The gardener's remembrancer. Exhibiting the nature of vegetable life and the effects of vegetation ... : to which is now added, the culture of the cucumber / by James MacPhail.

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THE GARDENER'S REMEMBRANCER;

EXHIBITING

THE NATURE OF VEGETABLE LIFE

AND THE

EFFECTS OF VEGETATION;

AND CONTAINING

PRACTICABLE METHODS OF GARDENING,

Both in the Natural Way, and in the Artificial Forcing Scheme;

ADAPTED EITHER TO SMALL OR LARGE GARDENS,
AND TO EVERY CLIMATE AND SOIL.

TO WHICH IS NOW ADDED,

THE CULTURE OF THE CUCUMBER;

The Plan of a lately invented

BRICK-FRAME FOR FORCING FRUITS, FLOWERS,
AND ESCULENT VEGETABLES,
WITHOUT THE INFLUENCE OF FIRE-HEAT;

AND ON THE MANAGEMENT OF TIMBER TREES.

THE SECOND EDITION,

GREATLY IMPROVED AND CORRECTED,

BY JAMES MACPHAIL,

Upwards of Twenty Years Gardener and Steward to the late Earl of Liverpool.

LONDON:

Printed by Strahan and Spottiswoode, Printers-Street;
FOR LONGMAN, HURST, REES, ORME, AND BROWN,
PATERNOSTER-ROW.

1819.

PREFACE.

THAT which is contained in the following volume is the result of many years experience, and constant practice for more than thirty years in the science of gardening and in agriculture. A few of the methods of planting, transplanting, and pruning of trees and plants, and of forcing fruit-bearing plants and flowers, and esculent vegetables, are entirely new, as I suppose, being of my own invention. Something I learned from books, both of a practicable and theoretical nature; but of course, most of my skill in the art of gardening I derived from the knowledge of practical men, by seeing the methods they took in the management and cultivation of different kinds of plants, and the result of their labours in the production of the fruits of the earth.

In the first part of this work, on different branches of gardening, I have, in Preliminary Instructions, in sixteen Chapters, treated on the nature and culture of plants, both in the natural and in the forcing system.

1. I have given my ideas of the nature of vegetable life, and of vegetation or the growth of plants and fruits, begun, carried on, and brought to maturity by the concurrent influence and powerful but immediately imperceptible efficacy of the elements of earth, water, heat, and air.

2. I have treated on the culture of the most esteemed and useful fruit-bearing plants, and on the forcing of some choice kinds of odoriferous flowers, and on

the propagation of mushrooms by new and by different methods.

3. I have described the diseases and symptoms of disease in fruit trees and in plants of different kinds, and have prescribed remedies whereby their diseases may be healed; and I have given methods, by the use or adoption of which, plants of various sorts, such as the pine apple, the melon, the cucumber, the peach, the cherry, &c. may be prevented, as far as possible, in the course of their cultivation, from being infected with disease of any kind.

4. I have shewn my way of managing and of cultivating the pine-apple plant, and other plants in the forcing scheme, which will, with unfailing facility, destroy all kinds of injurious insects on them, and also prevent the plants from being infested with hurtful insects of any kind.

5. I have commented on the nature and construction of hot houses, and on beds of dung, tan, and leaves of trees, made use of for forcing all manner of fruit-bearing plants, flowers, and esculent vegetables, which, in our country, are brought to maturity by artificial means.

6. I have given the plan, and a copious description of a brick frame of my own inventing, for forcing different sorts of fruit-bearing plants and flowers, and esculent vegetables, by making for them a suitable temperature of atmosphere by the heat of horse-dung, the steam of which being conducted into flues of brick-work, constructed in such a manner as to prevent the heat of the dung from injuring the roots of the plants. And I have likewise given a description of a steam-engine or apparatus for preserving green-house plants, and for forcing all manner of fruit-bearing plants, flowers, and eatable vegetables. This invention has only lately been put into practice.

The second part of the following volume consists of The Gardener's Remembrancer, by which the

reader is not only reminded of what business respecting gardening is required to be done, or to be attended to in the different and numerous branches of horticulture in one way or another in every month throughout the year, but also the manner of cultivating, by different methods, all kinds of fruits, flowers, and esculent vegetables, and of herbs for distilling, &c. This, I am persuaded, is the most effectual way of refreshing the memory, and of communicating the knowledge of gardening to those who want it, and are desirous of being easily and effectually instructed in the useful and pleasant science of horticulture.

Where gardening is carried on to any great extent, there is such a multiplicity of work of various kinds to be done in every month, and even in every day of the week, (for hot-houses and forcing-frames must be attended, in making fires, and in uncovering and covering up, and in giving and taking away air, even on Sunday, because if the plants were neglected in these respects only one day, they might be killed, or at least greatly injured), that the most skilful person in the art of gardening, possessed of a good memory, may happen to forget to do some things in their proper time, except he have recourse to a memorandum written by himself, or by some other person. These being facts which I suppose few practical gardeners will deny, I therefore believe that my Gardener's Remembrancer will be useful to numbers of gardeners and others, especially to aspiring young men, whose inclination leads them to follow after and excel in the business of horticulture, which requires uncommon skill and attention. And, I apprehend, that it will be serviceable to those who have gardens, and cannot afford to keep a gardener. By following the directions which I have given in the following volume, they may, if they choose, perform the work of their own

gardens themselves, or direct a common labourer to do it for them.

Of course, it is or will be generally known by the readers of my book, that it was a few miles from London, between 51 and 52 degrees of north latitude, where I resided upwards of thirty years, in the constant practice of gardening and agriculture. On this account, it may perhaps be supposed by some persons, that my Gardener's Remembrancer, and the methods of the culture of plants therein described, are not well adapted to other parts of the country, or to climates north or south of the latitude above-mentioned. But upon due consideration, I am inclined to think that such chimerical ideas will be easily obviated; for it must be allowed, after being proved by experience, that they will be equally useful in all climates of the world, and parts of the country where gardening is practised, either in the natural or in the forcing way.

For let it be remembered, that the temperature of heat necessary for the culture of the pine apple, the melon, the cucumber, the peach, &c. to bring them to good perfection, must be nearly the same in all climates, whether natural or artificial.

In regard to gardening in the open air, it is generally known in Britain that the work belonging to it cannot be done at the same time of the season, or on the same day of the month, in every succeeding year, even in the same garden; nor is it at all necessary that it should be so; and that in soils and in situations there is frequently considerable difference even in the compass of a few miles.

With respect to the degrees of latitude, by what I have taken notice of, when residing in and traveling through Scotland, England, and part of France, I think about four days time is a sufficient allowance in regard to the commencement of sowing and of planting, in all parts of countries, either to the north

or to the south of any given degree of latitude, say 52 north; so that, for instance, (putting out of the question warm and cold climates, caused by sheltered or exposed situations, and the nature of soils) supposing the proper time to sow or to plant in latitude 52 was on the fourth day of March, the time to do the same kind of work in latitude 51 would be on the last day of February, four days earlier; and in latitude 53 on the eighth day of March, eight days later than in latitude 51, and so on in a decreasing or increasing ratio, answering or according with the degrees of latitude, whether south or north.

It may be observed on a map that latitude 52 runs through England about twenty miles north of London, through Holland near Amsterdam, through Poland near Warsa, through part of Asia, through North America, and through the south of Ireland; consequently my Gardener's Remembrancer may be equally useful in every country on the face of the earth, where fruit trees and esculent vegetables are cultivated, either in the open air or by artificial means.

Respecting the temperature of the air in succeeding years, it is well known by experience, that in the same degree of latitude some seasons are three weeks earlier than others; so that the same kind of work in gardening may be performed three weeks sooner or later in the season, as may suit the cultivator, or the kind of weather which may happen.

It may be observed in my monthly directions, that I say such and such work should be done in such a month. Now, in all probability, that work in some seasons may be successfully performed in any time of the month the gardener may see fit. In fact, it may happen that what is directed to be done in any given month may be equally as well done about the end of the preceding month, or be left undone till the beginning of the succeding one. But notwith-

standing all that can be written on gardening, by the ablest practical men, practitioners in that science must in many things be ruled by the seasons, and be in general guided by their own skill and judgment: nor can authors of the greatest experience prescribe methods or give directions, which, if punctually followed, will at all times prove successful in the production of good crops, or in preventing failures, often caused by unfavourable weather, bad seeds, weak plants, or accidents that the best of gardeners cannot always foresee, nor be sufficiently guarded against, so as to prevent disappointment.

