or more, according to the quantity required, in the manner as directed above; and,

when the plants have each got four rough leaves, let the bed or beds be built for their reception, in the same way as directed for the seed-bed. If, from the state of the dung, there is reason to dread its heating too violently, let the beds be turfed all over, as before hinted; but, if it has undergone a proper fermentation, a large round turf being placed in the middle of each light, exactly under where the plants are to be set, will generally answer the purpose. But, previous to the turf being laid on, in the latter case, let the surface of the dung be covered, to the thickness of half a foot, with light sand, or well-reduced old tan, which should be rendered perfectly dry beforehand.

Put on the frame* and lights, and cover at night with mats, to draw up the heat; which, when it has arrived to a moderate degree, let three wheel-barrow loads of mould †, previously rendered quite dry, be

* The frame ought to be thirty inches deep in the back, and fifteen in front.

† Three-fourths of the richest black loam that can be got, (from a pasture, if possible), and one fourth of vegetable

be spread equally over each light-breadth of the bed. In twenty-four hours after, the bed will be fit for the reception of the plants. But, previous to planting, gather up a sufficient quantity of mould, from the surface of the bed, to raise hills, exactly above each turf, or in the middle of each light, to within five or six inches of the glass, the depth of fifteen inches, and to the breadth of ten or twelve inches at top. Make a hole in each to receive the ball entire, which must be carefully taken out of the pot, and to the level of the surface of the hill; and settle the whole with a little aired water. At the time of planting, the leaflets of the plants should generally be extended to a diameter of about three inches, more or less, according to the kind of cucumber, some growing more robust than others.

On the presumption, that the heat, steam, airing, and watering, shall be regulated according to the directions already given, the state of the weather, and the vigour of the

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plants,

vegetable mould from decayed tree-leaves, mixed well with a competent share of stable-dung, is what I have used for years with much success.

plants, till they begin to shew fruit; I will say no more on that head, but shall return to it after having considered the article pruning or stopping. That it is indispensably necessary, as some pretend, to pick out the heart-bud when the plant hath formed its rough leaves, I can by no means subscribe to; for, from the most minute observation, and the fairest trials, which I have repeatedly made, I am convinced it is of no consequence whether the bud is picked out or not: I seldom think of picking or pinching, till the plant begins to put forth runners or vines, nor even (unless it happens to put forth too few to furnish its side of the frame) till I perceive the rudiment of the fruit. It is then time to stop those vines which have fruit shewn: but the others may be suffered to run to the length of six or eight joints; and should then be stopped, to make them put forth fertile ones, which they will seldom fail of doing, if the plants are healthy.

If an extraordinary quantity of male blossom should appear, let a part of it be gently rubbed off with the finger and thumb;

thumb *; but I do not approve of this being done when an ordinary shew of these blossoms only appears. Nature should be kindly assisted; but neither spurred nor thwarted, where it can be avoided. When the female blossoms are sufficiently advanced, let them be carefully impregnated with the strongest and most healthy of the males, which will greatly promote the swelling of the fruit. And let it be here observed, that, if the fruit or female bloom is not impregnated with the male, it will not ripen its seed, although the fruit may swell to a good size, and be very fit for the table: and although it often happens that the farina of the male is carried, by insects, &c. and the wind passing through the frame, to the object of its destination, yet it is a more certain way to be at the trifling trouble of doing it with the hand; as handsomely set fruit can be marked for seed with a greater degree of certainty,

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and

* I would here observe, that the knife ought never to be employed in the pruning of Cucumbers and melons, unless in cutting out any strong, old vines; and as nothing is more brittle than the leaves of these plants, when in a healthy state, they ought to be handled at all times with the greatest care and delicacy.

and those which are impregnated will swell, and be fit to cut much sooner. The method of performing it is this: Choose a strong healthy-looking male flower; pinch it off with the stalk; divest it of the corolla or flower-leaves, carefully retaining the stamens and anthers; taking it between the finger and thumb, apply the anthers to the bosom of the female flower, which is distinguishable by the newly-formed fruit; and give the stalk a sharp twirl, whereby the farina of the male will be rubbed off, and deposited on the stigma, the female organ of fructification.

If no accident hath happened the plants, they will have made good progress before the bed has, in any great degree, lost its heat; and indeed, generally a few of the first set fruit are cut by that time*; which, supposing the bed was built about the middle of February, and the plants were planted about the 23d or 24th, should be fit for cutting

* This depends much on the kind of Cucumber sown; and, as the kinds are now so numerous, and almost every gardener having his particular favourite, it might be deemed presumptuous in me to say *which* ought to be preferred, especially as many known kinds have an equal title.

cutting by the middle or latter end of March, if the weather has been tolerably favourable.

If the heat has by this time considerably decreased, let preparations be made for lining the back and both ends, by slightly fermenting a quantity of fresh stable-dung, and mixing it, in the operation, with the old side and ends of the bed; which let be cut off, in the manner as directed for the asparagus bed (See page 15.), and let it be made up as it subsides: after which, cover it with turf or mould. The frame must be raised with bricks or tiles occasionally, as the plants advance in strength; so as to keep the glass free of the foliage.

By this time, also, the hills will require to be enlarged; as the roots will have made great progress. Therefore, let the surface of the bed be forked up with a small hand-fork, such as is used for plunging pine-pots, &c., to the depth of the surface of the sand or tan; and, if any of it has been burnt, (which I have but twice experienced in any hurtful degree), let it be replaced with fresh mould: Work gently into the sides of the hills with the fork, till the roots begin

gin to appear, and, if needful, pour in a little water; after which, let the surface be levelled up to the height of the hills, with fresh mould of the same quality as at first *. This operation, however, should either be done a few days before the application of the linings, or should be deferred till a few days after; that the plants may not experience a check, by the bed being cooled both without and within at the same time.

The plants will now grow vigorously, and produce fruit in abundance: and must forthwith have a large share of fresh air admitted every day, increasing the quantity as the season advances; and, when the month of May arrives, in fine, mild weather, the glasses may be entirely taken off in the day. Let them have large and frequent quantities of water given from the
rose

* I have here directed the bed to be earthed entirely up at once; which, if the forcing is not begun sooner than recommended above, will be found quite sufficient: but, if the forcing were begun a month or six weeks earlier, it would be imprudent to earth up the bed entirely at once, as a stronger bed and more linings would be required; and, consequently, the risk of burning the roots would be greater.

rose of a watering pan ; taking the advantage of warm showers as the season advances. Few plants require more of this element than the Cucumber ; and if it is withheld, the plants will, to the nice observer, quickly complain.

The most proper time for the application of water, is either in the morning about eight, or in the evening about four o'clock, an hour sooner or latter, according to the season of the year. The water, if possible, should always be of equal temperature with the air in which the plants grow ; in which case, no check is felt, or unnecessary effort made by the tender fibrils, the purveyors of the plant. Nor should an extraordinary quantity be applied at a time, for the same reasons.

Keep them moderately thin of vines and leaves ; taking care to lay them all out in regular order, and not to have them crossing one another. Be also careful to divest them of all withered and damped leaves, as they appear. It is as obnoxious for a plant as an animal, to breathe the air wherein its own corruption is confined. Neither should the Cucumber be pruned *much* at a time,

time, otherwise, by the wounds bleeding, the plant will be greatly exhausted.

About the beginning or middle of April, it may be necessary to line the front of the bed, which let be done in the same manner as the back and ends; but it will be quite unnecessary to renew these, as that of the front will throw in a kindly heat, which will last all that month, and afterwards bottom heat is of little consequence.

Succeffional beds for Cucumbers may be built in March, and in April. The same culture, as above, is to be practised; observing to make the beds a little lighter, as the season advances.

As I am to treat of the raising of *melons* in flued pits, when the culture of that plant is treated of, and as the culture of the two plants there are so nearly similar; I shall only observe here, that the same mould must be used for the Cucumbers as is recommended above, and a greater portion of air and water must be given, than to the melons.

The culture of Cucumbers under hand and bell glasses, although a species of forcing,

cing, being so generally understood, and insusceptible of improvement; it may be unnecessary to waste time in saying more on that head, than that they should be planted in mould of the same quality as above directed, should have plenty of water given them in hot weather, and, as much as possible, should be defended from cold and damp in Autumn.

I shall conclude this article, by observing, that I have seldom known any insect to infest the Cucumber, except the aphid, which, in any state or situation, is quickly destroyed by the fumigation of tobacco; a process that is familiar to almost every gardener.

CHAP.

CHAPTER III.

CHERRIES.

SECTION I.

On the Construction of the Cherry-House.

THE production of this justly-esteemed fruit, at an early season, has much obtained of late years; insomuch, that many of our capital gardens are furnished with a compartment for the purpose. These are of various constructions; occasioned sometimes by the fancy of the constructors, the subserviency to other purposes, and the converting of places that were originally erected for the production of other fruits or plants, to that of the Cherry: in all which, where properly managed, it has given general satisfaction. Consequently, it might be thought ambiguous in me to say, that a Cherry-house should be of such and such a construction; nor do I wish to advance such a proposition. But, where it is in contemplation to erect one, I would recommend such as is represented by Fig. 1.

Plate

Plate II., which, besides being perfectly adapted to the forcing of Cherries, is also to that of strawberries, kidney-beans, flowers, &c.

The fire (See the plan) communicates first with the front flue, and then has two returns in the back-wall; which returns are made on the presumption that the house may be converted into a vine or peach-house at pleasure: but, while it is appropriated to the forcing of Cherries, it will be improper to use any but the front flue; and of consequence, the back flues must be shut by a damper. My reasons for which are, that a small degree of fire heat *only* is requisite, even at an early season; and, the Cherry being so subject to be injured by the red spider, the working of the back flues would greatly encourage the breeding of that destructive insect.

SECTION II.

On Preparing the Border, and Planting the Trees.

IF the situation is dry, the bottom a kindly sand, gravel, or soft clay, and the soil a sandy loam to the depth of two feet; the

the border will require no other preparation than being well enriched with stable-dung, and if possible, a little marl; which ought to be trenched and well mixed, twice or thrice during the Summer before planting.

But, if the situation is wet, the bottom a cankering gravel or cold clay, and the soil either a poor sand, gravel, or stubborn clay; care must be taken to render them otherwise, by paving the border to the breadth of twelve or fourteen feet, running a drain in front to carry off the wet, and removing the bad, and bringing in good soil; so as to compose a rich sandy loam to the depth of thirty inches at the wall, and twenty-four in front, allowing three or four inches for settling. If a new building is erecting for Cherries, it is immaterial whether the building or border is completed first, provided the latter has a sufficient time allowed for the mixing and incorporation of the soil; as the front-wall and flue stand on pillars, whose foundations ought to be at least six inches deeper, if the border is not paved, than the soil.

About

About the 1st of January is a good time to plant; although a month sooner or later at this season is of little consequence, as no fire heat must be applied the first year. Having provided the necessary number of healthy, *well-rooted*, maiden, or one-year-trained May-dukes*; let them be planted against the trellis at the distance of eight, nine, or ten feet, as the length of the house will best divide; filling in the pits with vegetable mould from decayed tree-leaves, and settling all with a little water. Riders, having five or six feet *boles*, which have been trained two or three years against a wall, and have produced a crop or two, should be provided to fill the upper part of the trellis; where they will produce a few crops before the dwarfs will have extended, so as to require their removal. These will generally produce a few fruit the first, and probably will yield a full crop the second year.

Let the surface of the border be forked over once or twice a-year; and let a little well-rotten dung occasionally be

D worked

* Experience shews that no other Cherry deserves a place in a forcing house.

worked in. This may be performed in any of the winter months.



SECTION III.

On Training the Dwarfs.

THE dwarfs or principals being the only plants intended ultimately to fill the trellis, I shall discuss what relates to training the riders by observing, that, as these are planted solely for the purpose of obtaining a crop or two, while *those* are making their wood and forming their fruit spurs, and, by being checked by their removal, may not be expected to put forth much young wood while they remain here, it will be unnecessary to thin them out much; but let them be dressed regularly to the trellis, and, unless necessary to fill a blank, divest them of any shoots they make, paying respect to their fruit spurs only; for when they have served the purpose here, they will be of no further use.

After planting, let each shoot of the dwarfs, if maiden trees, be headed down to two or three eyes; in order to make them
put

put forth vigorous shoots, to furnish the trellis, from the bottom : and, if they have been one year in training, let the bottom branches be laid well down, and let the rest be dressed in a regular manner to the trellis, using strings of fresh matting to tie with ; being careful to allow full room * in the ties, as much mischief is done to fruit, especially Cherry-trees, which are so apt to gum, if not allowed a sufficiency of room.

The Cherry-tree being apt to gum, and the branches to decay, from the slightest injury, it would be imprudent to train it horizontally ; in which case, the loss of a branch is supplied with much more difficulty, than when trained in the fan manner : this last method I would therefore recommend.

When the tree hath produced its shoots to the length of five or six inches, let them be gone over and thinned, so as that they may be laid in at about the distance of ten or twelve inches ; observing to pinch off

D 2

such

* I make it a rule to allow every shoot as much room in the shred, or tie, as will at least admit another of the same size along with it.

such as are produced fore-right, and which are, from their appearance, not forming for fruit spurs: and, as they advance, let them be regularly disposed, and divested of any laterals they may produce. If all has gone well, at the end of the first year they will have produced shoots from twelve to thirty inches long; which should then be shortened down to about two-thirds of their length. This is necessary, in order to make them shoot strongly, and that the trellis may be furnished from the bottom, in a regular manner.

The second season, they will shoot vigorously, and will begin to form many fruit spurs on the preceding year's wood; which must be encouraged, for the production of a few fruit next season. Keep the tree clear of all superfluous and lateral shoots; and lay in the leading ones at the distance of eight or nine inches, which forthwith must be considered as the medium: and, at the end of the season, shorten a few of the strongest branches alternately, so as to make them break their buds in the spring, in a regular manner; as, henceforth, they will not require to be shortened.

The

The third season, they will produce a few fruit, make fine spurs and moderate shoots; which, as they advance towards the riders, give place to, by lopping off their branches, or thinning away their foliage, so as to afford a free circulation of air and admission of sun.

The fourth season, they will produce a full crop of fruit; and will possibly make such progress towards the riders, that these must be dispensed with: in which case, it will be advisable to sacrifice whatever fruit, or appearance thereof, there may be on them, to the encouragement of the principals.

After the trees have filled their spaces, and have begun to bear plentiful crops of fruit, they will make little or no wood; and will require no further care, on the score of training, than to supply the place of any branch that by accident may die out.

SECTION IV.

On the Temperature of the Cherry House.

THE Cherry, from its nature, will bear very little artificial (especially fire) heat. For which reason, I would not advise the forcing of it too early, especially if there is only one compartment for its culture; since, in that case, there would not be a continued succession for the supply of a table, and furnishing a desert, till they came in on the open walls. I consider the first or middle of February to be an eligible time for the commencement of the forcing; but, for a new planted house, the third year ought to arrive before fire heat is applied. Were it not for the sake of other articles that may be placed or planted in the Cherry house, it would be better that the glasses were not put on the first season at all; but this is generally too great a sacrifice: however, if they are put on, a free circulation of fresh air, even in the night, ought to be encouraged.

Suppose

Suppose then, that, the third year after planting, the trees have made good progress, plenty of fruit spurs, and that a reasonable hope of success is entertained; let the glasses be put on about the middle of January, plenty of air admitted through the day, and shut up at night. On the first of February, light the fire; which must be made so moderate, that at eight at night, and eight in the morning, Fahrenheit's thermometer may not stand above 40° . In which condition keep it, as nearly as possible, till about the 20th of the month; and then increase gradually to 45° : at which point endeavour to keep it, till the fruit is fairly set. Afterwards increase the heat to 50° , but not more, till the stoning is over, and the fruit have begun their second swelling.

Although, for the sake of the fruit, all danger will now be past; yet, if too strong a fire heat be afterwards indulged in, it will have the tendency of drawing the shoots up too weak; and, therefore, I would not advise that the air of the house, at the fore-mentioned hours, should ever pass 60° .

SECTION V.

On the Admission of Air to the Cherry House.

AS has been already hinted, the house ought to be uncovered all the first season after planting: but, if this is not the case, and if, from the nature of what other plants are placed therein, it would be imprudent to leave a little air in the night; let the house be opened by sun-rise in the morning, have a large and free circulation all day, and be shut up at sun-set. However, when the month of May arrives, it ought to be entirely uncovered.

The second season, let the glasses be put on by the first of March; let large portions of air be admitted, as directed above; and let the glasses be removed by the first of August.

From the commencement of the forcing, this article must be attended to more particularly:—The first ten days after which, a very large share of air should be given, to prevent the buds from breaking too suddenly, and of consequence too weakly:
for,

for, vegetation, in forcing, ought always to be brought on, as it were, by stealth: the juices flow more kindly; and the plant suffers the first impulse of reviving activity with more patience, than when hurried on in a violent manner. But, after the buds begin to appear turgid, a more moderate quantity may be admitted; still having respect to the temperature of the house, and the prevention of frosty winds from hurting the bloom. At all events, take advantage of sun-shine; which will allow a larger portion to be given, than at other times. Nevertheless, let no day pass, (unless in a severe frost), wherein less or more air is not admitted; and, in sun-shine, to the extent that the thermometer may not rise more than 10 degrees above the fire-heat medium.

After the crop is all gathered, if consistent with the welfare of the other articles contained in the house, let the glasses be removed, and the trees be exposed to the weather till the next season.

SECTION VI.

On Watering, Washing, and Steaming the Cherry House.

AFTER planting, let the mould be settled to the roots of the plants by a moderate watering; and, if the house remain uncovered the first season, little attention, except in dry weather, will be required in this article. Let due attention, however, be paid the second year, to keep the border in a moderately moist state, that the plants may grow freely; and, when their growth is stopt for the season, withhold the water, that the wood may ripen perfectly before they are exposed to the weather.

From the commencement of the forcing, give plentiful waterings to the border, until the bloom begins to open; and then in a more moderate degree, till the fruit is fairly set. After which, again increase the quantity, till the fruit begins to colour; and then diminish it by degrees, till it be entirely withheld, which ought to be done

done some little time previous to the fruit's being ripe; as otherwise, it would be rendered insipid.

Washing with the hand-engine, should commence with the day the fire is lighted; and, except from the time the bloom begins to appear, till the fruit is fairly set, should be repeated thrice a-week in the evening, and that with a considerable degree of force, till the fruit begins to ripen. The use of the engine here, and indeed in all forcing houses, is much preferable to the pampered trash of steaming apparatus. It is not merely to refresh the foliage that the engine is employed, but also to clear it of dust, insects, &c., a matter of evident necessity; for, the leaves being, as it were, the lungs of the plant, how can we suppose it in health while these remain clogged? Hence it becomes a duty, in the use of this instrument, to apply it with force: more so in the hot-house than out of doors, for the plain reason, that here the wind is not equally helping to this effect.

In the interval of washing, (*viz.* while in bloom, and till the fruit is set), let a little
water

water be poured on the flue every evening when the fire is strongest; which will cause a fine agreeable steam* to arise in the house, greatly to the benefit of the flowers and foliage: For at this time, water from the engine cannot, with propriety, be applied, lest the tender blossoms might be injured.

Soft and tempered water should be used at all times, and on all occasions.



SECTION VII.

On the Insects that infest the Cherry House, and how to destroy them.

THESSE are, the aphis, or green fly; the acarus, or red spider; the caterpillar;

* I do not consider the Cherry house of such importance as to be at the expence of erecting steaming apparatus purposely for its use; nor, indeed, do I think it worth the while to do so for the use of any kind of forcing, except a range of peach houses: in the near neighbourhood of which were it placed, a pipe might (if at a small expence) be borrowed for its use. But, at all events, I prefer steam which is produced from an earthen flue, to that produced from boiling water.

pillar ; and the grub *. The first, and least hurtful, is easily destroyed by a fumigation of tobacco. The second, may be suppressed by the process of washing with the engine, which is indispensably necessary to the health and vigour of the trees. Therefore, when they begin to make their appearance at any time, let the water, in the ordinary course of washing, be thrown against the trees with greater force ; making a point of beginning at the contrary end of the house each time ; whereby, if any part shall be missed the one way, it may be hit the other.

The caterpillar and grub, have given me more trouble than the preceding, or indeed any species of insect whatever ; and, after trying a variety of prescriptions, and having been at much trouble and expence, I can venture to assure the reader, that I have at last discovered a cure : the receipt of which I shall

* Not the land-grub :—a small greenish-black worm, of the caterpillar kind, with a black head, about three-eighths, or half an inch in length, often called “ the grub ” by gardeners. It is generally found rolled up in a kind of down or wool, in the leaves of cherries, apricots, &c.

shall candidly give; and hope that none will attempt to use it without giving it a fair and impartial trial.

Take of soft soap, two pounds; flowers of sulphur, two pounds; leaf, or roll tobacco, one pound; nux vomica, two ounces; and oil of turpentine, half an English gill: boil them all together in eight English gallons of soft or river water to six; and set it aside for use.

Any time in winter, at least a considerable time before the trees begin to vegetate, let them be all untied or unnailed from the trellis or wall; brush every part of the branches and buds clean with a soft brush, such as is used for painting: make the liquor milk warm; and, with a sponge, carefully anoint every part of the tree, trellis, &c. Dress the trees neatly to the trellis again; but use none of the old ties or shreds: and let this operation be repeated every winter* without reserve. The first summer after anointing there may a few appear, whose eggs have, by being concealed, escaped the action of the liquor, which

* This precaution is necessary, these insects being evidently blown by a fly in Summer.

which must be picked off, to prevent their breeding; but, if any, there will very few remain, as it is of the most penetrating nature.

This liquor must on no account be used in summer, as it instantly destroys the foliage; the fatal effects of which myself once experienced, through inadvertency. The most proper season for its application is between the fall of the leaf and the first of February, for trees growing out of doors; for trees in hot-houses, a month at least before the forcing commences. Fruit-trees of all kinds should be anointed with this composition every year; as it is equally destructive of all insects, and their eggs, which infest them: but surely none, who have the health and beauty of the trees contained in their hot-houses at heart, after being convinced of its efficacy, will be so neglectful of their own interest, as to omit doing it, since neither the trouble nor expence are great.

SECTION VIII.

On the Cultivation of Cherries in the Conservatory and Peach House.

CHERRIES are often brought to early perfection in these forcing compartments ; by being sometimes planted in pots, sometimes in the borders as low standards, and sometimes as rider standards : all which methods are attended with various success, from the circumstance of their being a secondary object.

Having, in the seven preceding sections, treated methodically of the cultivation of this fruit ; it may be unnecessary to enlarge more on it here. I shall therefore pass over the further consideration of trees planted in the border ; and conclude this chapter by dropping a few hints on the utility of cultivating a few dwarfs in pots or boxes.

Where there is an extensive variety of forcing, and a green house, or conservatory, Cherries may not only be produced at an early season ; but may be continued in

a long succession, by removing the pots or boxes from one house to another. Suppose there are forty trees provided for this purpose; let them be divided into four or five equal parts, to make as many successions; and let them be placed in equal rotation: first, in November or December, in the green-house, where let them remain till the fruit are fairly set; then, in an early peach or vine house, till they begin to colour; and, lastly, in the pine or dry stove, to come to maturity.

Let very rich compost, such as is recommended for cucumbers or melons, be made use of; and water the boxes frequently with the drainings of a dunghill. Wash or water the plants also frequently overhead with a hand squirt or watering pot; and place them in the most airy situations, in the conservatory, stove, &c.

It may be necessary to remark, that after plants are inured to this mode of culture, provided due attention is paid to the state of their roots, they are, and will continue to be, very prolific of fruit, though dwarfish, and unproductive of shoots and foliage. Their roots should therefore be

E

examined

examined each season, and, if necessary, the space about them should be enlarged, by removing the plants into other pots, boxes, &c.; using fresh, rich mould; and undoing any matted part about the bottom or edges of the ball, before it is replaced. When the plants are all shifted, give the roots a moderate watering, and let them be placed in a dry, free exposure in the open air, till again wanted for forcing.

CHAP-

 CHAPTER IV.

 FIGS.

SECTION I.

On the Construction of the Fig-House.

FORCING of this fruit is in pretty general practice, particularly in England, but I believe there are few houses built *solely* for the purpose. Figs are most frequently forced in other compartments, as peach-houses, vineries *, &c. ; but I am of opinion the cherry-house ought to be preferred ; the soil and climate which suits the one, nearly agreeing with the nature of the other, in forcing.

However, were a house to be erected for the forcing of this fruit alone, I hesitate not to say, that I am convinced such as is represented by fig. I. Plate II. would be

E 2

found

* Figs may be cultivated with success, in the same manner as advised for cherries, Section VIII. of the preceding Chapter.

found to answer the purpose perfectly. In this case, the trees are to be planted and trained to the trellis placed against the back-wall; and a row of dwarfs may also be planted in the border, provided it is not to be otherwise occupied.—See Section I. of the preceding Chapter.

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## SECTION II.

*On preparing the Border, and planting the Trees.*

**W**HAT has been said in Section II. of the preceding Chapter, respecting the preparation of the border, will also apply here, except that the soil should be made somewhat richer for Figs than for cherries.

Plants which have been a year or two in pots, and which have good roots, are to be preferred.

The kinds fittest for forcing are, The Blue Ischia, the White Ischia, the Brown Ischia, and the Black Genoa.

They may be placed on the trellis, at the distance of nine or ten feet apart; and in the border, to be kept dwarfish, at about  
five

five or six asunder. The season of planting is from the first of November to the first of March.

Rider cherries may, with propriety, be planted between those on the back-wall; as, especially if they have been a year or two in training, a few crops may be expected before it would be necessary to remove them. Fill in the pits with rich, light compost, and settle all with a little water.

### SECTION III.

#### *On Training and Pruning.*

THE chief art in training the Fig is, to keep every part of the trellis full of young shoots, the plant naturally running into naked unsightly branches in the middle. Shoots, however, may be produced with facility, by *shortening*: they also rise abundantly from the root, round the stem of the plant. Producing its fruit on the shoots of the preceding year, these, if well ripened, should not be shortened, but should be laid in at full length, and at the

distance of about twelve or fourteen inches from each other.

When the trees arrive at a bearing state, the knife should be used with caution; for the more their branches are lopped, the greater a profusion of shoots will follow in consequence; nor will such generally be fruitful, but soft and spongy. The most fruitful shoots of the Fig are short-jointed, round, and of little length in proportion to their thickness. But

The reader may see farther on this subject in Book II. Chap. I. Sect. IV.



#### SECTION IV.

##### *On the Temperature of the Fig-House.*

**T**HE Fig will bear but a small degree of fire heat; nor should it be forced much at any period. Keeping this in view, I would not advise that fire be lighted the two first seasons after planting; but the third year, a gentle fire heat may be kept up in the months of March and April, in order to forward the wood for forcing the fourth. At this time, Fahrenheit's thermometer



mometer should not stand, at eight at night, and seven or eight in the morning, above  $50^{\circ}$ .

The fourth season, provided the plants have succeeded tolerably well, they may be forced from the first or middle of February. If the house has been uncovered for the winter, or if the glasses have been kept on, let it be shut up at night, encouraging a free circulation of air in the day, from the middle of January: Make the fires so moderate for the first fortnight, that the thermometer may not stand above 45 at the above-mentioned hours. In the course of the second fortnight, increase the heat to  $55^{\circ}$  in a gradual manner; and in the course of ten more days, to  $60^{\circ}$ , at which continue for the season, with as little variation as possible.

The following, or fifth season, the house may be forced from the middle of January; but earlier than this I cannot approve. The rules above are to be followed the more scrupulously that the plants are forced early.

## SECTION V.

*On the Admission of Air to the Fig-House.*

**T**HE three first seasons, large portions of air should be admitted every day; varying the quantity, however, according to the state of the weather, and the state of growth the plants may be in; for sudden checks are hurtful to this plant, as to others, although their bad effects may not be so immediately perceptible.

In the fourth and fifth seasons from the commencement of the forcing, and for the first month or six weeks, admit air in such quantity in the day, that the thermometer may not rise to more than five degrees above the fire-heat medium. As the season advances, air may be more freely admitted. Let this be done in a liberal manner, and to the extent that the mercury, at no time, may rise to more than  $10^{\circ}$  above the fore-mentioned medium.

From the middle of May, or the first of June, the house may stand open night and day, in moderate weather. But the glasses should

should not be entirely removed till the crop is ripened off; because, by keeping them on, the flavour of the fruit may be considerably enhanced. The shoots may be better ripened, and the fruit, for the succeeding year's crop, may be better set and forwarded by retaining the glasses for a while, than by removing them too soon.

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#### SECTION VI.

##### *On Watering and Steaming the Fig-House.*

**T**HE border should be kept moderately moist at all times, except when the fruit is ripening off, when it should be kept rather in a dry state. This is necessary, because, otherwise, the fruit would be apt to drop; nor would it be well flavoured, but insipid. After the fruit are gathered, however, the border should again be brought to a proper state, by the application of a few hearty waterings.

Let the foliage be duly refreshed, twice or thrice a-week, by the hand-engine; which should be applied with some degree of force, in order to keep the leaves clear  
of

of dust, &c. As the fruit approaches to maturity, this may be withheld in a great measure, and unless the plants are afflicted with the red spider \*, entirely, till the fruit is gathered.

Steaming can be little necessary to the welfare of the Fig, since the engine may be worked at all times. The fear of hurting the bloom, unless the watering be performed in a very wanton manner, cannot possibly attach here, as in the cherry, grape, or peach house: And this is a circumstance so far happy, as the temperature of the fig-house is such, as seldom to admit of the flue being heated enough to excite steam in any great quantity.

## CHAP-

\* I have not known any other insect *materially* to afflict the Fig in the hot-house. Wasps, however, are fond of the fruit.

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## CHAPTER V.

### GRAPES.

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#### SECTION I.

##### *On the Construction of the Grape-House.*

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**T**HIS delicious and justly-esteemed fruit is now cultivated with such general eagerness in this country, that a garden unprovided with one or more compartments for its production is not only reckoned incomplete, but hardly to be met with\*. These vary exceedingly in construction; and, although *some* lay great stress on this article, and there are extremes which ought not to be followed, yet I am convinced the failure of success, in the production of the Grape, is much less a consequence of *bad* construction in the house, than in the preparation of the border,

\* I would here be understood as speaking of noble-men's or gentlemen's gardens in general, although there are also some Grape-houses found in market gardens.

border, the choice of the kinds, and the general management. I have formerly had the construction of three several and differently-constructed Grape-houses in the same garden \*, under my care, for years, which then uniformly produced excellent crops. This, in my opinion, is a proof of the necessity of a greater niceness in the formation of the border being observed, than in the construction of the house; the fire-place and flues excepted.

A perfect command of fire heat is absolutely necessary in the Grape-house; to effect which, proper attention should be paid to the construction of the fire-place and flues.

Fig. 1. Plate V. represents a furnace, and the entrance to the flue, on a plan that has given the highest satisfaction for many years: and although I should be sorry to advise unnecessary alterations in houses already built, yet I could wish to see all hot-house furnaces constructed on the same plan; from a conviction of the utility, not only in saving fuel, but in enabling the operator to work with a degree of

\* Wemyss Castle.

of exactness, and to enjoy a less disturbed repose in winter nights, than is generally done.

Fig. 1. and 2. Plate III. represent two different plans of Grape-houses ; which, if minutely copied, it is presumed, will not fail of giving satisfaction. Any alteration in the breadth and height, I would beg to caution against ; but the length may be extended or lessened at pleasure, provided respect is paid to the proportion of fire heat here allowed.



## SECTION II.

### *On the Situation and Preparation of the Border.*

**T**HE site of the Grape-house is an object of such consequence to the welfare of the plant, and successful cultivation and production of well-flavoured fruit, that the greatest care is necessary in the choice of it ; and, where the situation is not naturally good, the sparing expence, in rendering it so, is the cause of many disappointments. I shall, therefore, point out what I esteem a good situation, and the method

method of rendering a bad one comfortable.

A gentle hill, having a south aspect \*, and considerable declivity that way, the soil a strong brown loam of two feet, over a bottom of dry sand, gravel, or soft clay; is the most desirable, and in forming the border, would be the least expensive of all situations. In which case, the site would require no paving or draining; and would admit of a proper mixture of sandy loam, vegetable mould, marl, and dung, (by the removal of two feet of the natural bottom), with the natural soil, to form a border, perfectly adapted to the growth of the vine, in the following proportion, viz. One half strong brown loam, a quarter light sandy loam, an eighth vegetable mould of decayed tree-leaves, and an eighth stable-dung; to which add about a fiftieth part of shell-marl. Such was the composition of the vine borders at Wemyss Castle; none of which were formed less than four feet deep, and one (owing to the accidental situation of the house) was six.

Nevertheless,

\* All hot-houses should face the meridian sun, if conveniency will by any means permit; but a small variation to the east or west, is not attended with any injurious consequence.



Nevertheless, I would not wish to infer, that of the above mixture *only*, vine borders should be made. Every candid gardener will discriminate here, and choose the composition he thinks most suitable to the nature of the plant in question. But I would remark, that I have never known any to err, by forming vine borders too deep, or of too rich materials.

The nature of the plant, is to push its roots downwards, and extend them widely; consequently, our duty is to cherish, and not to thwart, its inclinations. We perhaps do them a violence, even by our greatest care and attention, in this mode of culture; since we impose on them a foil, climate, and an air, altogether artificial.

The breadth of the border for a house, as represented by fig. 1. Plate III. should be all the width of the house within, and at least ten feet without; and for such a one as is represented by fig. 2. should be to the extent of twelve or fourteen feet beyond the front-wall.

Having shewn the composition, breadth, and depth, the borders should be of, in a good situation; I shall only observe, in respect

spect of the contrary, that, if it lies low, damp, and flat, it will be advisable to raise an artificial hill, to the height of three feet above the common level, (allowing the surface to be one foot deep of tolerably good soil), composed of the above-mentioned materials, which may be mixed with the natural earth, and of the full breadth, as aforesaid: pave\* the bottom in a sloping manner all round, and, if necessary, run drains to carry off the wet; and here erect the Grape-house.


As the plants are to be planted within the house, it is obvious, that both the front wall and flues must stand on pillars; whose foundations must be to the depth of the pavement in the one case, and six inches deeper than the soil in the other.

The compost must be well prepared, by trenching and mixing it, three or four several times during the Summer preceding the planting; and the building may be going on at the same time.

Let the surface of the border, both without and within the house, be forked up annually,

\* For a more economical method of making a bottom, see Book II. Chap. I. Sect. 2.

annually, and let a little rotten dung be worked in. Hence it appears, that I do not approve of the border without the house being made a walk of, as directed by some; nor even do I approve of its being cropped with vegetables, unless in a very slight manner. Wooden walks should be used within the house, which ought to be composed of spars, placed within two inches of each other, to the breadth of eighteen inches; and these ought to be supported from the ground by tiles or bricks, that a circulation of air may be admitted to the border underneath.

  
SECTION III.*On Preparing the Plants.*

**I**F plants of proper kinds, and which have been one or two years in pots, cannot be procured, recourse must be had to producing young ones by cuttings, which is the most certain and speedy method.

The vine may also be propagated with facility, by layers, and by seeds; both which methods, however, are in some measure

sure objectionable ; the former, because that the plants thus obtained are apt to grow “much to vine and little to wine;” and the latter, on account of the difficulty of procuring effectually ripened seed ; and that, even in this case, it is apt “to sport.” Let us follow the most approved mode, viz. by cuttings. And,

For this purpose, in the pruning season, make choice of a quantity of the under part of the best-ripened, roundest, and shortest-jointed shoots of last year ; which let be cut off with two inches of the former year’s wood \*, headed down to three eyes, tied in parcels, numbered and registered according to their kinds, and stuck into the earth in a dry situation till wanted.

About

\* Mr Speechly mentions several methods of making vine cuttings ; and particularly recommends *that* by one eye. I have given them all fair and frequent trials ; and, after all, am inclined to stick by the old-fashioned Mallet method. I have always found the strongest plants to be obtained by it.—But, to make the most of a rare kind, the method by one eye is of great advantage. It is performed by cutting off the bud, with half an inch of the shoot below, and one inch above, in a sloping manner ; and placing it against the side of the pot facing the sun, to the depth of half an inch.

About the 1st of March, let a bed, in all respects the same as that which is recommended for asparagus, (See page 11), be provided; observing to lay a few inches more of old tan on the surface, and of a size corresponding with the number of cuttings required. Take garden-pots about six inches in diameter, and the same in depth; fill them with entire vegetable mould of decayed tree-leaves; place two cuttings in each, so deep as to cover the undermost eye an inch; and plunge them to the brim in the tan. Cover at night with mats, if necessary; admit plenty of air, in good weather, through the day; and refresh duly with well aired water.

The plants will grow a-pace: and, to their encouragement, let the bed be lined, when necessary; and as the shoots approach to the glass, let the frame be raised with bricks, &c. that they may have full room to extend. By the time they have made shoots to the length of five or six joints, they will require fresh potting; and must be put, singly, into pots of nine or ten inches in diameter, being filled with half vegetable and half melon or cucumber

F 2

mould,

mould, divested of all but one shoot, and placed in a vine-house, pine-stove, or a slight hot-bed, previously prepared; where let them be duly attended to in the articles of air and water. (Sometimes the drainings of a dunghill) during the remainder of the season.

Pinch off all laterals and tendrils as they appear; dress each shoot neatly to a rod; and, when their growth is over, and the wood ripe in the under part, head them down to three or four eyes, and place them in the open ground, in a dry and airy situation, till the planting season.



#### SECTION IV.

*On Planting, and the Kinds best adapted to the Grape-House.*

**A**BOUT six feet between the plants is the distance they should ultimately stand at; but it will be proper to plant them at half that distance, as a crop or two may be obtained before it will be necessary to thin them out; observing to place the kinds two and two together, that, in thinning

thinning alternately, any of the kinds may not be totally extirpated.

Suppose, then, that the house is built, and the border has been prepared conformably to the directions given in the last section, and that the plants are in readiness; let pits be made, at the above distances, eighteen inches deep, and as much in diameter; fill them half with vegetable mould; take the plants carefully out of the pots with the balls entire, and, unless matted, place them so in the pits, filling in with vegetable, or other rich, light mould, and settling them with a little water. But if the plants have been a considerable time in the pots without being shifted, and if their roots are in any measure matted, it would be improper to plant them so; therefore, let the ball, in this case, be reduced a little, and let the matted roots be singled out; retaining all the fibres possible, and spreading them carefully out, in placing of the plant. This operation may be performed any time from the first of November to the middle of March, with equal success\*.

F 3.

Amongst

\* On the first day of May 1793, I planted a Grape-house with young plants, struck in February. In 1795. they

Amongst the numerous variety of Grapes, I do not know above eighteen or twenty kinds worthy of a place in the vinery, and even that number cannot have places in an ordinary-sized house; but, where there are two or three houses, a variety to the extent of twenty-four kinds may be encouraged, without transgressing the bounds of moderation. The following is a list, viz.

|                    |                             |
|--------------------|-----------------------------|
| White sweet Water. | Syrian.                     |
| White Muscadine.   | White Tokay.                |
| Royal do.          | Flame-coloured do.          |
| Black do.          | White Passe Mosque.         |
| Black Frontinac.   | Grecian.                    |
| White do.          | White Muscat of Alexandria. |
| Red do.            | Black do.                   |
| Grisy do.          | Large black Cluster.        |
| Black Hamburgh.    | Black Constantia.           |
| White do.          | White do.                   |
| White Raisin.      | St Peter's Grape.           |
| Red do.            | Lombardy.                   |

Out of which, according to the fancy of the proprietor, may be chosen an ample collection to stock any Grape-house.

The following is a brief description of their properties and appearances; which, perhaps, they had a few fruit; and in 1796, the best crop I remember of having seen.



perhaps, may help to determine the choice of those who are unacquainted with their qualities.

### 1. *White sweet Water.*

This is the best early Grape we have. The berries grow close on the bunch, are white, or rather of a russet colour when ripe, round, large, and thin skinned; and are replete with an agreeable, sweetish juice. An error, too common, prevails of cutting this Grape ere it be fully ripe. Hence it is less in repute than it deserves to be.

### 2. *White Muscadine.*

The berries are of a moderate size, white, roundish, the skin thin, juicy and delicate; the bunch well formed, and moderately large. This Grape is also frequently cut before it be perfectly matured; but it is a good fruit, comes in early, and bears abundantly.

### 3. *Royal Muscadine.*

This Grape nearly answers in description to the preceding, only that the bunches

grow much larger, and the wood and foliage a good deal stronger.

#### 4. *Black Muscadine.*

The berries of this kind are black, round, and juicy; the skin is thin, the bunch of a moderate-size, and well formed. It is a plentiful bearer in general.

#### 5. *Black Frontinac.*

The berries are round, black, of a moderate size, and of the most exquisite flavour, as all the kinds of Frontinacs are; the bunch long, unshouldered, but well formed.

#### 6. *White Frontinac.*

The berries are large, round, and of a greenish white colour, except the side next the sun, which, when well ripened, is a pale russet. The bunch is large, and somewhat more shouldered than the preceding.