Whoever reads the Preliminary Instructions given in the following treatise, if the culture of any plant therein treated of appear defective, let them examine the monthly directions given in the Remembrancer. Or if they happen to be looking into the Remembrancer for the time to sow seeds, or to plant trees or shrubs, or for the culture of any sort of fruit-bearing plants, if they find it not treated of there to their satisfaction, they are referred to the chapter which treats of its culture in the Preliminary Instructions.

In the Monthly Remembrancer I have not only mentioned the names of most sorts of fruits, flowers, esculent vegetables, and physical herbs, worthy of cultivation, but have also given directions how to originate them from seeds, cuttings, layers, budding, grafting, &c. I have likewise given tables of the temperature of the air necessary for the production of choice fruits, flowers, &c. These tables exhibit on the thermometer the degrees of heat in the forcing scheme for the culture of the pine apple, the melon, the cucumber, &c. every day of the week throughout the year. Such a display or daily register of the temperature of the air, or of atmospherical heat, competent to bring hardy choice fruits, esculent vegetables, and flowers to perfection, at an earlier period of the

season, or in higher perfection than they would come to in the open air in this country, and likewise for growing exotic plants, and ripening in the British climate, and in climates in any country too cold to bring to maturity tender, delicious, exotic fruits, which, without artificial heat and extraordinary methods of cultivation would not at all ripen, has not been given nor published in any book whatever that I have seen or heard of, before that of my own composing and hand-writing.

By trying a number of experiments in the forcing of fruits and esculent vegetables by the influence of fire and the heat of fermenting vegetable bodies, I was led to imagine the probability that a bed or frame might be constructed for producing cucumbers early in the spring, by the influence of the heat of horse-dung, without having the hot-bed immediately under the stems of the plants, in the usual way. After much consideration and the result of experiments too numerous here to mention, I invented and got erected a brick forcing-frame or bed, the plan of which is to be seen in the following volume, facing page 113.

This brick forcing-frame was first planned and built for the sole purpose of preserving cucumber plants during the winter, that they might be able to begin to produce fruit in the month of February or beginning of March, which some good gardeners effected by means of a dung-bed, and by the application of linings of hot dung to its sides, when the heat of it began to decline. This brick frame answered my intended purpose so well for cultivating the cucumber, that I was induced to try what effect it would have in the production of the melon, and in growing pine-apple and other plants which require forcing to bring their fruit to maturity early in the season. In the culture of these, by means of the brick frame and linings to it of hot dung, I was equally successful as

I had been in the culture of the cucumber; hence, after a number of years practice, I was stimulated to make my system of forcing, on a new principle, publicly known; consequently, in the following volume I have given the plan of my original brick frame, and the way to manage it; and I have also given directions how to consruct, on the same principle, larger forcing frames or beds, with instructions for the management of them in the cultivation of different kinds of fruit-bearing plants, herbs, esculent vegetables, and flowers. *See* Chap. XVI. &c.

Since I first published this invention of mine, of forcing cucumbers, melons, pine apples, &c. on a brick bed by the influence of linings of hot dung, instead of a bed of dung in the usual way, a number of gardeners have adopted my principle and methods of forcing advantageously; and as a convincing proof that the system which I invented and now recommend, will answer the purpose of forcing fruit-bearing plants, &c., several gardeners who rear fruits and eatable vegetables for the London market, have adopted the principle on a larger scale than the plan given in this publication, which serves as a model, or otherwise, as may appear suitable to those who may think fit to adopt the brick-frame forcing scheme.

Several years have elapsed since I was excited to publish my ideas on some branches of gardening, by observing obtruded upon the public some methods respecting the cultivation and management of timber and fruit trees, which appeared to me to be founded on principles and carried into practice in a way more applicable to the animal than to the vegetable creation. My public opposition, and the opposition of a few gentlemen of greater learning and better abilities than what I possess, to the supposed utility of the application of purgatives, and of medicines, and of plasters to plants or vegetables of any kind, in the way such

are administered to human creatures and to brutes, together with the result of repeated experiments by many persons in trying to renovate old trees, and to heal the diseases and blemishes of young trees by such chimerical inventions, which were strongly recommended by learned men in high life, have fully proved their uselessness in that respect, so that they are now generally justly exploded. But although these methods of purging and of plastering trees, and of anointing their bark and wood, which were held forth as being new inventions; which, if put into practice, it was affirmed would be of much benefit to the public, and which for some time created a great bustle among gardeners and gentlemen, be entirely given up as being inefficacious; yet we observe other theoretical schemes of a similar nature, which in a late publication are exhibited as being efficacious for curing the diseases of trees, and for healing their wounds.

The publication to which I allude, is called "Abercrombie's Practical Gardener." The theoretical and erroneous opinions exhibited in that publication respecting some important branches of gardening, ought also to be exposed and combated by real practical gardeners and others who are able to do it; though in that publication the name of the author of the plasters and medicines for trees, published some time ago, as being effectual remedies for curing the diseases, hiding the defects, and renovating decaying trees of all kinds, be not mentioned by the "Practical Gardener," his ideas are adopted, and similar methods of anointing and plastering of trees recommended, to cure their diseases and cover their defects.

The following are a few specimens extracted from the "Practical Gardener," which the publisher says was written by the late John Abercrombie, and revised by James Mean, Gardener to Sir Abraham Hume, Bart. "The gum is a distemper caused by the joint or graft not uniting, or by bad

untimely pruning, and by external accidents; sometimes, on a sound tree, such a wound will heal of itself, or it will close with the aid of a plaster of cow-dung covered with a piece of linen to stop the discharge, and defend the part from the weather."

"The canker in trees arises from a minute insect; and Mr. Mean finds at least that an application, the success of which can be no otherwise accounted for, will eradicate the disease. To rub the part affected with canker with a brush dipped in train oil, is an effectual remedy."

"Dress the peeled parts of trees with train oil."

These and other such like methods, held forth by the "Practical Gardener" as being effectual remedies for healing the diseases of fruit trees and of other trees of different sorts, I hesitate not to advise every person who may have the management of trees of any kind, against using them. Plasters of cow-dung and ointments for rubbing trees, composed of dung, urine, and lime, were and are at least harmless dressings; they do neither good nor hurt to trees, the simple brushing of the stems of trees may do them some good, by destroying the insects on them; but the application of oil in any form to trees will heal none of their wounds, nor cure their diseases; it may however injure, and, if used copiously, will in all probability destroy them.

Many years ago, in Hampshire, where I had the superintendence of a garden, in which there was considerable forcing, and when I had not that experimental knowledge of gardening as I obtained afterwards, I was from report induced to scrape, rub, and anoint with oil, the stems and main branches of a few peach trees in a forcing-house, which greatly hurt them.

Nothing in my opinion ought to be applied to the stems or branches of trees, which, if applied to their roots in a tender growing state, would hurt them.

We might indeed suppose, that reason would teach those long in the practice of gardening or of agriculture, that oil of any kind is unfit for the food of plants: oil is the essence either of animal or vegetable bodies, which, when corrupted, rotted, and mixed with earth, is a compost which certainly contains rich food for plants, but too rich food may be given them. Oil extracted from plants or animals is too powerful food for plants to digest, or to anoint them with.

Theoretical Gardener would be a more appropriate title for the publication I am speaking of than "Practical Gardener." But this "Practical Gardener" cannot practise virtually by himself; he must have a "Companion," one very near of kin to himself indeed. For, by comparing the "Practical Gardener" and his "Companion" together, and from the reports of some eminent persons, well versed in the science of book-making, we may without mistake conclude, that the "Practical Gardener's Companion" has been mostly taken from himself.

That the smallest publication of which I am now writing, is over-named, is evident enough. It is called, 1. The Practical Gardener's Companion. 2. Horticultural Calendar. 3. Garden Seed and Plant Estimate. 4. Monthly Index. 5. Little Manual. 6. Gardener's Remembrancer. The last title is plagiarism. It has been stolen from my book; none others on gardening that ever I heard of, having before borne that name, till I had adopted it as the name of the following treatise.