#### 7. *Red Frontinac.*

The berries are round, of a brownish red colour, moderately large, and grow close on the bunch. I know many who esteem

esteem this above all the kinds of Frontinacs, for its high musky flavour. The plant is a moderate bearer, and produces well-shaped, middle-sized bunches.

8. *Grizzly Frontinac.*

The berries are round, of a grizzly brown colour, moderately large, and very high flavoured; the bunch of a middle size, rather longish, and unshouldered: a great bearer in general, when well managed.

9. *Black Hamburgh.*

The berries are large, black, of a roundish oval shape, and consist of a pulpy flesh and thickish skin; are not of a very high flavour, but agreeably sweetish. The bunches are large, handsomely shouldered, and are produced in great abundance: few, if any, grapes exceeding this in luxuriance.

10. *White Hamburgh, or Portugal.*

The berries of this kind are large, oval, of a pale white, thick skin, and hard pulpy flesh; the bunches are large and long, and somewhat shouldered. The plant is a great bearer,

bearer, and grows very strong, both in wood and foliage.

11. *White Raisin.*

The berries are large, white, oval, with a thick skin, and hard, firm flesh. The bunch is long and handsome, in which the berries hang loosely.

12. *Red Raisin.*

The properties of this kind are much the same as those of the preceding, only that the berries are of a reddish black.

13. *Syrian.*

Amongst the coarsest of the grape kind, nor has it any property to recommend it, except that it is a good bearer, and produces enormously large bunches. The berries are large, round, and white.

14. *White Tokay.*

The berries are white, rather oval than round, of a moderate size, thin skinned, and grow close on the bunches; which are of a good size, and well formed. This is

an agreeably flavoured grape, and a pretty good bearer in general.

15. *Flame-coloured Tokay.*

The berries are large, of an oval shape, pretty thin skinned, of a beautiful flame-colour when well ripened, but not very high flavoured; the bunches are large, and elegantly formed with shoulders; and the plant generally produces good crops.

16. *White Passe Mosque.*

This is a good Grape. The berries are large, round, and of a yellowish white when fully ripe; the bunches are of a moderate size, and well formed; and the plant is a pretty good bearer.

17. *Grecian, or Greek Grape.*

The berries are of a middle size, of an oval cast, of a blueish-white hue, and grow rather close in the bunches; which are of a moderate size, and well-formed. This is a high-flavoured grape, and a plentiful bearer in good soil.

18. *White*

18. *White Muscat of Alexandria.*

The berries are large, oval, of an amber colour, and a high musky flavour; but the skin is thickish, the pulp hard, and not very juicy. The bunch is large and handsome, on which the berries hang loosely. On the whole, it is an excellent Grape.

19. *Black Muscat.*

The berries are round, black, of a middle size, thin skinned, and of a high-flavour; the bunch is moderately large and well-shaped, on which the berries fit rather close. The plant is a pretty good bearer in general.

20. *Large Black Cluster.*

The berries are rather small, oval, black, grow close on the bunch, which is not very large, though pretty well shaped. The juice of this fruit is harsh, and makes the palate feel rough, as when having tasted Port wine; which is made from this plant alone.

21. *Black*

21. *Black Constantia.*

The berries are of the middle size, rather oval than round, black, but not very high flavoured. The bunch is moderately large, and well formed.

22. *White Constantia.*

Much the same as the preceding, but on the whole a larger and better fruit.

23. *St Peter's Grape.*

The berries are large, round, and black; the skin is thin, and the flesh delicate and juicy; the bunch is large, and handsomely formed; and the plant is a good bearer.

24. *Lombardy.*

The berries are pretty large, black, rather oval than round; the skin is thick, and the flesh soft and juicy. The bunch is very long, and unshouldered, on which the berries fit rather closely. The plant is a pretty good bearer.

## SECTION V.

*On Training and Pruning.*

**I**N the last Section, I have observed, that the plants should be planted at double thickness, in order to furnish the house, and obtain a crop or two while the temporary plants remain. These must be marked, and considered as such from the beginning: and, as the farther mention of them in respect of training and pruning would only tend to confusion, I shall simply treat of the principals; leaving the thinning away, and final extirpation of the temporals, to the judgment and discretion of the operator.

The plants being headed down to three or four eyes, as directed in Section III, will generally push them all; in which case, rub \* off the weakest one, and dress in the other three, as they advance, at the distance

\* The knife should be used as little as possible; and, the young shoots being of so tender and brittle a nature, there is no difficulty in doing all that is required in summer dressing, with the finger and thumb, except



distance of from nine to twelve inches, Pinch off all tendrils and laterals as they appear; making a rule, however, of leaving *all* the laterals above the *last tie*, which should not be nearer to the extremity of the shoot than ten or twelve inches; as that part, being so very brittle, is apt to break, should it meet with any obstruction, and at the same time be confined too near to the point: In case of which, it is advisable to leave the laterals, as above hinted, that one of them may lead on the growth, and become a substitute to the proper shoot.

When the two side-shoots have arrived at the height of four or five feet, they should be stopped, in order to throw in the more strength to the middle one, which must be encouraged, and suffered to grow without interruption the whole season; not only on its own account, but on that of the roots, whose progress always bears pace with that of the branches. The uppermost lateral

in cutting out any old sterile branch: which, however, ought never to be done before the flowering season; as, previous to that, much injury would be done by the plants bleeding, which never happens afterwards.

lateral of the side shoots, after being stopped, will push a fresh shoot; which suffer to grow two or three joints, and then stop it again, otherwise the uppermost eye of the proper shoot will break. Repeat this operation, on the lateral produced by the first lateral, as occasion may require, till the growth of the shoot is quite stopped for the season.

When the plant has done growing, the wood ripe, and when the leaves begin to drop; it is then the proper time for pruning\*. Let the middle shoot be headed down to three, four, or five feet, according to its strength; and the two side ones to two eyes each.

Next season, the plants will push vigorously. Train the uppermost shoot of the middle

\* This operation should never be deferred longer: for, if it is, it rarely happens that the plants do not bleed in a greater or less degree, the stopping of which is attended with much difficulty; and, to effect which, an application of hot wax answers as well as any thing. Care should also be taken to keep the plants from the extremes of heat and cold for ten or twelve days after pruning, that the wounds may gradually heal, and the pores contract; otherwise they are apt to burst out afresh, when the forcing is begun.

middle branch to the top of the house ; stop the lowermost shoot of said branch \* when it touches the bottom of the former ; and, if the intermediate ones should shew fruit, leave two or three with a cluster at each, and rub off all the rest. Train the strongest, from each side branch, to the height of eight or ten feet ; and stop the others at four or five eyes each.

In autumn, prune them down as follows : The uppermost shoot on the middle branch to eight, ten, or twelve feet †, according to its strength ; the undermost on said branch to two eyes ; the strongest of the two uppermost on the side branches to five or six feet ; and the weakest, to three or four ; and the lowermost on each side branch, to two or three eyes each, which finishes for the second year.

If

\* Let this be dressed to the old wood ; passing it over, under, or between the fruit spurs.

† It may be worthy of remark, that when the plants are in a vigorous state, and push forth strong shoots, the best formed, largest bunches, and finest swelled berries are produced from the extremities of those of this description. Indeed, in all cases, the handsomest clusters of the branch are produced on its extremities. And this observation is not applicable to the vine alone, but to fruit trees of every description.

If all has gone well, the plants will be fit to produce a tolerable crop of fruit the third season; for which purpose there are now three ranges of shoots in height, and at the distance of thirty or thirty-six inches from each other; having short spurs of two or three eyes each, for the production of a succession of wood between them, at bottom.

Train the uppermost shoot on the middle branch to the top of the house; the lowermost till it touches the bottom of said shoot; rub off all the intermediate ones which have no clusters, and shorten those that have, at one joint above the uppermost cluster. Train that shoot which was left *longest* on the side branch, to the top of the house: the lowermost to the bottom of said shoot; rub off what have not, and shorten those that have clusters, as above. Train that shoot which was left *shortest* on the side branch, to eight or ten feet; the lowermost to six or eight eyes; and rub off or shorten the intermediate ones, as above. Train the uppermost eye of each of the spurs, on the side branches, to five or six feet; and the lowermost to as many joints.

Thus

Thus will the trellis be completely filled with young wood to produce a full crop next season\*.

In Autumn, prune down as follows : The uppermost shoot on the middle branch, to within eighteen inches of the top of the house ; the lowermost † to the length of six feet ; the uppermost shoot on the longest side branch, to within nine feet of the top of the house ; and the undermost to the length of eight or nine feet ; the uppermost shoot on the shortest side-branch, to within nine feet of the top of the house ; and the undermost to five or six eyes ; the longest shoot from the spurs on the side branches, to three or four feet ; and the shortest to two eyes each ;—which concludes for the third year.

To the intelligent reader, it would be futile to go through the operation of train-

G 2

ing

\* Having made no distinction between the two kinds of Grape-houses in the culture ; I wish to be understood here as meaning the large house, the roof of which admits of four ranges of bearing shoots ; whereas the roof of the small house will admit of only three ranges.

† Next pruning season this must become the middle branch, by the lopping off of all above the bottom of it. See fig. 2. Plate V.

ing and pruning for the next season; I shall therefore conclude this section after having made a few necessary observations.

It may not be convenient to follow the above directions in all cases; therefore, much must be left to the judgment and candour of the gardener: but I would, in a general manner, caution him against any great deviation, and particularly from suffering too great a profusion of shoots and foliage in the Summer dressings. These, if the health and regularity of the plants are kept in view, will require to be repeated every five or six days; and let not this be thought a hardship, for, from experimental practice, I can assure him, it is attended with more ease and less perplexity, than when the plants are suffered to grow wild as a bush.

Therefore let all laterals, tendrils, and decayed leaves, be carefully removed as they appear; and when the fruit begins to colour, let at least one-third of the whole foliage be regularly thinned away, which will greatly promote the swelling, and render the fruit of an infinitely higher flavour, by the free admission of the sun and  
air,

air, than when shaded by the whole foliage, laterals, and tendrils, as is too frequently the case.

As there are a great variety in the kinds, not only in the fruit, but in the strength of the shoots and size of the leaves; respect must be had to the distance they are placed at accordingly, and also to the shortening of them, both in the Summer and Winter dressings.

Pay respect to the regularity of the young shoots only, no matter how near they lie to, or even if they cover, cross, or are dressed to the old wood; which last, let be cut away, when it has done its office.

In the lopping of strong branches, be careful to make clean wounds with the knife; and dress off, in a neat manner, the outward shreddy bark or rind found on such; which generally becomes a harbour for insects of the acari tribe, and otherwise is very unsightly. The branches should then be washed with the liquor recommended in page 62., or at least with a solution of soap-suds and sulphur.

And for an illustration of Autumn or Winter prunings, see Fig. 2. Plate V.

SECTION VI.

*On the Temperature of the Grape-House.*

**F**IRE should not be lighted the first season, unless it proves cold or wet, and the wood is not ripened in good time; in which case, a moderate fire heat, from the first of September, would greatly encourage the growth, and promote the ripening of the wood.

As the plants will bear gentle forcing the third season, it will be advisable to forward them the second, in a moderate degree.

For this purpose, let slow fires be made about the first of April, (by which time the plants will begin to vegetate), so as to raise the air of the house at six in the morning and eight at night to about  $55^{\circ}$ ; in the course of a fortnight increase the heat to  $60^{\circ}$ ; and in another fortnight to  $70$  degrees; at which let it continue till the first or middle of June, and then let fire



fire heat be totally discontinued for the season.

The third season, the forcing may commence on the first of March, without injuring the plants; and, if carefully performed, a fair crop of fruit may be obtained. Begin then, by making and regulating the fires, so as that the thermometer may not stand above 50 degrees at seven in the morning, and eight or nine at night; keep it so till every eye in the house is broke; and then gradually increase it to 60, 65, 70, and, when the bloom begins to open, to 75 degrees.

I have already hinted in another part of this work, that vegetation in forcing ought to be brought on as it were by stealth; which is the cause of my advising the above gradual and progressive rise in the climate of the house: and if this is not particularly attended to in the first stage of the operation, *disappointments* will follow, as the plants will not break their eyes (and of consequence will not show fruit) regularly.

Keep the air of the house as near to

75 degrees, till the fruit is fairly set \*, as possible ; and it may then be let down to 70 or 72 degrees. At this, endeavour to keep it, till the crop is all gathered ; after which, farther attention to the climate is unnecessary.

In the following season, the forcing may (if fancy requires) be begun a month or six weeks sooner ; that is, about the middle of January or first of February ; in which early season, great attention must be paid to the regulation of the fire heat. I believe I have been more scrupulous in this particular than most gardeners ; some of whom I know scoff at the idea of too much uniformity in the climate, alledging no such strictness

\* Grapes in general are found to set best in a moist heat of about 75 degrees. But I have found by experience, that all the kinds of frontinacs require a much greater degree of heat, not only when in flower, but from the time the clusters are distinguishable ; while those of the white sweet water and white and royal muscadines, require a much less degree : the former being apt to curl up and become sterile for want of heat, and the latter to produce a greater quantity of small berries in consequence of too much. Wherefore, if there is any difference of climate (which is sometimes occasioned by the placing of the furnaces) in the house, the above hint should be taken advantage of.

strictness to be necessary, from the unsteadiness of our own: not considering the vast disparity between the unsettled state of the climate in our island, and the regular serenity that prevails, at all times, on the continent.

A month may be gained each year, where there are two or three Grape-houses, and it is required to have Grapes at a very early season; until the forcing is begun so early as the first of October: but where there is but one or two houses, the first of March in the one case, and of January in the other, is quite soon enough to light the fires. But of this see farther in Sect. XI. of this Chapter.



#### SECTION VII.

*On the Admission of Air to the Grape-House.*

**A**FTER planting, let a due portion of air be given every day from sun-rise to sun-set, until the buds begin to break; after which, observe a more pointed regulation, being guided much by the temperature of the weather, and the quantity

tity of sun-shine; admitting less or more every day, unless the severity of frosty winds renders it imprudent to do so. But, as the Summer advances, be very liberal in this article in serene weather: it will greatly tend to the strengthening of the young shoots.

It is a practice with many to uncover their Grape-houses in Winter. This I never did, not so much that I disapprove of the practice, but owing to the expence attending it, not only in removing and putting on, but in breaking the glasses, and waisting the flues by the extremes of frost and blanching rains. But, my method has been to admit an equal and free circulation of air, by opening the sashes alternately at top, bottom, and middle, to the extent of at least a third part of the whole covering, and letting them remain so, day and night; never shutting up for any cause but that of too much wet.

The second season, observe much the same regulation as above; and, if fire is applied for the forwarding of the wood, (as hinted in Section VI.) pay due attention at that time, as the sudden breaking  
out

out of the sun in dull weather, when there is a good deal of fire heat in the house, is attended with much danger.

On the supposition that the plants have made good wood for the production of a crop the third year, and are to be forced from the first of March; let the house be shut up at night from the middle of February, and have the same quantity of air admitted in the day it enjoyed all Winter. From the time the fire is lighted, give a moderate quantity, every day, if possible, till the buds have all broke, to the extent that in sun-shine the thermometer may not rise more than  $10^{\circ}$  above the fire-heat medium: but, after the buds have broke, and the temperature of the house is increased, be careful in the admission of frosty, or foul damp air. The latter may be entirely excluded, except, perhaps, for an hour or two in the middle of the day; and the bad effects of the former may in some measure be avoided, by opening the top sashes \* *only*, a little way, to pass off the rarified

\* Few people pay the attention to this article which, in my opinion, it deserves. I have often seen air admitted in a manner as if by mere chance; sometimes  
by

rarified air occasioned by the sun-heat; which is frequently very intense in clear frosty weather, in the months of March and April.

In clear sun-shining weather, my practice has been, to give and take away air by degrees; that is, by giving *half air* about eight in the morning, full air about ten or eleven, reducing to half air about two or three, and shutting up about four or five in the afternoon, sooner or later, according to the season of the year.

From the time the fruit begins to colour, give large portions of air till the crop is all gathered, the flavour being thereby much enhanced; and afterwards expose the house night and day for the Winter, as  
directed

by opening two or three sashes at a place, sometimes in the middle of the house, the top, bottom, or either end, &c. without the least discrimination. The air ought to circulate freely in all parts of the house. To effect which, it should be admitted at top, bottom, and middle, or at least at top and bottom; dividing it equally in every part of the house, according to the quantity to be given: and that too at all times; unless the severity of frost renders it imprudent to do so any where but at top, as here directed.

directed above; shutting up, however, if much wet, or hard frost, should happen during the first ten or twelve days after the plants have been pruned for the season.

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### SECTION VIII.

*On Watering, Washing, and Steaming the Grape-House.*

**T**HE first and second seasons, keep the border in a moderately moist state while the plants are growing; but, after their growth begins to abate, (particularly the second season), withhold the waterings by degrees, in order to make them harden and ripen their shoots for the production of a crop the third year. Water frequently with the drainings of a dunghill; which will be found infinitely serviceable, and greatly to promote the growth of the plants. This is a method of manuring, perhaps inferior to none; and, whatever may have been said by theorists, respecting its tainting the flavour of the fruit, ought not to prevent the practical gardener from applying it in moderate quantities, at any season

season of the year. At a dry time, when the moisture of the dunghill had been suddenly exhaled by the heat of the sun, I have frequently laid dung *in sleep* for this purpose.

Wash with the hand-engine twice or thrice a-week in the evening, in order to refresh and keep the plants clean. Steaming is unnecessary, unless there is fruit in the house.

The third season, keep the border also in a moderately moist state, till the fruit begin their last swelling. Give large quantities of water till they begin to colour: after which, entirely withhold it till the crop is gathered; and then give two or three hearty waterings, in order to recover the state the border ought to remain in for the Winter, which should neither be dry, nor uncomfortably wet.

Wash twice or thrice a-week, till the flowers begin to open; withhold till the fruit is fairly set; wash again till they begin to colour; and then withhold entirely for the season.

Some disapprove of using the engine in the Grape-house; but it is equally neces-

sary



fary here as in the cherry or peach house; **nothing** being more conducive to the health of the plants, than frequently to sprinkle their foliage with water. Besides, by throwing it with some force, insects are thus destroyed, and their breeding prevented. By a proper application of the engine, endeavour to render the plants quite clean of insects, particularly the red spider, before the fruit begins to ripen off, as, after this time, it is not advisable to water the foliage, on a double account, viz. first, by moisture hanging about the clusters, the berries might rot through damp, and also become insipid in flavour.

In the interim of washing, steam every night when the fire is at the strongest, by pouring \* water on the flues till an object cannot be seen at the distance of two or three yards: and repeat this early in the morning,

\* In another part of this work, I have already hinted, that I do not think it worth the while to erect the steaming apparatus for any species of forcing, except peaches. For the Grape-house, it would be extravagant; as steam can be produced there at any period of forcing, especially in the flowering season, when a strong fire heat is requisite at any rate.

morning, if the temperature of the house should require the making of fires, or if there is a sufficient heat in the flues to produce steam, even in a middling degree.

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SECTION IX.

On the Formation, Thinning, and Maturation of the Clusters.

IN the vast variety of Grapes, it happens, that not only the berries, but the bunches, assume different forms: and although many kinds, from their nature, require little or no trouble, except thinning, in the formation of handsome clusters; yet, there are some which, from the looseness of their composition, require to have their shoulders supported from the body of the bunch, not only in order to promote the regular swelling, but to prevent the rotting of the berries, which otherwise frequently happens, if damp weather in the time of ripening.

Amongst these may be reckoned the Syrian, Tokay, Raisin, Lombardy, Royal Muscadine, St Peter's, and the Hamburgh; which,

which, when the berries have arrived at about the size of peas, should have their shoulders supported to the trellis or branches by strands of matting, &c. and, at the same time, have their berries regularly thinned out, with sharp narrow-pointed scissars, to the extent of about one-third of the whole. At this time, also, let the other kinds be thinned out in the same manner; observing to thin out the small, seedless berries only, of the Sweet Water, Flame-coloured Tokay, and Muscadine.

If the culture of the grape is attended even with ordinary success, it will also frequently happen, that many kinds will shew more clusters than, for the future welfare of the plants, ought to be suffered to remain on them. In thinning of these, no rule can be laid down in cases unseen; therefore, in this, as in many others, we must confide in the discretion of the gardener. But I would beg to remark, that the safe side of error is, to thin too much rather than too little, especially on young plants.

After the berries begin their last swelling, and approach to maturity; care must
 H be

be taken to keep the bunch clear of any which, from damp, bruises, or the bites of wasps, or any other insects, may begin to mould, as thereby the whole cluster will be quickly affected and entirely spoiled.

Grapes of all kinds should hang on the tree till dead ripe, particularly the thick-skinned ones.

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### SECTION X.

*On the Insects which infest the Grape-House; and how to destroy them.*

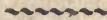
**T**HESE are, the green fly, thrips, red spider \*, and wasp.

The two first are easily destroyed by a fumigation of tobacco. The third are kept under by the engine in Summer; and effectually destroyed, as directed in page 62, in Winter. The last, by the destruction of their nests †, phials filled with honey and water,

\* Frontinacs are more subject to the red spider than most other sorts; and all kinds are more so in the pine or dry stove, than in the Grape-house.

† The most effectual method of destroying the nests of wasps is this: Make a squib-case of cartouch paper, pasteboard, or of a strong stem of hemlock; mix up combustible matter sufficient, of gunpowder and sulphur, to fill

water, or fugar and small beer, and bird-lime. All these methods are, however, sometimes ineffectual for the destruction of wasps, where they abound in vast quantity: and their fondness for Grapes renders it sometimes necessary to inclose the bunches in bags of gauze, or silken paper, which is truly a misfortune; as the Grapes, by being so much excluded from the action of the sun and air, fall greatly off in flavour.



## SECTION XI.

*On the Prolongation of the Grape Season, where there are more than one compartment for its Culture.*

**W**HERE there are two or three Grape houses, and a succession and fruiting  
 H 2 pine.

fill it in the common manner; but first put in as much clean gunpowder as will charge a pistol; fire the squib; thrust it into the hole of the nest, and instantly close it round with a little mud, previously prepared for the purpose. When the squib burns to the gunpowder, it will explode, and drive the whole smoke back to the innermost parts of the nest. In a few minutes, dig it up and each individual, if not already dead, will be found so much sickened as that it cannot escape. This operation should be performed after sun-set, when the enemy have returned from their depredations,

pine stove, the Grape season may be continued from the first or middle of March to Christmas; and where there are two or three Grape-houses only, from the first of June in the one case, and the middle of April or first of May in the other: to effect which, the following methods have been my practice.

For the production of ripe Grapes in March \*, I reversed my succession and fruiting stoves †; by which means, I had it in my power to force, in some measure, the vines therein contained: as I found, without doing so, I could not bring them in before April or May ‡. In this manner, (and from the way in which the plants were trained), the two stoves supplied a constant succession of fruit till the first or middle of June. To continue which, I began my first Grape-house on new-year's day; my second on the first of March; and my third, and last, I kept as much back as possible,

\* I have sometimes had them in the end of February.

† They were both on one plan.

‡ A more constant equality of climate being requisite in the stove than in the Grape-house, is obviously the cause.

possible, by exposing it to the weather night and day till the natural season brought the plants into flower.

By this time, it was the first of June. I then shut up at nights; and encouraged the growth of the plants and fruit, by lighting and continuing the fires the whole season; had ripe fruit about the first of October, which, by part being hung up in the fruit room, continued till Christmas.

Previous to my introducing Grapes into the pine stoves; and in order to have a supply of fruit from the month of April to Christmas; I began to force my first house on the 1st of November, my second on the 1st of February, and my third I treated in the manner above specified.

The following season, I began to force the first house on the 1st of October; and cut grapes on the last day of March: but, in the night between that and the 1st of April, the front flue burst; by which accident was lost the whole foliage, wood, and about five hundred bunches of Grapes just coming to maturity. Nothing could be more galling. I instantly cut down every new shoot *to one eye*; continued the same

degree of heat ; and gave plenty of air and large quantities of water. The plants made the finest wood that same season ; and had the best crop of fruit the following, I have seen.

The above curious circumstance I have related, not merely on its own account ; but to the end that, were the like happening to any person, the plants might not be thrown out in despair ; which had well nigh been the case with these. I also planted young plants between each of them ; but, as the old ones far surpassed them in vigour before the end of the season, I threw them out again.

Let it be here observed, that although I found it necessary to force the Vines in the stoves alternately, by reversing them from fruiting to succession houses, yet I by no means did, or would advise that to be done, with the Grape-houses. Forcing of any kind is an outrage done to Nature ; and the more it is avoided, the greater will be our success ; and consequently, the same rotation being observed, will be the less liable to error.



## SECTION XII.

*On the Cultivation of Grapes in the Pine Stove.*

**T**HE cultivation of Grapes in the Pine Stove is in general practice; and the plants are commonly planted on the outside of the house, introduced through holes in the parapet, and trained up the under-sides of the rafters.

This method I have presumed to deviate from, for the following reasons: First, Because I think it unnatural that one part of a plant should be, as it were, in Greenland, and the other in the West Indies; and, Secondly, Because I am convinced that no plant (especially the Pine) will live and thrive *as well* under the shade of another, as when exposed to the free sun and air. To obviate these objections, I planted my Vines in the lobbies between the stoves and peach and grape houses; introduced them through the partitions; and trained them horizontally on trellises fixed against the back-walls, and upright

ashes in front, (See Fig. 2. Plate I.) by which means, each of the stoves were rendered equal to any Grape-house, without being in the least injurious to the Pines.

The front-walls of the lobbies\*, were also built on pillars; and a border, both without and within, was prepared for the plants, in the same manner as for the Grape-house.

The second year after introduction into the stove, the plants completely filled the whole trellis; and a fine crop, the third year, gave a lustre and richness to the house (in conjunction with a good crop of Pines) highly gratifying.

The same methods, in regard to watering, washing, and steaming, is to be practised here as in the Grape-house. Air is admitted solely for the sake, and to answer the nature, of the Pines; the temperature of the house is also regulated for their sakes. But, the mode of training and pruning

\* This method may be practised in the same manner, where a grape or peach house adjoins the stove; and where a stove stands detached, it is customary, and indeed necessary, to build porches with double doors; and, of consequence, it is easy to render them subservient to this purpose.

pruning here is very different from that in the Grape-house. Here, it is impossible to bring on vegetation in that slow and regular manner which may be done in the Grape-house; and, consequently, were the shoots to be laid in at as great lengths, they would only break, perhaps, a few eyes at the extremities, and the remaining parts would remain naked.

This I found, from experience, to be the case; although it did not happen for the first three or four years, owing to the youth and vigour of the plants: but, when they had, in some measure, exhausted themselves by bearing a few crops, they began to break their buds in the manner above stated. I therefore made it a practice to train them only to five or six feet in Summer, and to shorten them down to one or two, in the pruning season; by which treatment they generally broke all their eyes, and produced plentiful crops of fruit.

In one house, I tried, for two seasons, to produce crops *by laterals*; but found that method attended with more inconveniency than the above, from the difficulty of procuring

curing a proper succession of strong shoots to produce the laterals, without which they bear very insignificant clusters.

I also, in the other house, produced a *second crop*, for two seasons : but, finding it to exhaust the plants very much, I discontinued it ; the more especially, as, having so many compartments for Grapes, this practice was the less necessary. The method is this :

Just about the time when the fruit is half ripe, and when the under-part of the shoot is also ripe to the length of about two or three feet, and the extremity of it in a growing state, shorten it, at about two or three feet above the ripe part. It will push again, and will generally bring two clusters. Sometimes, also, the second and third eyes will push, and bring a cluster or two. In winter pruning, shorten down the first, or spring-made part of the shoot, to two or three feet.

This method may be repeated, with pretty good success, once in two or three years ; but, if done every year, it will (in the course of three or four years) occasion the cutting of the plants down to the ground,

ground, in order to make them put forth a fresh stock of wood.

In the event of severe frost, and the plants being in an early state of vegetation; let the border, on the outside, be covered with a quantity of stable-dung, or long litter, to prevent the roots from being injured by the weather.

Unless the plants are to produce a second crop, they must not be pruned for good sooner than October; and, at the same time, that operation should not be deferred longer than the first of November, lest, when they begin to vegetate, they should bleed.

Grafting the Vine is performed with facility; but I do not think it of such consequence any where as in the stove. The method by approach\* is certainly to be preferred.

\* The common way of performing this method, is, by growing the young plants or scions in a pot, and engrafting the last Summer's shoot, on the old stock, just about twenty days before the plant begins to vegetate. But, the most successful way is, to perform this operation in summer, about the time the fruit begins to ripen, in the following manner: Apply the middle of a young shoot, whose bottom part is beginning to ripen, and  
the

preferred. The frontinacs, muscadines, and sweet-waters, would be greatly improved, and rendered more durable for this compartment, by being engrafted on the Syrian, or any of the other coarse growing kinds: but the Syrian is the most proper for a stock, of any.

Grape Vines will bear forcing, and last for many years, if under judicious management: but it frequently happens, (especially where the gardener is often changed), that the plants run out of a proper stock of bearing wood, either for want of keeping the border in a proper condition in respect of trenching and manuring, or by being irregularly and untimously forced. To recover which, the plants should be cut down to the last eye on the three lowest shoots of the former year, upon each; the roots should be cut to within a yard of the stem on each side; and the border should be trenched up, and, if necessary, the extremity in a free, growing state, to the last year's wood on the stock; bind up with strands of matting; and apply no clay. The young plant will be perfectly secure, before the growth is over, the same season.

cessary, renewed, and rendered equal to a new one. See Sect. II. of the present Chapter.

The plants will make vigorous roots and branches; and the *third* year afterwards, will be as good in all respects as they were in that of their age.

This is not theory; I have been eye-witness to the experiment, which has been crowned with success.

CHAP.

## CHAPTER VI.

*MELONS.*

**T**HE cultivation of this much-esteemed fruit is so general, that hardly a garden is to be met with where it is not followed in a greater or less degree, and that too with general success. As I have been particular on the forcing of cucumbers, as the treatment of these and Melons is in many respects the same; and as I have said much on the culture of the cucumber, which equally applies to that of the Melon, it will be unnecessary to go through an elaborate repetition here. I shall therefore briefly remark any particular difference in their management on the dung hot-bed, and then pass to the culture of Melons in flued pits.

Let the plants be raised in the same (or a similar) seed-bed as that of the cucumber; let the bed or beds, wherein they are  
to



to come to maturity, be made in the same manner, and a little stronger, turfed all over, the same quantity of old tan or light sandy loam be laid on\*, moulded and planted in the same manner, have air admitted freely, and kept moderately moist till they begin to shew fruit. After this, and till the fruit is fairly set and begun to swell, be sparing in the waterings, especially in damp weather, and also endeavour to keep the bed as free of steam as possible; shorten the vines which have fruit, at two joints above it, and train those that have none, in a regular manner, to the length of seven or eight, and then stop them, to make them push new vines, which will generally show fruit at the second or third joint.

When the fruit is fairly set, water freely till they have done swelling and begin to ripen, and then be very sparing, as too much water at this time not only takes  
greatly

\* One-half strong brown loam, a quarter light black loam, an eighth vegetable mould, and an eighth stable-dung, will make an excellent compost for Melons; of which quality is that I have used for many years, with success.

greatly from their flavour, but frequently occasions the bursting of the fruit, which renders them both unsightly and unfit for carriage. Let a piece of slate, tile, or glass, be laid under each fruit; it both keeps them from damping and partaking of an earthy flavour.

Some, indeed, slate the surface all over, and others cover with straw, reeds, moss, &c.; all which methods I disapprove. The slates being so near the glass, draw too strong a reflection in hot weather for the plants to bear with patience; and the straw, moss, &c. contain, and confine too much damp in dull weather; besides, the slates contribute much to the breeding of the red-spider\*, and the moss, &c. to the harbouring of beetles, earwigs, &c. which are

\* Melons are very subject to this destructive insect in hot weather, which is truly a calamity, as nothing will stop its progress but water, which at some periods of the Melon season cannot be applied without doing much mischief to the fruit; and the leaves and vines being of so brittle a nature, they cannot be brushed or handled (although ever so carefully) without sustaining less or more injury. The liquor (See page 62.) is effectually destructive of the spider, but must not be applied to foliage of any kind.

are very destructive of the plants and fruit.

As the fruit approach to maturity, keep the plants moderately thin of leaves, none of which suffer to shade them from the sun, and give large portions of air, which will add much to their flavour.

Melons should be kept regularly and moderately thin of vines and foliage at all times, should be frequently looked over, and should never be pruned too much at a time, as thereby the plants would be much exhausted, being apt to bleed at every bruise or incision.

Melons should be cut the moment they are ripe, otherwise they lose much of their flavour: this, in most kinds, is better known by the smell than colour of the fruit:

Many of the early kinds, and if early sown, will produce *a second crop*, equal, both in quantity and quality to the first. For this purpose, after the first crop is all cut, the vines should be shortened back to the last live-joint on each, the bed should be well-watered, and shaded from the mid-day sun, for eight or ten days; by which

time the plants will begin to push and show fruit in abundance. Second crops may also be obtained by layers; and they will produce very well by cuttings. But in following this latter method, a moderate heat should be prepared, in another bed, wherein to strike and grow the plants.

Melon seed ought to be perfectly ripened before sowing, by being kept in a dry place, or worn in the pocket; but it is safest not to sow it till a year old, and it will keep fresh for seven or eight. If the seed is not perfectly ripened, and saved from fruit which is also so, the plants produced by it will not be fruitful, running much to vines and male-bloom; and any fruit which may be shown are apt to drop away.

It is pretty generally understood by gardeners, that melons, like most exotic annual plants, degenerate, if they are cultivated in the *same* soil for any considerable length of time. Hence it becomes necessary, either to change or improve the soil, or to exchange the feeds. But the value of good kinds, particularly of the early sorts, when  
once

once got and ascertained, makes the former method preferable to the latter.

At one time, the idea occurred to me, that were the seeds of Melons laid by for a time, to sow them afterwards in the same garden might answer the purpose here in view. Accordingly, I laid aside, for three years, a part of each kind of my choicest sorts. I then sowed them, and they were evidently improved in quality; which I can account for in no other way, than that in the course of this time, I was at much pains and trouble to improve my Melon-mould. Perhaps, however, the seeds might have been partly improved by ag.

I come now to the culture of Melons in flued pits. (See Fig. 1. Plate I.) I have already said, that I do not think these pits so eligible for the production of Melons at an early season, as the dung hot-bed, and in page 26. have given my reasons. I will therefore suppose that the pit was also built for other purposes, is employed in the spring in forcing asparagus, &c., and is to be employed in producing a late crop of Melons.

The first or middle of June will be soon enough to plant \*; and at this season a very moderate degree of bottom heat will be sufficient; whatever articles the pit has previously produced will have been forced on tan or dung, which will also now be much exhausted. Let the heat, therefore, be renewed, by adding and mixing about one-third of new, with the old tan or dung; level it to the bottom of the flues all around; turfing will be unnecessary; *mould* to the depth of fifteen inches, which will raise the whole surface to the height of the top of the flues; and by the tan or dung subsiding, will again be level with their bottoms before fire heat is necessary. Place the plants in a row along the middle of the pit, at the distance of two feet from each other; and attend to them in the articles of water, air, pruning, impregnating †, &c., in all other respects as directed

\* The plants may be raised in a hot-bed, or under hand or bell glasses. I say nothing of the kinds; every gardener has his favourites, and will judge for himself.

† It is even more necessary to *impregnate* Melons than cucumbers, for this plain reason: The fruit of the cucumber is used green, and before it be matured; whereas

rected for the dung hot-bed, and according to the nature of the season, and state of the weather, till the first or middle of September; and by that time it will generally be necessary to apply fire heat, both on account of cold and damp, which then begin to be considerable.

The fruit by this time will be far advanced, some of which will be approaching to maturity; and for the maturation and production of the rest in a tolerable degree of perfection and flavour, let slow fires be made in the evenings, increasing as the season advances, so as to raise the air of the pit at eight at night, and eight in the morning, to about 70 degrees.

Air is essential to the flavour of the fruit; and that it may be admitted in to-

I 3

lerable

whereas that of the Melon, except for pickling, is useless and nauseous, until it be perfectly ripe. Now, it has been ascertained, that the fruit of the cucumber may be produced of a size fit for the table, although every male-bloom were destroyed at its first appearance, and consequently, the embryo fruit were not impregnated. But I have not yet been able, either by actual experiment or otherwise, to learn, that a Melon (except of one variety, a sub-hermaphrodite) could be produced in perfection without being *impregnated*.

lerable quantity, and at the same time that the heat may be kept up in dull weather, let a little fire be made in the mornings. Water must be used with caution; the growth of the plants will now be over; and when the fruit hath arrived to its full size, watering should be entirely discontinued.

CHAP-



## CHAPTER VII.

## MUSHROOMS.

## SECTION I.

*On the Construction of the Mushroom-House.*

**T**HIS vegetable is much in request in many families at all times of the year; and some have compartments built solely for its production; but it is generally produced in the back sheds of hot-houses or green-houses, cellars, ends of stables, &c. and sometimes on beds built in the open air, and protected by coverings of straw or other litter. This last is attended with much inconvenience, not only on account of the difficulty of effectually sheltering the bed from the inclemency of the weather in Winter, but that in covering and uncovering at the time of gathering the crop, many of the young

ones, which are just peeping through the surface are unavoidably destroyed.

Little light or air (except when the bed is in preparation) being essential to the production of mushrooms, they may be raised as successfully in the back-shed, stable, or cellar, as in any other way; but where they are required at all times of the year, a compartment where fire-heat may be commanded is indispensably necessary. Fig. 2. Plate IV. represents the plan of a mushroom-house, wrought by one fire, and divided for the purpose of producing them in succession, on a construction that has given much satisfaction for many years. It is of little consequence in what situation it is placed, provided the bottom be dry; and the roof may either be of slate, tile, or of thatch.

Where there is neither shed nor stable, &c. rather than make up the bed in the open air, and be under the inconvenient necessity of covering the surface with straw, &c. let a frame in form of the roof of a house composed of half-inch boards, be made to any convenient length, and to the width of six feet at bottom: This two  
people

people can lift off and on at pleasure; and in the severity of Winter it can be covered with litter, &c. to prevent the frost from destroying the plants or spawn. The boards should be imbricated and well painted or laid over with pitch, to prevent the wet from penetrating; and a trench should also be dug all round the bed, to keep its bottom dry. Boards should also be made, at two or three different places, to slip for the admission of air, when required.

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## SECTION II.

### *On Preparing the Mushroom-Beds.*

**B**ECAUSE the seeds of Mushrooms have not yet been discovered, some are doubtful whether there be really any such thing; and not a few are of opinion, that this, and many other plants, are produced spontaneously without seeds. Mr Berkeley says, “ The extremely small seeds  
“ of fern, mosses, mushrooms, and some other  
“ plants, are concealed and wafted about  
“ in the air, every part whereof seems re-  
“ plete with seeds of one kind or other.”

And

And Mr Switzer, an advocate for the idea of spontaneous productions, seems to be of opinion, that some plants are produced from juices, lodged originally in the ground.

Be this as it may, we know that the Mushroom may be produced from spawn; and also without any certain visible ingredient, or origin, from whence it doth spring. The former, being the most natural, has hitherto been the most common method; but of late years, even making, or, as it may be said, creating Mushroom-spawn, has become a branch of trade with some.

According to my mode, the production of the Mushroom depends almost solely on the preparation of the bed. Some pay little attention to this matter; and where spawning is uniformly practised, the less is necessary: but I prefer the method of making the bed a whole mass of spawn.

It may be objected, that this method is dilatory: This I grant is the case: but if the bed is duly prepared, the time of cutting may be reckoned upon with equal, if not greater certainty, although at a great-

er distance; and of what consequence is that? it only requires beginning the sooner to prepare the bed. Beds that are built and spawned in the common way seldom produce above three or four months together: I have frequently had them producing the year round in great abundance; and I once had a bed which produced two complete years, and in such quantities, that besides generally yielding a dish every day, several gallons of ketchup were made from it. However, Mushroom-beds of all kinds are subject to many misfortunes, and the spawn is of so delicate a nature, that it is quickly destroyed by too much cold, heat, drought, or wet.

My mode of preparing the bed is this: I first lay about a foot of furnace-ashes, brick-batts, or stone-chips, for a bottom; then six inches of horse-droppings\*, taken carefully from the stable every morning, and kept as whole as possible: These I suffer

\* I have found, that the richer the feeding of the animal, the more productive are their droppings; and therefore prefer the droppings of coach or hunting horses to those of the farm. It may be worthy of notice, that stone-horse droppings are the most productive of any.

fer not in any wise to heat ; and the whole time the bed is in preparation, I expose it to all the air in my power, provided it be not damp. After this course has lain ten or twelve days, is quite dry, and there is no apprehension of its fermenting, let it be covered to the thickness of two inches, with half vegetable mould of decayed tree-leaves, and half light, sandy loam, which should be well mixed together previously. But indeed, light, rich, dry mould of any kind will answer ; being of no other use than for the spawn to run in. Lay on another course of droppings in the same manner ; and when it is also perfectly dry, and past fermentation, cover it with the same mould, as above. Lay a third course of droppings and mould, in the same manner, which finishes the bed. In the making, the bed should be gently rounded in the middle (especially if it is placed out of doors) to run off the wet.