The publisher of the publication called "Practical Gardener," in his preface says, "That the loose way of throwing into a calendar practical instructions under detached monthly heads, is fundamentally inferior to the systematic method of connecting under one complete article every thing which relates to the culture or management of a distinct department." But not contented with recommending his systematic treatise, as he calls

it, and which in his view is superior to a monthly calendar, he immediately recommends "a compendious Gardener's Remembrancer, to remind the reader that such and such things will require attention, not to instruct him how to do them, is a useful assistant;" of course he means to them who have given nine shillings for his "Practical Gardener." This certainly is a cunning contrivance of the publisher, to induce people to purchase both his publications one after the other, for, according to his scheme, whosoever purchaseth his "Practical Gardener," cannot go on well in the gardening business till they procure for him an associate, a "Companion;" and whoever happens to buy first the "Companion," cannot know the methods of doing the gardening work till they obtain the "Practical Gardener."

Now I do believe that whoever adopts many of the methods given by the "Practical Gardener," especially those relative to the forcing scheme, and of curing the diseases of trees, they will have much trouble, particularly if they be servant gardeners, and their labour will I conceive prove almost abortive.

The table of the contents of these two publications might alone suffice to evince, that neither of them were written by John Abercrombie; nor can it be believed by intelligent gentlemen or by practical gardeners, that have seen or read or heard read only a part of them, that any practical man of the profession did either write, edite, or revise them.

Had a poor proprietor used such means to make his book sell, peradventure some excuse might be made for him, but surely no excuse can be allowed for one in a good state of worldly circumstances. It is a deception on the public to excite people to purchase books, because by their title-pages they are led to believe, that they have been written and edited by practical experienced gardeners; whereas, in fact, they are only a compilation modified agreeable to

the ideas and taste of the theoretical writer, whoever he be. That this is really the case I shall anon demonstrate, by a review of some parts of the contents of these two publications.

According to the account given by the publisher in the preface to his "Practical Gardener," Mr. Abercrombie was but a few years employed in writing the manuscript, which "he completed only a few months previous to his death;" a time of life ill adapted for writing books of this nature, had he really written them, for he died in the eightieth year of his age, in great poverty, as we are informed. But the editor says, "Mr. Abercrombie derived much satisfaction from the great number of editions through which 'Every Man his own Gardener' passed," (which however had, and still has, the name of Mawe to it, as being the author; and it is evident that it has had a number of dressings, not by the hand of John Abercrombie, nor of any practical gardener); poor consolation to a poor decrepit old man, in a state of indigence. But the proprietor says, "the publication of his Practical Gardener gave rise to many illiberal observations respecting the fact of its being the original suggestion, plan, and writing of Mr. Abercrombie." Until the month of September last, I knew not that it was published; it is therefore obvious, that many besides me are equally and rightly in a state of unbelief, respecting the authenticity of John Abercrombie being the author.

There can be no doubt that Mr. Abercrombie wrote some publications on gardening. We believe the original of what is called "Mawe's Calendar" was written by him. Mr. Mawe acknowledged before his death that he wrote none of it. It has passed through a number of editions certainly. When I was a lad in the year 1771, the fifth edition was published.

Had any practical gardener been the reviser of these two publications, can it be supposed that he would have allowed the following and many other similar paragraphs to remain in them? "The nobleman or private gentleman, with this manual before him (the Companion), will be enabled to appreciate the merits of his gardener, and to give him directions." Noblemen and gentlemen will be more able and better qualified to appreciate the merits of their gardeners, by observing the state of their gardens, and by the produce thereof sent into their families, and by their moral character, than by reading any or all the books that have been or that can be written on the subject of gardening.

However, I would here just observe, that it is of no consequence to the public, nor to individuals, who are the authors and editors of the "Practical Gardener," or of his "Companion;" the query is, are they fitted to be of that utility to the purchasers of them as is held forth in their title-pages and prefaces. To me it is evident, that they are better adapted to make or to entice people to purchase them, than to give sufficient practical instructions on several important branches of gardening not well understood by numbers of those who profess themselves to be practical gardeners.

If any person purchase the "Companion," which he is induced to do, on account of the price of it being two shillings, no sooner does he begin to read it, than he meets with—"See Practical Gardener;"—and which is continually repeated throughout the whole of it, sometimes four times in one page. And if they have not the "Practical Gardener" in their service, this becomes immediately a puzzling piece of business; for the little dwarf "Companion" cannot labour, nor was it designed he should; his business is only to remind persons what should be done in the gardening

way, not to instruct them how to do the work. So that, before they receive instructions, they must give nine shillings for the "Practical Gardener," whose instructions, in a number of essential points of gardening, will, I am persuaded, prove ineffectual.

But it is not to be credited by intelligent people, who have examined or may examine the Practical Gardener, that Mr. Abercromby, or any servant gardener, would, in writing or in revising, have used the words and phraseology of language contained in these two publications: for instance, is there one gardener among a thousand that understands the meaning of the following words, "*alluvial, unignated, abumen, evanescent, argot, concrete, azote,*" &c. Frequently hot-houses are called chambers; shoots of trees, herbs and spray; garden pots for plants are called cradles, as if they wanted rocking. In regard to the phraseology of language, here is a specimen: "The radical leaves are edible; the natural climate is unusually abrupt. For a stove to be in operation all the year, an angle of 40° presents a medium correspondence with the ever-varying altitude of the sun's place above the horizon, which is all that can be attempted. If a house is to be worked but a part of the year, it has been a principle to increase or diminish the angle, as the forcing is to commence before or after the vernal equinox. The roof, or rather diagonal side of a glass case, designed for a short periodical course of forcing, to begin the 21st of December, may be 55°; 21st January, 50°; 21st February, 46°; 21st March, 43°." Such words and phraseology of language, frequently used by the "Practical Gardener" and his "Companion," practical gardeners and the labourers under them are not acquainted with; they are too learned for them who were brought up and educated among the lower class of society; nor will the words and high language, I

think, suit "the Tradesman, Farmer, &c.," whom the "Practical Gardener" professeth to teach the art of gardening.

But I wish it to be understood and remembered, that I have given a specimen of the dark words and uncommonly high phraseology of language used, only as a proof that these two publications on gardening have neither been written nor corrected by good practical gardeners, but by some more learned theoretical person. Had no other faults but some dark expressions and high phraseology of language, not understood rightly by those who have not received an academical education, they would scarcely have been worth mentioning; especially by one who, like most in the practical line of gardening, received but little scholastic education, and whose language therefore cannot be expected to be altogether grammatical.

As the application of artificial means for regulating a bottom heat and the temperature of atmospherical air, so as to make suitable climates for the production of choice exotic fruits and esculent vegetables, and for bringing the fruit of hardy plants to maturity at an earlier period of the season, or in a higher degree of perfection than can be obtained from the plants in the open air in some cold wet seasons, require greater practical skilfulness and experience, and more attention than other branches of gardening, I shall now here give the degrees of heat marked on Fahrenheit's thermometer, and the temperature of climate, which the publications called "Practical Gardener" and his "Companion" recommend, for the production of different fruits, flowers, and esculent vegetables; this I do, that the reader, if he pleases, may have an opportunity, without being at further expence, of comparing the temperature of climate which the "Practical Gardener" recommends, with

that which I practised, and in the following volume have given and recommended.

For I think the best way to distinguish and prove which of our methods are most superior and worthy of being adopted, will be by putting both into practice, on a small scale, by way of experiment. There is such a great difference between the temperature of heat and methods which the Practical Gardener recommends, and those which I recommend in the forcing scheme, that we cannot be both in the right; however, I think that I shall be able to make it appear, that many essential things respecting the forcing of fruit-bearing plants, &c., recommended by the "Practical Gardener," is very wrong: for instance, he recommends the same degree of heat for forcing the cucumber as he does for forcing the potatoe. Now, in this particular, many labouring cottagers are able to give him a lesson: by experience, they know that the natural heat of our climate is sufficient every year to produce potatoes; but with the assistance of a little dung and a hand-light they cannot raise cucumbers every summer. Potatoes will grow, and do grow, very well in latitude 57 north; but in that latitude cucumber plants can make but little progress, in the open air, in the warmest months of the hottest summers. In that northern climate the nights are always cold, even in the month of July, when the days are nearly eighteen hours long of sunshine.

But the "Practical Gardener" tells us how to grow potatoes on shelves in the kitchen. He might as well have informed us how to grow cucumbers in the parlour. Every body knows that the kitchen is the place for cooking, and not for growing potatoes; and the parlour is the place for eating fine soft potatoes, cucumbers, and other nice wholesome vegetables and fruits in their season.