Thus the bed will generally be a month or five weeks in making, and in as much more will begin to produce, unless the weather or state of the droppings has been unfavourable.

It

It is obvious, that from the above mode of proceeding, a whole course of droppings cannot be laid on at once, unless where there are a great many horses kept, or the bed is but of trifling dimensions; therefore, when the last end of the bed is covered, proceed with the first, if fit, a second time, &c. previously covering with mould.

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### SECTION III.

#### *On the Temperature of the Mushroom-House.*

**I**T must here be understood of such as is represented by Fig. 2. Plate IV. or of one where fire heat is requisite, and at command. I have found that Mushroom-beds produce best in a constant heat of about 55 degrees; and the more regular it is kept, the greater will be the success. Air is of little importance, unless to dry off damp.

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### SECTION IV.

#### *On Watering the Mushroom-Beds.*

**T**HIS must, at all times, be moderately and regularly performed; but it will generally be unnecessary to apply water before

fore the bed begins to produce, as the moisture of the droppings is usually sufficient till that time. Let this be cautiously performed at first, until the bed attain to a proper consistency, and then with a little more freedom. As much water as will fairly wet the surface, once in three days, will generally be found to be sufficient. But it is safer to give too little than too much water, particularly in damp weather.



## SECTION V.

*On the Prolongation of the Mushbroom-Season.*

**I**N most places the open fields supply them for two or three months in Summer; yet in very wet seasons they are rarely to be found, if the soil be not of a dry nature: therefore, where there are two or three places appropriated to their production, and where they are in request at all times, it might be advisable to have little dependence on the fields, reserving the produce of these for ketchup, and preparing beds in constant succession to supply the kitchen,

For



For this purpose, the compartment where fire heat is at command, should always be appropriated to the Winter-beds, and the the sheds, &c. to the Summer ones.

In gathering the crop, care should be taken not to pull up or disturb the roots of those that are cut, as there are generally many young ones adhering to, or rising about them. Mushrooms also frequently form, come to maturity, and die away entirely under ground in these beds, if suffered; but they are easily recognised, as they are generally very large, and push up little hills like those of moles, above their heads. Discovering and cutting these should be performed with care, that the spawn may not be injured.

CHAP-

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## CHAPTER VIII.

### *PEACHES AND NECTARINES.*

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#### SECTION I.

##### *On the Construction of the Peach-House.*

**T**HE construction of the compartments for forcing this much-admired and justly-esteemed fruit, vary yet more than that of the grape-house; and what I have advanced in the first Section of the Chapter on Grapes, will equally apply here. But there are some kinds of compartments for the cultivation of peaches in use, which I disapprove of, and would wish to point out. These are, oiled-paper frames, and frames placed against flued walls, without front flues. I object to the first, on account of its darkness, and incapability of admitting the rays of light, and free air; both of which are so indispensably necessary to the health and vigour of the trees:—to the second, because the front is the most valuable  
flue

flue in any house; both on account of the saving of fuel from the circumstance of its having a greater command on the temperature, (all rarified air ascending), and on account of the injury done the trees by the violent heat of the back flues in keeping up the temperature of the house, in stormy weather; besides, the propensity of insects to harbour and breed between the trellis and flue, in these circumstances.

Fig. 2. Plate II. represents the plan of an approved Peach-house, wrought by one fire, which communicates first with the front flue, and returns in the back; and, in my opinion, is best adapted of any to early forcing. The trees are planted near to the front-wall, and trained to a trellis that covers the whole roof,—an approved method, of which see more in Sect. II. of Chap. XII.

Fig. 1. Plate III. is also on a construction that is perfectly adapted to the cultivation of Peaches. But, as this plan is given purposely for grapes, it may be necessary to remark, that the two fires are capable of working to an extent of ten feet more in length, if for a Peach-house; and

also, that, as the border for the Peach-house is to be only three feet deep, it will be unnecessary to found the pillars, which support the front wall and flues, any deeper than three feet and a half.

In a house of this kind, a trellis is to be fixed against the roof-beams or rafters, to the extent of half their height; trees planted between the front flue and wall, and trained thereto. These will in nowise shade those on the back. And thus will one house be rendered nearly equal to two, as the trees on the front will have a run of eleven or twelve feet.

I conceive this mode to be preferable to the common practice of planting grapevines to run up the rafters in the Peach-house; first, because, by the vines, the Peaches are generally much shaded; secondly, the soil for Peaches, and the soil for grapes, should be formed of different materials, and of different depths; and, thirdly, it is simply impossible to make and regulate a climate in one and the same house to suit both the plants in question. Of this the reader may be farther convinced by carefully perusing and comparing the

the Sections on the preparation of the borders, the temperature, and admission of air, for the Grape and Peach houses.

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SECTION II.

On the Situation and Preparation of the Border.

WHAT I have said in Section II. Chap. V. on the cultivation of the grape, in regard to the situation of the border, equally applies here, both in respect to the good and the bad; a repetition of which is unnecessary. I will therefore pass to the composition, breadth and depth.

Three fourths strong brown loam, an eighth light sandy loam, and an eighth stable-dung, with about a fortieth part of shell-marl, was the composition of the Peach borders at Wemyss Castle; all of which were made completely three feet deep. The breadth for the narrow house, is fourteen feet from the back-wall; and, for the wide one, all the width of the house within, and to the extent of twelve feet without.

It may be unnecessary to say, that the compost is to be well prepared for the plants, by trenching and mixing it thoroughly, and rendering it into a mass perfectly homogeneous. The necessity of this, in all compost preparations, is evident, and ought to be the chief butt of our aim, next to that of fixing on proper materials.

As before hinted, I would not wish to say that this composition *only* is fitted for Peaches: it may be varied; it may be made stronger, lighter, richer, or poorer, according to circumstances, and the judgment of the gardener. But I would remark, and observation and experience justify it, that the above may with propriety be deemed a good medium.

For particulars, respecting the annual management of the surface, &c. see the latter part of the second Section on the Grape.

SECTION III.

On Planting, and the Kinds best adapted to the Peach-House.

MAIDEN, or one-year-trained trees, are to be preferred to any other. Riders of the same age should be planted between the dwarfs; except on the front of the large house, where they would not have time to do any good before their removal would become necessary. From twelve to fifteen feet, according as the length of the house will best divide, is a competent distance between the dwarfs. The season is, any time from the first of November to the first of March. Fill in the pits with light rich compost, and settle the roots with a little water.

The following is a list of Peaches and Nectarines; out of which, those marked thus* ought to be preferred. But even this is discretionary, and every one has a right to indulge his own fancy, whether in respect to the choice or amplitude of his collection.

Peaches.

- Mignonette.
 * Red Magdalen.
 * White do.
 * Royal George.
 * Grimwood's do.
 * Nobleſſe.
 Chancellor.
 Belle Cheveraux.
 * French Minion.
 Early Newington.
 * Smith's do.
 * Montaubon.
 * Tetton de Venus.
 * Early Purple.

Peaches.

- * Late Purple.
 * Orange †.
 Ramboulliet.
 Hatiye.

Nectarines.

- * Roman.
 * Scarlet.
 * Elruge.
 * Newington.
 * Temple.
 * Duc de Tello †.
 * Murray.
 * Brunion.

S E C -

† This fruit, when ripe, is the most elegant of any of the Peach kind; is a great bearer, a cling-stone, and of these the best flavoured I know.

‡ This is a Spanish Nectarine; and, of all others, ought to take preference. The fruit is of the most exquisite flavour, dark purple, a free-stone; and generally grows to the size of a nobleſſe Peach.


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SECTION IV.

*On Training\* and Pruning.*

FAN-training is the only way in which Peaches will do well. Therefore, after planting, and to make the trees put forth vigorously and fill the trellis from the bottom, (I speak of the dwarfs), head them down to two or three eyes on each shoot, if maiden, and to the last eye on each branch, if one-year-trained trees.

The riders being temporary, and placed here only for the purpose of obtain-

K 4 ing

\* Much has been said, of late, respecting training on horizontal trellises; and some have even been at the trouble of erecting them in a manner whereby (by the use of ropes and pullies) they can depress or elevate them at pleasure. This, I confess, is both minute and reasonable, where it can be practised. But I am inclined to think that it cannot easily be done without straining the tree in the movement; and it is obvious that it cannot be done by any but a small trellis placed in the middle of the house. After all, the production of well-flavoured fruit depends much more on the judicious management throughout, than on what position the trellis be.

ing a crop or two while the principals are filling their spaces, need not be shortened so much, whether maiden or trained trees. This will make them push more moderate shoots, and bring them sooner into a bearing state; which object must always be kept in view while they remain here. And, as the treatment of them will, in all other respects, be the same as that of the principals, I shall take no farther notice of them; leaving the thinning away, and final expulsion of them, to the prudence of the gardener.

When the shoots have arrived to the length of two or three inches, rub off such as are placed fore-right or back-right, and lay in the others as they advance, at the distance of nine or ten inches; being careful not to bundle in the leaves with the tie, and to allow sufficient room for the swelling of the shoot: and pinch off all laterals as they appear. When their growth is stopt for the season, cut them back from one-half to a third of their lengths, according to their strength; and, in dressing, bear the side ones well down, to fill the bottom part of the trellis.

Next

Next season they will push vigorously, and must be laid in at the above distances; observing to lay in the undermost shoot on each branch to furnish the under part of the tree, and the uppermost for a leader: rubbing off all the intermediate ones, unless wanted; but at any rate the fore-right ones, as these greatly deform the tree. At the end of the season, leave them generally at three fourths of their whole length.

If the wood has been well ripened this season, the trees will bear a few fruit the following. But, unless the trees are very vigorous, a few only should be suffered; paying respect rather to the furnishing of the trellis for a crop the fourth season, which may reasonably be expected.

For this purpose, lay in the summer shoots regularly, at the distance of six inches, which forthwith must be reckoned the medium; and, in the winter pruning, shorten the shoots of the extremity of the tree *only* a few inches each, and lay in those of the middle at full length. Observe this practice till the trees have filled their places; and afterwards shorten

en

en none, unless to fill any casual vacancy, or in case of the extremities of the shoots being injured by bruises, &c.

It is a common practice to shorten every shoot less or more. This may be proper, in many instances, on peaches growing in the open air, as when the extremities of the shoots have not been fully ripened, and are injured by frost; but it can only be so far proper in the Peach-house, as to cause the plant push shoots to fill a vacancy, or to keep the bottom part of the trellis furnished with a supply of young wood.

Peach-trees require to be frequently looked over in Summer; and divested of laterals, and water-shoots from the old wood, where not requisite; being kept regularly thin, and neatly dressed to the trellis, &c. In tying, however, be careful not to tie too near to the point of the shoot; leaving always a few joints between the last tie and extremity: also, be careful not to bundle in the leaves with the tie.

About the time the fruit is fairly set, is that for *disbudding*: and this operation

is to be performed with great care and nicety. Select what buds on each shoot it may be thought necessary to leave, and rub off the rest with the finger. Those to be left are generally the uppermost and undermost, and sometimes one or two about the middle of the shoot; which last should be left in an alternate manner. A wood-bud is frequently placed by the side of, or between two fruit; in displacing of which, be careful not to injure them.

By the timely performance of this duty, much future trouble in pruning may be spared; and much better, and more vigorous shoots for the production of a crop the following season may be obtained, than when the strength of the tree is exhausted in the produce of superfluous growth, afterwards to be destroyed.

When the fruit begins their last swelling, let them be exposed to the free action of the sun and air, by picking off every leaf that overhangs them. And, when the leaves begin to drop, aid this effort of nature by switching off the leaves *gently*, from time to time: an operation more  
necessary

necessary here than on the common wall, on account that the wind is not so much helping to this effect.



## SECTION V.

*On the Temperature of the Peach-House.*

**F**IRE heat should not be applied sooner than the third season; and then only to ripen the wood, in the Autumn, (if necessary), for the better production of a crop the fourth year. But as, even the fourth season, the trees will bear but very gentle forcing, and as I wish to be particular on this head; I shall wave the farther consideration of the temperature of the house to the fifth season, and shall then suppose the forcing is to be commenced on the 1st of February.

Let the fire be made so moderate the first fortnight, that the thermometer may not stand at eight at night, and seven in the morning, above  $45^{\circ}$ ; and, in the course of the second fortnight, increase to  $50^{\circ}$ ; afterwards *gradually* to  $55^{\circ}$ ; at which point

point endeavour to keep it till the stoning is fairly over, and then increase to  $60^{\circ}$ ; and, towards the fruit's ripening, to  $65^{\circ}$ ; which it should never pass, on account of drawing the young shoots up weak.

It is hoped these rules may suffice for the regulation of fire heat, although the forcing were begun sooner in the season. In this case, however, much caution is necessary in the process, that by an *over-beat* at an early period of the year, the plants may not be injured. Indeed, in the whole progress of the application of fire heat, the greatest regularity and steadiness should be observed; as these trees are impatient of sudden checks of any kind, especially in the time of setting and stoning.

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SECTION VI.

On the Admission of Air to the Peach-House.

FROM the time the trees are planted, a large and free circulation should be encouraged every day, from sun-rise to sun-set, the whole of the first season; and, when

when the growth is stopt, and the wood ripe, let the house be exposed in the same manner as directed for the grape-house, in the Section on air, page 106. The second season, the house may be shut up at night from the 1st of March, and afterwards treated as above; and so of the following.

I come now to the fifth, or season of forcing. Let the house be shut up at night from the middle of January, and enjoy a large and free circulation through the day till the 1st of February; and then, in a more moderate degree, according to the weather, and paying respect to the temperature of the house, till the bloom begins to open. After this time, less or more air must be admitted every day, if possible; as the setting of the fruit, in a kindly manner, depends much on wholesome air, and a free circulation. In sun-shine, let it be admitted at this time to the extent that the thermometer may not stand at more than five or six degrees above the fire-heat medium; and at no time, till the stoning is over, above ten degrees; but afterwards, in the middle of the day, it may be suffered to rise to the height of fifteen.

When

When the fruit begins to colour, the house should be opened by sun-rise, and should not be shut till sun-set, unless to defend the fruit from heavy rains; paying little respect to sunshine at this time: air being as essential to the flavour of the fruit, as the rays of the sun; and the more so, when these are excluded.

After the crop is all gathered, let the house be exposed for the Winter, as before.

SECTION VII.

On Watering, Washing, and Steaming the Peach-House.

PEACHES, when in a growing state, require plentiful waterings; and the border should always be kept in a moderately moist condition: withholding a little in the time of setting and stoning, and totally from the time the fruit begins to colour. After the crop is gathered, give a few hearty waterings, to bring the border into a proper state for the Winter.

Wash thrice a-week, with the hand-engine, from the commencement of the forcing, till the flowers begin to open; withhold

withhold till the petals begin to decay ; wash again till the fruit begins to ripen ; and then finally withhold, unless the trees are afflicted with the red spider, &c. in which case, wash every day till they are quite clean.

In the interval of washing, steam night and morning, in the manner as directed for the grape-house, if not provided with the steaming apparatus.

In another part of this work, I have said, that I do not think this apparatus of any consequence, except in the Peach-house. My reasons are these.—In the grape or pine house, there is always a command of fire-heat, at any period of the flowering season, to raise a sufficiency of steam for the purpose. But, in the Peach-house, this is not the case : as, in mild weather, and in the flowering season, the temperature of the house is such, as sometimes to require very slow fires ; and, of course, the flue is perhaps not heated enough, to raise steam in any great quantity.

It may justly be said, that, in this case, it is the less requisite, as then the artificial air of the house approaches nearer to the natural :

natural: yet steaming, at this time, is of infinite benefit to the trees, as it both encourages the setting of the fruit, and prevents the breeding of the red spider; and the engine cannot be employed at this time, for fear of hurting the bloom. Therefore, where there is a range of Peach-houses, it may be advisable to erect the apparatus: but, for a single house, or two, I hardly think it worth the expence; as, in the case of steaming by the flues being impracticable, water can be thrown out of a small squirt or syringe, in the form of dew, against the bloom.

The idea, however, of steaming *every day* without discrimination, is, in my opinion, ridiculous. Is the world enveloped in a cloud of mist day by day? Does the health of either animal or plant require it? or, could they bear it? In order to avoid errors, let us follow, as far as the case will permit, the dictates of nature; and thus we may also save ourselves the mortification of disappointments.

SECTION VIII.

On Thinning and Gathering the Fruit,

THINNING is an indispensable duty ; as there are many kinds of Peaches and Nectarines which otherwise would soon bear themselves to death. This operation, however, should be performed with caution, and never done for good till after the stoning is over ; as, till then, all danger of dropping is not past.

My rule for thinning is this :—A fruit for every foot square of the surface of the tree for the large kinds, and for every nine or ten inches of the small kinds of Peaches, and Nectarines in general. This must be understood as for trees in a healthy and vigorous state ; but, when otherwise, they should only be suffered to produce accordingly. As an instance :—I once had an Elruge Nectarine, a great bearer, which had a tendency to grow naked of shoots below ; I pulled off every fruit within six or eight feet of the ground one season, and it made excellent wood in that part in consequence.

So

So that, it would appear, it were well to be contented with a fair crop; which is better, in the end, both for the tree and its owner.

But, certainly, nothing can be more censurable than the practice of those who negligently suffer every fruit the tree may set, to remain on it; evidently to the injury of the whole crop, and ultimately to the ruin of the plant. And, of what value or flavour are this multitude of *nutmegs*, compared with the graceful appearance and relish of well-sized fruit?

It is customary to let the fruit drop of its own accord, when ripe; and, for this purpose, the border is covered with moss, and nets or mats are hung against the trellis to catch them. I have ever been of opinion, that all kinds of fruits, except grapes, lose much of their flavour if they are suffered to remain on the plant till dead ripe; and, in conformity thereto, have made it a practice to pull my Peaches and Nectarines.

I have often been asked, how I came to know when they are fit for pulling? (as handling or feeling them is improper).

This is only attained to by minute observation and custom, and a thorough acquaintance of the kinds; and, if taking them gently between two fingers, the back of the hand to the tree, and moving them backwards and forwards, does not displace those suspected to be ripe, pass by them till next day. In this manner, let the trellis be gone over each morning, and good account will be found in the practice; as not the one-half are lost or bruised, which are, when suffered to fall; and the fruit, not being dead ripe, are much fitter for carriage, if requisite. This practice I would recommend also, on account that the border, when covered with moss, emits a bad flavour; and nothing is more conducive to a good one, than the surface being kept clean, and being frequently stirred up while the fruit are ripening.

SECTION IX.

On the Insects that infest the Peach-House, and how to destroy them.

THESE are, the aphis, the acarus, and the cocci, or scaly insect; to which may be added, although not an insect, that more deadly malady, the mildew.

In treating of this article in the third and fourth Chapters of this work, I have given ample directions for the suppression and extirpation of the insects; but the mildew remains to be considered.

It is evidently an itch or scurvy in the blood of the tree; occasioned by injudicious management in the culture, a damp situation, or cankering soil. And although I cannot say that I ever had it in my power to try experiments for its destruction, (having never been troubled with it); yet I have endeavoured, and I think successfully, to prevent its appearance, and that by preparing good and kindly soil for the trees, and paying all due attention to their health and cleanliness. I am also confident that the washing with the liquor

(See page 62.) has much tended to its suppression.

But, after all, if the border has not been composed of proper materials, and rendered perfectly dry and comfortable in the preparation, much fear of its appearance may reasonably be entertained. Hence it may justly be said, that the best cure for this malady lies in the prevention of it.

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### SECTION X.

*On the Prolongation of the Peach-Season, where there is more than one Compartment for its Culture.*

**W**HERE there are two Peach-houses, and a few trees planted against the open wall in a south aspect, the season may be prolonged from the first or middle of June, to the first of November, in constant succession, by beginning to force the first house on the first of February, and the second about the middle or latter end of March. But where there are three or four \* houses, and a flued wall, the season may

\* At Wemy's Castle, there were three narrow houses, a large double house, and an extensive flued wall, for which



may be successfully prolonged from the first of May to the first or middle of November.

My mode was this: I began to force my first house on the first of December, and as it was not much to be depended on at that early season, my second on the first of January; my third on the first of March; and the fourth, I let come of its own accord, without the aid of any fire heat. I never applied fire to the flued wall until the first or middle of August, and that in order to ripen the wood, and hasten the maturity of the late fruit.

I did not reverse the successive order of the Peach-houses, and consequently they were always ready to vegetate at the same time of year, on the application of the fire heat, much less to their detriment, in my opinion, than had they been changed in the order of succession.

I would here observe, that Peach-trees, if forced every year, will wear out in the course of twelve or fourteen; and, therefore, about the eight or tenth year, young

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dwarfs

which there were canvas screens; also a few trees on the common wall.

dwarfs should be planted where the riders stood, and the old dwarfs should be converted into riders by degrees as the young ones advance.

The Peach-season might be further prolonged by cultivating a few dwarfs in pots or boxes, in the same manner as is hinted for cherries, Chap. III. Sect. VIII. In this manner, I have witnessed the season of this fruit being so far changed, as that ripe Peaches were produced about Christmas\*!

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#### SECTION XI.

*On the Cultivation of Peaches and Nectarines on Flued Walls, with Canvas Screens, Nets, &c.*

**I**T may be said that flued walls are essential to the production of Peaches and Nectarines in the open air, in the more northern parts of this country, although there are some spots, and in some situations, where good crops in *some* seasons are obtained without them; but to their production

\* By Mr Black, gardener at Mordun, near Edinburgh, in 1797-8.

duction to a certainty, year by year, flued walls are indispensably necessary; and where a fine garden is building, the extra expence in flueing two or three hundred feet of the best exposed walls, will be found but trifling. If built according to the design, (See Fig. 1. Plate IV.) and worked according to my method as under, the annual expence will also be trifling.

For securing the crop in the Spring, by defending the bloom till fairly set, from the frosty winds which so frequently happen at that season, canvas screens or old nets are necessary; but the canvas is far preferable, and in the end, little more expensive than the nets.—There is a kind of thin canvas called Scrim or Ofnaburgh, which answers very well, and is sold at about ninepence the square yard.

But for the flued wall at Wemyfs Castle, I had canvas wove on purpose, much thinner than any other I have seen, which now, by the action of the weather, is rendered as fine as gauze in comparison; and which, in 1790, cost but eightpence a yard. As much as covers a wall two hundred feet long and fourteen high, cost only about  
fifteen

fifteen guineas, including spars, cords, and pullies.

The manner in which it was applied is this : The canvas was made into three equal sheets, which were joined together every season when put on, and unjoined when laid aside ; spars or rafters of two inches square were placed at the distance of four feet from each other, their upper ends being joined close to the copping, and their under ends to a stake drove into the border, at the distance of a foot from the wall. These were also made to remove at pleasure ; pullies were fixed to the top of each spar, and the canvas hoisted there-to by cords a little stronger than garden line. At first I clewed it at top ; but, a strong gale of wind having almost tore it from the wall, I contrived to clew it at bottom, at the distance of a foot from the ground. Two people can unclaw and hoist, or let down and clew, the whole in fifteen minutes.

When nets are to be used, they should be doubled, in such a manner as to render the meshes as small as possible ; and should be supported from the wall about a foot by  
hooked

hooked pegs. It is common to hang these on in a random manner, but this does not at all answer the purpose intended; which is rather to break the force of the wind, than to prevent frost. By being placed out, at a distance from the wall, and being doubled as above, the frosty winds are broke ere they reach the tender bloom; and every gardener of penetration will admit, that winds of this description are more baneful than even hard frosts.

As, in the preceding Sections, I have given ample directions for preparing the border, planting\*, training, watering, washing, &c. it would be futile to repeat them here; and as it may be presumed the trees will produce no very considerable crop before the fourth season, I will pass on to that time.

Some

\* Before planting, there should be a trellis, or spars an inch square, fixed against the wall, to the height of the first course of the flue only; this being requisite to keep the young shoots from being scorched or anywise injured by the fire heat: and by the time it has returned into the second flue, the trees may be dressed to the wall without danger.

Some apply fire heat to their flued walls in the Spring. This I pointedly disapprove of, as no species of forcing is so intricate; the trees being placed between the extremes of heat and cold, and it being quite impossible to make or regulate a climate for them. All that is necessary for the production of a crop, is, ripening and hardening the wood in Autumn, and screening from frosty and boisterous winds in Spring.

By the time the buds begin to appear turgid in the Spring, let the screens be hung up: and, if canvas, let them down in the day, from eight in the morning to five or six in the afternoon, in mild weather; but if boisterous frosty winds prevail, continue them all day. They should not be totally removed till about the middle of June; by which time the fruit will be fairly set, and all danger will be past.

About the first or middle of August, according to the season and forwardness of the fruit and wood, light the fires. These must be made very moderate at first, and increased as the season advances. If the surface of the wall, about the second course of the flue, is kept milk-warm in the night, it is all that is necessary. And here observe,

serve, that the quantity of fuel must not be enlarged in a stormy night in the same degree as in a hot-house; otherwise, all will be ruined. To attempt making a climate for the trees here is ridiculous, and also perfectly unnecessary; the sole intention in the application of fire, being to ripen the young shoots for the production of fruit next season.

The following quantity and proportion of small coal is taken at a medium, and what I have found sufficient to work a well-drawing furnace for years, viz. From the time of lighting the fire to about the 10th of September, four ordinary shovels-full at five, and as much at nine in the evening; from the 10th of September to the middle of October, six shovels-full at the above times in the evening; and from the middle of October to the middle of November, six shovels-full at four in the evening, eight shovels-full at nine, and three or four at seven in the morning.

The above is only given as a hint; and much is left to the nature of the season, and judgment of the operator. But much care, in this species of forcing, is indispensably necessary to the insurance of success.

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## CHAPTER IX.

### PINES.

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#### SECTION I.

##### *On the Construction of the Pinery.*

**T**HAT few thoroughly understand the cultivation of this most admirable fruit, is demonstrated by its being discontinued in many places where it has been tried for years. Some have also given up the cultivation of Pines, because of the expence attending it in respect of fuel: the waste of which is greatly occasioned by the construction of the fire-place and flues; which are generally ill adapted to the burning of wood or turf, without working the house unsteadily, and giving the person who attends them much trouble.

Such a furnace, as is represented by Fig. 1. Plate V. is better calculated for burning wood or turf than any other I know.



know. And although I never had occasion to use that kind of fuel at Wemyss Castle, where coal is plenty; yet, when at the Marquis Townshend's in Norfolk, I was under the necessity of substituting other kinds of fuel for the use of the Pine stoves; and to burn which, I pulled down and altered my furnaces, from the common, to the plan as represented by the Plate. The fuel I used was turf and screened cinders, mixed in equal quantities; and a more steady fire I have never used any where.

Pine stoves are variously constructed. Some are single pitted; some double; and some are even triple pitted; some have flues running under, and some round the bark-bed. I disapprove of these; being very dangerous to the roots of the plants, if over-heated. I also disapprove of double and triple stoves; as being very uneasy to work in stormy weather, and confining a great quantity of stagnate unwholesome air in dull hazy weather. A stove, where fire heat may be perfectly at command, and in which a free circulation of  
air.

air can be admitted in all parts, is certainly to be preferred; and none can be so convenient for this purpose as a single one: and where it is in agitation to erect one, I would recommend such as is represented by Fig. 2. Plate I.

For the sake of uniformity, if placed in a range of vine and peach houses, &c. it may be raised to the same height with them; observing to raise the bark-bed accordingly, the surface of which should not be farther than four or five feet from the glass. The succession-house may also (if requisite) be of the same construction; and a nursing pit (See Fig. 1. Plate I.) will be found to be of great advantage, and answer the purpose perfectly.

The situation is immaterial, provided the surface be dry, as the bark-bed is raised above it, and paved. And hence it appears that I do not approve of a border being made in front for the production of grapes to be trained up the rafters, which I esteem as being highly prejudicial to the Pines. For my method of preparing the border, and training vines in the Pinery,

See

See Section XII. on the culture of the grape.



## SECTION II.

### *On the Preparation of the Bark-Bed.*

**T**HIS is an article of much consequence to the welfare of the plants ; and if not judiciously performed, is productive of great evil. It is no uncommon thing to hear of whole pits of Pines being burnt at the root by the over-heating of the bark-bed ; and Mr Speechly and others give this as a principal reason for their using oak-leaves. I have grown Pines for many years, and can declare that I never had the roots of a single plant injured by bark-heat ; and if my method of preparation is strictly followed, I can be bold to augur that none ever will. The manner is the most simple imaginable.

My opinion, in respect of the quantity and quality of bottom heat required by the Pine, has been different from that of any other author I have read on the sub-

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ject.

ject. Pine plants, except in striking of suckers, &c. should not stand in a bottom heat above that of blood-heat at any time, and that too of a mild moist nature. If the watch-stick, to the depth of the bottom of the pot, feels just a little warm when felt with the hand, or applied to the cheek when the body is of a comfortable temperature, it is sufficient; and it certainly consists with reason, that the bottom and superficial heat should correspond at all times. For the more effectual attainment of which, and that the roots may sustain no injury, the following rules, for turning and trenching the bed, are what I have followed, viz. never to sift the tan in the pit at any time; never to add above an eighth of new, which, if necessary, give place to by skimming off a little of the surface of the old; never to suffer the new tan to lie within a foot of the surface, by which means the pots are entirely plunged in the old; to lay the half of whatever new tan is added, in the bottom of the trench, and divide the other half equally to within a foot of the surface of the bed: in trenching, to throw the sides to the middle, and the

the middle to the sides, that there may be an equal mixture of the old tan. Thus will the bed be of a mild and equal temperature from the first, and will continue much in the same state for three or four months; and, after the first filling, is attended with very little expence for new tan.

From the above, it is obvious, that, in filling the pit of a new Pinery, it should either be done several months before the plants are to be placed therein, or should be well sweated and reduced by turning, in an open shed, &c.; but it would be advisable not to plunge the pots above half their depth, for the first two or three months after filling, in either case.

In adding new tan, it should always be thrown up in an heap for eight or ten days before it be used, in order to drip and sweeten; and should never be applied fresh from the tan-yard; being both wet, and apt to heat violently and cake in the bed, if applied in that state.

Some object to tan, on account of the expence and trouble attending the working with it: but, if the above method is

practised, these will be found to be inconsiderable; and, as the plants require frequent shifting, the stirring up of the bark-bed at that time is a trifling trouble, and sometimes the addition of new tan is unnecessary.

I am convinced there is no ingredient can be substituted for tan, that will equally answer the purpose in the Pinery; and therefore would recommend the use of it, in preference to all others, where it can be procured on reasonable terms: but less or more of it is indispensably necessary.

Oak-leaves are certainly the next best material; but they are not to be had in many places. Where they are used, I would advise that at least eighteen inches of well-reduced tan be laid on the surface, wherein to plunge the pots.

A mixture of stable-dung and tree-leaves of any kind, is the next best ingredient. But these should be well fermented before they are used, and at least two feet of reduced tan should be laid on the surface.

Some

Some have understood the reason why Pines are planted in pots instead of the surface of the bed, to be the want of permanent heat in it; that they may be removed with the greater facility in the time of renewing the bark, &c. This is not my idea of the matter. For were the heat of the bed rendered ever so permanent, I would rather grow my Pines in pots: and here let me observe, that I would never wish to be concerned in the culture of Pines, unless I had at least two distinct compartments for the purpose. All plants of any kind do not grow alike in their native clime; much less the Pine in an artificial one. Hence the necessity of at least two compartments, and growing the plants in pots; that they may be removed and classed, according to circumstances, with the greater ease and safety. Moreover, many plants, in any situation, do much better in pots than otherwise: of these are all the succulent tribe; and surely the Pine may be reckoned amongst them.

## SECTION III.

*On Propagating the Plants.*

**P**INES are propagated most successfully by crowns, produced on the top of the fruit, by suckers produced from between the leaves, and by suckers produced from the root of the old plant. These last are the most despicable, and should never be used except in a case of necessity. The crowns are twisted from off the fruit when served at table; the suckers, by breaking down the leaf immediately under, and moving them gently from side to side: but this is not to be done till the under part is ripe and of a brown colour, otherwise the sucker is apt to break by the middle.

Much stress is laid on the article of drying them; some recommending a week, others a fortnight, and some the laying them on the shelves, flues, &c. of the stove: but if they are perfectly ripe, and the old plants have had no water for a week or two before they were taken off,  
(which



(which they ought not), nothing of this kind is necessary.

The crowns are gathered one by one, as the fruit is used; and should be stuck into the bark-bed till the whole crop, both of them and suckers, can be potted together. Let a few of the bottom-leaves be rubbed off with the thumb, and let the under part of the stump be smoothed with the knife; and place them in pots of three or four inches in diameter and five or six deep\*, (according to their sizes), being filled with entire vegetable mould of decayed tree-leaves; in the bottoms of which should previously be laid a little clean gravel, of the size of horse-beans, to the thickness of an inch.

Meantime, let the nursing-pit be prepared for their reception; and, deviating

M 4

from

\* Pots of this proportion are not generally to be had; but where there is a stock of Pine plants, there should be a set of pots of all sizes made for them on purpose, three or four inches deeper in proportion to their width, than those in general use. My reason for which is, that a handful of clean gravel may be laid in the bottom of each pot, which I find is of infinite service to the plant: the Pine requires frequent refreshings with water, but will not bear the smallest degree of its stagnation.

from the rules given in last Section, let new tan, to the extent of a fifth or sixth part, be added; but suffer none to lie within ten or twelve inches of the surface. Here plunge the pots quite to the brim, in regular order, at the distance of two or three inches pot from pot each way, and keep them perfectly level.

It may here be expected, that I should say whether crowns or suckers ought to be preferred. To be plain, I do not prefer a good sucker to a good crown; for, if the sucker has the advantage of being a stronger plant, it has also the disadvantage of running to fruit more untimously than the crown.



#### SECTION IV.

*On Preparing the Mould; and what Kind is fittest for the Pine Plant in its different States.*

**V**EGETABLE mould being a chief ingredient, a stock of it should be provided wherever the culture of the Pine is followed. The kind to be used here is that from decayed tree-leaves, and those of the oak

oak are to be preferred; but where a sufficient quantity of them cannot be had, a mixture with those of the ash, elm, birch, alder, maple, fycamore, &c. and indeed any kinds, that are not resinous, will answer very well.

In Autumn, and immediately as the leaves fall\*, let them be gathered and thrown together into an heap, and let just as much light loam, as will serve to keep them from being blown abroad by the wind, be thrown over them. In this state let them lie till May; and then turn them over and mix them well; they will be rendered into mould fit for use by the next Spring; but from sticks, &c. being amongst them, will always require to be sifted before they are used.

Strong brown loam is the next article. This should consist of the sward of a pasture if possible, which should, previous to  
using,

\* They should never be suffered to lie above a day or two, otherwise they lose much of their virtue; but should be gathered into an heap as they fall, in order to bring on a fermentation while they retain their saline juices.

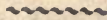
using, be well reduced, by exposing it a whole year to the action of the weather.

Pigeon-dung also, that has lain at least two whole years in an heap, and has been frequently turned, and well exposed to the weather, is to be used. Also, shell-marl. And lastly, sea or river gravel, which should be sifted and kept in a dry place; such part of it as is about the size of marrow-fat peas is to be employed.

This is the proportion:—For crowns and suckers, entire vegetable mould, with a little gravel at bottom, to strike in; afterwards, three-fourths vegetable mould, one-fourth loam, mixed with about a twentieth part gravel, and a little entire gravel at bottom, till about a year old. For year olds, and till shifted into fruiting pots,—one-half vegetable mould, one-half loam; to which add about a twentieth part gravel, and as much shell-marl, with a little gravel at bottom, as above. For fruiting in, one-half loam, a fourth vegetable mould, a fourth pigeon-dung, to which add gravel and marl as above, and lay two inches of entire gravel at bottom.

Of

Of this composition has been the mould I have used for years, with, perhaps, as general success as most gardeners. But my ideas are not so contracted as to presume, that this may not be deviated from, in any case, or that it cannot be improved. It is given as what I consider to be a good medium soil for the production of the Pine; and with the hope that the candid will apply, improve, or partly reject, according to circumstances and practical observation.



#### SECTION V.

*On the Treatment of the Plants the First Year\*.*

**I**F the plants were struck (as is directed in Section III.) about the first of September, the bed will continue of a kindly heat till the first or middle of November, and must then be worked over, and about an eighth part of new tan trenched in.

The

\* I reckon the year from the 1st of September, supposing the crop to be all cut, and the crowns and suckers to be struck at that time.

The plants will also have made good roots by this time, but will not generally require fresh potting; therefore, let such *only* as are anywise matted, be put into pots of the next size immediately above those they are in, observing to take off the matted part only, and put them in, balls entire.

Plunge them to the brim as before, and let them remain till the 1st of March.

At this time, let the bed be worked over as directed in Section II.; let the plants have the mould entirely shaken from their roots, be put into the same pots, and plunged as before. Here the roots which are fresh are not to be disturbed; only cut away those that are wasted, and any rotten part about the bottom of the stump.

They will now grow vigorously, and will again require potting about the first or middle of May; at which time also, let the bed be stirred up to about half its depth, and if necessary, let a little new tan be worked in. Put the plants into pots of about six inches in diameter \* on a medium,  
according

\* This is always to be understood as the inside diameter at top, and the particular number of inches specified, to be a medium for the plants according to their sizes.

according to their sizes, with the balls entire; and if any of them are matted, displace that part; plunge them to the brim, at the distance of about fifteen inches\* from centre to centre of the plants, and give a little water.

About the first of August they will require fresh potting, and if there are three compartments, being removed into the succession-house. Let the bark bed be worked to the bottom at this time, the plants put into pots of eight inches in diameter, plunged to the brim at the distance of sixteen inches on a medium, and settled with a little water.



## SECTION VI.

*On the Treatment of the Plants the Second Year.*

**A**BOUT the middle of November, the bark-bed will require to be worked over to last for the Winter; the plants must not be shifted at this time, but let any decayed leaves about their bottoms be twisted

\* This must be understood of the largest plants; a foot will be sufficient for the small ones.

ed off, let a little fresh mould be laid on the surface of the pots if requisite, and replunge them to the brim as before.

I would here observe, that I disapprove of the custom of tying up the leaves of Pine plants at the time of shifting or potting; the intention is to keep them from being bruised, but they are generally much more bruised in the tying, than when left loose. My method has been, to have a person standing opposite me in the time of potting, (performed on a stage or table about a yard high), whose business was to hold up the leaves in a loose though regular manner between the arms, and prepare and hand the pots, while another hands and sets aside the plants. In this manner I have often shifted an hundred one-year old plants in two hours.

In carrying the plants through the doors of the stove, the person should turn back foremost, by which it is easy to save the leaves from injury, as in that case the pot goes first, and the leaves are drawn backwards.

By the first of March, the plants will again require shifting, and the bark-bed  
trenching



trenching as before. Let the plants at this time be shaked out, and replaced in the same pots, in entire new mould, cutting off any decayed roots, or the end of the stumps, and twisting off a few of the bottom leaves, &c. Replunge them as before, and give a little water.

About the first of June they must again be shifted. Work over the bark-bed to about half its depth, and add a little fresh tan if necessary; place the plants, balls entire, into pots of about ten inches in diameter, plunge them at the distance of eighteen inches from centre to centre, and settle with a little water.

In potting at all times, a few of the bottom-leaves should be twisted off, that the plant may make fresh roots to furnish the surface, which also tends to keep it steady in the pot.

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#### SECTION VII.

*On the Treatment of the Plants the Third Year.*

**B**Y the middle of August or the first of September, the plants must be put into their fruiting pots, and should be placed  
in

in the fruiting stove; and for their reception, the bark-bed therein must be prepared, by trenching it to the bottom, and adding about a tenth part of new tan. Put the plants into pots of a foot in diameter, plunge them to the brim, and give a little water. In potting, a small stick should be used to tindle down the mould between the ball and side of the pot, so as to leave no cavity, and this should be observed at all times.

About the middle of November, the bark-bed will require to be stirred to half its depth, and a little fresh tan added; but the plants are not to be shifted at this time; therefore, replunge them to the brim again for the Winter.

It is common at this time, to add a great deal of new tan, in order to keep up a strong bottom heat through the Winter; than which, nothing can be more erroneous in my idea of the matter. I have already said, that the bottom and superficial heat ought to correspond at all times; and if the house is to be worked to 60° *only*, for the Winter, it certainly follows that a very moderate degree of bottom heat  
is

is sufficient. The temperature of the house being so much reduced in Winter, is to prevent the plants from starting too soon into fruit ; and their doing so, is frequently more in consequence of too much bottom heat, than irregularity in the climate.

By the first of February, (the best showing-season,) the bark-bed will require trenching ; and this is the only time of the year that I would advise a deviation from the rules given in Section II. From this time, the house is to be worked as high as  $70^{\circ}$  ; and that the bottom heat may keep regular pace with the superficial, new tan to the extent of a sixth part may be added.

Such of the plants as are not shown at this time, are healthy at the root, and stand erect and firm in the pot, should have a little fresh mould laid on the surface, by the removal of about two inches of the old. But let those that are *already shown*, and those which are anywise unhealthy, or appear stunted, be *shaked out entirely*, and replaced with fresh mould in

the same pots ; but none of the roots, unless wasted, must be cut away.