The following are the degrees of bottom heat, and the temperature of the climate, or the heat of atmospherical air in the green-house, and in the different forcing departments, which the "Practical Gardener" recommends:

1. *Green-house, temperature of the.*

"Delay not to light the fires when the external air is down at 35°; but as exotics, more susceptible of injury from cold, are involved in the temperature to be sustained, the nature and health of the plants generally will be best consulted, by aiming to keep the internal heat at 42°, and not suffering it to fluctuate more than two degrees above or below. The morning air, immediately warmed, is beneficial to green-house plants, if it be below the freezing point."

2. *Asparagus, forcing of.*

"The standard artificial climate for forcing asparagus is some degrees under that necessary for tender exotics. The temperature at night should never be under 50°. In the day-time, keep the maximum down to 62°."

3. *Cucumber, forcing of the.*

"The minimum for the cucumber is 58° of Fahrenheit: in the day-time 65° is sufficient for the maximum; because air admitted when the sun has got influence, will do more good than a higher heat."

Note.—The heat here prescribed by the professed "Practical Gardener" will not make the cucumber plant produce fruit.

4. *Kidney-bean, forcing of the.*

"The temperature for the kidney-bean is 60° for the minimum, and 75° for the fruiting-bed."

5. "*The Temperature for some of the principal Esculents, forced in Frames or otherwise, should be as under:*

	Minimum at Night.	Maximum in the Day.
Sea kale - -	50° -	58°
Asparagus - -	50 -	60
Potatoes - -	60 -	70
Kidney-bean -	60 -	70
Cucumber -	60 -	70
Melon - - -	65 -	75"

Note.—According to the above given temperature of atmospheric air, the potatoe, the kidney-bean, and the cucumber, require the same degrees of heat to force them. But let it be remembered, that this is only the ideas and assertions of the wrong-named "Practical Gardener" and his "Companion."

6. *Melon, forcing of the.*

"This exotic requires the aid of artificial heat and glass in this country, where it is cultivated with eminent care, on account of its fine fruit of peculiar rich flavour. Ripe fruit may be had by forcing at any season. The melon, by retaining its original tenderness of nature, requires a minimum heat of about 65° of Fahrenheit, from the germination till that of fructification, and a heat of 75° to ripen in."

7. *Grape-house, temperature of the.*

"Begin at 50° min. 55° max. In a week raise the minimum to 55°, and the maximum to 60°. Till the time of budding, the temperature should not exceed 60° min. 64° max. from fire, and 68 from sun-heat. By the time the blossom expands, the lowest effect from the flues should be 66°; the highest may be 72°: and when the sun's influence is strong, let it be accumulated, by confining the interchange of air to the ventilators, till the heat rise to 80°. After the fruit is set, the minimum should be 75°. If the fruit be

not off by the middle of August, heat dependent on the natural climate will hardly be sufficient to ripen the wood; and therefore, as soon as the natural air declines to 68°, resume gentle fires morning and evening, so as to keep the mininum temperature of the house to 70°. The maximum need not exceed 75° in sun-shine."

Note.—In the following treatise I have shewn, that after the fruit of any sort of trees is ripened sufficiently, no artificial heat is wanted to mature the wood for bearing the succeeding crop, excepting that arising in the house by the protection of the glass case, and the influence of the sun. The grape vine, as well as all other fruit-bearing plants, loves to have a breathing time; that is, in a grape-house or hot-house the temperature in the morning in the spring, summer, and autumn, may be about 55, and rise up in the course of the day, with the influence of the sun, to about 90, having a free circulation of external air into the house among the plants. In bright sun-shine days, even in the month of September, the grape vine trained against a good wall of a south aspect, sometimes receives a heat of upwards of 90 degrees, while in the morning it may happen to be as low as 50 or 45, without the least endangering the plants or the fruit. This I believe was the case in September last, 1818, when grapes on walls in the south of England ripened very well. After we pass 54 of north latitude, the grape vine would be better of a little fire or dung-heat throughout the summer, till its fruit be ripened. The nights are seldom warm to the north of 54 north latitude.

8. *Peach house, temperature of the.*

" Begin at 45 min. 50 max. from sun-heat. In the progress of the second fortnight augment the temperature from three to eight degrees, so as to have it at the close up to 53 min. 56 max. from sun-

heat. When the trees are in blossom, let the heat be 55 min. 60 max. Continue to aim at this till the fruit is set. When the fruit is set, raise the minimum to 60, the artificial maximum to 65. When the sun shines, do not let the maximum from collected heat pass 70."

9. *Cherry-house, temperature of the.*

" On the subject of forcing the cherry, the principal thing is to regulate the course of heat by a specific scale. Begin at 40 by Fahrenheit, and through the first week let the minimum be 40, and the maximum 42. By gradual advances in the second, third, and fourth week, raise the course to 42 min. 45 max.

In strong sun-shine admit air freely, rather than have the temperature above 52. In the fifth and sixth week the artificial minimum may be gradually elevated to 45, but the maximum should be restrained to 48 from fire-heat, and to 55 from sun-heat, until the plants are in flower. After blossoms are shewn, and until the fruit is set, aim to have the heat from the flues at 48 min. 52 max. At this stage maintain as free an interchange of air as the weather will permit; and when the sun is strong, do not let the temperature within exceed 60. As the fruit is to be swelled and ripened, the requisite heat is 60 min. 65 max."

10. *Fig-house, temperature of the.*

" From leafing-time till the ripening of the fruit, this plant requires a temperature between that scale which is proper for the peach, and that of the cherry. It may be introduced with general good success, where either of those plants is the principle. It is advisable not to keep the frame off throughout the winter; but if the glass-case is wanted elsewhere, both the root and herb should be protected during frost; the root with dry long litter, the branches, if unnailed

and laid down, also with litter, otherwise with matting."

11. *Strawberry, temperature for forcing the.*

"Where strawberries are forced in large quantities, it is a good method to apply a pit to their sole cultivation, constructed for the purpose, with a low glazed roof, and with facilities for giving plenty of light and air to the plants. Begin at 40 Fahrenheit, and raise the heat as in the cherry-house."

12. *Hot-house, temperature of the bark-bed in the.*

"To measure the heat of the fermenting body of bark, keep trial sticks in the bed, or plunge the bulb of the thermometer about a foot into the bed. The following may serve as a standard, within a latitude of five degrees below or above which the forcing gardener should aim to keep the bark-beds:—general hot-house without pines, 75; nursery pine pit, 72; fruiting pine pit, 82. The degrees of heat for the succession pit is fixed at a lower ratio than that for the nursery pit, contrary to the progress of nature; but in the artificial situation of the plant, it is safer to keep the bottom heat for succession plants reduced to 67 min. and 77 max., lest they should start untimely into fruit. Many persons work pine stoves with a bottom heat five or ten degrees higher than the maximum standard set down for each house above. *These on the one hand, and the theorists on the other, who censure the application of any bottom heat to exotics as unnatural, both seem to be on extremes.* In tropical climates, the earth of itself about the roots of plants is frequently so penetrated with the violent heat of the atmosphere, as to maintain a temperature of 80 or more in the shade; consequently, for the roots of exotics from such climates to be plunged into a bed heated to that degree, is not unnatural: still it should be remembered, that the heat of the air there has a

proportionate elevation above the earth. During our winter, therefore, instead of keeping the roots of pine plants in a factitious heat of 80, while the artificial temperature of the air is in some cases down to 55 and 60; perhaps a better relation of the bed with the atmosphere would be supported by having the bark bed at 60 or 65, and the air of the pit at 70, at least never less than the heat at the roots."

Note.—I think there cannot be greater theoretical reasoning on the culture of the pine-apple plant, than in the above paragraph. According to all the authors which I have read on the heat of foreign climates, where the pine-apple grows in the open ground, the temperature of the air is never lower than about 70 degrees in the morning, and it rises up in the course of the day to 85, and sometimes to upwards of 90 in the shade. The heat in the island of Sumatra fluctuates between 82 and 85 degrees, and seldom rises higher than 86 in the shade.—*Marsden's History of Sumatra.* At Kingston, in Jamaica, the thermometer in the hottest time of the day, and during the hottest season of the year, ranges from 85 to 90 in the shade. In the severest season, about sun-rising, which is the coldest time in the twenty-four hours, it ranges from 70 to 77, and rises up in the day-time sometimes to above 90.—*Philos. Trans.* The heat in Bengal, in the summer months, is variable in the shade from 98 to 120 degrees: in the sun it probably does not fall short of 140 degrees.—*Dr. Watson's Essays.* In countries between the tropics, the heat is nearly uniform. It is at a medium on the coast and on the plains not much elevated above the level of the sea, at 80 degrees of Fahrenheit's thermometer.—*Dr. Moseley.*

13. *Hot-house, atmospherical temperature of the.*

"Recourse must be had to the furnace whenever the temperature of the house from the natural heat of the season, aided by the bark pit, falls below 60.