The above, in respect of the plants that are *shown*, I presume, has never been recommended before ; and I am happy in being enabled to do so with confidence. It has ever been a matter to be regretted, that Pines, from the want of sun and air in the Winter months, are apt to be stunted, and show their fruit too soon ; and that fruit so shown, seldom come to be of any considerable size or flavour ; the plants thus stunted, being unable to nourish the fruit ; and these, from the want of sunshine in the early months, coming far short in flavour to those matured at a later period.

I first tried the experiment on a dozen of plants ; the half of which were in, and the other half past the flower, at this time of the year. They were kept back a full month by the operation. Those that were past the flower equalled, and those that were only in flower considerably exceeded any of the others of their forwardness at the time of shifting. Being encouraged by my success, I treated my whole stock of

of *fruiters*, in the manner as directed above, the following year; they were kept back to a better season, and swelled their fruit to as good a size as those that showed in February.

About the first or middle of May, let the bark-bed again be trenched to the bottom, a tenth of new tan added, and the plants replunged as before; and no further trouble is necessary on this head.

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SECTION VIII.

On the Temperature of the Pinery:

FOR the nursing-pits, the fires will require to be lighted about the first of October. Work so as to keep the thermometer at nine at night, and seven or eight in the morning, as near to * 65° as possible, till the first of March, and then gradually increase to 70°, at which continue, till fire heat is unnecessary.

For the succession-house, light the fires as above, according to the season; keep

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at

* Fahrenheit's scale.

at 60° till the first of March, and then gradually increase to 65° for the season.

And for the fruiting-house, work to 60° till the first of February, and then instantly rise to 70° ; increase gradually to 75° till the first of March, at which work for the season.

Although it is not practicable to work to a degree as here stated, yet the best endeavours should always be used to do so ; and no person should have the management of the fires, who has not also the charge of the house.

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## SECTION IX.

### *On the Admission of Air to the Pinery.*

**I**N Winter, even frosty air should be admitted, but in a moderate degree, and always at the top of the house ; but in fresh weather, at this season, air should be admitted to the extent that the thermometer may not rise to more than 5 degrees above the fire-heat medium, and that till the middle of March ; after which, and for

for the whole season, not to more than 10 degrees.

In Winter, I have frequently made fires in the morning, solely for the purpose of enabling me to admit air, and at the same time keep up the temperature of the house.

Although the Pine (from its nature) does not appear to *quickly feel* the effects of bad management, there are few plants in reality do it more so; and too due an attention to the temperature of the house, especially in Winter, cannot be paid, the want of which is almost sure to throw the plants into fruit at an untimely season.

Very large portions of air should be admitted to the fruiting-house, while the fruit are ripening; this is not only essential to the flavouring of the fruit, but highly conducive to ripening and hardening the suckers.

Some shade their pines at certain times; but I cannot conceive this to be necessary, except perhaps in striking crowns and suckers, which, by the erroneous practice of *drying* them, have been enfeebled.

## SECTION X.

*On Watering and Steaming the Pinery.*

**W**ATER must be given sparingly to the plants in dull weather, particularly in Winter. From about the first of October to the first or middle of March, once in eight or ten days will generally be sufficient, and that in very moderate quantities; but from March to October, plentiful waterings will be requisite, and considerable quantities at a time, generally once in three or four days.

The crowns and suckers must have no water for the first fortnight after planting; and none over-head the first Winter, lest their hearts should damp. Indeed I do not advise watering much over-head, except in clear weather, in Winter. But, in the Summer months, my practice has been, first, to give the quantity requisite to the root, from the spout of the watering-pot; and then a sufficient quantity to wet every part of the leaves from the rose.

My



My reason for which is, that I have found the different kinds of Pines require very different quantities of water. The Queen requires a third more than the King, Antigua, or Brown Sugar Loaf; and the Montferat and Green or Stript Sugar Loaf, require a medium quantity between the two. I speak of plants in an equal state of health and size.

The fruiting-plants will require very large quantities of water, from the time they are out of flower, till they begin to colour; which should then be gradually withheld, and, towards its maturity, totally. This will enhance the flavour of the fruit, and perfect the ripening of the suckers.

Water frequently with the drainings of a dunghill in the Summer months; but not in Winter: as at this time the plants are in a dormant state, they imbibe little nourishment; and this kind of water causes a stench, and produces foul air in the house, which cannot be so conveniently drawn off at this time as in Summer.

I neither think steaming necessary nor hurtful to the health of the Pine, except

in hazy, dull weather in Winter, at which time it is certainly prejudicial. Therefore, if there are grapes in the stove, regulate this matter for their sakes alone, without reserve.

Soft, and *well-aired* water should be used at all times; and should be applied either about eight in the morning, or four or five in the afternoon.



## SECTION XI.

### *On the Maturation and Cutting of the Fruit.*

SOME kinds put forth suckers at the base of the fruit; which should be rubbed off as they appear. Others put forth suckers from the root; and, as these are not proper to be taken into the stock, they should also be twisted off, or otherwise destroyed, as they appear.

It is certain, that if a plant were to be divested of all its suckers, the fruit would grow to a much larger size in consequence; but as this would ultimately tend to the extirpation of the whole stock, it is by no means advisable. However, it is proper to  
reduce

reduce the number of suckers on the plant to two or three at most. This should be done in the May shifting; or when the suckers are about half grown. Choose the best, and destroy the others by breaking out their hearts. But where the increase of the stock is the object, all suckers, even of the root, should be encouraged.

Some of the kinds grow on long foot-stalks, which are apt to bend down as the fruit gets heavy. These should be supported to small stakes, &c.: For if the fruit fall over, the stalk will be bruised, and its nourishment will thereby be obstructed.

Pines lose much of their flavour if they are suffered to grow till dead ripe: and where the gardener is not restricted, he should always cut them by the time the fruit has attained to a greenish-yellow colour; and either let them remain in the heart of the old plant, or lay them on the wall-plate, &c. in the stove, for a few days afterwards.

If required, Pines may be preserved in good order for several weeks after they are cut, in the following manner:—Cut them, as above, with the stalk as long as possible; put

put it into a bottle of pure water; which renew every two or three days, and at the same time pare a thin slice off the end of the stalk; and place it in a temperate and well-aired room of about 60 degrees.

It may be expected here, that I should say something in respect of the flavour of the different kinds. This I choose to avoid, as men's palates are as different as their minds; but I would observe, that the Queen is most to be depended on for a sure and regular crop. The Antiguas and Brown Sugar Loaf grow the largest of any, and make a noble appearance on the table; but they frequently fruit untimously. I have had a few plants of the Montserat which did not fruit till the fifth year; and I was then under the necessity of placing them in the green-house for a fortnight, in order to give them a check. The King is, of all others, my favourite; and I have been at much pains to discover the bent of its nature. I find it requires much less water, and a greater quantity of gravel, both in the mould and at the bottom of the pot, than any of the others.

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SECTION XII.

On the Insects that infest the Pine; and how to destroy them.

THESE are, the brown and white scaly insect, of the coccus tribe; to which may be added the ant. But, as I could never discover that these last do any harm to the plant, and as they are seldom seen if the former be not present; I am rather inclined to think, that their presence is in consequence of that of the coccus, on which they seem to feed. The brown scale does no other injury to the plant than dirtying it, and therefore is of little importance. But the white scale, or bug, is of the most mischievous nature to the plants; and where it abounds, little good may be expected of them.

For my own part, I have been so far happy in this respect, that I have never had it in my power to try experiments for their destruction, but once; and as I was completely successful, I shall candidly lay my method before the reader.

When

When I went to Wemyſs Caſtle, the whole ſtock of Pines * were infected to that degree, that I had obtained permiſſion, and was determined, to throw them out; but having built a nurſing-pit, and not having immediate occaſion for it, I bethought myſelf, and treated them in the following manner. I prepared a ſtrong heat for them in the bark-bed of the nurſing-pit; ſhaked out, and cut every fibre from their roots, (whereby they were rendered the ſame as fuckers at firſt), not excepting thoſe that were in fruit, ſome of which were juſt in flower; dipped them into liquor †, the ſame as is recommended in Chapter III. Section VII., excepting the turpentine; put them into pots, ſix inches in diameter, and plunged them to the brim; kept up a fire heat to about 75 degrees; gave them but little air; ſhaded them in ſunſhine; and gave them plentiful

* Theſe were in a ſmall ſtove in the old garden; the new garden and hot-houſes not being then built.

† This experiment gave riſe to my trying it for other infects; but I found it ineffectual for the deſtruction of the caterpillar and grub, without the addition of turpentine.

tiful waterings over head with the same mixture reduced to about half its former strength.

I continued this treatment for two whole months. At the end of which, I again shaked out their roots, and washed the whole plant in pure water; put them into fresh pots, eight inches in diameter; replunged them into a kindly heat in the other nursing-pit; and treated them in all respects as other plants. I never saw a vestige of the bug afterwards; and of those very plants were produced my principal stock. A few indeed of those that had shown fruit died; but the others brought such fruit as might have been expected from plants of their size, of any other kind.

CHAP-

CHAPTER X.

STRAWBERRIES.

THIS fruit is forced in most gardens where there are hot-houses of any kind; and, being generally understood, with equal success. I shall therefore be very brief in treating of it here; the only reason of my doing so at all, being to render this work as complete and useful as possible.

Strawberries are brought to early perfection in the pine-stove, vinery, peach-house, &c. But, in my opinion, the cherry-house is the fittest for its production, as the climate there coincides more nearly with its nature. As a compartment wholly for its use, flued pits are best adapted; and might be advantageously employed, in the latter

latter part of the season, in the production of melons, &c.

In any situation, the plants should have plenty of free air, especially when setting and ripening; and be abundantly supplied with water till the fruit begin to colour; after which, very moderately.

My method of preparing the plants for forcing is this:—In the middle of July, or first of August, (when the runners of Strawberries out of doors are producing fine young plants), fill pots, of ten or twelve inches in diameter, with strong, rich loam; and plant three or four in each: settle them with a little water; and place them behind a wall, &c. to shade them, till the plants have taken root; after which, plunge them to the brim in any dry open situation in the garden.

Dress off their leaves in Autumn; cover them with a little litter in Winter, to prevent the pots from being wasted by the frost; pinch off any flowers that may appear in the Spring; keep them clear of weeds, &c. in Summer, and in dry weather refresh them with a little water; and in
Autumn

Autumn drefs off the leaves, &c. as before. They will be fit for forcing any time after Chriftnas.—Of all the kinds, the fcarlet is to be preferred.

As the plants are of no ufe after being forced, a quantity fhould be prepared 'as above, every feafon, where they are in request.

CHAP-

CHAPTER XI.

THE GREEN-HOUSE.

SECTION I.

On the Construction of the Green-House.

THIS compartment being an object of taste alone, is more subject to diversity in its construction, and that too with more propriety, than any other in the garden. And although the gardener (if a judge) should have the sole direction in building the different species of forcing-houses; yet the fancy of the proprietor, I speak in general terms, in respect of the Green-house or Conservatory, may be more safely indulged in: since nothing is at stake here in comparison to what is in the pinery, grape-house, or peach-house.

Many Green-houses are not paved. This, in my opinion, is erroneous; as the water that drops from the plants, in watering, causes much damp in Winter, which is

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very

very prejudicial to the health of the plants. Water so spilt should be instantly wiped up; and this cannot be done where the floor is of earth or sand. The floor should therefore be bedded on brick-bats, stone-chips, furnace ashes, &c.

Air and light, in Winter, being of the utmost consequence to the health of the plants, the free admission of them should be studied in the construction; and, at the same time, that wherein a great deal of fire heat may not be required, which tends to draw the plants up weak in Winter and Spring.

Plate VI. represents the plan of an approved Green-house, for breeding and bringing young plants to an early flowering state. But where elegance in the building is studied, and the front is to be of free stone; architecture and masonry may have their full sway *, in any of the orders but that

* The Green-house at Wemyss Castle is supposed to be the most elegant of any in this country. The front is of freestone: and done to the Corinthian order, in the lightest manner. The windows are circular; whose width is six feet and an half each, and the pilasters only eighteen inches.—It is placed in the centre of the principal range of hot-houses, and has a very fine effect.

that of the Gothic, without much inconvenience to the plants : but this last, from the construction of its arches, is of too dark a nature for their welfare *.



SECTION II.

On the Temperature of the Green-House.

LITTLE fire-heat is necessary here ; except in the time of a severe storm, or in long-continued dull weather, to dry off damp. In the former case, the thermometer, in the night, should not stand above 50 degrees at any time ; nor should it be under 40 degrees, as otherwise many tender plants might suffer. In the latter case, it may sometimes be advisable to light pretty strong fires, in order that large portions of air may be admitted : at which times, if the thermometer stand above 35 degrees, it is sufficient.

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S E C-

* In some late designs, where an elegant Green-house has been wished as a centre-piece, I have shewn a glass, instead of a slate or lead roof ; a matter of evident utility, as thereby the plants enjoy both a perpendicular and horizontal light.

SECTION III.

On the Admission of Air to the Green-House.

AIR and light are of the greatest consequence to the welfare of the plants; and ought to be encouraged at all times. In some Green-houses, it is common to cover at night with canvas, mats, &c. in order to save fuel in winter. These should always be removed betimes in the morning, to admit the rays of light as they break from the horizon; and should never be put on at night till the twilight, to exclude them. A free and large circulation of air must be admitted, according to the weather; even frosty air in Winter must not be entirely excluded, especially in sunshine.

In the Spring, keep the house cool and well-aired; otherwise the plants will grow both too tender and too rapidly, to bear the weather when set out of doors, without being much hurt at first: and for several weeks previous to the plants being put out, the

the house should stand open, to its fullest extent, both night and day. Let it also remain open for several weeks after taking the plants in, in Autumn, lest they begin to grow, which is not advisable at this time.

SECTION IV.

On Watering the Green-House.

ACCORDING to the variety and nature of the plants herein contained, so is that of the quantity and frequency of watering: and hence the impropriety, nay impossibility, of any rule being given.

The judgment and discretion of the gardener must here be entirely relied on; but a few hints may be useful. Plants are like infants: they will complain when hungry or thirsty; and, like them, too, should be timously prevented by the indulgence and care of the nurse. Is it not painful to think, that an infant should cry and endure pain for what it cannot express? Even so with a plant. I have often felt much pain in seeing a plant *flagged* for want of that

very element without which it could not long exist; and the more so, if want of attention was the cause.

On the other hand, an infant may be much hurt (nay, killed) by being too much glutted with food or drink, especially if of a bad quality. So it is with a plant. Therefore, the nicest observation is necessary, to discover their natural inclinations; and which should be treated and encouraged in a kindly manner at all times.

In Winter, and when the plants are in a dormant state, it is safest rather to give too little than too much water; and the contrary in summer, and when the plants are in a vigorous growing state.

A practice too commonly prevails, of placing a flat or saucer under the pots, especially of plants kept in the drawing-room or parlour; which may be very proper, for the sake of the furniture; but which is too generally of mischievous consequence to these shrubs. If the saucers were emptied so soon as the superabundant water has filtered through the earth of the pot into them, it were well; but if left there to stagnate, it must of necessity operate

rate

rate to the destruction of the roots, and ruin of the plants.

In the spring, when in the house, and in dry weather in Summer, when out of doors, they should be occasionally washed with the hand-engine, in order to refresh and keep the foliage clear of dust, &c. and in Winter, any water that may be spilt in watering should be carefully wiped up, to prevent noxious damp.

SECTION V.

On the Compost Mould to be used in the Green-House.

WHAT I have said in the last Section, in respect of the nature and inclination of the plants, might with equal propriety be said here. I will therefore only drop a few hints on this subject.

Many kinds of mould are necessary, to form the many different composts that are required; and where there are a great variety of plants, and their culture is industriously studied, the following ought not to be wanting:—

Clay, gravel, sand, strong loam, light loam, peat-earth, moss, marl, vegetable mould, lime, and rotten dung. Out of which, according to the nature of the plant, may be formed a compost of any kind for its use. But of this, a novice cannot be supposed a competent judge: Some practice, and much observation, are necessary requisites.



SECTION VI.

General Observations.

IT is necessary to put out the greater part of Green-house plants in the Summer months, in order to harden and keep them in shape; but they should not be set out before the frosts are quite over, which is seldom before the first or middle of June. For two or three weeks, they should be placed behind a wall, or other fence, to shade them from the violence of the sun, and keep them from being scorched, or otherwise injured by the weather. After which, they may be placed in any form or situation

tion which fancy requires; provided the exposure is such, that they may enjoy at least one-half of whatever sunshine there is. Here let them remain till the end of September or 1st of October, according to the weather.

Some of the tender kinds will require to be let stand longer in the house in the Spring, and taken sooner into it in Autumn, than the others.

The best time for general shifting or potting, is, when they are removed out of or into the house; but individuals may be fresh potted at any time.—The luxurious growing kinds should be rather under-potted, and kept in stiffish soil; which will tend to check their growth.

These plants look much better, when of an ordinary size, than when suffered to grow tall, and with naked stems. Therefore, they should be frequently headed down and trimmed; so as to make them put forth young shoots in every part, if possible. They should also be divested of all dead branches and leaves as they appear, at all times.—Young plants of all the kinds that will, should be *struck* every season;

season; and the others should be propagated by layers, budding, or grafting, in order to keep up a stock.

On the stage, they should be placed, in manner of an amphitheatre; regular, thin, and the kinds should be as much intermixed as possible, which gives the better effect to the whole. They should be frequently turned round to the sun, in order to make them grow upright and equal on all sides.

The flower these plants grow, the better; provided they do grow, and are healthy.

The aphid and thrips are often very troublesome in the Green-house; which should therefore be frequently fumigated with tobacco, in order to destroy them.

CHAPTER XII.

EXPLANATORY OF THE PLATES.

SECTION I.

Explanation of Plate I.

FIGURE I. represents the plan and section of two nursing-pits, on a construction that will equally answer the striking of young Pine-plants and forcing Asparagus, Cucumbers and Melons, Strawberries, French-Beans, Sallads, Flowers, &c.

For the conveniency of shifting the tan, &c. the pit is sunk to the depth of a yard below the ground level, but where the situation is not perfectly dry, this is not advisable; therefore, if the situation is damp, the pit should be built on the surface, and a sloping bank should be raised
all

all round, to the height of a yard, against the sides and ends; and this I chiefly advise, on account of the value of the front flue, which may be so easily rendered serviceable in raising early fallads, &c. on a well-prepared border immediately adjoining thereto, as hinted in the note, page 19.

Here the furnaces are placed behind, communicating first with the front flues, which return in the back, singly. The surface of the bark-bed is level with the bottom of the flues all round, a cavity separates the front flue from the bark-bed, and consequently no apprehension of burning need be entertained. The inner wall of the flue is a brick on edge, and for the sake of strength, the outer wall a brick on bed.

Although in this design the divisions are but thirty feet long each, yet were a greater extent required, they might be made forty, as a furnace is perfectly capable of working that much, if the pit is of the same width.

One length of a sash is sufficient here, and they are worked in the manner of a
common

common hot-bed, with fastenings at top to keep them from slipping down.

Fig. 2. represents the plan and section of a single-pitted Pine-stove, on an improved and much approved construction, either as a fruiting or succession house, worked by two fires, and having a shed behind, which will be found a great conveniency in many respects; such as the keeping of moulds, tan, &c.; and it is also well adapted to the cultivation of mushrooms.

The bottom of the bark-bed is level with the circumjacent ground; and its surface is gently elevated, to the intent that the plants, when properly arranged, may enjoy an equal share of sun and light. Some pay little respect to this article, keeping the surface of the bed perfectly level, and placing the plants indiscriminately therein; but my method has been to arrange the plants in manner of an amphitheatre, that they might enjoy the rays of the sun more equally.

Trellises are placed against the back-wall, and upright sashes in front, whereon to train the vines in this compartment; which is preferable to the method of training

ing

ing them up the rafters, as is generally practised. (See Section XII. on the Grape.)

Here must be two lengths of fashes on the roof; the under ones should *all* be made to move either up or down, and the upper ones to move down alternately, to the extent of half their lengths at least. It is immaterial whether the upright fashes are made to slip or not, as by moving the under ones of the roof upwards, *bottom air* can be admitted equally well.

Here also would fallads, &c. sown on a well-prepared border, close by the front wall, reap great advantage from the heat of the front flue, which in this compartment requires to be kept very hot all the Winter and Spring months, having the greatest command on the temperature of the house.

SECTION II.

Explanation of Plate II.

FIGURE I. represents the plan and section, and also the elevation of the front wall of a Cherry or Fig house, worked by

by one fire, that communicates first with the front flue, and has two returns in the back wall; which returns are made on the supposition of its being converted into a Peach-house at pleasure; but while it is appropriated to the cultivation of cherries or figs, the back flues should be shut by a damper. See Chap. III. Sect. I.

The trees are trained to a trellis placed against the back wall, and if the border is not occupied by French beans, fallads, flowers, &c. a row of dwarf standards may be planted in front, within two feet of the flue. Two rows of strawberries may also be placed on shelves hung against the upright sashes in front.

The front flue is run here in the same manner as in the nursing-pits, and consequently the same advantage ought to be taken of it, in respect of making a border for raising early fallads, &c. in front of the house.

It stands on pillars and arches, which last ought to be made as obtuse as possible; but where lintels can be procured, they are preferable, and should not be more than six inches thick. The pillars should
be

be no thicker than the length of a brick at most, that all the space possible may be allowed the roots of the plants.

The sashes should be of two lengths on the roof here, all of which ought to be made to move, but the upright ones may be made *dead*.

Fig. 2. represents the plan, section, and elevation of the front wall of an approved peach-house, which is also worked by one fire, communicating first with the front flue, and returning in the back. The front wall and front flue stand on pillars, which ought either to be lintelled, or obtusely arched. The trees should be planted near to the front wall, and trained to a trellis that covers the whole roof. This is a cardinal improvement in the culture of early peaches and nectarines, as their size, colour, and flavour, are thus greatly enhanced: and if an impartial comparison is made, it will be found, that by training peaches in this manner, a much greater quantity of fruit may be obtained for the sum expended in erecting the house, than by training them on the back-wall. There are evidently many more superficial feet in the

the roof, than in the surface of the back wall, of any hot-house.

The sashes are all to be made moveable; both up and down, for the admission of air at top, bottom, and middle.

In the plan of these houses, I have shewn no back-thed; but, if one is not erected, which in some situations may be very improper, the *stock-hole* should be inclosed with a wall, arched over, and a trap-door made to go down in manner of a ship's hold, over which, when not at work, may be laid a little mould, &c. for concealment.

But where the appearance of the furnace is immaterial, it is of no consequence whether it be covered over or not; as, if the furnaces are built according to Fig. 1. Plate V. they will be found to *draw well* in any situation.

Fig. 3. represents part of an espalier rail on an improved construction. Here the posts are set in blocks of stone, which are placed under the surface of the border; and, for durability, the ends of the posts are burned, and run in with pitch.

SECTION III.

Explanation of Plate III.

FIG. 1. represents the plan and section of an approved Grape-house; worked by two fires. Here the front wall, and front flue, stand on pillars which should either be lintelled or obtusely arched, as above hinted. The vines are to be planted within a few inches of the front wall, and trained to a trellis which covers the whole roof.

Some build their front walls and flues on the surface, without supporting them: this is by no means advisable; as, in this case, there is no possibility of effectually renewing or trenching the border without endangering the wall and flue, which operation frequently becomes necessary.

In this house, there are no upright sashes; the length of the roof being of the greatest importance here. In houses where grapes are trained on the roof, and which have upright sashes, we generally find that part but indifferently covered with wood or fruit;

fruit; besides, it alters the pitch of the roof, which in a house for a principal Summer crop is certainly of importance.

Here must be two lengths of sashes; all of which ought to be made to move at pleasure, in order to admit an equal and free circulation of air.

A house on this construction is also perfectly adapted to the cultivation of peaches; than which, I know not a fitter receptacle for the production of a principal crop; and, if requisite, it might be extended ten feet more in length, as the fires would command a sufficient heat for peaches.

In this case trees are to be trained against the back trellis to the top, and on the front one to half its height only, that the trees on the back trellis may not be shaded by those on the front.

Fig. 2. also represents the plan and section of a grape-house, which is divided, in order to afford a succession of fruit. The front wall and flue stand on pillars, that the roots may have a free range; the plants being planted near to the front wall,

and trained to a trellis fixed to the roof-beams.

The sashes are also to be double on the roof, and made *all* moveable, that air may be freely admitted in all parts of the house.

Fig. 3. represents the elevation of the front wall of either house, being the same, except in length.



SECTION IV.

Explanation of Plate IV.

FIG. 1. represents the plan and vertical section of two divisions of a hot-wall, on a new and much-improved construction.

Here the flue makes four returns, decreasing gradually towards the top of the wall, which is necessary to the distribution of an equality of heat to the surface; and here also the upper course of the flue is carried much nearer to the top of the wall than is generally done, which is of great utility in ripening the extreme shoots of the tree, these naturally growing later and

and more spongy than those of the other parts.

Some who give designs for hot-walls, advise building the breast of the first flue a brick on bed, and that of the other a brick on edge, without decreasing the depth of the flues as they ascend, in order to give an equality of heat to the surface. But this matter is better accomplished by the gradual diminution of the flues, as here shewn, though the breast of all the flues are a brick on bed. A wall of this kind is more subject to the vicissitudes of the weather than a flue in a hot-house; and, consequently, the breast of the flue being a brick on bed, will keep a more constant heat, when once warmed, than when on edge. To prevent accidents, however, a trellis should be fixed, or spars an inch thick, nailed against the *first course* of the flue, whereon to dress the trees; above which they may be dressed to the wall without the least apprehension of danger. (See Chap. VIII. Sect. XI.)

Fig. 2. represents the plan and section of a mushroom-house, worked by one fire, and divided for the purpose of producing them

in succession, on a construction that has given satisfaction for many years.

Little fire heat being required here, the flues of both divisions are gathered to the furnace, which works them both equally; and by the help of dampers, the one can be worked higher or lower than the other, with the greatest facility; or by stopping the vent close, the one can be worked altogether independent of the other.

It is a matter of little importance in what situation this house is placed, provided the bottom of the mushroom-beds be rendered perfectly dry, by draining, if necessary.

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## SECTION V.

### *Explanation of Plate V.*

**F**IG. I. represents the plan, and horizontal and vertical sections of a Furnace, on the best construction yet discovered for the use of hot-houses; and to which, from a conviction of its utility, I would seriously advise a strict conformity. It is laid



laid down by a large scale, which, I hope, will be found legible to, and understood by every operative person, without the minutiae of explanation. But it remains for me to give some directions for the working of it, and to describe that which constitutes its principal difference from the common furnace.

In the common hot-house furnace, the grate occupies the whole space allowed for the fuel, and is also generally placed on a level with the bottom of the flue, its entrance being thereby easily choaked, which occasions what is termed an *ill-drawing furnace*. And where the bottom of the flue is elevated above the grate, the consequence is worse; in which case, the fire burns with such rapidity, that it is hardly possible to regulate the climate of the house to the degree required; besides, there is a great waste of fuel.

This is obviously occasioned by there being no space allowed for the fuel but the surface of the grate, through which, and consequently through the whole fire, the current of air must pass into the flue; whereby it is suddenly exhausted, and the

flue heated to a much greater degree than required.

In these furnaces, the fire will not last above three or four hours; which, in stormy weather, and in Winter, occasions a constant attendance, perplexity, and the impossibility of regulating a climate in the hot-house. But all these objections are obviated by the furnace as here represented. Here the grate does not occupy one-third of the space allotted for the fuel; and, at the same time, is sufficiently large to kindle the whole mass; which, when kindled, will keep of a moderate and equal temperature for many hours together. Here, also, the operator is not troubled with fresh lighting the fires every day;—I have frequently known them to keep fire for ten days together without any addition of fuel. My method of regulating and working this furnace is as follows:

As after the first lighting for the season, there is always fire remaining in the back part of the furnace, in *kindling-up* in the evening, &c. clear all the ashes from off the grate, and the spaces at the sides  
of

of it, and bring forward two or three shovel-fulls of fire to the front; behind which, throw the quantity of fresh fuel required, shut the door close, and in the space of an hour or so, revisit it to see how the fire is burning. If it is burning too slow, stir it up by applying the fire-poker (the end of which is turned up) underneath the grate, clearing the interstices of the bars the whole length; but if it is burning too rapidly, open the furnace-door a little way; by which means the current of air will be divided, part of it passing over, and part of it through the fuel. In the space of another hour, again pay it a visit; (having previously consulted the thermometer in the hot-house); and if the fire is consuming too fast, open the furnace-door accordingly; but if too slow, shut it close altogether.

This method is much preferable to that of working by dampers, it being very difficult to hit on the exact proportion of the aperture to be left in the vent; besides, whatever air passes through the vent must also pass through the fuel, and that too with greater velocity than when the  
damper

damper is not shut at all, since by the partial contraction of the vent the current will be increased.

In moderate weather, I have generally found two fires sufficient for twenty-four hours; or rather, strictly speaking, a fire and an half: viz. a full fire, according to the season and temperature the house is worked to, about four or five in the evening, and half as much at nine at night. In severe weather, three fires at most; viz. one at four in the evening, one at nine or ten, and one at six or seven in the morning. But here observe, that in this case, the furnace-door will generally require to be opened quite, after the fire is fairly kindled; as the flue will be kept constantly hot, by the slow soaking heat of the furnace. And this is none of the least of the advantages which this furnace has over the other, as hereby the climate of the house is regulated, even in the most stormy weather, with a much greater degree of exactness.

By a small variation in the construction of this furnace, almost any kind of fuel may be used with success. Turf and  
screened

screened cinders mixed in equal quantities make an excellent fire, and for which there need be no alteration made in this plan; but for turf or wood alone, the furnace should be made at least a third larger, and the grate considerably smaller.

Cinders, with a small portion of coal, or charcoal of pit-coal, is certainly the kind of fuel to be preferred to all others; on account that it causes little smoke, and consequently the flues keep the longer clean. It might therefore be proper, where there is a considerable extent of forcing, to collect or purchase cinders, or to have charcoal made on purpose.

Fig. 2. represents the Winter pruning of three vine plants, and part of a fourth and fifth, according to my method. (See Chap. V. Sect. V.).

Plate VI. represents the plan, sections, and elevation of a green-house on an improved construction for breeding young plants, and bringing them to an early flowering state. See more on this subject in Chap. XI. Sect. I.

## SECTION VI.

*General Observations on the Construction of Hot-houses.*

I WOULD recommend the greatest substantiality in the construction of all hot-houses. The materials ought to be of the best kind, the wood well-seasoned, and the workmanship *well* performed, in a plain and neat manner. The joiner ought to be very attentive in making true and handsome joints, otherwise he may expect them to grin in his face before the end of the first year. The painter, too, ought to be careful in the performance of his part; if the colour is not well prepared and carefully applied, it will scale off by the heat of the sun in Summer. But in order to keep the wooden part of hot-houses in good repair, they require to be painted on the outside every second year, and on the inside every sixth or seventh.

In glazing, I would seriously recommend crown glass, being far superior to the common; it admits much more light in dull weather,

weather, and in sunshine allows of a larger portion of fresh air, and of keeping up the temperature at the same time, which is certainly a great object in forcing. Besides, it is furnished as cheap as the common.

The price of the superficial foot of glass varying according to the size of the squares, it is of importance not to make these too large; for instance, a square which is twelve inches on the side, and which contains just a foot of glass, is sold at tenpence; (I speak of third crown); whereas, two squares eight and a half by eight and a half inches each, and which contains the same quantity to a mere fraction, is sold at sixpence halfpenny. So that the smaller the square, the cheaper is the superficial foot of glass; and this is occasioned by the small squares being cut from the broke or waste of the large ones, which, if the manufacturer has no market for, he is under the necessity of re-melting.

From the above, I would not wish to infer that the squares should be made too small, as thereby the roof would not only be darkened by too many laps, but there would be too many astragals in the sashes  
and

and, consequently, the saving in glass might be more than counterbalanced by the price of the sash-work. The panes should be made perfectly square, however, and that for the following reason:—I find they generally split longitudinally, if not broke by accident; which is occasioned by the wood, &c. swelling and contracting by the influence of the weather. The pane is not a whit the worse; and, if it was perfectly square at first, is as useful in the same place as ever, by being taken out and reversed. For this purpose, the laps should be made half an inch at first, and will now be a quarter, which is sufficient.

I would here observe, that I disapprove of the method of puttying up the laps in glazing, as thereby foul air is confined in the house. The hot-house as much requires a free circulation of fresh air at all moments, as the dwelling-house; nay, more so: Do not the flues make foul air in the house every moment they are at work?

Earthen flues, that is, flues whose walls are of brick, and covers of tile, are to be preferred to all others; as they keep the most constant and agreeable heat of any,  
and



and are also best adapted to the purpose of steaming, where required. The soles of the flues should be supported from their foundations, in order that the heat may escape from under them, and be diffused through the house. A cavity of three inches is sufficient for this purpose; but the wider the spaces between the *pillarets*, the better. Consequently, where pavement-slugs can be had, they should be used; if not, large tiles should be made purposely.

Where fire-brick and fire-clay can be procured, all hot-house furnaces, and about ten feet of the flue next to them, should be built therewith. This is more expensive at first; but in the end will be found to be a great saving, as they will last for many years without needing repair.

Neat wooden or leaden spouts should be carried under the eaving, and conducted to a cistern placed in some convenient part of the hot-house. No water is equal to that which falls from the heavens; and a very considerable quantity may be collected in this way.

In

In very wide houses, it is customary to erect light wooden or iron pillars to support the rafters, which are frequently a greater nuisance than ornament. This is done, not altogether because of the inability of the rafters to bear the weight of the sashes; but because the rafters fall down in the middle, which they would even do by their own weight, and obstruct the free running of the sashes, in the admission of air, &c. There is a method of obviating this matter, and rendering the pillars useless; which, though very simple, is perhaps not generally understood, and therefore may be worth the relating.

Suppose the rafter nine inches deep at either end, let it be made ten in the middle, rounding it gradually away to the extremities; whereby, when it comes to settle, the surface will become perfectly straight. This must be understood of the upper surface of the rafter and the sash-beds, and not of the under side; which last will become roundish as it subsides. This is what is termed, "cambering the rafter."

In trellising, iron-wire is a great improvement, especially when placed on the roof, as in Fig. 1. Plate III. It is not only more durable than wood, but is nearly as cheap at first, and is much lighter and neater. It should be well painted, to prevent it from rusting.

Hot-bed frames should be made with screw-bolts at the corners, in order that they may be laid up when not at work, which is a great preservation to them. They generally experience more decay by being tossed about and exposed to the weather in Winter, than in all the time they are at work in Spring and Summer.

I shall conclude this Chapter by observing, that, where there is an extensive variety of hot-houses, it is not only more convenient, but also more elegant, to have them standing in a range, than detached from each other. In this, uniformity ought to be studied. For instance, if there is a green-house, place it in the centre; and the other forcing houses in pairs, right and left, corresponding with each other respectively.

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Although

Although I have made the grape and peach houses fifteen feet high each, and the pine-stove only twelve; yet, for the sake of the above uniformity, the stove might be made of equal height with them; observing to raise the bark-bed in the same proportion, that the pine plants may not stand too far from the glass.

BOOK

## BOOK SECOND.

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# THE FRUIT GARDENER.

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### CHAPTER I.

ON THE MAKING OF FRUIT-TREE BORDERS ;  
PLANTING AND TRAINING FRUIT-TREES  
AGAINST WALLS, ESPALIERS, &c.

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### SECTION I.

*On the Construction and Situation of Garden-Walls and  
Espaliers.*

**T**HIS is a matter of great importance :  
A garden without shelter and a tolerably good soil, so far as respects the production of fruit, will remain, comparatively, a wilderness. Therefore, the greatest care is necessary in the choice of the site

of the garden ; and it is frequently very difficult to find both a sheltered situation and a kindly soil. The last object, however, in my opinion, ought to give way to the first, for the following reasons :—In a complete garden, different kinds of soil are absolutely necessary, particularly for the fruit-tree borders ; and were the soil ever so bad, there is no difficulty in rendering it otherwise, in the space of a few months ; but where shelter is wanting, many years, even where the soil is good, are requisite to the production of it, in a tolerable degree.

A fine\* garden is certainly a great luxury ; and surely nobody would be at the expence of building and planting one, who

\* The garden at Wemyss Castle is placed in the middle of a plantation whose trees are an hundred feet high ; for the site of which, and also the shrubby, the whole ground was to clear. The half at least of the soil now within the walls was brought from the fields. The fruit-tree borders were all entirely made, and generally cut out of the rock ; none of which are less than a yard deep. This was done merely for the sake of shelter ; as there are situations hard by, where the soil is excellent, but without shelter. The garden was begun and finished within sixteen months.

who would not also wish to see it in perfection, and partake of its fruits. As, then, as it is presumed, it will never arrive to that perfection in this country without shelter, which it may with it ; it is surely preferable to lay down a garden in a sheltered situation with a bad soil, to laying it down in an unsheltered one with a good soil ; since the one may be remedied in a few months, and the other, perhaps, not in a lifetime.

The happiest situation for a garden is, a gently elevated hill, having a south, south-east, or south-west aspect, encompassed on all sides with plantations at the distance of about one hundred yards from its walls. In this case, it should be made a parallelogram, whose breadth is equal to two-thirds of its length, (according to the size required), extending in length from east to west. This is not only the handsomest and most-approved form of a garden ; but it gives greater length of a south aspect than when made square. If the garden is very extensive, it should be equally divided by a wall running north and south.

Between the fore-mentioned plantations and walls, should be made a belt of low shrubby, walk, and border; that the walls may be covered on all sides with fruit-trees.

Brick is certainly the best material for the construction of garden-walls; as being both better adapted to training, and of a more kindly nature for the trees, than stone: and where the wall is not entirely composed of brick, it should at least be *lined* \*. But where these cannot be procured,

\* We have heard much of late, concerning the *propriety* of constructing garden-walls of brick: I have said above, that *brick is certainly the best material*. I said so, in my first edition of this work, five years ago; and from every observation I have made, in a pretty extensive practice, I venture to hazard the same opinion now. That *black whin-stone* is the next best material, I am fully persuaded: not altogether because that *black* absorbs heat more than any colour, having proved black bricks to be superior; but that this species of stone is less porous than those of the free-stone kinds. I have moreover found, that although brick is more porous than stone in general, and consequently, absorbs moisture more readily; yet it also sooner expels moisture than stone of any kind. Perhaps, therefore, if we wish to arrive at the climax of perfection in this particular, we ought to put our garden-walls in mourning!



cured, and the wall is to be built of stone, it should not be built in that rough, and irregular manner, which is too prevalent; but should be neatly done in courses of not more than six inches, and the surface in some measure should be dressed with the iron, and rendered somewhat smooth for the trees being trained against, without the fear of having their bark ruffled in windy weather.

Much has been said concerning copping of garden-walls: some advising that there be no projection; and others three, four, and some six, inches of projection; in order to throw the drip off the foliage. All which, in my opinion, is of no importance whatever. The quantity of rain that falls on a *two-foot wall* is but trifling; and does it not frequently happen, that the wind dashes it against the tree ere it fall to the ground, in either case \*?

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\* A temporary copping of boards, projecting perhaps a foot, is certainly of infinite service to the trees in the spring, while in bloom, in diverting or repelling the *perpendicular frosts*: But these frosts are less hurtful than *frosty winds*, which fall not perpendicularly. Therefore, as a complete remedy for both, I would advise the application of canvas screens, or nets, as recommended in Sect. XI. of Chap. VIII.

The handsomest and most useful manner of copping is, to bevel off the stone to the thickness of two inches on each side of the wall, and give it as much projection; with a groove underneath, as is commonly practised.

The most eligible height for a garden-wall, and that which suits the generality of fruit-trees best, is fifteen feet; but where uniformity is studied, the height of the walls should correspond with the extent of the garden, or rather with the apparent extent. However, I would wish the extremes to be fixed at ten and eighteen feet. I would be understood here, as speaking of the height above the surface. And let it be observed, that no garden-wall should be founded less than three feet, most kinds of trees requiring a yard of soil.

Espaliers are not only ornamental, but useful, in the garden, and are much to be preferred to standards; which both overshadow the crops, and are liable to be shaken with boisterous winds, much to their detriment in the flowering and setting seasons. But, being neatly dressed to a rail, many kinds of apples and pears will  
produce

produce as well in this manner, as if trained to a wall.

Espaliers are generally, with the greatest propriety, run parallel to the walls on the opposite side of the walk, and at the distance of three or four feet from it. They are also run on each side of the other principal walks which divide the garden, at the above distance from their edges; which, when well covered with healthy trees, form handsome avenues.

For a representation of part of an approved espalier-rail, see Fig. 3. Plate II.



## SECTION II.

*On the Breadth, Depth, and Composition of the different Borders, for Apricots, Apples, Cherries, Figs, Pears, and Plums.*

**B**Y the rules of proportion in laying out of gardens, the border should be as broad as the wall is high; and the walk half as much. In this rule there is no variation, unless the wall is less than twelve feet in height, which, in my opinion, ought seldom to be the case; but if it is so, the border

border should not be less. For espaliers, twelve feet is the medium breadth.