At 55, indeed, the decline of atmospheric heat will not go so far as to hurt stove plants; but if you light no fires till the thermometer fall to 55, it may sink five or six degrees lower. The maximum heat, with fire alone, is 68. The artificial heat in the nursing pit is 55 degrees for the minimum. This will keep the plants in winter from a check a few degrees above a dormant state, when dung-heat is employed. When fire-heat is employed, it is better to aim at 60 degrees. In winter, the maximum need not go beyond 65 degrees. When the plants are growing vigorously in autumn or spring, the artificial maximum is 70. In winter, with the aid of sun-shine, it should not be allowed to rise higher than 70 degrees. In the summer, the maximum, under the effect of strong sunshine, may rise to 85 degrees. To keep it down to this, give the benefit of air freely."

Note.—Except the pots in which pine-apple plants grow be plunged in a bottom heat of from 90 to 100 degrees, they will scarcely make any progress in an atmospheric heat of 70 degrees of Fahrenheit's thermometer. One hundred degrees of heat at the bottoms of the pots in which pine-apple plants are set, is not too much to make them grow vigorously, when the medium heat of the air in the hot-house among the plants is kept up to about 80 degrees.

14. *Roses and small Shrubs, temperature for forcing of.*

"When the potted plants are first introduced, keep the air of the house to 55 degrees, never letting it fluctuate to more than two or three degrees below or above. In the second week, aim at 60 as the standard: in the third week, at 65. When a month has nearly elapsed, begin to increase the heat gradually to 70. Having brought it to this standard, let it afterwards exceed it from three to five degrees, rather than sink below."

Thus I have given some extracts from the "Practical Gardener" and from his "Companion," shewing the degrees of bottom heat for the roots of exotic plants to grow in, and the temperature of climate or degrees of atmospheric heated air, which he holds forth as being effectual for the production of choice exotic fruits, flowers, and esculent vegetables.

The heat of the tan-bed recommended by the wrong-named "Practical Gardener" for the growth of the pine apple plant is very insufficient indeed, which evinces that neither the author nor the reviser were sufficiently acquainted with the culture of that plant, where artificial heat is necessary; but even in climates where the pine apple is produced by natural heat, the earth for its roots to grow in must be far greater than the "Practical Gardener" says is sufficient for bringing its fruit to maturity by the assistance of artificial heat in Britain.

By a gentleman who resided for many years in a part of the world where the pine apple grows spontaneously, I have been informed (and his information is corroborated by several authors whose books I have read), that the internal heat of the earth is constantly not lower than 80 degrees; consequently in sunshine weather, the surface of the earth for six or seven inches deep, must be at least 100 degrees warm, and near and upon the surface it must sometimes be higher. There, as that gentleman informed me, when the pine apple plant is well cultivated and gets plenty of water, it grows to a large size and is excellently flavoured.

It is enough to make those laugh who well understand the nature and culture of the pine apple, when they observe the professedly sagacious "Practical Gardener" censuring real practical gardeners on the one hand, and theorists on the other, and holding himself forth wiser than all of them; that this is a fact, hear him once more. "In the situation of the pine

apple plant, it is safer to have the bottom heat for the succession plants reduced to 67 min. and 77 max. lest they should start untimely into fruit. Many persons work pine apple stoves with a bottom heat 5 or 10 degrees higher than the maximum standard. These on the one hand, and the theorists on the other, who censure the application of bottom heat to exotics as unnatural, both seem to be in extremes."

If the above quotation be not a convincing farther proof, at least to practical gardeners acquainted with the culture of the pine-apple, that the writer of the professed "Practical Gardener" is a theorist, I am greatly deceived in this respect.

From experiments which I made at different times, I am persuaded that pine-apple plants, if kept in a good temperature of air, such as I have recommended, would, after being well rooted, make greater progress during six months of the year, if the pots with the plants were set three or four inches deep into a bed of old cold tan or light earth, in such a position that the sun could shine on the pots occasionally, than to be plunged to their rims in a bottom heat of from 67 to 77 degrees of warmth, recommended by the "Practical Gardener." In the former situation, the roots of the plants would receive a medium heat, I think, of about 85 degrees. In the latter situation, they would only receive a medium heat of about 70 degrees.

In treating on the culture of the melon, the pretended "Practical Gardener" says, "Ripe fruit may be had by forcing at any season." In this and on treating of the culture of different sorts of plants, and on a number of branches of gardening, he has imitated his brother, "Every Man his own Gardener," who gives a list of what fruits, &c. gentlemen may expect from their gardens in every month of the year,—such a list, not only of fruits, but of flowers and esculent vegetables, which nature, assisted by

artificial means, is incompetent to produce in every month of the year in any country in any degree of latitude under the sun: hence, from lists of this kind being given in books said to be written by practical gardeners, ariseth strife between masters and mistresses and their servant gardeners. The author of the "Practical Gardener" appears to have been led into an error; for, surely, it must be acknowledged generally, that it is wrong conduct in any man to sanction by his name, as being a reviser of books on gardening, palpably erroneous in a number of particulars, and in methods of the culture of plants, and of ripening of fruits at seasons contrary to the established nature of things relating to the wonderful economy of vegetable life and vegetation.

In the course of my practice, I generally began to force melon plants in the month of January; and though I had every conveniency, and dung and fire-heat as much as I chose to employ, I never was able to ripen the melon till the latter end of April; nor did I ever know any gardener that was able to ripen the earliest sort of melons before the month of April. By sowing the seeds of the melon, and by managing the plants in nearly the same way as I have given directions for cultivating the cucumber, perhaps ripe melons might be obtained in the month of March; but it would only be a matter of mere curiosity, attended with considerable labour and expence, with little probability of success. And even supposing melons to be ripened in the month of March, I conceive the fruit would be insipid. Fruits of no kind that I know of are good flavoured nor wholesome, except they be ripened when the days are long, and they get plenty of sunshine. The fruit of the cucumber is eaten green, otherwise it would be useless to try to obtain fruit from it before the month of May.

From what I have here related, it may be clearly ascertained, that for the sake of a little worldly gain

and public applause, names of persons merely nominal authors, editors, and revisers of some books on gardening, are substituted and prefixed to them. This practice I disapprove of, and therefore no addition is to be made to this my book, called The Gardener's Remembrancer, while I live, without my approbation; and I desire that no addition be made to it after my death. I am now alive, and accountable for what I have written and allowed to be published. After my decease I wish no praise from man. Let my name rot with my body.

I believe it is right to compile books on gardening and on other subjects—they may become useful if compiled from good authors, and be carefully revised and corrected by an experienced practical person: but surely it must be wrong to prefix names of persons to books as being the authors or revisers, who do neither write, revise, nor correct them, especially the names of those who are dead before the books are written to which their names are prefixed as being the authors or revisers of publications they neither wrote nor saw.

London,
January 21st, 1819.

JAMES MACPHAIL.

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THE

GARDENER'S REMEMBRANCER,

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CHAP. I.

Remarks on Vegetable Life and on Vegetation. — Of the Cause and Symptoms of Disease in Fruit Trees, and Means of Prevention and Cure.

EVERY thing upon the face of the earth and in the earth, and upon the face of the waters and in the waters, which grow or are capable of growing, and not possessed of animal life, I consider to contain vegetable life, or the rudiments of it, which may be put in action by the elements of water, earth, air, and heat. It appears that every kind of animal has a feeling of pain or of pleasure in some way or another; but it seems that vegetables have no sensible feeling or instinct to induce them to use means to preserve life, for wheresoever they happen to grow naturally, or be planted, there they must abide, till the hand of man remove them, or they die naturally, or be destroyed by disease or accident.

Over the face of the earth, throughout the world, there are innumerable quantities of herbs, low-growing shrubs, and trees of many sorts and sizes; and although they all spring out of the earth and derive their sustenance from elements of the same nature, yet each species differ in their manner of growth as well as in their qualities; some of them grow upright, some spread on the earth, some are climbers, and some are parasitic, growing on and receiving their nourishment from plants of a different sort; some are

made parasitic by ingraftment; and some are good for food for man and beast, some for medicine, and some are of a poisonous nature. It is in the constitution of some plants to live to a great age, others are of short duration, many die yearly, but all have a tendency to propagate their species, and perpetuate their generation.

By modern botanists it has been ascertained, that among plants there is a sexual system, which was not wholly unknown to the ancients, though their knowledge of it was very imperfect; accordingly we find, in the account by Herodotus of the country about Babylon, where palm trees abounded, that it was a custom with the natives, in their culture of these plants, to assist the operations of nature by gathering the flowers of the male trees and carrying them to the female. By this means they secured the ripening of the fruit, which might else have been precarious, or at least not to have been expected in equal quantities. The sexual system is suggested and confirmed by the analogy observable between the eggs of animals and seeds of plants, both serving equally to the same end, that is, that of propagating a similar race; and by the remarks which have been made, that when the seed of the female plant is not impregnated with the prolific powder of the male it bears no fruit, insomuch that as often as the communication between the sexual parts of plants has been intercepted, which is the means of their fecundity, they have always proved barren. But though this be the case, vegetables are left entirely to nature, or to the assistance of man, for the dust of the male flower is carried to the female by the wind, or by bees and insects of different kinds.

The diseases which affect trees and esculent vegetables are perhaps as numerous as the diseases incident to animals, though not so perceptible in the former as in the latter. The diseases incident to mankind, that is, in adults, may be known by their words and outward appearance; the diseases in beasts may be known by outward appearance, and their groanings and manner of action; but disease in trees and esculent vegetables can be known only by the appearance of the plant, either in its stem, in its branches, or in its leaves; consequently diseases in trees may begin, and make such progress as cannot be remedied, before the disease can be discovered by those

not well experienced in the practice of gardening, or in the study of the nature and growth of trees.

Barrenness and disease of every kind, in fruit trees, is produced by the bad qualities of the earth and air in which they grow, or by a deficiency or superabundance of heat, or of water, or by the inroads of insects.

Symptoms of disease in fruit trees, in the spring and summer, before the fruit comes to maturity, are, leaves and shoots not of a natural green colour; curled or ragged leaves; some of the branches in a decaying state in any season of the year; the juice oozing out in gum on the stem or branches, decayed parts of the bark; shoots growing out of the border from the roots of the tree at a distance from the stem.

It may be supposed by some, that diseases are brought upon fruit trees by unskilful pruning; and it is maintained by writers on horticulture, that certain modes of pruning, and the application of salves, plasters, and outward anointings and inward medicines, will prevent and cure the diseases of fruit trees: but practice, and the study of the nature of the operations of vegetable life, have led me to form a contrary opinion. However, be this as it may, it is certain that to keep fruit trees in a good healthful state, requires such practical skill, attention, and labour, that it is no wonder so many fruit-bearing trees are in a condition which leaves room for much improvement.

In the pruning and in the training of fruit trees, different methods may be practised with equal success; for if in pruning and training the trees be regularly supplied with bearing shoots, neither crowded nor too thin, nothing more in that respect is requisite. Diseased trees, and those that are deficient in crops, may be improved by heading down and by putting some good earth to the roots of them; but let it be remembered, that some fruit trees are better bearers than others of the very same kind; and that trees may be barren for several years successively, and the fault not constitutionally in the trees nor in the management of them, but in the seasons, which no man can alter. The constitution of fruit trees cannot be bettered by pruning nor by training; but, by the change of climate and soil, they may be made to produce finer fruit than if they were allowed to grow in bad earth and in an uncongenial climate.

Trees become diseased, not only on account of their being planted in bad soil, or in an unkind climate, but also for want of a sufficient supply of nourishment from the earth in which the roots run: for instance, let a diseased tree be headed down, and it will make strong healthy shoots for two or three years; but if the food for it be not increased by an application of fresh earth, or of manure of some suitable sort, its branches will soon return to a similar state of disease as those were in which were cut off. The cause, I think, is evidently clear and natural; for some of the branches being lopped off, the remaining parts of the tree continue to be supplied with the same quantity of nutritious food as the whole received before the divestment, which enables it to shoot vigorously; and if it happen to stand in a genial climate, it may continue apparently healthy till its requirement of proper nourishment become greater than the supply.

In fine warm seasons fruit trees, though diseased, may produce abundant crops of fruit; indeed, were it otherwise, there would not be so much fruit in the country as we observe there generally is; those, therefore, who have the management of gardens and orchards, had best deal gently with their fruit trees, and not be too hasty in heading them down, nor rashly divest them of their bearing branches, in expectation that such unnatural methods will renovate them in a way apparently miraculous to the credulous and inexperienced.

Judicious pruning and cutting away the decaying parts of trees of all kinds, are the means of producing good effects; for all rotten and decayed parts of trees hinder the evaporation of morbid juices, contracted by over-abundant moisture or bad soils, or density of air confined; and although the decaying parts of trees may safely be cut off in any time of the year, the spring and summer months are the best seasons in which to perform this work, because in the spring and summer the juices of the trees flow most copiously, all the vegetative powers being by the influence of the sun then in a most active state, causing efforts in the tree to bring to maturity its fruit and seed, to answer the purposes for which it was created.

There is in some respects an analogy between plants and animals, though the life in each is maintained apparently by different causes. An animal has the faculties of life and

motion within itself; but the motion of the life of vegetables depend upon the effect of something often detached: consequently, the health and fruitfulness of trees arise from the different degrees of power communicated to them by earth, water, heat, and air; and if the elements do not harmonize, or if their influence be too great or too little in communicating to the tree the necessary supply of sap, it is not able to perform its designed natural office: therefore when any deficiency in either of these necessary elements happens, barrenness, and perhaps death, may be the consequence. The truth of these observations is less or more evinced to satisfaction by the practical experience of every one who uses methods of art in setting plants in different soils and in different degrees of heat, which are thought to be most congenial to their respective natures.

And farther, proper pruning and cutting away the cankered, moist, rotting parts of trees, are the means of promoting their health, and of causing them to live longer than if they were to be left wholly to nature; but the fruit from a healthy tree, I apprehend, is more healthful for food than fruit produced by an unhealthy tree. In the cultivation of trees and of vegetables of every description for the use of man, good land, kindly air, clean water, and a sufficiency of heat suitable to the nature of each, are the chief things requisite to enable them to grow and bring their fruit to maturity.

Cleanly methods, together with additional supplies of good earth or good manure to the roots of trees, or by transplanting them out of poor into rich land, frequently become effectual means of enabling them to produce plentiful crops of fine flavoured fruit.

I have removed from poor land and exposed situations fruit trees whose branches and roots were in a most cankered diseased state, and planted them in good earth in a genial climate, the natural one being assisted by the influence of fire and glass frames, which process never failed to be the means of healing their diseases; and with proper pruning and other good management have enabled them to produce good crops of fine fruit. Trees thus dealt with will continue in a flourishing state many years, provided the supply of nourishment given to them be equal to the exhaustion of nutritious food in consequence of the increase of their size and the quantity of fruit they produce.

The sap in trees doth not circulate in them in the manner as the blood does in animals; consequently, the wounds or cuts of whatever kind, or by whatsoever cause brought on them, cannot be healed by applications of plaster or medicine of any kind; their diseases can be healed only by the application of those elements which keep vegetables alive and their sap in motion while they are in a growing state.

That vegetables, by means of their roots, draw all their food from earth mixed with or which contains water and air, is evident; for if the earth in which the roots of a tree extend themselves be deprived of sufficient moisture, the leaves will flag, although their stems, branches, and leaves have the opportunity of imbibing as much moisture from the surrounding air as their nature prompts them to do.

Trees receive their nourishment and are increased in size by means of the ascent of the sap between the bark and woody part; for between the bark and the wood there is a whitish glutinous rind or substance, which appears to be converted gradually into wood; and if a circle be drawn round a tree by incision, and the bark and the glutinous rind under it be totally taken off, the tree will die gradually; unless the barks separated come together, and unite again, which upon some sorts of trees it will do; that is, on the pear and apple-trees, provided the circle peeled be but narrow, and the wood from whence the bark is taken be in a lively state; in this case, while the disbarked part of the tree continues alive, which cannot be longer than two or three years, the sap will go up in an unnatural way through the pores of the lively inner wood, while life remains in it.