The depth for apricots, apples, cherries, and figs, should be from two to three feet; that is, three feet at the wall, and two at the walk: and for pears and plums, four at the wall, and three at the walk.

If the situation is wet, and the bottom a cankering gravel or clay, which is far from being an eligible situation for a garden, drains must be run along the front of the border to the depth of the bottom, to carry off the wet; and a kindly bed must be made for the soil. This is most generally done by paving with stone or brick, but it is attended with an enormous expence; and if the bottom is not previously rendered quite dry by draining, it is of little use. Therefore, let the draining be carefully performed; and practise the following method in making a bottom: which will be found to be preferable to any pavement, and much less expensive.—

Let the bottom be laid, in a sloping manner, from the wall to the drain, having a fall of six inches. First, lay two inches of good loam, of any kind, which spread  
smooth,

smooth, and pass the roller over; then, the same quantity of clean pit or river gravel, which also gently settle with the roller; over this, lay a second course of loam, to the depth of an inch only, and likewise pass the roller over it. All this must be done while the materials are in a pretty dry state. But now the whole is to be made a little moist, and rolled till the surface becomes glazed; after which, water and roll alternately till it acquires a hard, shining consistency, and the gravel is in a considerable degree appearing through the loam.

Thus will a bottom be formed, which no roots will penetrate, of a more kindly nature, and at a much less expence, than brick or stone.

The fittest composition for apricots, apples, cherries, and figs, is—three-fourths light sandy loam, and one-fourth strong clayey loam, mixed with a competent quantity of stable-dung, cow-dung, and marl, in compost; the apricots and figs requiring considerably more dung than the apples and cherries. For pears and plums—three-fourths

fourths strong clayey loam, and one-fourth light sandy loam, mixed well with compost, as above.

Yet I would by no means wish to infer, that of such composition *only* should fruit borders be made; it being clear to demonstration, that trees thrive and produce fruit well, in different soils: but where the above materials can be procured, I would recommend a near conformity to this composition, breadth, and depth.

To follow this mode of preparing fruit-tree borders, it is necessary to class the different kinds of trees; that is, to keep the pears and plums by themselves, and also the apples, cherries, &c. by themselves. And this may easily be done, although some of each are placed on the same aspect; it is only determining on the quantity and space to be allowed for each kind, before preparing the border.

The compost should be duly prepared before planting, by trenching and mixing it well two or three several times. And, in order to keep the mould in *heart*, a little well-reduced dung, or other compost manure, should be digged-in each season; being

being careful not to injure the roots of the trees in the operation.

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SECTION III.

On the different Kinds of the above Trees adapted to this Climate; the Aspect they should be placed in; and the Distance from each other, according to the Height of the Wall, &c.

THE following is a list for the walls, and the aspect they should be placed in; out of which, those marked thus * are to be preferred.—But observe, I do not wish to dictate in this: every one has a right to choose the kind that suits his fancy, and to place it in the situation or aspect in which it most likely will succeed.

Names.	Aspect.
<i>Apples.</i>	
* Golden Pippin, - -	S.
Stone or Gogar do. - -	S. E. W.
* Ribston do. - -	S. E. W.
Newton do. - -	S. E. W.
* Balgon do. - -	S.
* Golden Rennet, - -	S.
* Golden Ruffet, - -	S.
Royal do. - -	N. E. W.
	Names.

Names.	Aspect.
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Apples.

* Wheelers do.	- -	E. W.
* Nonpareil do.	- -	S.
Nonfuch,	- -	N. E. W.
Hawthorndean,	- -	N. E. W.

Apricots.

* Orange,	- -	S. E. W.
Roman,	- -	S. E. W.
* Bruffels,	- -	S. E. W.
* Breda,	- -	S. E. W.
Turkey,	- -	S. E. W.
* More Park,	- -	S.

Cherries.

* May Duke,	- -	N. S. E. W.
Arch-Duke,	- -	S. E. W.
* Holeman's Duke,	- -	S. E. W.
* Black Heart,	- -	S. E. W.
* White do.	- -	S. E. W.
Harrifon's do.	- -	S. E. W.
Kentish,	- -	N. E. W.
* Morella,	- -	N. E. W.

Figs.

* Blue Ifchia,	- -	S.
* Brown do.	- -	S.
* White do.	- -	S.
Black do.	- -	S.
* Black Genoa,	- -	S.
Brown Naples,	- -	S.

Names.

Names.	Aspect.
<i>Pears.</i>	
* Jargonelle, - -	N. S. E. W
Summer Bergamot, -	S. E. W.
* Autumn do. - -	S. E. W.
* Swifs do. - -	S. E. W.
Orange do. - -	S. E. W.
* Ganfell's do. - -	S. E. W.
* Creffane do. - -	S.
Chaumontelle, - -	S.
* Burie de Roy, - -	S. E. W.
Terling, - -	S. E. W.
Swan Egg, - -	E. W.
* Grey Achan, - -	N. E. W.
Colmar, - -	S. E. W.
St Germain's, - -	E. W.
* Green Yair, - -	N. E. W.
* Black Worcester, -	N. E. W.
Cadilac. - -	N. E. W.
Warden, - -	N. E. W.

Plums.

* White Magnum Bonum,	S. E. W.
Red do. - -	E. W.
* Green Gage, - -	S.
* Yellow Gage, - -	S.
* La Royale, - -	S.
* Imperatrice, - -	S. E. W.

The

The following is a list for the espaliers ; and, as these are generally equally and freely exposed, may be placed indiscriminately.—

Apples.

- * Ribston Pippin.
- Kentish do.
- * Oslin do.
- English Codling.
- * Kentish do.
- * Royal do.
- Dutch do.
- * Royal Ruffet.
- Wheeler's do.
- * Summer Pearmain.
- * Royal do.
- * Loan's do.
- Green Leadington.
- * Grey do.
- Yellow do.
- * Summer Queening.
- * Winter do.
- * Yorkshire Green.
- Nonfuch.
- * Hawthorndean.
- Lady Wemyfs.
- * Norfolk Beafing.
- Strawberry.
- Purfemouth.

Cherries.

- * May Duke.
- Black Heart.

- * Kentish.
- * Morella.

Pears.

- * Crauford.
- * Jargonelle.
- * Yair.
- * Black Worcester.
- * Cadilac.
- Warden.
- * Achan.
- Moorfowl Egg.
- Drummond.
- Summer Bergamot.
- Scotch do.
- Lammas.

Plums.

- * Orlean.
- * White magnum bonum.
- Red do. do.
- Drap d'Or.
- * Wine Sour.
- * Damask.

—
Out of which, those marked thus * are to be preferred.

The

The following is what I esteem a proper distance at which the above trees should ultimately stand on the wall: but, as they will be many years in filling their spaces, and as in most kinds a few crops may reasonably be expected before that time, riders of cherries, pears, and plums, may be placed between them.

For a wall twelve feet high:—the apples to be placed at twenty; apricots, thirty; cherries, twenty; figs twelve; pears thirty; and plums, twenty feet apart. And for a wall fifteen feet high—apples, fifteen; apricots, twenty-four; cherries, fifteen; figs, ten; pears, twenty-four; and plums, fifteen feet apart. And so in the same proportion for walls of any height from ten to eighteen feet, which, as I have already hinted, ought to be the extremes.

For espaliers:—apples, thirty; cherries, twenty; pears, thirty; and plums, twenty feet apart. But these should be planted at double thickness, placing two of a kind
R together,

together, that, in thinning them out, any of the kinds may not be extirpated.

Maiden trees, of all the kinds, ought to be preferred; and the season for planting is, any time from the first of December to the first of March.

The Apples should be chosen of such as are worked on crab stocks raised from seed, and the Pears on free stocks, also raised from seed. Sucker-stocks of any kind are to be rejected, on account that they cause the plants to run much into unprofitable wood. The plants of all the kinds should be clean, healthy, and well-rooted.

The pits should be filled in with rich light mould, and that for all the sorts without exception; as all trees are found to strike root most kindly in light soil, although their nature may require a very different kind afterwards. Care should also be taken not to place them too deep; if the stem is covered two inches higher than it was when standing in the nursery, it is sufficient. It should be placed two or three inches clear of the wall; for, if placed too near,

near, that is, touching it, it has the effect of throwing the branches forward when they come to be of strength; so that they are with difficulty kept properly dressed. To say that the *roots* of the plants are injured more or less by its being placed a few inches nearer to, or farther from the wall, would be absurd; and yet this has been advanced.

Let them be settled with a little water, and duly attended to with that element in dry weather, the whole of the first Summer. Also, let a little mulch be laid round each of them; which will tend to keep their roots from being injured by the frost in Winter, and the early part of Spring, and also from being scorched by the sun in Summer.

SECTION IV.

On Training the different Kinds of the above Trees on Walls and Espaliers.

I. APPLES. THESE trees may be trained either in the horizontal or fan manner, with facility. But I

prefer the fan manner, not only for them, but for all other trees planted against walls; for these reasons, viz. We can make the tree fill its space sooner by one-third of the time, and can also supply the loss of a branch with greater ease at any period of its age. But for Apples on espaliers, or on very low walls, the horizontal method of training is to be preferred; as the height of the espalier, &c. will not admit of fan training in a handsome manner. I shall, therefore, first treat of *fan-training*, as for walls, and then of *horizontal training*, as for espaliers.

Fan-Training.—After planting, let each of the shoots be headed down to three eyes, in order to make them push strong, and furnish the wall from the bottom; and when the young shoots have grown so long as to admit of being laid in, lay one on each side, that is, the lowest, perfectly horizontal, and divide the intermediate ones equally at the distance of ten or twelve inches. In the Winter, shorten them all back to from one-half to two-thirds

thirds of their lengths, according to their strength.

Next season, they will push vigorously. The undermost shoots on each side are to be continued in a horizontal direction, as before; and the others should be laid in at the distance of from nine to twelve inches, according to their strength, and kind of the trees, some growing more gross, both in wood and foliage, than others; and, in Winter, they are to be shortened back about one-fourth of their lengths on a medium. Whatever laterals appear on them at any time should be instantly pinched off.

Next season they will push strong shoots; and many of the kinds will begin to shew fruit-spurs on the last year's wood. They will also push many superfluous shoots; which must be pinched off at the second joint, by the time they have grown to the length of eight or nine. Some rub off these as they appear; but as this frequently ruffles the bark, and thereby injures the tree, it is better to pinch them as above in Summer, and cut them clean off in the

Winter pruning : but if they push a second time in the course of the Summer, they are, in that case, to be rubbed off as they appear.

Continue the undermost shoot on each side in the same horizontal direction, which is to be invariably done till the trees meet each other ; and lay in the rest at the distance of twelve inches on a medium. And, in the Winter pruning, shorten the strongest and farthest extended shoots *only* a few inches each, and lay the others in at full length ; unless it is necessary to shorten some of them a little, for the purpose of making shoots to fill any thin part.

This is forthwith to be done in the Winter prunings, never shortening for any purpose but that of filling the wall regularly ; and the medium distance at which the branches are to be placed from each other, is nine inches in the small, and twelve in the large growing kinds. At this time, also, are the superfluous shoots, that were produced and shortened in Summer, to be cut neatly off ; unless there be fruit-spurs formed, or forming on their under parts,
which

which in many of the kinds frequently happens.

Next season, most of the kinds will produce a few fruit, and will forthwith make more moderate shoots and plentiful fruit-spurs : and must henceforth be treated in all respects as for last year ; observing to dress them neatly and regularly to the wall at all times, and divest them of the superfluous and lateral shoots, as above directed.

Horizontal Training.—Young trees which have *three* shoots are to be preferred ; but if there are but two, the weakest must be cut clean away, and the other retained, whereof to form the tree. But, for the sake of brevity, I will suppose the tree consists of three shoots.

After planting, let the middle shoot be headed down to nine inches ; and let the two side ones be laid in at full length, in a horizontal and parallel direction, within nine inches of the ground, if possible ; and if their extremities are anywise bruised, shorten them back a few inches, that they may push freely ; but this is never to be repeated unless in like circumstances.

When the young shoots are of sufficient length, train that from the extremity of the principal stem or leader in an upright, and the two immediately below it, in a horizontal direction, right and left, and parallel to the two undermost branches of last year; which, as the stem was headed down to nine inches, will also lie at or about the same distance respectively. Produce the young shoots from the extremities of last year's branches in the same direction; and pinch off all the others, both on these and the stem, as directed for fan training.

As the horizontal shoots are never to be shortened unless their extremities are bruised by accident or hurt by the frost; and as all superfluous and lateral shoots should be treated in manner as directed above; it may be unnecessary to say more of these. I shall therefore confine my observations to the stem or leader.

As the branches are to be produced from the stem, and laid in (if possible) at the distance of nine inches on a medium; and as, in most kinds, more than two pairs cannot be produced each season without running the risk of irregularity; the stem
must

must be headed down to eighteen or twenty inches, year by year, till the horizontal branches arrive at the top of the rail, &c. But this must be understood of apples in general, and that too when they are in a moderate state of health and vigour; for some kinds, and indeed any, when in a luxuriant state, will generally produce three pairs of shoots on the stem; which, in that case, must be left from thirty to thirty-six inches in length.

Great care should be taken, when laying in the horizontal shoots which issue from the stem, that they be not split away in the operation. I generally lay them in the manner they will best lie, till they are sufficiently hardened to bear being laid in, in their proper position; and I likewise generally lay in or reserve *all* the shoots that issue from the stem, till that time, (whether needful or not), in order to guard against accidents.

II. APRICOTS.—As these trees bear both on spurs and the young shoots of last year, fan-training is certainly to be preferred. Therefore, after planting, let them be headed

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ed down, and treated the two first years, in all respects as directed above for apples; laying the shoots in at the distance of nine inches on a medium. But this is to be understood of the principal branches: for when these trees arrive at a bearing state, they frequently make fruit-spurs, or shoots of a few inches in length; which may also be suffered to lie at the distance of a few inches from each other. They also frequently make their fruit-spurs in clusters: in which case, they are to be neatly thinned out; generally reserving those which lie nearest to the wall, that the fruit produced on them may be benefited by its influence. Indeed, although spurs which stand at a distance from the wall frequently produce bloom in abundance, it is seldom the fruit sets or comes to maturity on them: and therefore they may be considered as superfluous shoots, and thinned away with them in the Winter prunings; unless they are sufficiently long to admit of being laid in, and the scarcity of blossom on the trees renders this advisable.

The breast wood produced in Summer is to be shortened back to two or three joints,

as

as directed for the apples ; and also neatly cut away in Winter ; unless bloom appear on them, which frequently happens if the tree be not in too luxuriant a state.

In pruning of Apricots, the greatest care should be taken, at all times, to make clean and handsome wounds ; and also to prevent bruises of any kind, either by the knife, hammer, or by nails bearing against the branches, which are of much injury to the trees, they being apt to canker and gum at the slightest bruise.

III. CHERRIES.—These should also be trained in the fan manner on the wall : and as all the kinds, except the Kentish and Morella, are apt to produce large clustered spurs when of age, and in a proper bearing state, they are to be allowed a distance of from nine to twelve inches between the principal branches ; observing to lay them in, and shorten them in the manner as directed above for apples. The breast wood, laterals, &c. are also to be treated in the same manner at all times ; and the same care is to be observed in respect of wounds and bruises as hinted above

above for the apricots ; Cherries, and indeed all kinds of stone fruit, being apt to canker and gum at every bruise.

The Kentish and Morella kinds, bearing principally on the young shoots of last year, they should be trained much in the manner of peaches, (See Chapter VIII. Section IV.) and are to be laid in at the distance of six inches on a medium, divesting them of all lateral and superfluous shoots, as above.

On espaliers, I have seen the attempt made to train Cherries horizontally, but I never saw it accomplished handsomely ; and would therefore advise fan-training, as above.

IV. FIGS.—These trees, bearing on the young wood of last year, being naturally apt to run upwards, and put forth suckers from the root annually, should be trained in an upright manner resembling that of the vine. The foliage being very large, they require to be laid in at the distance of a foot or fifteen inches between the young shoots : and as the distance between these is the principal object here, it is immaterial

rial how near they lie to, or even if they cover or cross the old ones. These trees are apt to grow to the extremities, and consequently run into naked branches in the centre; a succession of young shoots from the bottom should therefore be constantly encouraged.

When the trees arrive at a bearing state, which they generally will do in the course of four or five years, and as they show the fruit which is to be ripened next year on the shoots of this; let such as are not wanted for furnishing any part of the tree with wood, be stopped about the middle or end of July: which will cause them to shew and set their fruit sooner, and thereby be better established before the Winter frosts set in, than when the shoots are suffered to grow late in the season. On the open wall, this is of beneficial effect, though unnecessary in a forcing-house.

V. PEARS.—These, of all others, do best, and make the handsomest trees, in the horizontal manner; but they will fill their spaces sooner by a third, if not one half of the time, by fan-training, which is certainly

certainly a great object. On espaliers, however, horizontal training is most advisable; and also on very low walls.

As I have been pretty explicit on both these methods in the first head of this section, it will be unnecessary to repeat them here. I shall only, therefore, briefly remark any particular difference to be observed in the training of apples and Pears in either manner.

Most kinds of Pears being apt to make longer spurs than apples, the branches are to be allowed two or three inches more of room between them respectively: and as their spurs are also apt to grow more clustered than apples in general, these are to be more carefully thinned in aged trees; observing to retain such parts of them as lie nearest to the wall, in that operation.

As Pears are not so apt to show fruit-spurs on the bottom-part of the breast-shoots shortened in Summer, as apples, these are generally to be cut clean off in the Winter pruning; thus giving the more room to the real spurs, and preventing a profusion of useless and superfluous shoots from rising the following season. This matter

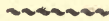
matter is but too seldom attended to in general.

As most kinds of Pears (especially if in proper soil) grow more luxuriantly when young than apples; in fan-training, the leading branches, which require to be shortened for the production of shoots to fill the wall, may be left at greater lengths in general; and in horizontal training, the stem or leader may also be left ten or twelve inches longer in Pears than apples, as they will generally produce a pair more of horizontal shoots from it. The Jargonelle, however, ought to be an exception from this rule; as I have seldom found it produce more than two pairs of shoots from the stem, in a regular manner, annually.

VI. PLUMS.—Fan-training is also to be preferred, for the reasons already given; nevertheless, they will make very handsome trees in general the horizontal way. In either case, they are to be treated much as already hinted; laying in the branches of the small growing kinds at the distance of seven or eight inches, and the others at nine or ten apart.

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The spurs in most kinds are apt to grow in clusters, and at a considerable distance from the wall; which should be thinned in the manner as directed for the apricots, as being nearly allied to them in their nature. In *fan-training*, the leading branches for the production of shoots to fill the wall, will generally require to be shortened about half their lengths, especially in the small kinds; and in the *horizontal* way, more than two pairs in the *small* kinds, and three in the others, will seldom be produced from the stem annually; which, of consequence, must be shortened to about sixteen or eighteen inches in the one case, and to about twenty-four or thirty in the other.



SECTION V.

General Observations on Training and Pruning, and on Thinning and Gathering the Fruit, &c.

THE health and beauty of a wall-tree depends more on the regular arrangement of the young, than of the old wood; and consequently, should be neatly and regularly

regularly dressed at all times ; but more particularly in the latter part of the season ; that every advantage may be taken in ripening, not only the fruit, but the shoots and spurs for the production of a crop the following season.

We too frequently see these trees totally neglected in the latter part of the season ; particularly apricots, cherries, plums, &c. ; which, when the crop is gathered, are generally no more thought of, or attended to : but this is very erroneous, as most of these trees grow a deal afterwards ; and if the extremities of the shoots are not kept dressed to the wall at this time, they will neither be ripened for the production of a crop, nor for enduring the winter frosts.

Great care should be taken that no part of the branches be bound with the shred or tie, and that the heads of the nails do not bear against them ; which, if they do, are sure to induce canker. My rule is, to drive the nail rather in an oblique direction, inclining its head *from* the branch ; and to allow as much room in the shred or tie as will at least admit another shoot

of the same size along with it; and also, never to drive nor suffer a single nail or shred to remain on any part of the tree, that is not absolutely wanted.

It is common to tie espalier trees with willow shoots; but I prefer tying with strands of fresh matting. For I have often seen branches much injured by the willow shoots, when bearing hard against them, or if neglected to be cut away in the Winter pruning; these being of a hard wirey substance, and lasting over year. But in using matting, no danger of this kind need be apprehended; as the strands are not only soft and pliable, but will not last above a year.

Winter pruning and dressing should be performed in good time, that is, before the buds begin to vegetate; otherwise they are in danger of being rubbed off in the operation. In ordinary seasons, apricots, cherries, pears, and plums, should be finished by the first, and apples and figs by the end of March.

In horizontal training, it frequently happens that the buds on the stem do not break regularly; and sometimes a bud will

will remain in a dormant state the first, and push the second year; which if it does not, make an incision crosswise to the depth of the bark, immediately above it: it will not fail to push the following season.

In what is termed a bark-bound tree, (in which case, it has a sickly appearance in general, hard and shrivelled bark, makes weak shoots, with the leaves of a languid colour, and the stem and branches frequently covered with moss), it is a good practice to rip the stem lengthwise, to the depth of the bark: but this is to be performed on apple and pear trees only; stone-fruit, from their aptness to gum, not admitting of this operation with propriety.

When a tree is in too luxuriant a state, and does not set to fruit, the knife should be used sparingly, keeping it rather thick of wood (but regular) for a season or two; and at the same time let a trench be dug round its stem, at the distance of four or five feet from it, so as to cut quite through all its roots. The check, which it thereby receives, will generally throw

it into a bearing state in the course of a season or two.

In pruning, be careful to make clean and handsome wounds at all times; using the knife chiefly; but the saw in amputating strong branches, and dressing the edges of the wound, thus made, smooth with the knife. In lopping branches from the stem, or twigs from larger branches, cut always in to the level of the bark, leaving no stub. And, if from the position of the wound on large branches, or on the stem, particularly in aged trees, there is reason to doubt its healing easily, let it be laid over with a little tar; which afterwards keep in a sound state, in order to exclude moisture till the wound is quite healed, and skinned over with fresh bark.

It frequently happens, that after much pains has been taken in rearing and training a tree, it turns out to be of a very different kind from that for which it was planted: which is a great disappointment, as perhaps it occupies a space upon a much better aspect than it deserves; and were it to be removed, would occasion an
unightly

unfightly blank on the wall for several years, until a young tree filled its place. But, to remedy this, at least in a considerable degree, it is more advisable to ingraft or inoculate (according to the kind of tree) proper kinds upon its branches: in a *horizontal-trained* tree, near to the stem; and in a *fan-trained* tree, towards the bottom and lower extremities.

On the stems or branches of trees which have become naked of shoots through age, buds or grafts may be inserted, in order to restore them to regularity; but if the tree is not in a healthy, clean state, this labour would be in vain. In some cases, if the tree in question be of a good kind, it may be more advisable to head it down entirely, that a stock of wood may issue from the bottom, afterwards to be trained regularly: observing, however, not to cut *below* the original bud or graft.

In this variable climate, our prospect of a crop is frequently blasted in Spring, while the trees are in bloom and setting, especially in apricots, cherries, and plums. To secure which, canvas-screens being applied, or nets suspended, as directed in

Chap. VIII. Sect. XI. will be found of infinite advantage, and preferable to the common method of screening with fir-boughs.

Apples, apricots, and pears, in favourable seasons, are apt to set more fruit than the tree is able to sustain, or should be allowed to produce: the fruit should therefore be regularly thinned; the apples and pears when about half grown, and the apricots when the stoning is fairly over. But, as no fixed rule can be given for this operation, the discretion of the gardener must be relied on; and the health and vigour of the trees must determine to what extent it is to be performed. In the More Park apricot, however, a fruit for every ten or twelve inches square of the superficial content of the tree, when in a healthy state, will be a good medium. This, by many, is esteemed the richest of all stone-fruit, when well ripened, and ate off the tree.

What I have said in Chapter VIII. Section VIII., in respect of gathering peaches and nectarines, will equally apply here in respect of apricots and plums.

Jargonelle

Jargonelle pears, and some of the kinds of bergamots, should be ate off the tree, or at least within twenty-four hours after being pulled, as they lose much of their flavour by keeping. The other kinds of apples, and pears in general, should not be gathered till their pips are of a blackish-brown colour, and they should then be laid in the store-room ; which, for that purpose, should be fitted up with shallow shelves, so as to admit of but one course of the fruit, and room for the hand.

Hence it would appear, that I disapprove of what is termed *sweating* of these fruits :—they generally retain an ill flavour ever after.

The greatest care should be taken to prevent bruises in these fruits, and they should be frequently looked over and picked. The store-room should also be kept well aired, and secured from frost.

SECTION VI.

On the Insects which generally infest Wall-Trees; and how to destroy them.

THESE are, the green-fly, red-spider, caterpillar, grub, ear-wig, wood-louse, and wasp.

The green-fly is easily destroyed by a fumigation of tobacco; but this is sometimes performed with difficulty on open walls. My method is this:—Sprinkle the tree gently with water from the engine; then fumigate for the space of eight or ten minutes with the bellows, when the vermin will be quite sick; and afterwards give a hearty washing with the engine; by which means they are dashed to the ground, which dig over in order to bury them. This operation should be performed in a calm morning or evening; otherwise the smoke is immediately dissipated, and, of consequence, is the less effectual.

The red-spider and grub are kept under with the engine in Summer, and effectually destroyed in Winter by the *liquor*, see Chap. III. Sect. VII., which is to be applied

plied in a milk-warm state with the sponge, as there directed. It must also be applied at least a month before the buds begin to vegetate.

For ensnaring and catching the ear-wig and wood-louse, the following is my method:—Take a quantity of water reeds or strong wheat straw, and cut them into lengths of five or six inches; place them all over the surface of the tree, between the branches and wall, allowing two or three to every square yard; also lay a quantity on the ground at the bottom of the wall. In these the insects take shelter so soon as the morning sun appears on the surface of the wall; which, in an hour or two after, are to be blown into a bottle having a little water in it, replaced as before, and this should be repeated every morning in the same manner till they are quite eradicated; which will generally be very soon accomplished, as they may be taken in vast quantities in this manner.

The only sure method of keeping the wasps under, is by destroying their nests*; but in rugged and rocky places this is not easily accomplished. They are also ensna-

red

* See Chapter V. Section X.

red in great quantities by placing phials filled with honey and water, or fugar and small beer, against the walls; also, by suspending small sticks covered with bird-lime, over which a little honey and water is poured at times.

The green-fly preys most on the peach, plum, and cherry; the red-spider on the apple, cherry, peach, and plum; the grub on the apricot and cherry, and sometimes on the apple and pear; and the ear-wig, wood-louse, and wasp, on the fruits of all.

Washing with the garden engine is of infinite service to wall-trees, and should be frequently performed in dry weather in the Summer months: it both refreshes, and keeps the trees clear of dust, &c., and also tends, in a great measure, to suppress insects of all kinds, particularly the red-spider.

Washing the stem and branches of trees, which are anywise mossed, with soap-suds and sulphur, is also of great utility, and should be performed in Winter or early in the Spring; previously rubbing off the moss with the hand, and brushing the branches clean with a brush, such as is used for cleaning of plate, &c.

CHAPTER II.

CULTURE OF ORCHARD FRUITS.

SECTION I.

On the SITUATION for Orchards.

ORCHARDS in this part of the united kingdom (Scotland) are an object of trivial concern at present; for, excepting those of Clydesdale, some in the Carse of Gowrie, and a few near Jedburgh, there are none of any note. It is certain, we (in Scotland) need not expect to cope with our sister country, in this respect; but it is equally certain, there is a possibility of imitating, and even nearly approaching her, in the productions of the Orchard; or at least so far as to answer the consumpt of the country, in good seasons.

The productions of those in Clydesdale, which in some seasons is astonishing, are a proof in point, and these are neither extensive, nor (excepting one) even kept in tolerable

lerable order. They are, however, capable of very great improvement, and with little expence and labour might be rendered productive in treble or quadruple proportion, *on an average of years.*

Their situations, and indeed the whole bank of the river, from the Falls of Clyde to Hamilton, and thence to Bothwell Castle, &c. are so peculiarly adapted to the purpose, that I am convinced the proprietors could not occupy their land in any other way that would give a fourth of the return. The banks are in general steep, and in many places inaccessible to the plough; and these very *steeps* are beyond all other situations desirable for that purpose, especially those on the north side of the river, being exposed to the sun, the banks reflecting his rays, and rendering the situation in some degree as if the trees were planted against a wall.

In this tract we find many acres covered with broom, bramble, brushwood, &c. which at present do not bring the proprietors, perhaps, ten shillings an acre; and which are so admirably situated, and the soil so congenial, that were they converted

ed

ed into orchards, might, in a few years, bring *fifty pounds* on an average*.

This peculiarity of situation is not confined to Clydesdale. There are many other dales in Scotland equally well adapted to the purpose. But dales, and those through which a river meanders, are to be chosen in preference to all other situations: *Because*, first, their banks afford shelter from the winds by their frequent windings and turnings; secondly, their steep sides confine and reflect the rays of the sun, whereby the climate is rendered more mild and warm than in other situations; and, thirdly, there is a constant vapour or effluvia arising from the river, which is particularly grateful to the trees while in bloom and setting; and also tends to *soften the climate* at that season of the year,

* There is a proof of more than I say, on the spot lately improved by Mr Harvey of Brownlee: it is a very steep bank, was overrun with bramble, briar, &c. and does not contain above an acre and an half, the far greater part of which is not yet arrived at a full bearing state; yet, this spot for some years back, has produced from seventy to *one hundred pounds* a year to the proprietor, who, as an *improver* in this, as well as many other respects, is a Gentleman of much merit.

year, which is frequently inimical to the setting of fruit in other situations.

In this case, the most desirable situation is the North, East, or West bank *, from the verge of the river (including the haugh or holm, if such there be) to within a few yards of the termination of the bank, more or less according to its steepness, so that the trees, when full grown, may be *within its level*, and thereby be screened from the Northern and other prevailing winds.

The haugh or holm on the opposite side of the river, and also the banks, if not very steep, in many cases may answer very well; but if the bank is very steep, and the soil not particularly inviting, its occupation as an orchard will be attended with inferior success.

Many dales without a "river meandering," may also prove excellent situations; and many spots *in any dale* may prove more so than others; which may be occasioned by the super-excellence of soil, congeniality of subsoil, peculiarity of exposure,

* Supposing the river to run parallel to any of these aspects, or to any aspect from East to West.

sure, ease of access, happiness of shelter, &c. But,

Unsheltered plains are situations, where success in rearing and bringing orchards to a state of maturity, will ever be precarious in this country.

SECTION II.

On the Soil for Orchards.

THE soil *most properly* adapted to apples, is a brown loam of a middling texture, and which is at least eighteen inches deep, over a bottom of dry sand, gravel, or soft clay; in which they are found in the highest health, and of greatest durability. Nevertheless, they will do well in many soils, such as sandy loams, gravelly loams, chalky loams, clayey loams, &c. which are of various depths, and which are also incumbent on various substrata, as chalk, limestone, dry rock, sand, clean gravel, &c. But if the bottom is wet, and the subsoil a till, retentive clay, or iron gravel, clay, &c. little good may be expected

expected of them for any length of time, if the upper foil be ever fo good.

That *moft properly* adapted to Pears, is a ftrong clayey loam, a yard in depth, over a bottom as above. The fame exceptions as above, are alfo to be confidered.

Cherries and Plums are of little importance compared with Apples and Pears, being of no ufe whatever, unlefs there is an immediate confumption for them, from the circumftance of their *not keeping*. The foil which answers Apples and Pears, will answer Cherries and Plums refpectively, and equally well.

It would be vain to attempt rearing an orchard, where the bottom is not either naturally dry, or is previously rendered fo by draining; and this is to be obferved in all cafes and fituations whatever.

This reflection more naturally occurs in refpect of flat or hollow ground, than otherwife; but it is as frequently neceffary on fteep banks, which are often interperfed with fpouty or fpringy fports, occafioned by the different ftrata of which the higher ground is compofed. To enter, however, into a fyftematic mode of draining,

draining, would be foreign to the subject here; and the reader is referred to Mr Elkington's, as explained by Mr Johnstone; being at once the most effectual and least expensive method.

SECTION III.

On the Kinds of MANURE fit for Orchards.

ORCHARD ground should be moderately enriched with the kinds most properly applicable to the soil. Compost is to be preferred to simples.

If the soil is of a cold nature, a compost of lime, stable-dung, pigeon-dung, soot, ashes, &c. is to be advised; if light and hot, cow-dung, hogs-dung, loamy marl, pond-mud, scouring of ditches, &c.; or, as simples, any of the kinds which is best calculated to correct or enrich the soil. Marls are *eminently* useful, and, in general, are to be preferred to lime, being less apt to canker the roots of fruit-trees.

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SECTION IV.

*Of the KINDS of Orchard Fruits.*

THE kinds in cultivation at present, in my opinion, are too numerous. They are also very indistinct, being confused and misconstrued, by the many provincial names which are given for the same fruit. He who plants an orchard, has the undoubted right of indulgence in this respect. The following list is given as the one which I would adopt, were I in the predicament, preferring those marked \*, viz.

*Apples.*

- \* Ribston Pippin.
- \* Oslin do.
- \* Royal Codling.
- Kentish do.
- Dutch do.
- \* Royal Ruffet.
- \* Royal Pearmain.
- Loan's do.
- \* Summer do.
- \* Golden Rennet.

*Apples.*

- Kentish Rennet.
- \* Leadington.
- Summer Queening.
- Winter do.
- \* Yorkshire Green.
- Margill.
- Nonfuch.
- \* White Hawthornden.
- \* Norfolk Beasing.
- Strawberry.

*Pears.*

*Pears.*

- Drummond.  
 \* Longueville.  
 \* Jargonelle.  
 Lammas.  
 Crauford.  
 \* Green Yair.  
 \* Achan.  
 \* Scotch Bergamot.  
 Summer do.  
 Worcester.  
 Cadilac.  
 Warden.

*Cherries.*

- \* May Duke.  
 \* Black Heart.  
 \* Kentish.  
 \* Morella.

*Plums.*

- \* Wine Sour  
 \* Orleans.  
 \* Green Gage.  
 \* Blue do.  
 \* Yellow do.  
 \* White & Red Mag. Bon.  
 \* Damask.

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SECTION V.

CULTURE.

BEFORE planting, the soil is to be trenched to its full depth; and the manure well incorporated with it in the operation.

Maiden trees of all the kinds are to be preferred, having boles of three, or four feet in length, the apples being worked on crab, and the pears on free stocks. The distance at which they should ultimately stand is, thirty feet either way, for Apples

and Pears. For Plums and Cherries, six feet less respectively.

As I by no means approve of *a mixture of crops*, or even of an under crop as a reimbursement for present expence, I would advise planting four trees for one that is to stand for good ; that is, at fifteen feet each way for Apples and Pears, and at twelve for Plums and Cherries. Three of these must be considered and treated as temporary trees from the beginning, and ought to be chosen of the least durable, and at the same time, soonest bearing kinds ; such as the Nonsuch and Hawthornden apples ; Crauford and Yair pears ; May Duke and Morella cherries, &c. which may be interspersed as *temporaries* amongst all kinds without discrimination.

The season for planting is from November to March, with equal success. The pits should be filled in with light compost of earth and manure, for all kinds, except the Nonsuch Apple, which is most durable, and also generally most fruitful without manure at any time ; wherefore, in the annual dressing, manuring, &c. this tree

tree is to be an exception, so far as not to injure the others by its treatment or neglect.

If the first Summer proves dry and hot, let the trees be frequently watered; and, in order to retain the moisture, let a little dung or other litter be kept round them on the surface.

The only indulgence which I would subscribe to, in respect of an *under crop* is, a single row of Beans, Cabbage, Carrot, Peas, Potatoes, Turnip, &c. in the centre between the trees, and that only for a few years, and with a view of defraying the expence of hoeing and keeping the ground clean of weeds, &c. which is invariably to be done for the first ten or twelve years, or till the temporaries are removed. By this time the principals will be so far established in the soil, and advanced in strength and size, that the ground may safely be laid down in grass, so to remain, that their roots be no further disturbed for seven or eight years; after which, it is to be periodically broke up every fifth or sixth, and moderately manured.

Previous to this, let a moderate quantity of manure be digged in every second year, observing to dig deepest, and apply most of the manure *beyond* the extremities of the roots, thereby preparing *food* for them as they advance.

The criterion for relinquishing the practice of *under cropping*, is, when the roots of the trees respectively come into contact.

SECTION VI.

On PRUNING, &c.

JUDICIOUS pruning is of the utmost consequence, both to the welfare of the tree, and to the production of beautiful and well-sized fruit. That old trees produce diminutive fruit, is not, perhaps, altogether because of their *age*, but because of the want of judicious and timely pruning; and as old, or at least established trees; are the surest bearers in general, it is *subject of regret* that so many instances are found of total neglect in this particular.

particular. In all the Clydesdale orchards, there is *not one tree in fifty* in proper order in this respect.

From the day the tree is planted, to the day in which it is no longer suffered to “encumber the earth,” it should undergo an annual *visitation* of the “pruning hook,” which should be in the hand of one “who knoweth the fruitful and profitable branch, from the unfruitful, and that which is naught, and perisheth.”

This operation, however, is to be performed with caution and moderation, especially on young trees; as too free an use of the knife is attended with the consequence of too great a profusion of young shoots the following season. The tree should be kept moderately thin, and free of branches crossing one another, endeavouring to have every part of it regular, and fanned out towards the extremities; also, thinning out the clustered spurs (as in many kinds they form too thick) regularly, and cutting out such as are rotten, bruised, &c.

Let the temporary trees be thinned away, as the principals advance towards

each other, and, by the time their extremities meet, let them be entirely stubbed up.

In aged trees, which have been neglected, and are too thick of wood, spurs, &c. the pruning *saw* and *knife* should be used with freedom at first, and that in every part of the tree, without discrimination of fruitful or unfruitful branches.

By the judicious performance of this operation, it is incredible in what astonishing degree a tree will *renew its age*; and will forthwith for many years flourish, and produce excellent crops of fruit.

The season for performing the above operations, is any time from October to March, but after that time it is not advisable to handle fruit-trees, as the buds then begin to vegetate, and are easily displaced.

It is no uncommon thing to see apple, pear, and plum trees, &c. in a great measure destroyed by *moss*. This is most generally occasioned, by the roots having *touched a cankering bottom*; but it is also frequently occasioned by the tree being kept too thick of wood, and consequently of foliage, which confines stagnant air
about

about its branches, in dull hazy weather. It is of less *bad* consequence, if this is confined to the trunk, or strong branches only; but if the extremities and fruit-spurs are affected, the juices will be obstructed in their circulation, and consequently the fruit will be more immediately injured.

Therefore the moss should be rubbed off every pruning season, and the branches and spurs should be anointed every second or third, with a solution of sulphur and soap-suds, in the following proportion, viz. one pound soft soap, one pound flowers of sulphur, six gallons river or rain water, boiled all together for half an hour—applied when milk warm with a sponge.

If the trees are afflicted with the caterpillar, or grub, which is frequently the case, the liquor, see p. 62, must be used instead of the above, being careful to anoint the *eyes of the buds*, as it is *there* the eggs of the insects are chiefly lodged, whence they issue with the young shoot, and inclose themselves in the leaves, on which they feed, or perforate to the very great injury, and frequently the total destruction of the
foliage;

foliage ; and consequently to the detriment and ultimate ruin of the tree.

SECTION VII.

Of CATTLE in Orchards.

IT is a prevalent custom to *pasture* in orchards.—I disapprove of the practice. It is too frequently the cause of total neglect of the *fruit* ; the trees being often left unguarded, and consequently much damaged by the cattle browsing on the branches, and rubbing themselves against the boles.

Pasturing of sheep is attended with equally bad (if not worse) consequences ; as nothing is more pernicious than the oil or grease, which exudes from their wool, in rubbing themselves ; which, if often repeated on the same tree, and this is almost always the case, this animal instinctively following example, more than any other, has the effect of completely closing the pores of the trunk so rubbed, much to its detriment.

But

But I have other objections than these to this practice, viz. 1st, Until the trees have been about fifteen years in the ground, are well established, and the temporaries are all removed, the ground should *not* be laid down in grass. 2^{dly}, If planted with the view of being an *Orchard only*, the trees will necessarily stand so thick, and the herbage be so much shaded, that it will be of little value, and of very bad quality for pasture. 3^{dly}, I consider it as being prejudicial to the roots of the trees, particularly in stiff wet soils, to be pent up in the earth, and retarded in their annual progress by the weight and constant treading of the cattle.

Wherefore, I would rather advise, that the under crop be used as *cut grass*, (which generally comes very early), and this is found to pay better than pasturing; the first cutting, which is always had before the trees are full in leaf, being equal to the whole value of the pasture.

SECTION VIII.

On the Cultivation of SMALL FRUIT.

THE method of planting standard Fruit-trees, to divide the quarters of the kitchen-garden, is now justly exploded. They are found to injure the under crops *much*. The method of planting currants and gooseberries round the edges, and to subdivide the kitchen-garden, is also justly exploded; and they are now generally planted in quarters by themselves: so are raspberries and strawberries.