To make trees of the pear and apple kinds fruitful, some persons have used the method of peeling off a part of the bark of the stem, or of the leading branches, in form of a ring. This method of depriving the branches of being supplied with the usual quantity of sap from the roots in a regular natural way, and lessening the measure of it, causeth the tree to send forth blossoms more abundantly, and perhaps may by chance make the tree for a short period bear more plentifully, especially if the tree were given to luxuriancy: but the utility of the practice cannot be depended on; indeed, it is an operation contrary to nature, throwing the tree into a decline till the sepa-

rated bark unite. Those who chuse to try the experiment, should take care not to make the peeled ring too wide, for fear the wood die before the separated parts of the bark meet to conduct the sap in a natural way from the roots to the branches. Whoever may chuse to put this method into practice, will in the process observe, that that part of the tree on which the experiment is made below the peeled ring, will not grow larger till the union of the separated bark takes place, which must be by the operation of the growth of that part of the tree above the disbarked part growing down over the ring, bare of bark; for by the sap being diverted from its natural channel, to supply the branches above the disbarked part with food, the bark beneath the disbarked ring cannot grow while the tree continues in its unhealed state. This process is in proof that the sap of trees does not circulate or descend in any manner to nourish the tree, as some theoretical writers and others have maintained and do affirm. In trying this curious experiment on trees, if the tree operated upon appear to be in danger of being injured or destroyed, because the bark does not advance downward quick enough to cover the bared place, artificial assistance may be given to accelerate its progress: take three or four cuttings of young shoots of the pear or apple kind, fit for grafts; insert one end of each into the bark above and the other into the bark of the tree below the disbarked ring, in the manner of common grafting; cover with clay the parts put together, to prevent them from being dried, which would prevent a vegetative union from taking place; and if all the grafts, or one of them, unite effectually with the bark of the tree, the sap, by means of the graft, will be carried up through it in the natural way, which will be the means of assisting it to recover itself of the deadly wound which it received.

If one half of the stem of a tree be completely cut away from the surface of the ground to the upper part of it, where the branches begin to divide, the tree being supported that it break not down, it will continue to grow; and if it be a young healthy plant, the bark on each side with new wood will advance annually, and in a few years they will meet and unite, so that the stem of the tree will become round again. In this way the parts of trees divested of bark, by whatever means, are covered over gra-

dually by annual extensions of bark and wood, till the defective parts are entirely healed. But let it be remembered, that wounds in trees cannot be healed, nor do they heal, in the manner that wounds in animals heal, for it is not in the nature of a tree, or in the nature of plants of any sort, as has been already observed, to form or generate bark immediately on disbarked parts, divested also of that glutinous rind between the bark and the wood of the tree.

To supply every part of a tree sufficiently with vegetative juices, there must of necessity be living bark and wood united in an uninterrupted continuation from the roots of the tree to the extremities of its branches; for although, by the methods already described, that whole continuation may for a time be interrupted, and the tree continue to live two or three years by the effect of the sap being carried up to the branches in an unnatural channel, such a process weakens trees and may prove their destruction.

That a part of the bark of a tree may be taken off, and the remaining barks unite again in continuation, is clearly evinced by the nature and effects which result from the methods of budding and grafting. In the performance of that operation, the bark of the stock or tree to be grafted upon is raised, and a leaf-bud with a piece of bark and the rudiments of bark is cut off from the young shoot of another tree, and applied closely to that part of the stock underneath the raised bark, so that in this operation a part of the whitish rind or glutinous substance between the bark and wood of the tree, after the power of vegetation has united the bud with the stock, is converted annually into layers of wood adhering to the disbarked part of the stock and small piece of bark which contains the bud: and thus the rudimental lively principle of both bark and wood enables the stock and bud or graft to unite. The want or the destruction by any means of this vital vegetable substance in stock or in bud, is the reason why failures frequently happen in budding or in grafting of fruit trees or shrubbery plants of any sort. And it is also for want of the said lively uniting substance on those parts of trees which have been disbarked by accident, by pruning or by lopping, that bark cannot be immediately formed upon nor be united to them, though in process of time new bark and wood cover them over completely, as it were apparently in a rolling manner.

Matured wood of trees cut asunder cannot be united again by vegetation, but by the union of bark and the coverings of annual layers of newly formed wood, the parts of wood once separated are pressed together with such powerful imperceptible vegetative force, that it becomes difficult to distinguish the part where the separation took place: this is demonstrated by the effects which arise from the operation of the grafting of trees of any sort.

Some philosophers have given it as their opinion, that the earth acts only as a place to receive and contain the food of plants, and to be the means of supporting them erectly; but I am inclined to believe, that these are not its only usefulness in the process of vegetation, for when the leaves of trees or their wood or vegetables of any kind are rotted, they are turned into earth, which proves that vegetables are partly composed of earth apparently entirely free of sandy particles similar to the earth, which may be obtained from animal bodies rotted. In fact, simply speaking, the whole creation, both animal and vegetable, are made up of earth, for dust they are and unto dust they must return. But it is said that by experiments it has been proved, that the earth is very little exhausted by the growth of plants, which, they say, consequently affords a presumption that plants are not fed by the earth. To this however I would answer, that it is likely that the earth receives as much additional supply of earth from the rains which fall upon it as what is drawn from it for the nourishment and increase of the bulk of trees and vegetables of all kinds. There has been a good deal of controversy about what constitutes the food of plants. Some say it is the saline unctuous subtle slime which the water separates from the earth; but be that as it may, I am decidedly of opinion, that all that can be ascertained about this wonderfully mysterious work of creation is, that, to make vegetables grow and bring their fruit to maturity, they must have earth, water, heat, and air, the intrinsic nature of which useful elements mankind are unable fully to comprehend or define.

It is evident that water has much to do in the nourishment of plants and vegetables of every kind. They consume a great deal, and if they be deprived of it, they die or languish till by the application of it to them they are revived. Water has been defined to be a mixed fluid in which

are contained all sorts of particles proper for the composition of plants. To be sure, plants of many sorts will make root and grow in water—even the pine apple plant, which, it has been said, ought not to get much water, will grow in water in a hot-house, but by being treated in that way it cannot bring its fruit to perfection. When water is deprived of heat it becomes ice, and if it be in a very cold state, it seems too thick to pass through the vessels of living vegetables, but a small degree of heat rarefies it; and as its particles are capable of being greatly extended by a proportionate degree of heat, it is by this means rendered fit to pass into and through the finest vegetable canals; and as water contains earthy particles, earth is carried into plants by means of water. The rains which fall from the clouds mix with the nutritive particles lodged in the earth, from which the roots of plants, as mouths, take in nourishment for esculent vegetables, trees, and fruits of every kind.

Considerable quantities of air are found in water, and in all sorts of plants and fruits. The commonest observation proves how necessary this element of air is to mankind. If they be deprived of air, their life is soon lost. If they have not a sufficiency of it, they are brought into sickness, and perhaps death ensues. Plants are found to flourish in a free and open air; and to grow weak and pale, and to languish, when they have not a sufficiency of it. Air is not only necesary for the branches and leaves of plants, but also for their roots: they will not grow well if the soil be too much bound: water loosens the hardest of soils so as to admit air to the roots of plants. The atmosphere, or air which surrounds the earth, contains a mixture of all the active light parts of the whole habitable world, whether animal, vegetable, or mineral. Whatever corrupts, or whatever perspires, sends forth an evaporation which impregnates the air in a greater or less degree, which being acted upon by heat, produces different operations, and disperses again in new generations that which had been received from corrupted bodies of a like nature.

Heat, as it proceeds from that great body the sun, sets the whole vegetable creation in motion. By his warmth the sun sets forward that fermentation in the earth which effects the growth of plants, and digests their juices to make them fruitful. It is by the extension of the air and

juices drawn into the roots, and all the parts of a plant, that motion and expansion are given to it. By the ascending force of the juices the plant pushes into buds, leaves, flowers and fruits, sending off superfluous and excrementitious moisture into the atmosphere, casting forth scents peculiar to each. That the heat of the sun effects this is evident from what is experienced in the application of heat to plants, which hastens on their growth, which is ever proportionate to the heat applied, provided there is a proper supply of water. Without the heat of the sun the other elements would be inactive matter in the economy of vegetation: the sun is the fountain of light to our world. In the forcing way, plants too much deprived of light by coverings in the day time are apt to become yellowish and sickly. Plants turn to the light as a powerful attraction, or as if sensible how necessary to their existence.