And thus an opportunity of changing crops is afforded, as the best method is to make new plantations of strawberries every fourth or fifth year; and of currants, gooseberries, and raspberries, every seventh or eighth. The three last named, having much the same effect on the soil, may not take place of one another with propriety; but may with strawberries, and also raspberries with any of them.

The

The ground should be trenched, and moderately enriched with any of the kinds of manure most properly applicable to the soil; which, for currants, gooseberries, and raspberries, if not a perfect sand, cankered gravel, or wet, stubborn clay, will (with proper culture) produce them abundantly. Strawberries are an exception. They are most productive of fruit, - and least so of straw, on a strong loam, and in an open exposure. Nevertheless, we find them prolific, with proper culture, in many different soils.

If the ground is broken out from grass, let the turf be chopped well; bury it in the bottom of the trench, and the manure one spit deep. If from ground which has been under tillage or kitchen crops, bury the one-half in the bottom, and the other at one spit deep; observing to divide and break the soil well in the operation.

The methods of producing young plants of all the kinds being universally known, it would only be wasting time in saying more in that respect, than that they should be clean, healthy, and well rooted.

To enumerate the kinds would be an endless task, particularly of gooseberries; nor would it be at all satisfactory, almost every one having their favourites. But it cannot be doubted that the *rage* for multiplying the varieties of this fruit has been carried too high of late years; and that many of our old kinds far excel the new ones, in respect to flavour.

Currants and Gooseberries

Should be planted at from four to six feet apart each way, according to the quality of the soil. The season is any time from November to the first of March.

Currants and gooseberries produce both on spurs, and on the shoots of last year; but the fruit on the latter is always largest. Therefore, the shoots to be retained should be left at full length; and the plant ought to be regularly thinned out, leaving these generally at the distance of from nine to twelve inches apart, and twisting off all suckers, &c. from the root, which take greatly from its strength.

Gooseberry plants, in particular, should be kept free and open in the middle; nor is

a Winter pruning sufficient; but they should have a Summer dressing also, when the superfluous shoots are to be rubbed off. This, however, is not so necessary for currants. Indeed, they generally swell their fruit larger if shaded in a moderate degree, though it must be allowed the flavour is not so high, as when the plant is kept more open and free of luxuriant shoots.

Some gooseberries are of the weeping kind, and when heavy laden, the fruit is frequently much injured, and even dashed off by the branches dragging on the ground. To prevent which, a hoop should be fastened to stakes or pegs drove into the ground, and at the distance of a foot from it; to which let the branches be dressed in a regular manner.

Raspberries

Are also to be planted at from four to six feet apart each way, according to their kind, and the quality of the soil. In good land, the Antwerp kinds require at least six feet: the common, a foot or two less, as they do not grow so luxuriantly. I have seen a quarter of *Antwerps*, which averaged

ged ten feet in height each shoot, and proportionally strong; some of which girted above three inches. They grew in a mixture of peat-earth and sandy loam of considerable depth.

Raspberries bear entirely on the shoots of last year, which are plentifully produced from the root every season. In Winter dressing, the old shoots are to be cleared away, and also the major part of the new, retaining three or four of the strongest only, otherwise the plant would become a perfect bush next season.

The most simple, and best mode of supporting them is, by twisting the shoots loosely together, and tying the extremity with a piece of spun-yarn, or strands of fresh matting.

Strawberries

Are to be planted, either in July or August, or in March or April, according to the forwardness of the season, in rows from twenty-four to thirty inches asunder, according to the kinds and quality of the soil, and at from six to eight inches in the row; kept clean of weeds at all times; the
straw

straw cut in October; the rows ruttet on each side, left six inches broad, and the intervals dug a full spade deep. A slight dunging each season, or a good one every second, will be sufficient to keep the land in heart.

Where the situation is particularly inviting, and (which sometimes happens) the culture of any other crop would be attended with *more* difficulty; strawberries may be successfully continued on the same spot for many years, by reversing the rows and intervals every third season.

This is attended with no manner of trouble, the runners planting themselves. But when new plantations are to be made, such runners, after having struck root in July or August, are the fittest plants for this purpose, and should then be transplanted.

It is observable, that strawberries planted in manner as above, that is, in *rows*, are much more prolific of large fruit, than when planted *thick* in *beds*. In single *detached rows*, they are still more so; and are with propriety run round the alleys of the kitchen-garden, in the double cha-

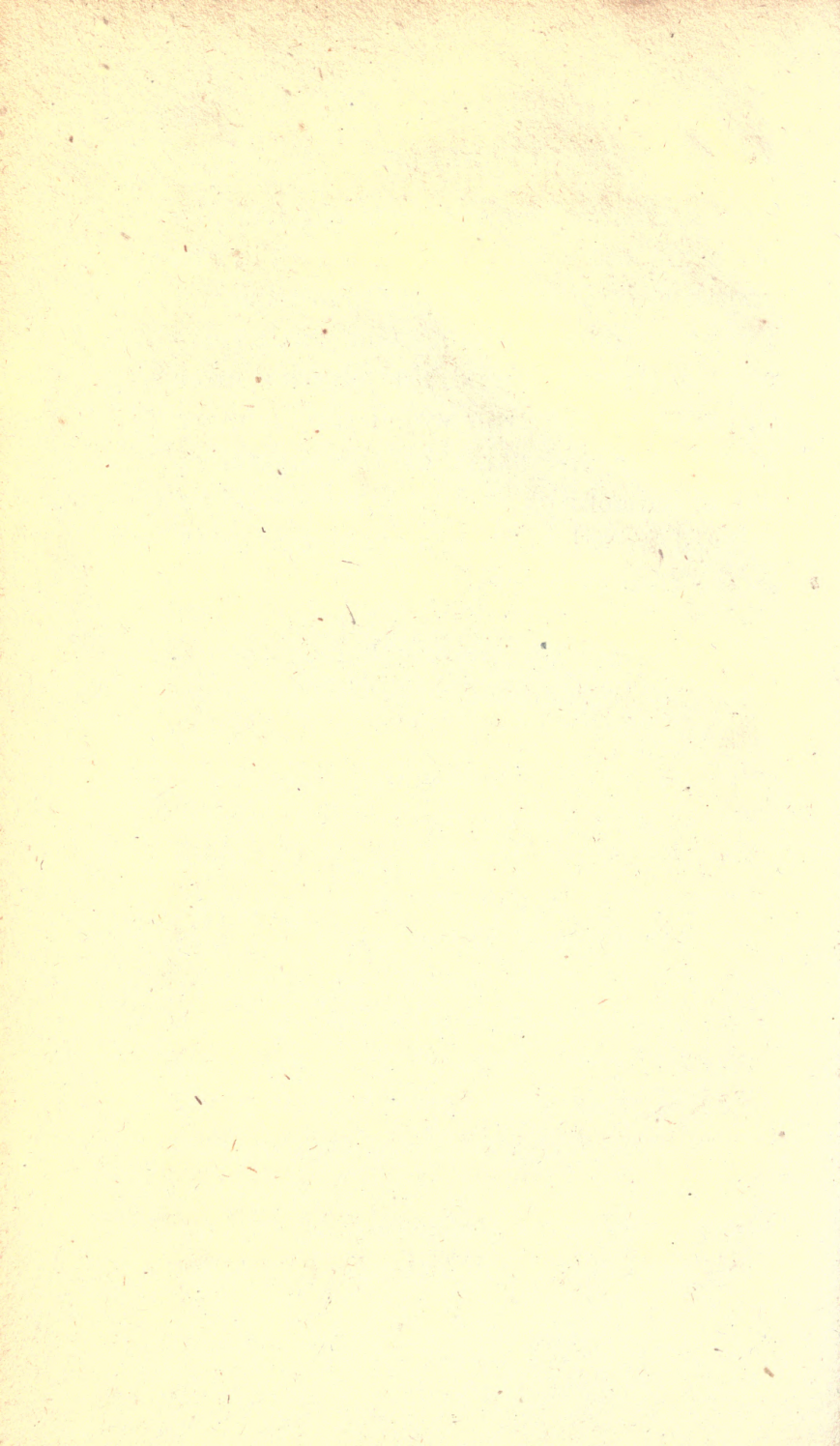
racter of edgings, "ornamental and fruitful."

Some, who are sanguine of the produce of their ground, introduce kitchen-crops of all kinds amongst their currants, gooseberries, and raspberries, and frequently with too little discrimination of which is the *intended* crop. Why are they planted by themselves at all? Is it not that they may be produced in the greater perfection? If so, why with open eyes thwart the original intention, by robbing the ground with burdensome crops of vegetables?

Nevertheless, I wish not to see an inch of land lost. There is certainly a medium. A single row of beans, broccoli, cabbage, cauliflower, carrot, turnip, potatoes, &c. in the centre between the currant-trees, &c. being sown or planted, would be conform to strict prudence. And here they would be of the very best quality, if the soil were congenial to their natures, as they would have full room to extend.

I have seen excellent vegetables produced in this manner; but at the same time
have

have seen much injury done the fruit, by its being too long persisted in. Till the fourth year, it may be practised; but not longer. Indeed, there would little (perhaps no) profit attend the practice after this time, as the fruit would sustain more injury than the value of the vegetables would indemnify; and these last would be lessened in value, by being overshadowed by the trees or bushes.



BOOK THIRD.

THE KITCHEN GARDENER.

INTRODUCTION.

NCESSITY, which is justly said to be the mother of invention, is the first and grand stimulus to industry. Hence the cause, why the northern nations are farther advanced in the arts of gardening and agriculture than the southern, most probably is, that the soil and climate are generally less favourable, and consequently less productive of the necessaries and comforts of life.

As commerce extended, and mankind began to have more intimate intercourse with one another, not only their *real* but imaginary wants were mutually discovered,

ed, and the means of gratification employed. The progress was long *slowly progressive* in our island; but now a spirit of useful improvement hath manifested itself in all orders of the community, unknown to other ages. The branches of gardening and agriculture have made rapid progress; but an ample field is still left open, in which the ingenious and industrious may display their talents and perseverance.

The various modes of raising food for man, by cultivating the earth, are to be comprehended under the two general heads, Gardening and Agriculture. These go hand in hand, being nearly allied to one another; the chief constituent difference being in the implements used, and the manner of employing them. In the one, the labour is chiefly manual; but in the other, the far greater part is performed by aid of cattle.

The plough is a most useful instrument, but it is not so efficacious on a small scale as a spade. Hence the superiority of the garden over the field, in respect to the superabundance of its produce.

The more we do for the soil, the more grateful

grateful will it be in return; and prudence, as well as interest, shew the necessity of skilful industry, whether in gardening or in agriculture, and spur on to improvement.

A just knowledge of the value and effect of manures, their application, the quality, nature, and pulverization of the soil, is the grand basis of agricultural improvement, and lead to all subsequent discoveries. These can be more minutely followed in gardening than in agriculture, and also with less risk of disappointment. Hence have the discoveries and improvements in gardening generally been the forerunners of those in agriculture.

Inasmuch as not only garden vegetables, but grain, produce most abundantly on what is termed *new land*, effectual plowing, digging, trenching, &c. would appear to be of the utmost importance. This matter is susceptible of being more effectually performed in gardening than in agriculture, and is another reason why the garden is more productive than the field.

A third reason, in some instances, may be local situation, shelter, &c. But this

does not always hold good, as many kinds of vegetables, particularly those most useful, are found to do as well, if not better, in an *open* field-garden, than in one which is *sheltered*.

Garden land is generally higher rented than that of the farm; a much smaller quantity is appropriated to the maintenance of a family; the occupier is under the necessity of using all diligence, industry, and perseverance; and of working and manuring his ground to the utmost of his ability in the hope of a return. Thus may another reason be deduced why the garden is more productive than the field. And, lastly,

Private gardens, being both an object of utility and amusement to the proprietor, are generally placed in the most favourable situations, well kept, manured, &c.

Nevertheless, the efforts of the most skilful, in the culture of the more tender esculents, are often baffled; more especially if his soil be not congenial for the purpose. And who is he that can withstand all the casual occurrences of weather, and vicissitudes of a variable climate? In fine,
gardening

gardening and husbandry, labour under many disadvantages in this country, unknown on the continent, particularly in the earlier part of the season. Not so much that the weather is *more* severe, which indeed may be questioned, but that it is *more* changeable, and that we are less favoured with the visits of that refulgent luminary, the first stimulus, the very *essence* of vegetation.

To remedy, then, as far as may be in our power, the disadvantages under which we labour, let us endeavour to render the climate more salubrious by the *high cultivation* of every spot of ground, in whatever way it may be employed; which unquestionably hath a good effect, and goes far towards the attainment of this desirable object.

Draining comes first in point. For, while latent water remains in the body of the soil, we may despair of ever rendering it productive, in a superlative degree, of either vegetables *, grain, or timber. And
happy

* According to the general acceptation of the word; for *vegetables* embraces the *whole* of one of the kingdoms of nature.

happy is it for this country, that *now* a method of performing this frequently necessary operation, is discovered and divulged to the world, than which, perhaps nothing could be a more valuable acquisition.

The reader will probably perceive, that I allude to Mr Elkington's, as explained by Mr Johnston. He is referred to it.

Next to this, effectual ploughing, digging, trenching, incorporating, and aërating the soil, would seem to stand forward and demand our particular attention. Let us bestow it. Let us not exhaust one part of the soil, while another remains in a state of inactivity, and is, perhaps, at the same time equally capable of production. But rather let us bring up what probably has never, or at least for years past, been accustomed to the dividing *rutt* of the *coulter*, the penetrating *thrust* of the *spade*, and consequently, the produce of "food for man and beast;" and which, by being fresh and unexhausted, may afford a timely relief to that which is the contrary, overburthened, perhaps, by long and successive production.

But

But while we search after, and bring up this "hidden treasure," let us not be too sanguine. Let us be careful not to bring up in mixture with it, what would not fail to thwart our best intentions,—cankering gravel, irony till, or corroding sand.

What next comes in point, and is eminently useful, whether for improving this *new acquisition*, or refreshing, and in a great measure restoring, the *exhausted* soil, is the discreet application of manure. There are many kinds of this most useful ingredient. The judicious will always apply *that* which is most evidently calculated to enrich and divide the soil, if over tenacious, or which will add adhesion to, and also enrich it, if too light and porous.

Next follows, skilful, and moderate *cropping*. In respect of the former, practice and experience *alone* can ensure success, and the attainment of perfection. In respect of the latter, whoever shall bear in mind, that it is as necessary for land to rest from *producing*, as for man to rest from labour, and that it is of as bad consequence to overburthen land with crops at any time as man with labour, will not fail to tread the
right

right path. Farther, it is certainly preferable to have an article *good* in quality, than twice the quantity which is, perhaps, neither nutritive nor wholesome. The judicious will proportion the *weight* of *crop* to the strength and ability of the soil.

And this leads to another consideration, namely, that of *weeds*. Of all things in nature, where art hath connection, the most disgusting is that of a garden of weeds,—a thing inconsistent in itself, and also with common sense. Do we sow or plant with the intention of reaping? Do we wish to raise wholesome and well-ripened crops? Do we look for re-imburement and compensation for expence and labour? And do we, at the same time, negligently suffer weeds to impoverish the soil, and rob the crop of the nourishment necessary to sustain and bring it to perfection, and consequently produce the desired return?—Let us bestow the attention this subject would seem to deserve, and we shall conclude, finally, that successful cultivation and production of vegetable food, in a great measure, depends on the following desiderata:

A just knowledge of the quality of the soil ; effectual draining ; effectual plowing ; effectual digging ; effectual trenching ; discreet manuring ; moderate cropping ; careful weeding ; industrious reaping ; and judicious fallowing.

CHAP.

CHAPTER I.

ON THE PROPER DEPTH AND SITUATION OF GARDEN LAND.

THAT kitchen vegetables do best on what is termed *new land*, is a generally-received opinion, and plainly demonstrated in many instances. It is also a common complaint among gardeners, that their ground, from what is termed *worn out*, will not produce certain kinds of vegetables: not that it is poor and hungry, or altogether unadapted to the production of them, having perhaps formerly produced the very articles in great abundance; but that the surface has been many years under these crops, and that they have not a sufficient quantity of ground for a proper change. In *walled* gardens this complaint is most general; and it would appear to be occasioned by the expence of inclosing a sufficiency of ground to serve the family, or of composing a body of soil of a competent depth.

That

That many kinds of kitchen vegetables do as well (if not better) in an open field-garden, as in one that is inclosed with high walls, and sheltered, and perhaps shaded, with trees, is an undeniable fact: and, were it not for the production of the finer fruits, there would be little use in rearing garden-walls at all. But the ground thus inclosed is certainly occupied with more propriety in the production of vegetables than of any other crop.

And, as it is presumed, the ground thus inclosed is to be occupied as a garden many years; that the walls have been built at a considerable expence; that the ground is trenched, walks made and laid out at a considerable expence also; and that, above all, it is desirable to have a supply of wholesome vegetables for the use of the kitchen, while the ground is thus occupied;—I shall drop a few hints on the method of obtaining this end, and which I have partly practised * with success.

First,

* I say partly practised, because the operation of it requires many years, and it has happened, (by my change of situation), to be out of my power to follow it fully

First, then, it is necessary to have a depth of soil from twenty-four to thirty-six inches; which, in many instances, is not attainable without much expence and labour: but which, however, if the above object is kept in view, ought to be a secondary consideration, as it requires but once doing; and the matter of from ten to twenty per cent. on the expence of the garden, will, in most cases, be sufficient for its accomplishment. In this case, it is obvious, that whatever the depth of the natural soil lacks of twenty-four inches, is to be supplied by *forcing*, that is, carrying in soil from the adjacent fields: for it is not advisable to trench up and mix *much* of the sub-soil (of whatever texture it be) with it. Indeed, in many cases, gardens are almost ruined by the injudicious admixture of the sub-soil with the surface mould.

Secondly, Situation is to be considered. In page 245, I have already dropped some hints

fully out in practice. But I hope the theory will be found to be reasonable, and consistent with both horticultural and agricultural improvement; and that it will be followed out by some of the many ingenious improvers of land wherewith the country abounds.

hints on this head ; and would here further observe, that in few instances is it advisable to lay down a garden on a level spot, such seldom having a dry bottom, and being drained with more difficulty, if requisite, than when there is a declivity. A north aspect is also to be avoided, and preference should be given to a south, south-east, or south-west : but even an east or west aspect, in many cases, may prove excellent situations. A declivity of from a foot in twelve to a foot in thirty or forty will generally answer ; but about one in twenty-five has the happiest effect.

The rule I had laid down; and which I have partly practised, is this, viz. To take three crops off the first surface, then trench *three spit* deep, by which the bottom and top is reversed, and the middle remains in the middle ; take three crops off this surface, and then trench *two spit*, by which the top becomes the middle, and the middle the top ; and take also three crops off this surface, and then trench *three spit*, whereby that which was last the middle, and now top, becomes the bot-

X

tom,

tom, and that which is now the bottom, and was the surface at first, now becomes surface again, after having rested six years. Proceed in this manner alternately; the one time trenching two spit deep, and the other three: by which means the surface will always be changed, and will rest six years and produce three.

Hence will there always be *new soil** in the garden for the production of wholesome vegetables; and hence also will much less manure be required, than when the soil is shallow and the same surface constantly in crop.

I have said above, that the soil should be from twenty-four to thirty-six inches deep: and I would not advise that it be much more, or at least that it be trenched to a greater depth; as thereby the surface might be buried too deep from the action of the weather and influence of the sun, and consequently would be crude and
unmeliorated

* I presume the appellation is consistent with the idea we have of New Soil, as certainly in reality there is no such thing; but, by this process, it will be in a great measure renovated.

unmeliorated for some time after trenching up.

In situations where the soil is only so deep as to allow of trenching two spit, and expence in making it deeper is grudged, the above hint may also be followed with advantage: as by regularly trenching every third or fourth year, the ground will rest half its time; and, if judiciously managed, and cropped in proper rotation, wholesome vegetables may be produced on it for many years successively.

In many instances, it may be inconvenient, nay improper, to trench the *whole* garden over in the same season; nor do I wish to advance such a proposition: one half, or a third, at a time, may be more advisable, and also more convenient; of which, circumstances *alone* can determine. But I would here observe, that, in cases where the bottom is wet or tilly, in trenching at any time, care should be taken to go exactly the same depth with each trench; a matter of evident benefit; for, if the bottom be left rough and uneven, and if *galls*

are left between each trench, water will stagnate in the soil, and, of consequence, by *souring* it, injure the crop, whether of trees or vegetables.

CHAP-

CHAPTER II.

ON THE NATURE AND VARIETY OF GARDEN LAND;
WITH THE MEANS OF IMPROVEMENT.

IT is a happy circumstance, that in many instances we meet with different soils in the same acre. In the same garden they should never be wanting; and where nature (or natural causes) hath been deficient, recourse must be had to art; inasmuch as the variety of fruits and vegetables to be cultivated, require a variety of soils to produce them in perfection.

It would be absurd, however, to imagine, that for every particular vegetable there is to be a particular soil prepared. The variety of soil in any garden may with propriety be confined to the following:— Strong clayey loam; light sandy loam; (which are the two grand objects): a composition of one-fourth strong, with three-fourths light loam; half strong, and half light; and one-fourth light, and three-fourths strong. Which, by a proper treatment,

ment, and with the proper application of manures, may be rendered productive of any of the known and commonly cultivated vegetables, in the highest degree of perfection.

But, in order to improve a soil, we must be guided much by its nature, so as, if possible, to render it serviceable in a general intention. And hence, our duty is, to endeavour to hit on that happy medium which suits the generality of esculents, in the formation or improvement of the soil in the kitchen-garden. Such a soil should be sufficiently tenacious to adhere to the roots of plants, though not so much so as to be binding, which would certainly retard their progress and extension in quest of food. Hence, a loam of a middle texture, rather inclining to sand, may be denominated the most happy soil for the purpose here in view; and that on a double account, viz. The greater part of the valuable kinds of kitchen vegetables delight in such, and it is worked at less expence than a stiff soil; neither in severe droughts is it so apt to crack or be parched; nor in
hard

hard frosts is it so apt to throw or spew tender plants or seeds out.

If soils be too strong, the tender roots of plants push weakly in them, sicken, canker, and perish; and if a soil be too light, and if it be poor withal, plants deposited in it will push their roots far, and in vain, in quest of that stability and nutriment which is necessary and essential to their support. So that, if the butt of our aim be perfection in the production of wholesome and well-matured vegetables, we must put aside careless indifference in the formation of a proper soil; nor trust entirely to the force of dungs, were they even to be had in the greatest plenty; for these, by *too free* an application, have an effect on the quality of esculents, not altogether salutary.

Wherefore, that our efforts may be attended with success throughout, let us bestow a moderate and prudent expence in the first outset, on composing or so improving the soil to be appropriated to this purpose, as that, in our best judgment, it may fully answer the intention. For,

Forming and composing the soil of a garden, is certainly more easily accom-

plished before, or at the time the walls are building, than afterwards: and we often find, where that matter has not been properly attended to at first, and where even the expence of doing it afterwards would be chearfully bestowed, the principal obstacle is the cutting-up of the lawns, shrubbery, walks, &c. These considerations, however, ought to give way to the more solid advantages to be derived from the improvement of the kitchen-garden; the more especially, as in the course of a season, and at a trifling expence, they may be replaced in all respects as they were before.

In many cases might the soil of the garden be improved in a very considerable degree at a small expence. Thus, where the bottom is wet, and the sub-soil of a cankering nature,—by judicious draining, which is certainly one of the greatest improvements in this case: where the soil is stubborn,—by the addition of small gravel, sea sand, wherein is a considerable quantity of small pebbles and shells, coal ashes, lime-gravel,

gravel, pounded brick-bats *, brick-kiln ashes, &c. &c. and, above all, by being carefully laid up in ridges in the Winter months, and indeed at all times when not in crop, in such a manner as to give the greatest extent of surface for the weather to act upon: where the soil is a poor sand or gravel, &c.—by the addition of clay, or strong clayey loam, scourings of ditches which run through a clayey sub-soil, pond-mud in a like situation, or scrapings of roads, which lie in a clayey district, &c.

Soils that abound with metallic substances, and which generally make them appear of an iron colour, are termed foxbent or till. These substances are often found to be intimately mixed, or rather consolidated with the soil, in considerable masses, which are adhesive and very ponderous. Such soils are the most unfavourable to vegetation of any; and are quite ineligible for

* I have witnessed the effects of pounded brick-bats and brick-kiln ashes in mixture, which were applied freely, in fertilizing a cold, wet, back-lying, clayey field, in an astonishing manner, by a single dressing. This is a proof that clay, after being burnt, is completely changed in nature and effect.

for the purpose here in view, without being much improved. For this purpose, lime will be found the most serviceable of all things, if judiciously applied, and the soil be frequently turned over by digging or trenching; so as that the soil and the lime may be intimately mixed together, and that the atmosphere may have full effect upon them: for without this, the lime will not operate so effectually, nor will the tilly particles of the soil be divided or meliorated so well.

It may seem unnecessary to observe, that according to the quantity of iron matter contained in the soil, lime will be required to reduce it. In order to ascertain this quantity, a magnet will be found useful; and, by one of the masses being calcined, and then reduced to a powder, will separate the iron particles from the soil or residuum; showing the proportion of iron, and of earth. Thus we may judge, what quantity of lime will be required to fertilize the soil; taking for the extremes in ordinary cases, and supposing the lime of a middling quality, 150 and 400 Winchester bushels an acre; applying the lime in a quick

quick or powdered state, and properly working the soil; being careful, in the first place, to drain it of superabundant moisture.

Ridging-up of land, as above hinted, has the happiest effect, especially for stiff soils, and should never be omitted when the ground is not under crop. In dead sandy loams, also, and in cankering gravels, it is of infinite advantage for meliorating them: but in very light sandy soils, it is not advisable to carry this practice to too great an excess. For it is a fact proved by experience, that, by exposing soil to the sun's rays in part, by throwing it into a heap, whereby it is also partly shaded, and trenching it once a month, will sooner restore it to fertility than any other process, exclusively of adding fresh matter.

And thus, if any ingredient, noxious to vegetation, abound in the soil, it may be expelled, or exhaled, by the action of the atmosphere; more particularly if the soil undergo a Summer, and also a Winter fallow. In the latter case, however, care should be taken to have the surface incrust-ed by frost as often as possible, by turning it, and giving it a new surface each succeeding thaw.

CHAPTER III.

ON MANURES, AND THEIR APPLICATION.

THOSE most to be preferred for the use of the kitchen-garden are—stable-dung, cow-dung, hog-dung, sheep-dung, pigeon-dung, foot, lime, loamy marl, shell-marl, sea-weed, wood-ashes, whin-ashes*, fern-ashes, coal-ashes, vegetable mould of decayed tree-leaves; and vegetable mould of decayed vegetables of all kinds, as cabbage leaves, haulm, weeds, &c. to which may be added with much propriety, although a fluid substance, the richest of all, and that in which is most of the food of vegetables, viz. the drainings of the dung-hill.

Manures

* I have witnessed the astonishing effects of whin-ashes *alone*, in producing herbage in a five or six fold degree; which was the more obvious, on account that the field on which they were applied was much alike in quality, (a stiff, wet, clayey loam), and the ashes were applied partially. The effect was visible for several successive years. Also, on the timber-trees, with which the field was afterwards planted.

Manures are to be applied either as simples or compounds; but the latter method is certainly the most eligible. For certain it is, that if they have not undergone a proper fermentation, their effects are, giving a rank and disagreeable flavour to fruits and vegetables; and if an immoderate quantity is applied, of producing a considerable degree of unwholesomeness, and tainting the juices of all plants.

A combination of stable-dung, sea-weed, lime, and vegetable mould, which has lain in a heap for three or four months, and has been two or three times turned during that period, will make an excellent manure for most kinds of garden-land. Also, cow-dung, hog-dung and sheep-dung, mixed with foot or any of the kinds of ashes. Pigeon-dung, marl, and vegetable mould, well mixed, will also make an excellent manure for heavy land; or even for lighter soils, provided the pigeon-dung be used sparingly.

Neats-dung, that is, of cows and oxen, and hog-dung, being slightly fermented, will compose a very fit and rich manure for light, hot soils. For those of a dry,
absorbent

absorbent nature, perhaps none would answer better, or last longer, by reason that they retain moisture for a greater length of time, and also ferment more slowly, than other dungs.

Pigeon-dung, lime, foot, ashes, &c. should never be applied as simples; the quantity of them required being comparatively small, and the regular distribution difficult, without the admixture of other matter. But these should generally be applied in compost, of good earth, turf, or sward, or of cow or other dung of a cool nature: applying them in quantity according to the cold, or the hot nature, of the soil to be manured; allowing the compost a sufficient time to incorporate, and mixing it thoroughly.

Marl is an excellent manure for almost any soil; and may be applied as a simple with as much propriety as any of the kinds of cattle-dung, or even vegetable earth. The kind called shell-marl is much to be preferred; and should be freely applied to strong lands, but more sparingly to light: the loamy kind being best adapted to light lands.

Stable-

Stable-dung, if used as a simple, should not be applied in too-rank a state, nor should it be too much fermented. It should generally lie in a heap for two or three weeks; during which time it should be turned once or twice. A ton of it in this state, is worth three that has been used in the hot-bed, and is a year old. This manure, and indeed dung of any kind, when applied as simples, should never be carried from the heap to the ground, till it is to be digged in; as, by its exposure to the air, the virtues evaporate, and it is the less effectual.

The necessity of the instant application of sea-weed after landing, if used as a simple, is even greater than the above; as it instantly corrupts, and its juices flow downwards, and are lost. If this manure is used as a compound, the heap wherein it is compounded should be more frequently turned on its account; that none of the juices may be lost, but that the other part of the compost may absorb them.

Horse-dung, and the dung of sheep, deer, rabbits, &c. are most eligible for cold, wet soils; and all these, or any of these in
compost.]

compost with lime, will be found beneficial. For such soils also, a compost of coal-ashes, pigeon-dung, and lime; or of wood-ashes, whin ashes, fern-ashes, and stable-dung; or, of deer-dung, rabbits-dung, foot, and burnt sward, &c. will make a good manure.

Manures being valuable in proportion to the salts and the oils they contain, are to be applied in quantity according to their quality. Hence, the dung of pigeons should be used in much smaller proportion than that of horses, it containing a greater quantity of volatile salts; and so the ashes of vegetables containing a portion of fixed alkaline salts, being more powerful, are to be applied in still smaller quantity. So also, lime, being the most powerful of the calcareous kinds, should be applied, in ordinary cases, in much smaller quantity than marl.

Vegetable mould may either be used as a simple or a compound, and is to be applied with equal propriety to all soils. None can be hurt by it in any degree; since almost every plant will grow luxuriantly in it entirely, without the aid of any
soil

soil or manure whatever. It seems to be the ambrosia, and the dunghill drainings, the nectar, of vegetable life. The latter, however, if too freely indulged in, is rather of an intoxicating nature.

The importance and effect * of manure being now generally credited and acknowledged, (at least much more so lately than heretofore); it would appear to be the indispensable duty of every gardener and cultivator of the earth, to be careful in the collection of it, and also to distribute it with skilful frugality. For this purpose, a well, cistern, &c. should be contrived so as to collect the dunghill drainings; and in the application of manure of any kind, the greatest care should be taken to divide it equally, according to the quantity to be applied.

All animal substances, when properly applied, are good manures; and as animals

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derive

* We may briefly define the effect of manures, when *properly* applied, thus: Correcting tenacity, crudity, and porosity in the soil; exciting its fermentation, communicating nutritive matter, and affording nourishment to the roots of plants; thereby promoting vegetation, and their perfection.

derive their sustenance, either immediately, or ultimately, from vegetables, these, when properly decomposed, become great promoters of vegetation. Hence, dungs in general are superior to other manures; and are the more valuable in their kinds, according to the proportion of oils they contain, which are most easily reducible, by the nitrous acid of the air, into that species of mucilage, allowed to be the essential pabulum or nutriment of plants. Our duty, therefore, is to collect these with care, and apply them with attention.

The dunghill may also be considerably increased by throwing the haulm, stalks, and leaves of all vegetables into a common heap, letting them remain till well rotted, and afterwards mixing them with lime, marl, ashes, foot, &c. or in the process of collection. Watering the whole frequently with the drainings of the dunghill, would greatly enhance its value. Like a good *roast*, it should be well *basted* with its own drippings*.

CHAP-

* An observation that lately excited a hearty laugh from an epicure.

CHAPTER IV.

CULTURE OF KITCHEN VEGETABLES.

SECTION I.

ARTICHOKES.

THIS plant will grow freely in light loam of any kind, provided it be well enriched with compost, stable-dung, marl, or sea-weed. It requires a depth of soil from twenty-four to thirty inches, to produce it in perfection. In stiff wet lands, artichokes frequently perish in winter.

It is propagated with facility by offsets from the old stools, which are produced every spring in great abundance, and are to be planted in patches of two or three plants each, at the distance of four feet, patch from patch each way, watered frequently in dry weather, the first summer, and kept clean of weeds.

As this plant is very tender, and easily killed by frost, the rows, &c. should be

carefully covered with stable-dung, or other litter, in the early part of winter, which is preferable to the method of digging out trenches, and moulding up with the earth dug therefrom, as, by that mode, the roots are doubly exposed. In a thousand instances were the whole stock of Artichokes killed, by the early setting in of the frost in 1796, which lasted but three weeks, and was far from what may be termed severe. And many of these were landed up; but none that were *well covered* suffered.

In proceeding to cover up the plants with litter, &c. let the decayed stalks, and also the strong outside leaves be removed; then lay the litter in a ridge all along on the rows, of breadth sufficient to cover the extremities of the roots, and to the thickness of about ten or twelve inches.

In spring, *i. e.* about the first or middle of March, the littery part of the covering is to be removed, and the small, or rotten part should be digged in, previously reducing the number of plants on each stool to three or four of the strongest; as otherwise they

they would grow too thick, and the heads, in consequence, would be rendered small.

One hoeing will generally be sufficient for the season, as hardly any weed will grow under their foliage, and these will soon cover the whole ground.

The above culture is to be repeated every season, for the old stools; and where a succession of Artichokes are in request, a few young ones should be planted every year. They will produce in autumn, in succession to the old ones, and last till the frost destroys them.

Old stools should not be suffered to remain above seven or eight years in the same spot, otherwise they produce diminutively.

SECTION II.

ASPARAGUS.

THIS vegetable is most successfully produced on a light sandy loam of at least two feet in depth. And the best manures, in this case, are—a compost of stable or cow dung, hogs-dung, sea-weed, marl,

and vegetable earth; or stable-dung and vegetable earth; or, sea-weed and any of the above.

Strong loam does not answer well for Asparagus; but it may be much improved by the addition of gravelly loam, light sandy loam, sea gravel, brick-bats pounded and mixed with the kiln-ashes, &c. In this case, the best manures are—a compost of vegetable earth, foot, pigeon-dung, and any of the kinds of ashes; or, stable-dung, sea-weed, and shell-marl; or, sheep-dung, sea-weed, and marl; or, sea-weed, stable-dung, or shell-marl, as simples.

As Asparagus does not come to maturity for several years; and as there is no possibility of *effectually* manuring it after sowing or planting, without hurting its roots, which are very brittle, the greatest care is necessary in preparing the ground for its reception, which should be trenched at least two feet deep, and the manure well mixed with the soil in the operation.

It is common to raise Asparagus on a seed-bed; and transplant it into beds four feet wide, with alleys of two feet between them. In some instances, the beds are

are only two feet, and contain but two rows, with alleys also of two feet. This method is preferable to the former. But the most approved, is, to drill in the seed where it is to remain, in single rows, a yard apart and an inch deep; sowing pretty thick, in order to insure a crop*: even, four feet apart for the rows would not be too much.

I have seen an instance where a piece of ground was equally trenched and manured; the one-half of it was drilled at one yard, and the other at two apart; that which stood at two yards, as I was assured by the proprietor, produced a greater quantity of grass on the same quantity of ground than the other, and the buds were much larger.

That Asparagus, which is sown where it is to remain, will be stronger, against the third year, than that which is transplanted, I have myself proved in more than one instance; and would therefore advise this practice in preference to the other.

If the spring proves dry after sowing, the rows should be frequently refreshed

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with

* The middle of March or first of April, is the proper season for sowing.

with water. When the plants have arrived at the height of three inches, thin out the rows to about five or six apart, and draw a little mould to the stems of those left. Keep clean of weeds for the remainder of the season, and indeed at all times; frequently stirring the surface, which will greatly promote the growth of the plants.

The best manures, and most proper application, for the rows or beds of *Asparagus*, is—the drainings of the dunghill, which may be applied at any time; seaweed, which may be applied at any time from October to March, and should be spread on the surface as it is carried from the shore; a compost of lime and dung, or dung and marl; and stable-dung alone, which should be spread on the surface about October or November, and let remain till the first of March.

This last is the common method of manuring *Asparagus* land: but there are many who do so merely because they see others do it; and who imagine it to be done in order to preserve the plants from the effects of frost, and of consequence they choose the most littery part of the dung for
this

this purpose. This idea is erroneous; and I have sufficiently proved that Asparagus roots will in nowise be injured by the severest frost. Plants of the first year, however, may with propriety be covered, to prevent their being spewed out of the ground; but, otherwise, it is not necessary to their preservation. In the very severe Winter of 1794-5, there was no covering of any kind on my Asparagus, nor was it even what is termed *landed up*.

Instead of *landing-up* in Autumn, having previously cut the haulm down to the ground, clear the surface of weeds, &c. and stir it up to the depth of two or three inches with the fork; that it may the more freely receive, not only the juices of any manure that is applied, but be more readily acted upon by the weather. In Spring, if it has been covered with stable-dung or sea-weed, gather off the rough part of it, and slightly point in the small; at the same time shedding a little mould on the rows, being careful not to go too near the roots of the plants, as these, if possible, should never be disturbed. This operation is to be performed

formed about the first or second week in March.

It is a common practice to plant or sow other crops on the beds, or between the rows of Asparagus. This may be proper for the first year or two, if done in moderation, introducing a row of cauliflower. Turnips, &c. in the middle of each interval of the rows, or in the alleys between the beds. But after this, it becomes altogether improper, as by the time the roots begin to spread, in either mode of sowing or planting, they ought; on no account, to be disturbed; more particularly if it be wished to rear large, handsome grass.

Asparagus *beds* should not lie above eight or ten years; but where it is cultivated in *rows*, it may lie considerably longer. However, where the forcing of the roots is practised, it is seldom suffered to lie even that time; as plants of from four to eight years old are fittest for this purpose.

In respect of cutting, the third year should arrive at any rate, even if the grass is sufficiently strong the second, (which, however, is seldom the case): because, by being cut too soon, it weakens the roots
 much;

much; and the encouragement of these, till the grass is perfectly established, is a principal object.

We often see blanks in Asparagus beds, &c. that are producing, which were not originally in them, or before the grass was begun to be cut. This is occasioned by injudicious cutting; and not, as is generally supposed, by accidental natural causes: and what occasions it is evidently, that, in cutting, *all the stalks* of some of the plants are cut; which, although they may put forth the next Spring, (but this they will in some instances do in Autumn. See note, page 11.), do so in a very weak manner, and perish in the following Winter. Wherefore, care should be taken to leave at least one or two buds to each plant in order to draw nourishment to, and encourage the growth of the roots.

In cutting, be careful not to injure the young buds rising about those fit to be cut, nor to wound the crown of the root. The roots of few plants take worse with *wounding* than those of Asparagus, which, from their succulent nature, bleed more or less at every bruise.

SECTION III.

BEANS

DO best in strong land; but are successfully produced on almost any kind of garden ground. In gardening, the land is seldom manured for a Bean crop, as they generally follow that of cabbage, cauliflower, &c. which are commonly planted on well-prepared ground.

Beans may be transplanted with success, and where they are required at a very early season, the following method should be practised:

Sow, of the early Mazagan, in large pots or boxes, being filled with rich mould, about the first of November; place them in the green-house, peach-house, &c. or under a frame and lights, and so, as that the plants may enjoy the free air and light, and grow slowly; when they come up, refresh moderately with water; keep them here, or in a like situation, till the first of March; and then plant them out
under

under a wall having a south aspect, or other well-sheltered warm spot, enjoying the full sun, all along in a row at two inches apart; taking them carefully out of the pots or boxes, with their fibres entire.

For a second crop, sow of the Mazagan or Lisbon kinds, on an early border, in a south aspect, in rows twenty inches apart, about the first of January. And for successional crops, sow or plant in an open exposure, of the Long-pod, Windsor, Sandwich, Toker, &c. in rows from twenty-four to thirty inches apart, from the first of February to the first of June, at intervals of about three weeks.

The crops are invariably to be kept clean of weeds, and earthed up at two different times, viz. first, when the plants are about two inches high, and, lastly, when they are about ten or twelve.

Topping the early crops, about the time the pods are distinguishable on the lower part of the stalks, is of advantage; the pods will swell considerably sooner in consequence.

SECTION IV.

BEET.

OF this plant, there are two kinds in cultivation for the use of the kitchen, viz. the Red, for its roots, and the Green, for its leaves, which are used in manner of spinage. The former, however, being most in demand, I will chiefly confine my observations to it.

The soil which suits this plant best, is a light dry loam, of at least eighteen inches in depth. On stiff, shallow soils, the roots canker and get forked. In all cases, the ground should be deeply digged or sub-trenched, and should be well broke in the preparation. It is better not to apply manure at the time of cropping with *beet*, but the land should be in good heart.

The season for sowing is from the middle of March to the first of May; taking, for the fittest time, the first week in April.

After

After digging, &c. roll the ground lightly, or tread it smoothly with the foot; then draw drills an inch deep, and twelve or fourteen inches apart, according to the quality of the soil; sow the seeds thinly; cover them in, and smooth all with the rake.

When the plants have arrived at an inch or two in height, thin them out to five or six apart in the row; and keep them clean of weeds at all times. Beet may be preserved in Winter, by being stored in the manner of carrot. See Section IX. of this Chapter.

The Green fort may be raised much in the manner as above; but as the *tops only* are useful in the kitchen, it is not necessary to take equal pains in preparing the ground. It is much like spinach in its manner of growing, and is generally used in the same intention. In gathering the leaves, care should be taken not to injure the crown of the root, as in that case, it would bleed much.

SECTION V:

BROCOLI

DELIGHTS in a strong loam, but will do well in any common garden land, if well enriched with stable or cow dung. Where a succession of it is required, a little should be sown on an open light spot about the middle of March or first of April, and planted out about the first or middle of May, on an open rich spot, in rows two feet apart, and eighteen or twenty inches in the row. The principal crop is to be sown about the first or middle of May, and planted out in July; and a later crop may be sown in the end of June, and planted out in August: Strong loam in an open situation is the most eligible soil.

All the crops should be sown *thinly* in free soil and an open situation. If otherwise, they will require to be pricked out into nursery beds, in order to strengthen them, and that they may be furnished with good roots.

The

The brown, green, or purple kinds, answer best for early crops, and the white, for the principal and late.

Keep them clean of weeds, and when the plants are fairly established and begin to grow, let a little earth be drawn up to their stems, which will greatly promote their growth. Before the leaves expand so as to cover the ground, let them be finally moulded up; and this is to be observed also for cauliflower, cabbage, favoys, &c.

In fine seasons, it will sometimes happen, that the early crops of brocoli get too forward, and are unfit to stand the Winter frosts. When this appears to be the case, in the end of October or first of November the plants should either be lifted entirely and *soughed in* on another spot, or they should be *heeled* and laid over in a sloping position where they stand. Being thus checked, and their hearts guarded from the weather, they will better endure the severity of Winter.

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SECTION VI.

BRUSSELS SPROUTS.

**T**HIS is a good vegetable for Winter and Spring use, and is much admired by many. The sprouts which issue from the stem are the eatable part, and are fine delicate greens; good substitutes for brocoli.

The soil, situation, and the culture that answers for brocoli, will also answer for this plant in all respects.

TO I

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SECTION VII.

CABBAGE.

CABBAGE is plentifully produced on garden land of almost any kind; but most abundantly on a strong loam of eighteen to twenty-four inches in depth.

The land should always be manured for this crop, as one of the leguminous kinds should

should follow it. If it is a light sand, &c. cow dung, hog dung, or loamy marl, is most eligible; if a strong loam, stable dung, sea weed, or shell marl, as simples; or a compound of all these, or of any of these with sheep dung, pigeon dung, vegetable mould, or of any of the kinds of ashes; if a clay, stable dung, sea weed, shell marl, or sheep dung as simples, or a compound of lime, stable dung, sea weed, pigeon dung, and vegetable mould, or of shell marl, stable dung, sea weed, any of the kinds of ashes, and vegetable mould; or of any two or more of the above.

The same manures for the same soil, will equally answer for cauliflower, greens, favoys, &c.

There are many kinds of cabbage in cultivation; but those most esteemed for the garden are, the Early Dwarf; Early York; Early Sugarloaf; Late ditto; Battersea; Red, for pickling; and the large broad Dutch for cattle.

For an early crop, sow of the Dwarf, York, Early Sugarloaf, or Battersea, (but the true Early York is to be preferred), on a light open spot about the first or second

week in August ; and about the first of October plant them out on an early border, or other warm spot, at the distance of a foot each way, that in Spring the one row may be cut up for Greens, which are then in general request, and the other may be retained to come to maturity ; and for a successional crop, plant of the same sowing and kinds, and also on the same or a similar situation, about the first or middle of February, at the distance of eighteen or twenty inches each way.

For crops to succeed these, sow of any of the above kinds every three or four weeks from the first of February to the first of June, on an open spot of light land ; and plant, when fit, in an open and free situation, at the distance of from eighteen to twenty-four inches each way, according to the kinds, and quality of the soil.

The Red kind is to be sown in August or February ; and should be planted out in October or April, on an open spot at the distance of two feet each way.

The broad Dutch is to be sown about the first of September, and planted out in
March ;

March; or in the beginning of February, and planted out in April; on a well-exposed spot, at the distance of thirty inches each way.

The two last kinds, being generally left in the ground for Winter and Spring use, and from the length of their stalks, are frequently much injured by the severity of frost, should be laid over in an oblique direction, which both secures them from frost, and from the bad effects of blanching rains, in rotting their hearts.

SECTION VIII.

CAULIFLOWER.

THIS vegetable being much esteemed, there are few who are not provided with hand or bell glasses for its early production. For this crop, the plants should be sown on a light open spot, about the latter end of July, or first of August; and when they are fit for pricking out, should be put singly into pots of four inches diameter, filled with rich mould, and placed

in a peach or vine house that is not at work, or under a frame and lights, where let them enjoy free air, and be moderately refreshed with water. In very severe weather, defend them from frost, and from blanching rains, &c. till the middle of February or first of March; and then plant them out on an early and well-enriched spot, placing two under each hand, and one under each bell glass. If, however, there is a sufficiency of plants, it may be advisable to place one more in each, than is requisite to remain for good; as early cauliflower frequently start or button about the first of April, and if one or more of them does not, it is but the trouble of pulling them out again.

For a crop to succeed these, plants of the same sowing, and which have been treated in all respects as above, may be planted in a like situation and soil, in the open air, about the first or middle of March, at two feet apart each way.

For successional crops, sow as hinted in the note, page 19., or on a slight hot-bed about the first of January, and when fit, plant them out in an open rich spot of loamy

loamy land. Sow again about the middle of March, and when fit, plant as above. And lastly, sow about the eighteenth or twentieth of May, and also plant as above, or on a wall-border, which has an east or west aspect.

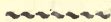
In the Summer months, water frequently in dry weather. Do not plant too deep, otherwise the hearts of the plants will not only be liable to rot through damp, but become an easy prey to slugs, &c.

In the heat of Summer, it is a good practice to break down one or two of the larger leaves, over, and so as to cover the flower. This will prevent it from being scorched, will keep it longer from *blowing*, and preserve it of a more delicate colour.

The last crop will come in about the first of October, and if a sufficiency was planted, will last till the frost destroys it. It is common to preserve these in cellars or other out-houses, or in back-sheds of hot-houses, &c. by taking them up roots and all, and laying them in sand, &c. or by placing them in vine-houses, peach-houses, hot-bed frames, &c. &c. in all

which methods care should be taken to keep them as dry as possible, and to divest them of any leaves which decay.

The soil that produces this vegetable best, is a loam neither light nor stiff, of at least eighteen inches in depth, and which is well enriched with any of the common manures usually applied to such soils. Of this, see the article Cabbage.



SECTION IX.

CARROT.

THIS, above all other vegetables, delights in *new land*, and that which produces it best is a light, sandy loam, of eighteen or twenty inches in depth at least. Carrots should never be sown with manure of any kind at the time of sowing; being produced best and cleanest on land that has been manured for the preceding crop.

The best crop I ever saw, was growing on a spot of ground (a sandy loam, and rather poor), which was trenched three spit

spit deep, and which a spade or plough had never previously penetrated into, above nine inches.

For an early crop, sow of the early horn, or orange kinds, on a slight hot-bed, about the middle of January; or on a light, early border under hand-glasses, &c. about the first of February. Let them be frequently refreshed with water, exposed to the air in fresh weather, and kept clean of weeds; also thin them out to about three inches square.

The principal crop should be sown about the first or middle of April, in an open exposure, in drills an inch deep, and at the distance of twelve or fourteen apart. The long red, or orange kinds are fittest.

The chief property of this vegetable is the length and cleanness of the root; and for the attainment of perfection in this respect, the land should be trenched or sub-trenched to the depth of eighteen inches at least, and well broke in the operation of trenching. Before drilling, the surface should be lightly rolled, or evenly trodden with the foot, otherwise the seed is apt to be unequally buried.

When

When the plants have arrived at the height of two or three inches, thin them out to the distance of five or six apart; but this operation should not be performed in very dry weather, or when the ground is in a dry state, especially if the plants have risen thickly, as thereby the remaining ones will be much hurt, those which are pulled out, both loosening and leaving the ground about them full of holes to the depth of their extremities. The ground should be immediately hand-hoed, whether it be foul or clean of weeds, and that with the view of closing the holes about the remaining plants. For want of the above precaution are many crops of carrots much injured.

Keep them clean of weeds at all times, and pull out such as run to seed, these being both useless, and greatly exhausting the ground.

Such part as are to be preserved for winter or spring use, should be built in *walls* of about thirty or thirty-six inches thick, with dry clean sand. If thicker, they are apt to heat. They should also be taken up when the ground is in a dry state, if possible;

ble; but if this is not the case, they should, previous to building, be laid thin in the barn, shed, &c. for eight or ten days. The situation where they are to be stored, should be cool, dry, well aired, and capable of being defended from frost.

SECTION X.

CELERY.

THIS vegetable is much in request in most families; and in many, as long a succession of it as can be produced is required.

For the first crop, sow about the first of January, either as hinted in page 19., or on a hot-bed; for a second, by the first of February as above, or on an early border having a south aspect, and cover either with a frame and lights, or hand-glasses, &c. for a third, by the first of March, also on an early border; and for a fourth and last, about the first of April on an open spot. This will generally be the crop most to be depended

depended on, the others frequently running to seed.

In all which cases, light rich mould is to be chosen. I have found vegetable mould of decayed tree-leaves, of infinite advantage for the early crops.

The manner of planting, situation, and soil, for all the crops, should be the same, and the following is most approved: The plants in all cases are to be pricked out into nursery beds, which strengthens them much, and makes them put forth fine young fibres; and when they are fit for planting they are to be planted in rows, twenty inches asunder, and eight inches in the row, across trenches of eight feet wide, having spaces of four feet between them, whereon to lay the mould that is dug out of them, which is to be done to the depth of six inches only, this, together with the depth of the soil of said spaces, being sufficient for moulding up with. This is to be understood, however, of land that is at least two feet deep, and which lies dry; as, on the contrary, the plants are to be planted on the surface, and the spaces between, are

to

to be a foot or two more, to afford a sufficiency of soil for blanching with.

The soil best adapted to the production of Celery, is a rich loam of a middling texture; and the fittest manure is a composition of stable dung, and vegetable earth; but stable dung alone, which is pretty well reduced, will do very well. Light sandy loam well enriched with cow dung, will also produce Celery in abundance. Celery grows well, and arrives to a good size, in peat-earth.

In moulding up, a dry day is always to be chosen, and too much is never to be applied at a time, lest the hearts of the plants be covered, in which case they are sure to rot, if damp weather ensue. Celery may be successfully preserved for many months in sand, &c. in the same manner as carrots. See the preceding section.

SECTION XI.

CARDOONS

ARE in request in many families. They are most successfully produced on a deep sandy loam, not too rich.

Prepare single trenches, in manner as is practised by many for celery, at the distance of four or five feet from centre to centre, and just as deep and wide as a single spit will make them, laying the mould in the interspaces. Point in a little compost manure in the bottom; draw a drill an inch deep in the centre of the trench, and drop the seeds at two inches apart. The season is, from the middle of May to the middle of June.

When the plants are two or three inches in height, thin them out to about nine or ten apart. Mould up in all respects as for celery, with this difference only, that the leaves must be gathered, and tied together each time with a bit of old matting, otherwise the mould would get between them in the process of blanching.

Cardoons

Cardoons may also be preserved in winter, in the same manner as carrots, celery, &c.

SECTION XII.

FRENCH BEANS

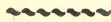
ARE most succesfully produced in a rich, light, dry loam, and are most prolific without manure, at the time of sowing or planting.

For an early crop, sow in a hot-house, hot-bed, or under hand-glasses, of the Speckled Dwarf, about the first of April, and plant them out, when fit, at the bottom of a wall or other fence, having a south aspect. For a second crop, sow in drills two feet apart, of the Speckled Dwarf, Battersea, Negro, Liver-colour, &c. on an early border, or other warm spot, about the middle of April or first of May; for a third crop, of the same kinds, on an open exposure about the middle of June; and for a fourth and last, of the Scarlet or White Runners, on a like situation, in drills three feet apart, about the first or middle

of

of July. These must have sticks to run on, and will generally produce till frost destroys them.

Keep them clean of weeds, and let them be earthed up, first, when the plants are about three inches high, and finally, when about nine or ten.



SECTION XIII.

GARLICK

WILL grow freely on almost any kind of garden land. Plant the cloves in rows twelve inches apart, and six in line, any time from the first of March to the first of May.

It requires no other attention than being kept clean of weeds, and being lifted when the leaves begin to decay.



SECTION XIV.

GREENS,

THAT is, Savoys, Cale, or Kail, German Greens, &c., are cultivated in all respects much in manner of cabbage; and are

are generally planted in an open and well-exposed situation. The times of sowing are February, March, May, June and August; and of planting, March, May, July, August and September. But where a constant succession is required, they may be planted every three or four weeks from February to September. The distance is from twelve to twenty-four inches each way, according to the strength of the land, season of the year, size and age they are suffered to grow to, &c.



SECTION XV.

HORSE-RADISH.

THIS is a wholesome root, is much used, and in constant demand. It does best on a rich sandy loam, but will grow freely enough in common garden earth of any kind, provided it be a foot in depth.

It is propagated most speedily by parting the crowns of the roots into slips; but any part of the root, having an eye, will

A a

grow

grow and become a plant. The season is October, November, March, or April.

Plant in trenches six or eight inches deep, fifteen apart, and six inches asunder in the trench; or in deep drills; or with the setting stick, according to the size of the roots or slips.

This plant requires no other culture than being kept clean of weeds; and where it is required in perfection, new plantations being made every three or four years.



SECTION XVI.

LEEKs.

THIS is a hardy vegetable, and does well on most kinds of garden land, but is produced in greatest abundance on a strong loam. The ground should always be manured for this crop, especially if for spring use, as, in that case, leeks exhaust the ground much. It may be any of the kinds most properly applicable to the soil.

The

The seed is to be sown on a bed of light, rich loam, at any time from the first of February to the first of April. The true Scotch (broad-leaved or flag) Leek is to be preferred. The season of planting is, from the first of June to the first of August; and they are to be planted in rows twelve or fourteen inches asunder, and five or six in the row. The most approved method is to make deep holes with the setting-stick, thrust the plant to the bottom, and let the hole remain open. This is done with the view of saving time in drilling, as it is found the plants strike root as fast this way as if the earth were closed about them; and so afford an opportunity of blanching equally well.

A crop to come in, late in the Spring, may be sown in May, and planted out in the end of August or first of September, according to the season.

Keep clean of weeds; and *top* the leaves three or four different times in the course of the season, which makes them put forth new heart leaves, and consequently swell the stalk to a much greater size than they otherwise would.

SECTION XVII.

ONIONS.

THIS is a valuable vegetable, as most people are fond of it. It requires a strong rich loam to produce it in perfection; but in wet seasons, we frequently see good crops raised in light land.

In all cases, the land should be well enriched with manure, which, however, should not be applied at the time of sowing; the best method being either to fallow or take a light crop immediately before, when the manure should be applied; which may be any of the kinds best adapted to the nature of the soil. If this is not the case, and if manure is to be applied at the time of sowing, compost is to be preferred to simples.

A fixed season for sowing can hardly be determined, as in all cases we frequently see the crop blasted in Summer, either with too much wet or drought, in which latter

latter case, it is sure to be destroyed by maggots. Amongst the best crops I ever saw, were sown about the middle of January. The middle of February or first of March, however, seems to be a more eligible time, as the weather is then generally more favourable for sowing small seeds.

I have also both raised, and frequently seen, excellent crops of Onions that were sown about the first of August; in which case, about the first of May following, when they begin to shoot, their hearts should all be picked out to prevent them from running to seed. This, in fact, seems to be the surest way of obtaining a crop on light land; but in wet land it is not advisable.

Onions should be sown either on four-foot beds, or in drills a foot asunder, and should be thinned out to five or six inches square in the one case, and three apart in the row in the other. The kind best adapted to this climate is the Strasburgh, for although the Portugal, &c. will grow freely enough, it seldom ripens well, and consequently does not keep.

Onions may be successfully transplanted; and when it happens that there are blanks in the beds or drills, this should be practised, that there may be an equal crop on the ground.

In all cases, let the ground be kept clear of weeds; and about three or four weeks before the crop is fit for pulling, let their stems be all broke down, or in other words, *laid*. This is most speedily performed by two people taking each the end of a rod, and walking slowly up the alleys or rows, holding the rod at such a distance from the ground as to generally strike the plants at the height of four inches above the bulb. This is of great use, particularly in wet or late seasons, as the growth is thus diverted from the leaves, and the bulb swells faster in consequence.

It is of importance that Onions be taken up and *housed* in a comfortable, dry state; therefore, when the crop approaches to maturity, advantage should be taken of favourable weather, to have them pulled and prepared for storing, by turning them over frequently, and spreading them thin in a dry, airy place. Being *strung*, and
hung

hung up in a shed or loft that may be defended from frost, is as good a mode of preservation as any other.

Crops to pull green, for Winter and Spring use, should be sown, thickly, about the end of July or first of August. None of the kinds are so fit for this purpose as the Strasburgh. The Welsh Onion has been much used in this intention, but is now generally out of repute.

SECTION XVIII.

PARSNIP.

THE cultivation of this root is so nearly similar to that of carrot, that it would only be wasting time in saying more of it, than that the season of sowing is from the first of March to the first of May; and that, as the leaves grow more gross than those of carrot, they are to be allowed an inch or two more between the plants in the row.

This root, however, although now much out of use in the kitchen, is of a very nou-

rishing quality ; and for cattle feeding, is known to be very profitable. As carrot is good food for horses, so Parsnip is good food for kine ; and it is a productive crop, even on indifferent soil.

SECTION XIX.

PEAS.

THESE are in general request from the month of June till November, if the weather will permit. The most successful way of producing the early crops, is this : Of the true early frame (or Charlton, if these are not to be had) sow a quantity in boxes or large pots, &c. about the first of November, and place them either in a peach-house or hot-bed frame, &c., where they may enjoy plenty of air and light, and grow slowly ; keep them here till the middle of February or first of March, and then place them out of doors in a warm and free situation ; let them be covered with mats at night, and even in the day at first, if the weather prove stormy,

stormy, observing to harden them by degrees; and when the weather is mild enough, let the mats remain off at night occasionally; continue this treatment till the first of April, and then draw drills three inches deep, on a warm light border in a south aspect, in which plant them an inch apart, observing to take them carefully out of the boxes, &c. that none of them be bruised.

Peas, sown *thickly* in a warm, well-exposed spot, being kept under bell or hand glass, and defended from the severity of frost by mats, &c. through the winter; and being hardened in spring, and transplanted as above, will also succeed well, and come in at an early season.

For successional crops, sow first, of the same kind, and on the same border, or a similar, about the first of January; secondly, charltons, and also dwarf marrows, on an open spot about the first of March; thirdly, dwarf or tall marrows, blue Prussian, or any of the other kinds, so soon as the last appear above ground, which repeat till the first or middle of June; but the last sowing or two, should be of charlton or framing,

as

as these answer best for both early and late crops.

Peas do well on almost any kind of garden-ground, but they are most prolific in strong soils. The land is seldom manured for them, as they generally follow some crop that required manuring or fallowing.

The best method is to sow in double drills ten inches apart, if they are to be sticked; as one row of sticks placed in the middle will generally serve both the rows of peas. The distance in this case is, from four to five feet between the centre of the double lines, according to the size of the kinds. For single rows, a foot less respectively.

Keep clean of weeds, and earth up, first, when the plants are about two inches high; secondly, when about eight or ten; and lastly, when they begin to flower.

Late crops of peas are generally much afflicted with the mildew, which retards their growth, and prevents them from *filling*. Perhaps the best remedy is, to sow these crops in rich, light, dry loam, and an open, exposed situation.

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SECTION XX.

POTATOES

**A**RE an abundant crop on most kinds of garden land, but they are cleanest on light loams. In gardening, the ground is sometimes manured for this crop, and sometimes not; if so, a moderate dunging with any of the kinds best adapted to the nature of the soil, will generally answer.

The object, in gardening, is generally a few early ones, except sometimes for the sake of changing crops. For this purpose, plant of any of the early kinds on a warm border, or other sheltered spot, in rows eighteen or twenty inches asunder, and six in row, about the first of March. Sooner is attended with bad consequences: the seed will seldom begin to vegetate before that time, if planted ever so soon, and if hard frost or much wet ensue, it will be much injured.

For a principal crop, plant on a free and open exposure, in rows from twenty to thirty inches asunder, and from six to twelve in row, according to the kinds and quality of  
of

of the foil, any time from the middle of March to the first of May. The sets should generally be buried three inches deep; and they may be put in either with a blunt-ended dibble; or they may be laid in drills; following the former method in light, and the latter in stiff, soils.

Keep clean of weeds; and when the plants have arrived at the height of three inches, let a little earth be drawn to their stems, and when to nine or ten, let them be moulded up for good. Any weeds that appear afterwards, are to be pulled with the hand. The hoe must not be used after their roots begin to run.

Much has been said respecting cutting of Potatoes for seed; some recommending planting them whole, and others cutting them into single-eyed sets; some cutting them two or three weeks before planting, and others planting as they are cut. My method is this: Cut the large ones into four or five; the middle-sized into two or three; and the small, plant whole. Plant within forty-eight hours of cutting, and not sooner than twenty-four: whereby the sets are of a moderate size and strength,

nor

nor is there any waste; are sufficiently dried to resist corruption, and not too much to prevent instant vegetation\*.

The method of planting the shoots is justly exploded. I have, for one, given it fair and frequent trials, and I am convinced it is of little utility.

The *curl* is a disease, which has given the cultivators of this plant much trouble, nor has there, as yet, perhaps, been any effectual remedy discovered †.

It has been supposed to be occasioned, either, 1<sup>st</sup>, by an insect being lodged in the eye

\* By comparison, and observations made last season in different parts of the country, I am convinced of the utility of using *scoops* for taking out the eyes or sets, in times of scarcity; as the remaining part of the root may be used for cattle or pigs. The *scoop*, however, should be of the deepest sort, that is, rather more than a hemisphere, whose diameter is an inch; for if shallower, the set will be too weak.

† I have just learned, that a respectable gentleman in the neighbourhood of Edinburgh, is convinced, by actual experiments made by himself, that the cause of the *curl*, lies in the seed being over ripened; and he advises, as a remedy for this disease, that potatoes, intended for seed, should not be planted before the 15th of May; and they should be taken up in a much *greener* state than those intended for culinary purposes.

eye of the set, since frequently we find clean and infected stems issuing from the same root, and which continue distinctly so throughout. *2dly*, By being planted in too heavy or wet land. *3dly*, By being planted in too poor and hungry land. *4th*, By the same land having been too frequently and too recently cropped with potatoes. And *lastly*, as is the most general opinion, for want of changing the seed.

At any rate, it is a malady, which every one ought to endeavour to remedy. What follows are given as hints with that intent, and which, it is hoped, the candid will apply, or improve, as they may seem to merit.

In respect of the first opinion, whether it be really an insect, or whether it be not rather in consequence of the set being, by some unknown cause, diseased, merits investigation. That it is an insect, I cannot bring myself to think. But that it may proceed from disease in the set or root, seems to carry reason along with it. What might occasion this disease, may either proceed from the seed being injured by frost, by damp, mould, or being over dried. And it is well understood, that, from no diseased



diseas'd seed, shoots or spawn, need we ever expect to raise plants as healthy, or that shall ever become so, as from clean, fresh, and well-matured seed, &c.

In respect of the second and third opinions, as in fact they embrace the same thing, since they imply, that neither of the situations are congenial to the nature and inclination of the plant in question, I have just to say, that if a plant shall be stinted in growth, from any cause whatever, disease will inevitably follow. On annuals of a quick growth, such as the plant in question, this is sooner perceptible than on others.

In respect of the fourth opinion, which certainly carries with it a strong presumption of the case, if we admit there is propriety in changing crops, and that all culinary plants, which are not natives, degenerate less or more, if continued in the same soil successively, we may reasonably suppose it probably proceeds hence. And yet it hath been proved, in some instances, that this is not the case, by potatoes being continued for many successive seasons on the same spot, without any appearance of the *curl*, although they degenerate in size and shape.

In

In respect of the last and most prevalent opinion, viz. for want of changing the seed, by which is to be understood, from one farm, &c. to another, or from one country or district to another, much might be said on both sides of the question. But I must beg to say, that it by no means carries conviction to me, that this is the cause, or indeed, that it can possibly operate in the smallest degree towards it. On the contrary, the *curl* has frequently been brought to places where it was never known before, by this mistaken notion.

But, may not the seed be as effectually changed on the same farm, or garden, if of any considerable extent, as by being carried from one parish or country to another? Are potatoes improvable, like wine, by being sea-borne, or land-borne, without being afterwards planted in soil, different from that in which the last grew? Certainly no. And shall he who has his seed brought from land, non-descript, and which he never saw, be certain of planting again in that which is essentially different in quality? May it not as probably happen, that, *per* chance, he shall plant in land exactly

exactly similar to that in which his seed was produced?

I therefore hold, that he who shall be at all due pains in saving wholesome seed, by divesting the crop intended for this purpose, of all infected plants, so soon as they appear; secures it from frost, damp, or much drought, till planted; plants no weak, or insignificant sets; plants on fresh, well-broke, moderately-enriched land, of a midling texture, rather light than otherwise; allows a sufficiency of room; and keeps clear of weeds; bids fair for overcoming the anxiety attendant on this malady\*.



## SECTION XXI.

SALSAFY, SCORZONERA, AND SKIRRET.

**T**HESE are all cultivated alike, and much in manner of Carrot and Parsnip. A free, light, deep soil, and an expo-  
B b
fed

\* But the reader may see more on this subject, in a paper written by myself, intituled, "An Inquiry into the cause of Diseases in Plants; with hints for their Cure or Prevention;" lately published in Edinburgh.

fed situation, are most eligible. The season for sowing is all the month of April; sowing in drills an inch deep, and twelve or fourteen apart; thinning out to five or six asunder, in line; and keeping clean of weeds.

These roots may also be preserved in Winter, as already hinted.



## SECTION XXII.

### SHALLOTS

**A**RE a precarious crop, being equally subject to injury by too much drought or wet. A rich dry loam and free exposure are most eligible. A fixed season of planting can hardly be determined, and it is most advisable to perform this operation at different times, viz. November, January, and February.

Plant either in four feet beds at eight inches square, or in rows a foot apart, and four inches in the row.

Keep clean of weeds, and whenever any of the plants begin to canker and become  
maggoty,

maggoty, pull them up; as otherwise the whole will be quickly affected. Neither should the crop remain in the ground after the leaves begin to decay, but should be taken up, gradually dried in an open shed, &c. and afterwards stored in manner of onions.

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### SECTION XXIII.

#### SPINAGE.

**F**OR the Summer crops, all soils will answer; but for the Winter, light rich loam, and a dry situation are fittest. Manure is seldom applied, except for the sake of what is to follow; yet, by a moderate dunging, the Winter crops are much benefited, and will grow more luxuriantly in Spring.

For the Spring and Summer crops, sow of the round-seeded kind, thinly, in drills a foot apart, from the first of February to the first of August, at intervals of ten days each; and for the Winter, of the prickly kind, any time from the middle of July to

the middle of August, also in drills as above. Some prefer sowing broadcast; but I believe it is a matter of little importance, provided the plants are kept equally clean, which mode be practised. By sowing in drills, however, the crop is gathered with less difficulty, and is much easier kept clean. Being of a quick growth, weeding or hoeing is seldom necessary for the Summer crops. For the Winter, once or twice will generally be sufficient.

Spinage may successfully be transplanted; by which method also, a succession may be had of the same sowing.



## SECTION XXIV.

### SEA CALE.

**T**HIS vegetable is most successfully produced in light rich sand, of fifteen or eighteen inches in depth. It will do pretty well, however, on all lightish loams, that are well mixed with sharp or drift sand. In stiff soils, it makes little progress,

progreſs, and is alſo apt to periſh in Winter.

The manner of culture is ſimple; and the plants may either be raiſed from ſeed, or by offsets from the root, which come up in abundance in Spring, and are the eatable part of this vegetable. The moſt eligible method is to ſow or plant (in March or April) in rows, a yard aſunder; and the plants are to ſtand, for good, at the diſtance of ten or twelve inches in the row. As the ſprouts riſe in the Spring, let a little earth be drawn to their ſtems, in order the faſter to blanch them, and render them fit for uſe.

Keep clean of weeds at all times, and in Autumn or Spring let a little compoſt manure, or well-rotten dung, be ſlightly pointed in, ſo as not to injure the roots; at the ſame time ſhedding a little mould on the rows; following much the aſparagus mode of culture.

## SECTION XXV.

## TURNIPS.

**T**HE lightest soil in the garden is generally best adapted to their culture, and it should also be well enriched. If it is to be manured for the turnip crop, compost is preferable to simples. In either case, all the kinds of ashes, foot, and pigeon-dung, are to be avoided. Strong loams, however, if not wet, are abundantly productive of this vegetable, provided they be well broke in the operation of digging, trenching, fallowing, &c.

The first of March is soon enough to sow, as we seldom see plants sown sooner come to any good; they generally run to seed and canker. A few may be sown on an early border, but these are not much to be depended on; an open situation being the best at all times of the season.

For producing a constant succession, make it a rule to sow so soon as the last appears above ground; and repeat this till the first of August. The early white  
Dutch



Dutch is generally sown for the Summer crops, and the yellow\* for Winter, for table and market use. They are generally sown broad-cast, and thinned out to from nine to fifteen inches apart, according to the quality of the soil. In gardening, however, Turnips are also frequently sown in drills, from twelve to twenty-four inches apart, and singled out to six or eight in line.

In all cases, the plants should be carefully kept clean from weeds; and in dry weather, the early crops should be frequently refreshed with water.

The fly is often very troublesome, but as they only prey for a few days on the infant plants, the most effectual way to secure a crop is to sow thick, thereby satiating them. Nevertheless, they frequently destroy them in patches, and some

B b 4 in

\* It is singular, that Yellow Turnip should be so little used in England. In London, I believe, it is hardly known. Yet it is certainly much superior to the white, both in point of flavour and nutriment; nor is it injurable by frost in the same degree. For cattle feeding, three loads of yellow are equal to four of white; and they are generally a more certain crop, and also more productive.

in that case, sow again on the same spot; but this is seldom attended with success, as they are either destroyed again by the fly, or do not keep pace with the other part of the crop, so as to make this an object worth the trouble.

Before concluding this chapter, I would observe, that all seeds and plants should be committed to the ground as it is turned over, or as soon after as conveniency will permit. It is then in the most active state, and vegetation instantly commences. Neither should ground ever be dug in a very wet state, except, perhaps, sometimes in following.

CHAP-

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CHAPTER V.

CULTURE OF SALLADS AND HERBS.

---

SECTION I.

SALLADS.

*Chervil, Cress and Mustard.*

THESE articles are all raised much in the same manner ; and where there is the conveniency of a few hand-glasses, a hot-bed frame, or hot-house of any description, with the addition of a few boxes, tubs, or large pots, may be had every day in the year, in abundance, by the trouble of sowing once a-week, or ten days, as occasion shall require. To say more of them, would be trifling with time.

*Endive.*

*Endive.*

Although I have ranked this vegetable as a fallad, it is also frequently used in the kitchen; and by many is much in demand.

It succeeds best on a light, dry, loam. On wet land, it seldom fails to rot in autumn. Neither should the ground be manured for this crop at the time of planting.

For the first crop, sow of any of the kinds, preferring the green curled however, in a light open spot, about the first of June, and plant about the first or middle of July, in rows from fifteen to eighteen inches apart, and nine in the row, on an open exposure. For a full crop, sow also of any of the kinds as above, about the middle of July, and also plant as above, about the middle or latter end of August.

A late crop may be sown about the middle of August, and planted out in September, on a light, dry border, in a south aspect.

Some plant Endive in drills or trenches, and others on the surface. In dry soils, the

the former method is advisable; but in wet ones, the latter mode should be practised.

Keep the plants clean of weeds, and let them be earthed up at two or three different times, in order to blanch the leaves. This is also effected by tying them up, but in wet seasons they are apt to rot. Endive may be successfully preserved in Winter, by being laid in dry sand, in the cellar, shed, or under a frame and lights, &c. In this latter intention, however, the best method is to form the plantations of Endive into beds answerable to the size of the frames; placing these on late in Autumn, on the approach of bad weather; and admitting air freely at other times.

#### *Indian Cress*

Is often used in sallads, and makes a beautiful garnish. The flowers are the useful part for this purpose, and the seeds make a fine pickle. Any soil will answer; and the most eligible situation is against a dead fence, or unsightly wall, which it will rapidly cover and beautify.

The

The season for sowing, is any time from the middle of February to the first of June, in drills an inch deep, and in manner of peas, &c.

*Lettuce*

Is successfully cultivated on all soils, in all situations, and almost at all seasons. The times of sowing are from January to October, at intervals of from one to four weeks, according to the season and demand; and of planting, from the first of February, to the first of November, at intervals also as above.

The kinds are numerous; and those most to be preferred, are the true green coss, hardy green, and brown Dutch, for standing the Winter. These are to be planted in October, or beginning of November, at the bottom of a wall or other fence having a south aspect and dry bottom; or under a frame and lights, hand-glasses, border in the peach or vine house, &c. &c. in which case they are to be duly refreshed with water, have air freely admitted to them in fresh weather, and to be defended from severe frosts, or blanching rains.

Lettuce

Lettuce is frequently forced on hot-beds in the Spring. In this practice it is necessary to beware of too much heat; to refresh duly with water; and to admit large portions of air in fresh weather; for this plant will bear but little artificial warmth with patience.

*Parsley*

Is both used as a sallad and in the kitchen, and is in constant demand. Some force it in hot-beds, &c. but a Winter store is better secured by covering with a frame and lights, or hand-glasses, part of the preceding Summer's crop; which, for this purpose, should be sown about the first of June. Other crops are to be sown in beds, or rows round the quarters, walks, &c. of the garden, from the first of February to this time, as circumstances shall direct, and of the kinds most in demand.

The Hamburgh Parsley is an excellent diuretic, and is used in soups, in the manner of carrot, &c. It should be sown in March, in drills an inch deep and a foot apart; and when fit, should be thinned out

to

to three or four in line. A few drills may be sown in July, for Winter and Spring use, where a succession is required.

*Purflane*

May also be raised in all respects, in manner of chervil, cress, &c. Being of a succulent nature, it likes a dry sand the best. It does not stand frost well, and therefore should not be sown out of doors, sooner than the first of April.

*Radish*

Is plentifully produced on all soils, and is sown from January to September, with success, at intervals of from one to three weeks. The short-top and salmond are most proper for early Spring; the white and red turnip for Summer; and the black Spanish for Winter use; but these three last named will stand the Winter in general, and for this purpose should be sown on light soil, about the first of September.

Being sheltered with a frame and lights, or hand-glasses, would be of advantage for  
the



the white and red turnip kinds; in which case, air must be freely admitted in fresh weather, and water moderately applied.

In the latter end of Spring, the short-top, and salmond kinds frequently get sticky, and run for seed sooner than successional crops can be got forward, in sultry weather. To remedy this inconveniency in a great measure, it may be gratifying to the admirers of this fallad to know, that by closely pinching off the tops, drawing them upwards half an inch, so that the tap-fibres be just broke, and letting them remain till wanted, they will keep fresh and good above a week afterwards, until the successional crops come forward.

In forcing of this fallad on dung-heat, what is said above respecting lettuce, will apply.

~~~~~

SECTION II.

POT HERBS.

Basil.

THIS is a tender exotic, and requires artificial heat to forward it in Spring. About the first of March, sow, either on a
gentle

gentle dung-heat, in a vine or peach house, or as hinted in page 19, in rich, light mould; and transplant, when fit, on a well-exposed, rich, light spot of ground, in rows a foot asunder, and three inches in the row.

Of this plant there are two sorts, the *tall* and the *bush*; and they are both used in the same intention. For soups, &c. they are much in demand, on account of their high flavour.

Such part as is to be kept for winter use, should be cut over, so soon as full in flower, and gradually dried in an open shed, &c.

Borage.

This is both used as a pot-herb, and *for cool tankards*. It should be sown in a light, dry spot, in March, April, May, and June. Wherever it has been sown last year, will, if let stand till of maturity, be shown this; nor is it easy to clear the soil of it, as its seeds lie long in the earth, keep fresh, and so spring again.

Fennel

Fennel

May either be raised from seed, or may be propagated by slips of the root. It will grow freely, in any soil that is not very stiff.—A few plants of it will serve a large family.

Marigold

Is to be sown in the spring months, in two or three successions, from the middle of February, to the first of May. The flowers *only* are useful.

Marjoram, Savory and Thyme.

The same culture answers all. Sow in beds of light earth, in a free situation, about the middle of March, or first of April. When the plants are a few inches high, thin them out to six apart each way; or transplant into rows nine or ten inches asunder, and three in line. If the knotted marjoram, or sweet savory are wanted early, a little may be raised in manner of the Basil as above.

Green Thyme, pot Marjoram, and Winter Savory, may be kept fresh all winter, if required, by being sheltered with hand-glasses, a frame and lights, &c. but when properly dried, they have the same effect in soup, broth, &c. and this is seldom practised. These last are most generally propagated by slips, planted in April, July, or August, in light, rich earth, at six inches apart.

Mint,

That is, sweet, or spear mint, is propagated most speedily by slips of the root. The season is March or April. It may either be planted in rows, nine or ten inches asunder, or on four foot beds. Rich, light loam will produce it in highest perfection.

If it is wanted early, a little forced on a slight dung-heat in manner of asparagus, either under a frame and lights, or hand-glasses, will generally serve till it comes in the natural ground.

Sage.

This plant is propagated, either by slips of the root, or by cuttings, with facility.
For

For the former method, March or September is the season. For the latter, any time from May to August. Sage thrives, and also stands the Winter best in lightish, sandy loam, and a free exposure. Its leaves for Winter use, are to be cut when full in flower, and gradually dried in a shed, &c.

Sorrel

Will grow almost any where, nor is it easily eradicated from the soil afterwards. Slips planted in March, or indeed any time, will not fail to grow vigorously. The French and the common sorts are both propagated alike.

Tansy and Tarragon.

What has been said above will apply here, except that Tarragon will sometimes, if in a wet situation, perish in Winter.

CHAPTER VI.

ON THE ROTATION OF CROPS.

AS in agriculture, so in gardening, a proper rotation of crops is of great importance, and the reasonable and useful practice of cropping a *part* of their ground *every season*, with some of the species of grain or grasses, is becoming prevalent among market gardeners; which, besides being useful for their cattle, is found of infinite advantage to their ground.

This matter, however, can by no means be so effectually accomplished in the garden, as in the farm, for these reasons: it is smaller, and the articles to be cultivated are more numerous, and also more a-kin to one another.

The different articles, however, might with propriety be classed in this case, as, Brocoli, Cabbage, Cauliflower, and Savoys; Beans, French-beans, and Peas; Carrot, Beet, Parsnip, and Turnip; Leeks, Onions, Shallots,

Shallots, &c. Celery, Endive, and Lettuce, &c. &c.

Celery is an excellent preparative for asparagus, onions, or cauliflower; turnip, or potatoes, for cabbage or greens; brocoli or cabbage, for beans or peas; cauliflower, for onions, leeks, or turnip; asparagus land that has lain long, for carrot or potatoes; (currant, gooseberry, raspberry, and strawberry land, may answer the same purpose); turnip, for celery or endive; peas, &c. for clover, as a restorative, with which barley or oats might be sown.

In this latter case, however, the two preceding crops should not be manured, as otherwise, at least in most instances, the barley, &c. would be apt to grow rank, to the detriment of the clover.

After the land has lain one or two seasons thus, it will again be fit for the reception of an esculent crop, of any kind, as carrot, asparagus, potatoes, &c.

Clover, with barley or oats, may also very properly be laid down as a restorative for land of any kind, which has been long under esculent crops without a proper

change, and is consequently foul and cankering.

If it is suffered to lie two seasons, the land will again be prepared for culinary vegetables of any kind.

As a change for land as above, and which cannot be spared from esculent crops above one season, a crop of barley, oats, rye, or wheat, as a *cleanser*, may be advantageously taken; which will, in a great measure, refresh, restore, and again render it fit for the production of wholesome kitchen vegetables.

In all cases, a studied rotation is to be advised, and such an one as that no crop of the same class may immediately follow another. For the more effectual accomplishment of which, the garden should be regularly divided into quarters, numbered, and a journal kept, wherein is recorded what respects the cropping, manuring, trenching or fallowing of each of them.—Thus:—

No. 1. (1793.) Subtrenched after asparagus, for carrot, without manure. Winter fallowed. (1794.) Early cauliflower, with a moderate dunging, 2d Mar. Yellow turnip, with a compost dressing, 20th July.
(1795.)

(1795.) Onions, without manure, 8th Feb. Cabbage, with a light dunging, 5th Oct.

(1796.) Charlton peas, for a late crop, without manure, 10th June; trenched three spit deep, in Dec. Winter fallowed.

(1797.) Potatoes, with a moderate dunging, 20th Mar. German greens, without manure, 10th Sept.: intended for leeks next June.

This sketch is taken from my Journal formerly kept, and is here given as an example *only*; which every judicious gardener is requested to alter or improve, as he may find convenient.



(1860) Owing to the late season, the crop

of wheat was very small, and the

price was very low, and the

crop of barley was also very

small, and the price was very

low, and the crop of oats was

also very small, and the price

was very low, and the crop of

rye was also very small, and

the price was very low, and

the crop of clover was also

very small, and the price was

very low, and the crop of

straw was also very small, and

the price was very low, and

the crop of hay was also very

small, and the price was very

low, and the crop of

potatoes was also very small,

and the price was very low,

and the crop of

turnips was also very small,

and the price was very low,

and the crop of

carrots was also very small,

and the price was very low,

and the crop of

beet was also very small,

and the price was very low,

PLATE I.

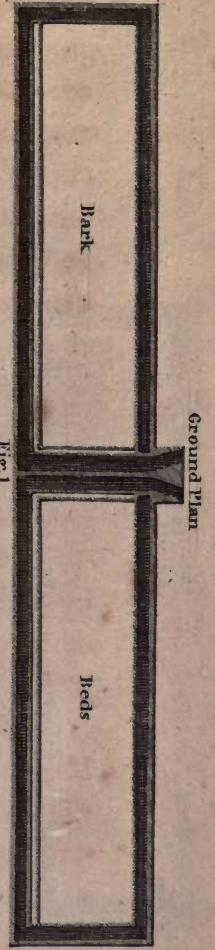
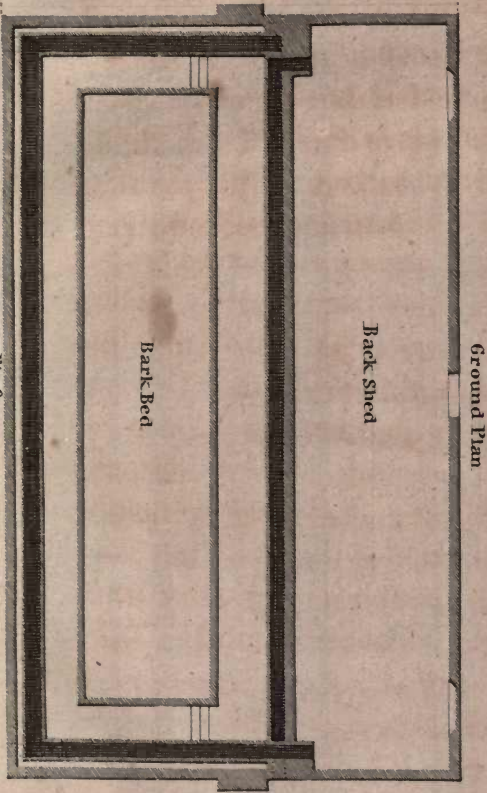
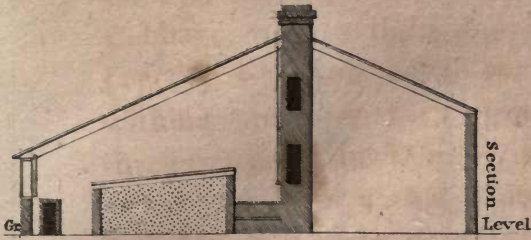
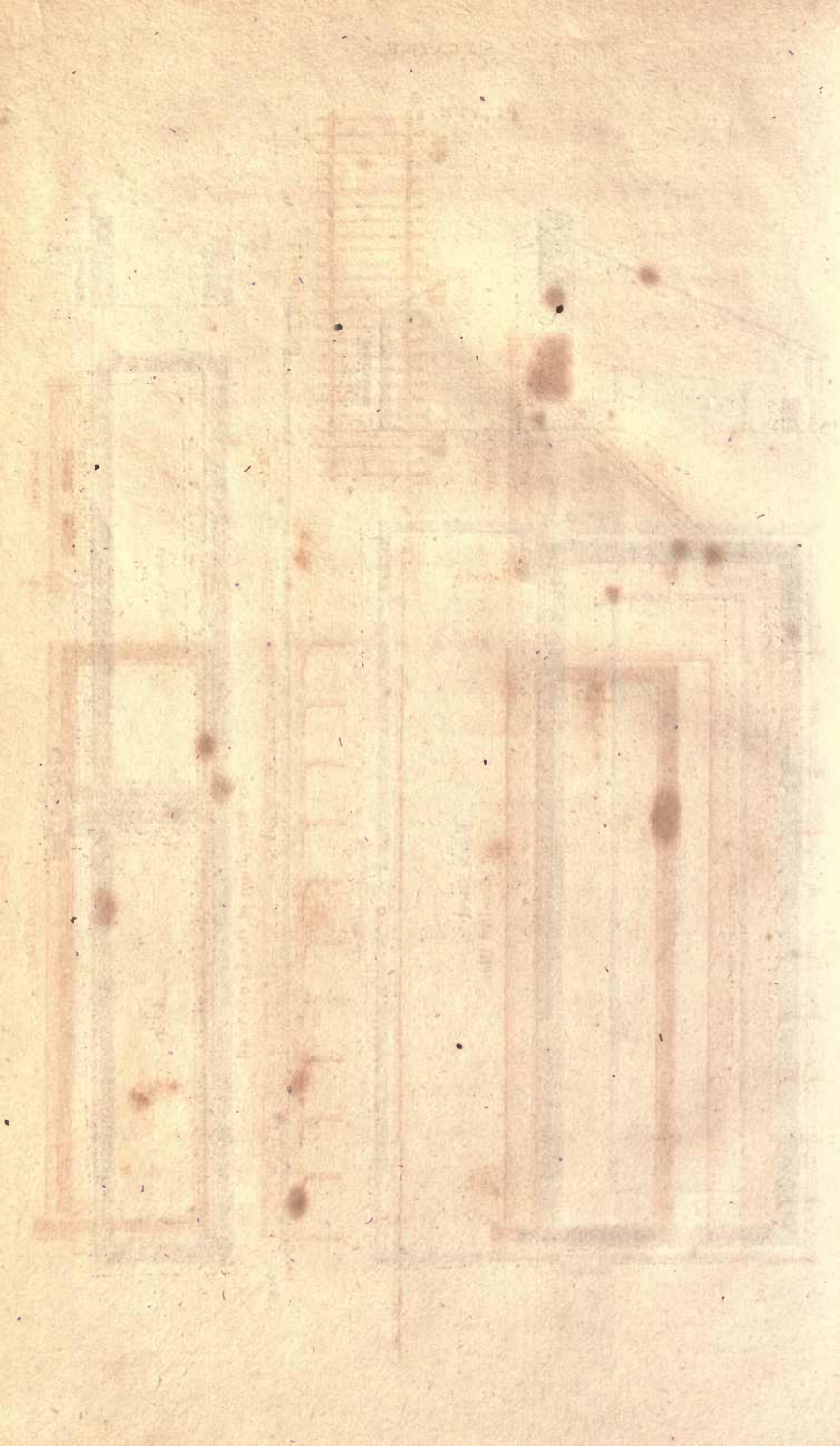
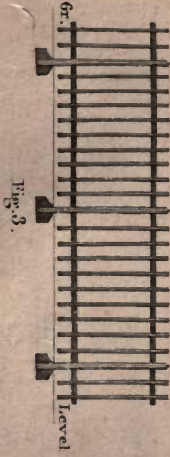


Fig. 2.

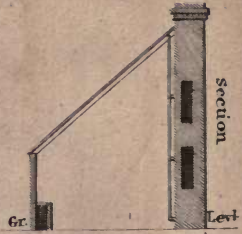
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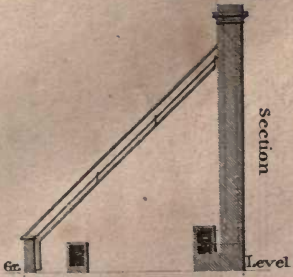
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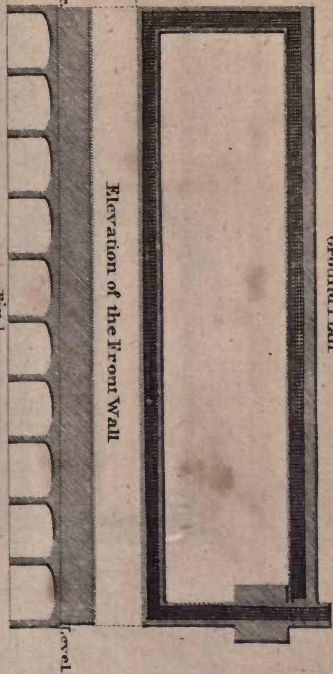
Section



Section



Ground Plan



Elevation of the Front Wall

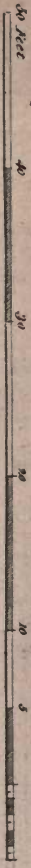
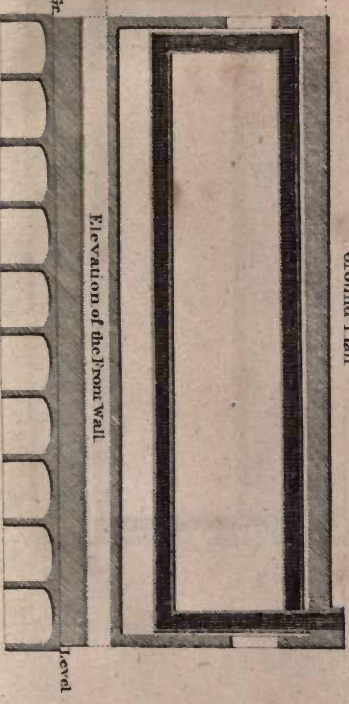


Fig. 1.

Ground Plan



Elevation of the Front Wall

Fig. 2.

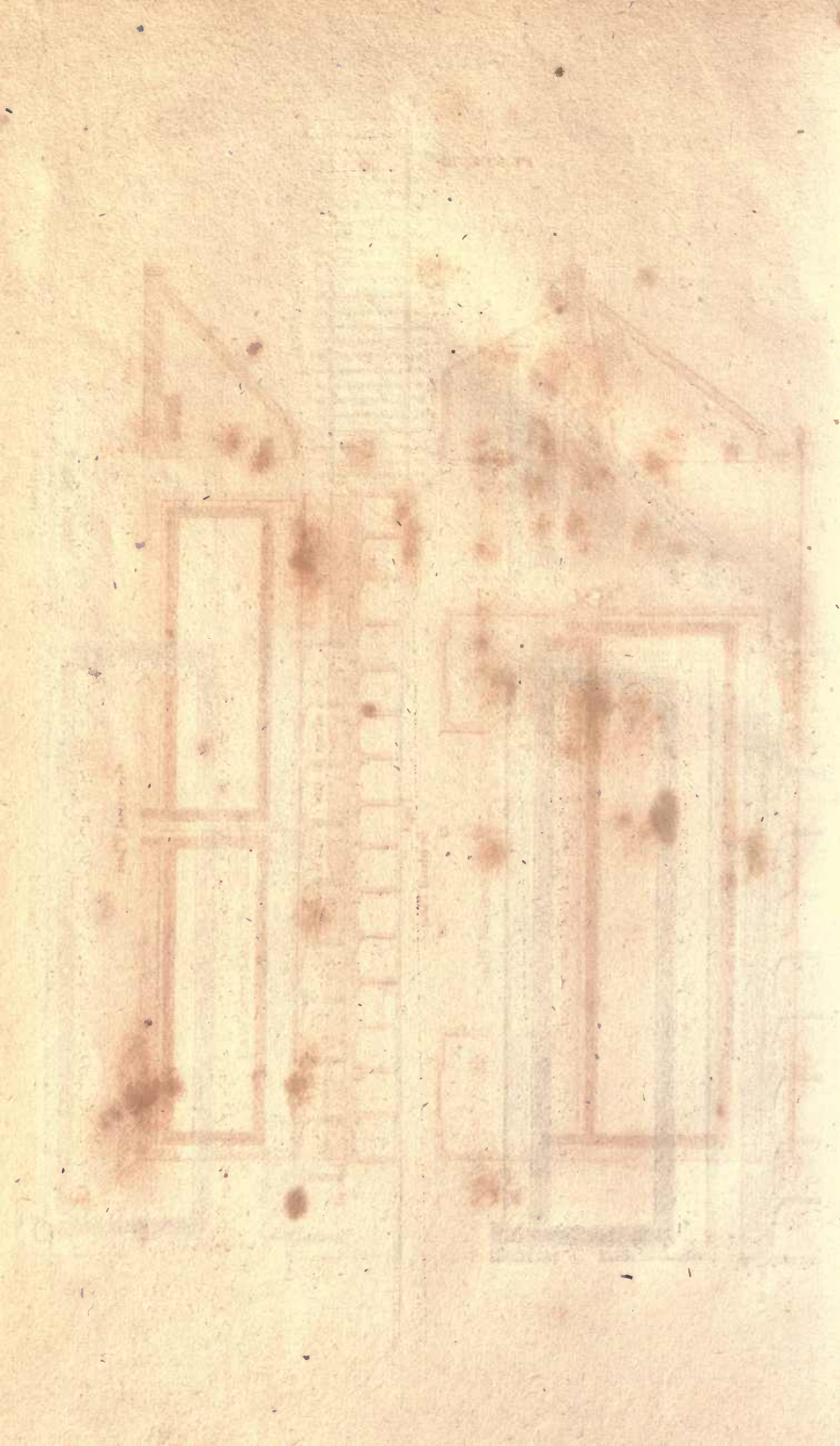
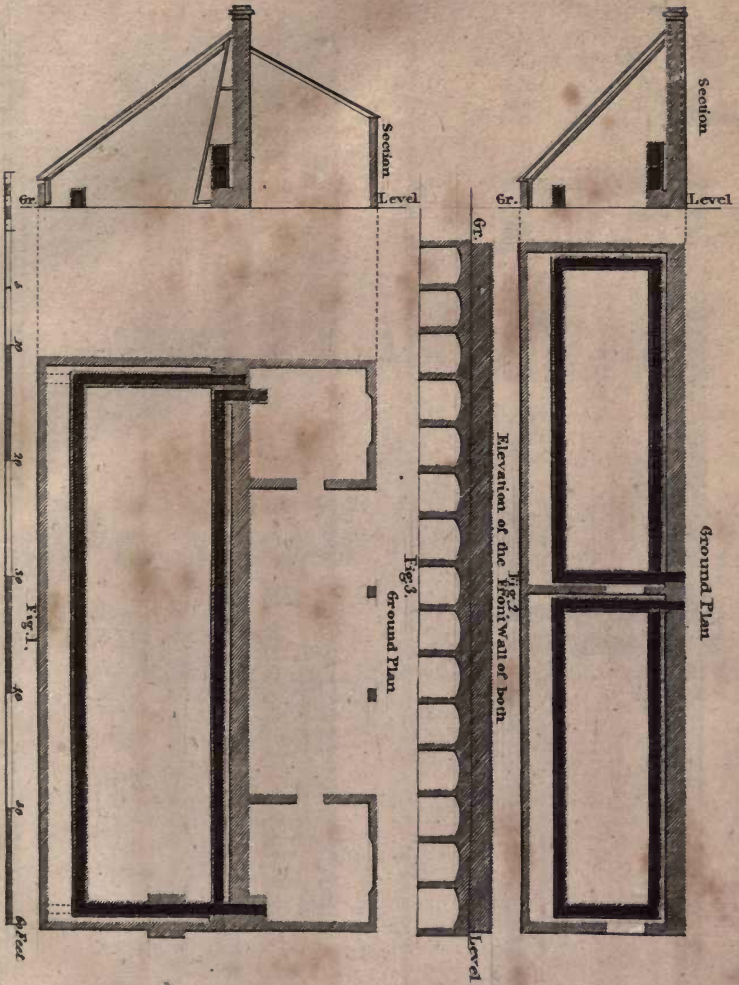
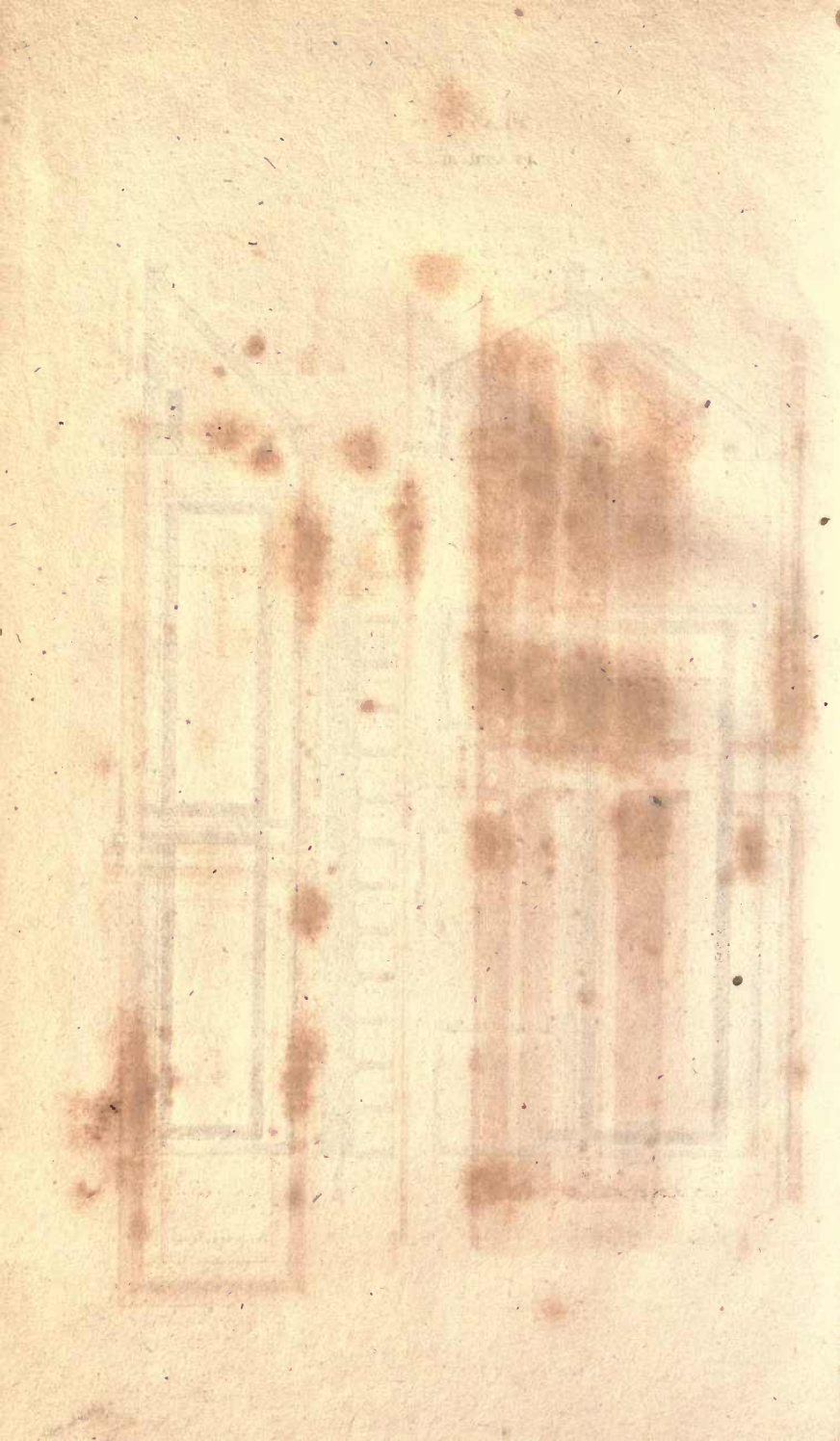


PLATE III.



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D. Lear & Comp.



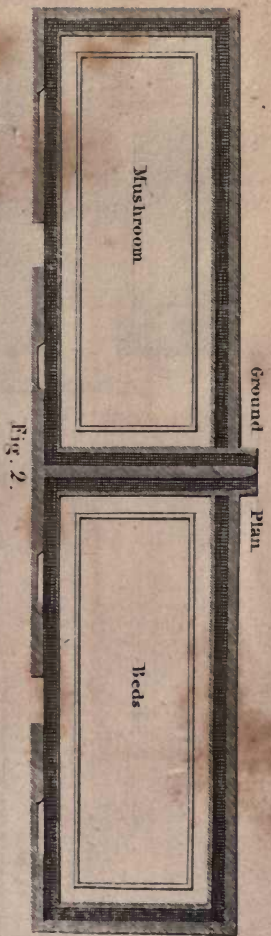


Fig. 2.



Section

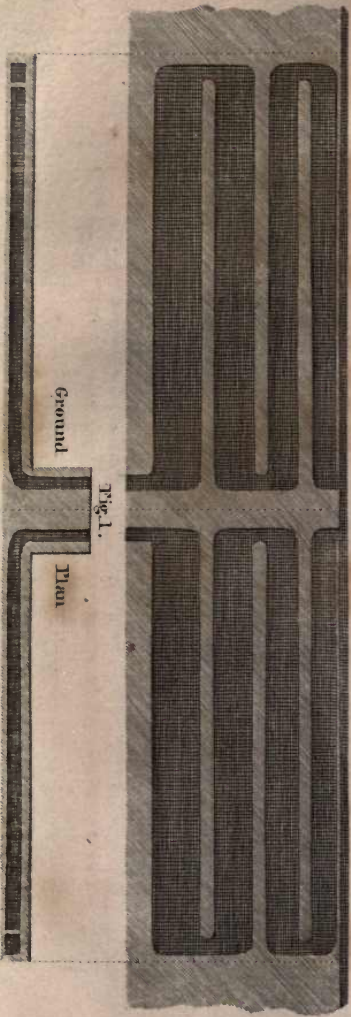


Fig. 1.



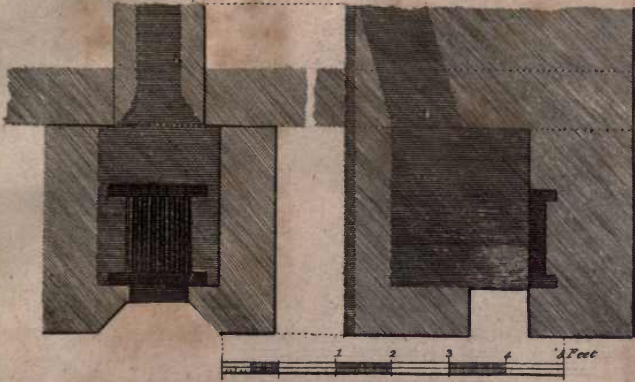
PLATE V.
Vertical Section.



Fig. 1.

Horizontal Section

Ground Plan



Winter Pruning

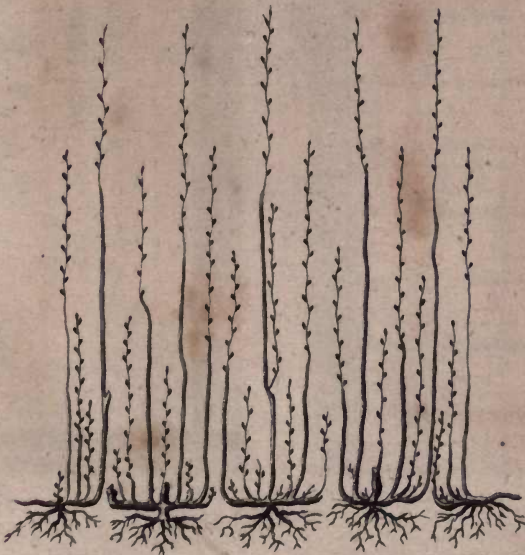


Fig. 2.

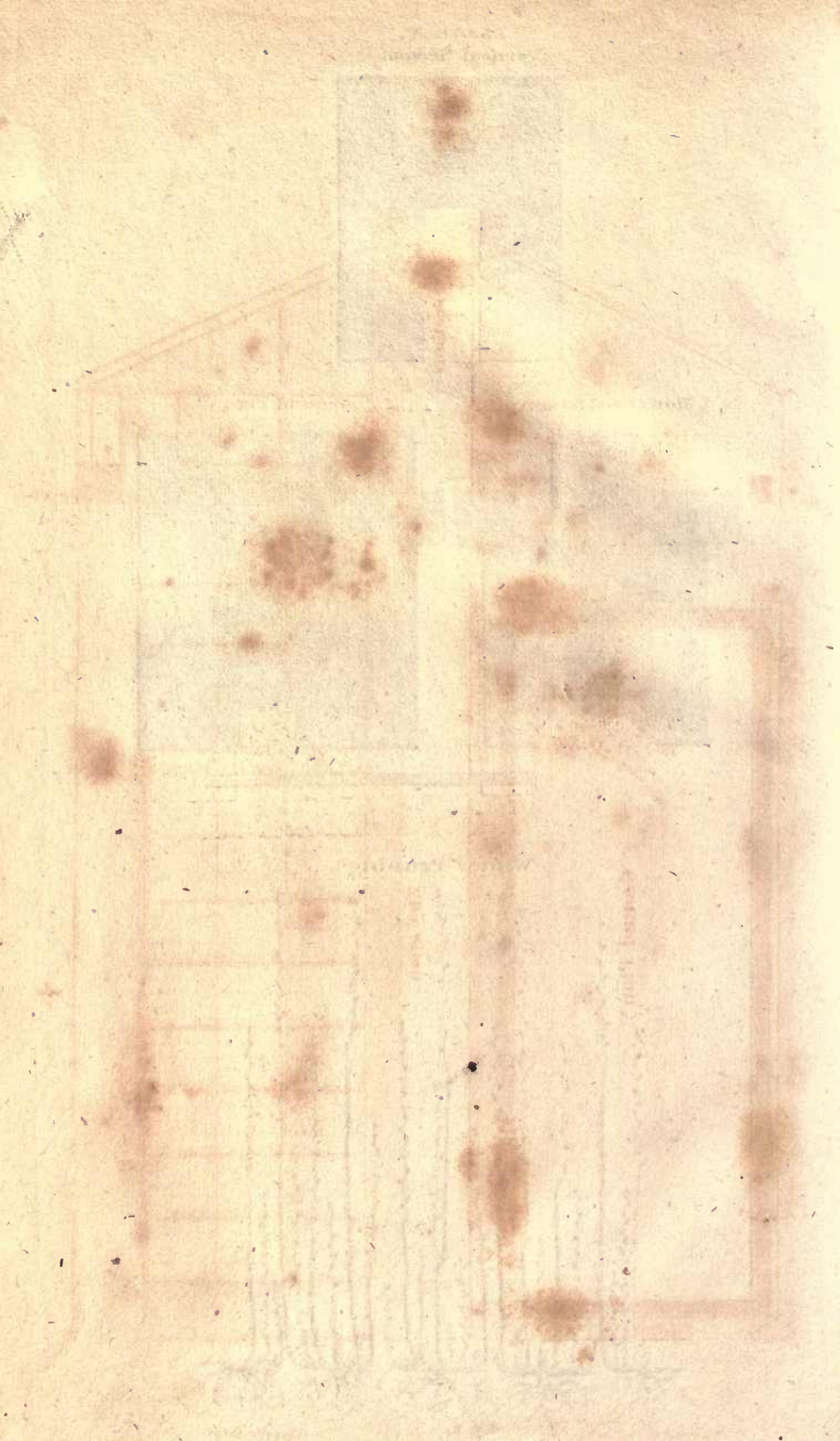
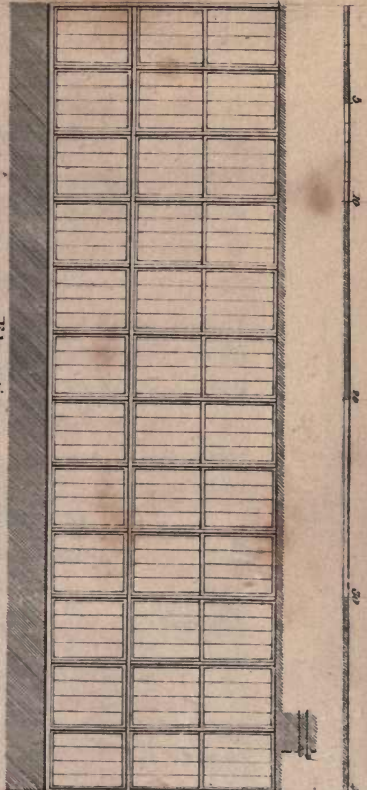
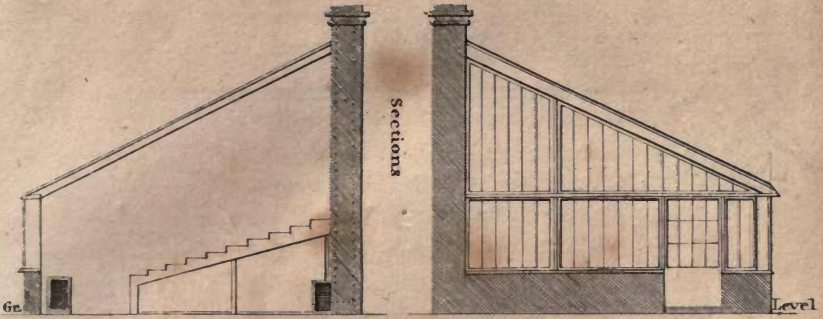


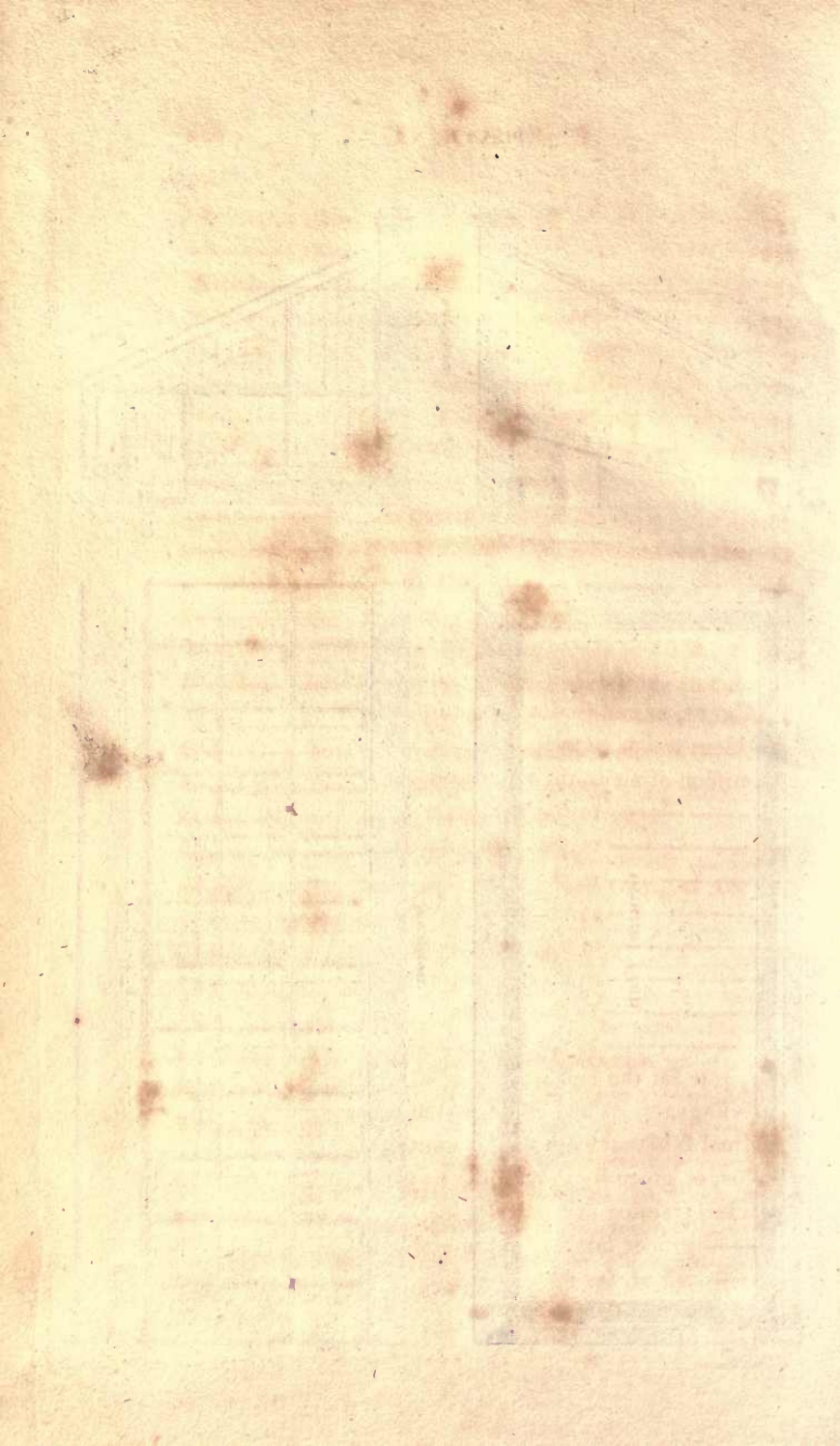
PLATE. VI.



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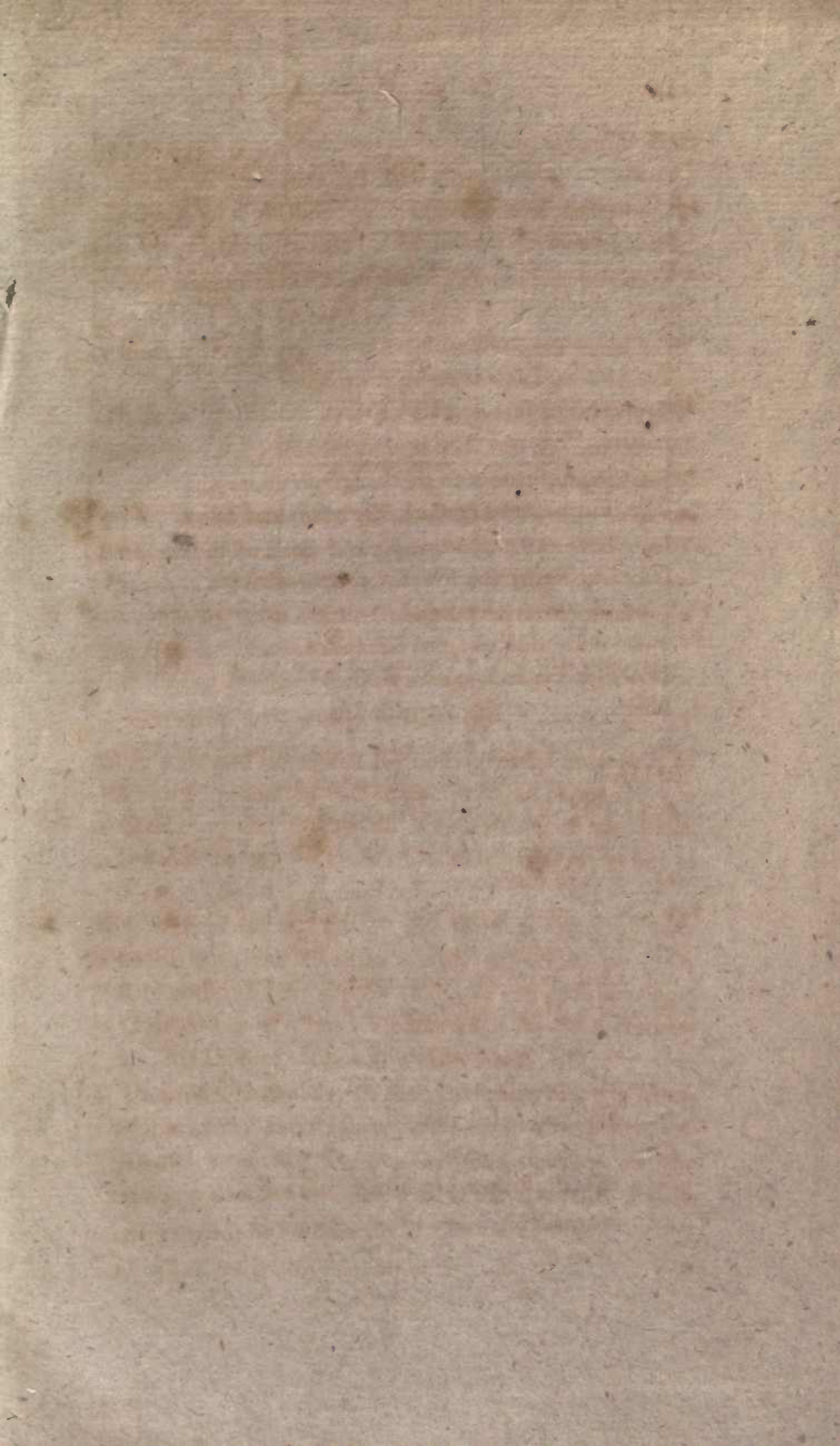
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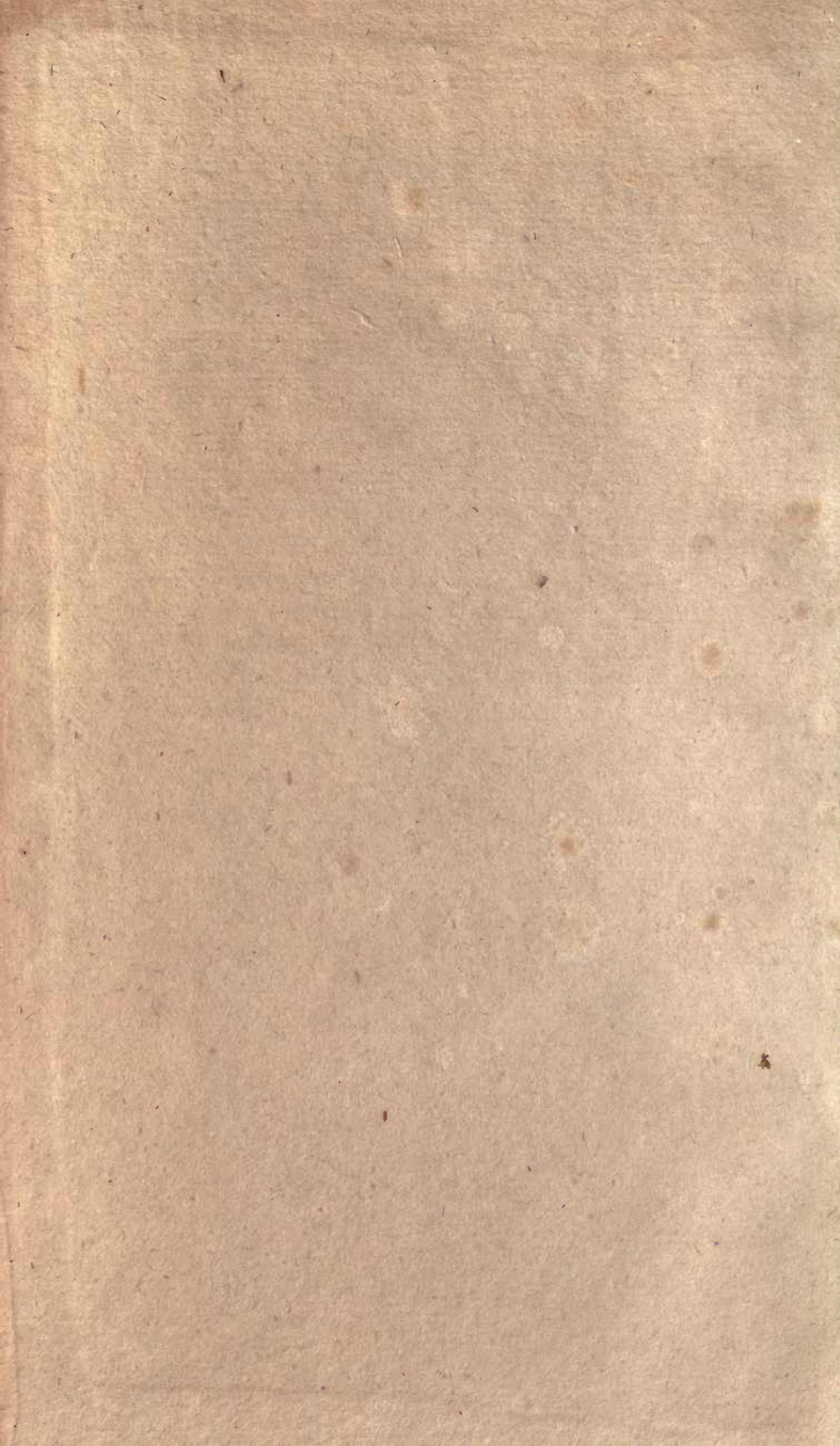
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