To endeavour to bring fruits to the best degree of perfection, instead of using any kind of means to check the natural ascent and exhalation of the juices of trees, they ought rather to be assisted by methods not contrary to but congenial with the nature of vegetable life. Trees have no other way that I know of, of evacuating or casting off their superabundant and excrementitious parts but by evaporation and oozing forth their sap in a gummy substance; consequently if the natural evacuations of trees be stopped or retarded by means contrary to nature, they must to a certain degree be at least injured, if not destroyed. When trees send forth their sap in a gummy substance it indicates, as I have before hinted, that they are diseased; and therefore instead of using plaster or any thing else to try to heal the parts through which the sap oozes, it should be enlarged to assist the efforts of nature in casting out noxious juice. The way to assist fruit trees in this respect is described in another part of the Gardener's Remembrancer.

CHAP. II.

Hints on the Formation and Improvement of the Kitchen Garden; and on the Method of planting Fruit Trees against Walls and in Borders.

THE best land for a garden is a sandy loam, not less than two feet deep, of good earth, not of a binding nature in summer, nor retentive of rain in winter, but of such a texture that it can be worked without difficulty in any season of the year. A garden may be made and laid out in any form; but I think a square or oblong form is the most convenient. Walls ten or twelve feet above the ground is height enough for training most sorts of fruit trees. It should be remembered that there are few sorts of fruit trees or esculent vegetables which require less depth of earth to grow in than two feet to bring them to the best perfection; and if the earth of the kitchen garden be three or more feet deep, so much the better; for when the plants are in a state of maturity, if the roots even of peas, spinach, kidney beans, lettuce, &c. be minutely traced, they will be found to penetrate into the earth in search of food to the depth of two feet, provided the soil be of a nature to allow them.

If it can be done, a garden should be made on land whose bottom is not of a springy wet nature. If this rule can be observed, draining will be unnecessary; for when land is well prepared for the growth of fruit trees and esculent vegetables by trenching, manuring, and digging, it is by these means brought into such a porous temperament, that the rains pass through it without being detained longer than necessary. If the land of a garden be of too strong a nature, it should be well mixed with sand, or scrapings of roads where stones have been ground to pieces by carriages. For bringing the produce of the soil to the greatest perfection, the garden should be sheltered from the east, north, and west winds by hills, rising grounds, high buildings, or plantations of trees, at a distance on the east and west sides, not to prevent the sun from shining upon it; and it should

be well supplied with water, to water the plants in dry seasons.

To cultivate a walled garden in the most advantageous manner, the walls should be surrounded with a paling of some sort, at a distance from the walls of about thirty feet or more. The paling will be very useful, either for a nursery to bring dwarf fruit trees of different kinds into a state of training, to be transplanted when wanted to fill up vacancies on the walls of the garden; or for trees of dwarf sorts, to produce fruit in that situation. The slips of ground between the paling and garden walls may be advantageously employed by planting in them strawberries, gooseberries, currants, &c. and different sorts of vegetables. Where a close paling cannot be conveniently had, a garden may be inclosed with a hedge of evergreen or deciduous plants; but hedges being a shelter for the breeding of birds and insects of various kinds, which injure a garden, a paling is to be preferred. Hedges also greatly rob the ground of moisture conducive to the growth of fruits and eatable vegetables for which a garden is appropriated.

In the laying out a new garden, or in the improvement of an old one, the depth and the quality of the earth should be well examined. If the borders for the trees be good earth, but not three or more feet in depth, lay as much good earth upon them as to make them not less than three feet deep, lay some good thoroughly rotted dung upon them, and trench them only as low as the foundation of the wall, mixing the manure and earth perfectly well together, so that the one may not appear in a way easily distinguishable from the other, taking care to gather out stones, old roots, and whatever would interrupt the roots of the trees in their growth and progress in search of food for the plants.

When a garden wall is about to be built, the foundation for it should be dug out no deeper than the thickness of good earth on the surface. In my young days I had the superintendance of making a new garden, the earth on the spot where it was to be made was only about eight inches deep, on a dry chalky bottom; the walls were to be built twelve feet high; the bricklayer insisted that it was necessary to dig three feet down to obtain a good foundation, and the proprietor agreeing with the ideas of the bricklayer in this respect, contrary to my opinion, consequently, in

making the borders for the trees, I had to remove, at the gentleman's expence, more than two feet deep and twelve feet wide of chalk, otherwise about three feet of the fine new wall must have been totally lost by being buried lower than the bottom of the border.

If the earth of the borders adjoining to the walls consist not of good earth, nor be of a nature capable of being improved by an addition of good earth and rich manure, the whole of it should be carried away to the breadth of twelve feet, and earth of a better quality laid in its stead. If the borders along the walls lie a little higher than the rest of the garden ground, no ill effect will arise to the growth of the trees, nor to the appearance of the garden, provided it be judiciously laid out. A garden, however, had best, if possible, be made nearly of one depth of earth all over, the place where the walks are to be made not excepted, if fruit trees of any kind are to be planted not far from them. Five or six inches deep of gravel, for walks in the kitchen garden, is enough. If the object in view be that a garden shall produce plentiful crops of vegetables, wall trees and espalier trees only should be planted in it. Standard fruit trees, whose branches are allowed to spread, are detrimental to esculent vegetables; they do not prosper well under the shadow of standard trees, which ought in general to be planted by way of an orchard, where they can be properly managed with advantage.

In planting fruit trees on walls, the distance between each tree should be proportioned according to the growth of the sorts and the height of the wall they are to be trained against; and in this business the depth and quality of the soil ought to be considered, for trees require more room in rich fertile soil than in a poor hungry one; and some trees of the same species, on account of their quick and vigorous growth, require more room than those of a less luxuriant growth. Peach trees, and nectarine trees, and apricot trees, and cherry trees, and plum trees, and pear trees, and apple trees, planted in good ground, may be set from ten to sixteen feet apart, according to their manner of growth. If trees are small when planted, they may be set about five or six feet asunder; and when they require more room, every other one can be removed.

Trees planted in the borders to be trained on trellices of wood, should be planted further apart than those on walls;

because they cannot conveniently be allowed to run so high as those against walls, and of course all their leading branches will have to be trained horizontally. Espalier, as well as standard trees, are hurtful to crops of vegetables in the kitchen garden; therefore those who have plenty of ground had best have pear, apple, cherry, plum, and other trees of a like nature, planted by themselves, in a well cultivated orchard, where the ground may be cropped with such fruit bushes and vegetables which can best bear to be shaded a part of the day, such as raspberries, currants, gooseberries, &c. and potatoes, Jerusalem artichokes, &c.

When a garden is about to be planted with fruit trees, in order that they may come into a bearing state soon, and add to the probability of their continuing long in a prosperous state, it is best, if they can be had, to make choice of those not very young, but such as be healthy and have been transplanted several times, and been in a state of training for two or three years at least; these should be preferred. In every garden where there is much walling, especially if there be houses for forcing peaches and nectarines, a certain part of walling had best be allotted for the training of young trees, that some may be always in readiness to replace any that may happen not to grow well, or chance not to be approved sorts.

CHAP. III.

On the Culture of the Peach, and of the Nectarine, and of the Apricot.

THESE fruits seldom come to perfection in any part of Britain without more warmth than is natural in this northern climate; so that, to bring these delicious fruits to maturity in the least expensive way, walls of brick and of stone have been built for that purpose. To ripen these choice fruits, the trees must be planted on the east, west, and south sides of the walls, and the branches of the trees must be spread on the sides of these walls by means of nails and shreds; by this contrivance, the fruit in fine

seasons is brought to maturity in the months of August and September. The earth which is most suitable for growth of the peach, nectarine, and apricot, is a moderately strong loam, with a mixture of sand in it, on a dry bottom of clay or marl. If the bottom be sand, gravel, chalk, or rock, the borders of earth ought to be at least three feet deep after it is made and thoroughly settled. Before the trees be planted, the border should be well trenched, broken well, and cleared of stones, and some good manure mixed thoroughly with it. If the earth be of a rich loamy nature, it will require but little manure; but if it be a strong clayey loam, some sand, scrapings of roads, vegetable mould, or dung of hot-beds well rotted and broken till it have the appearance of vegetable mould, should be mixed with it.

To bring these choice fruits to maturity in this country, garden walls are the most simple and cheapest method of forcing these fruits. The next cheapest method is glass frames, warmed, when the heat of the sun is not sufficient, by the influence of tanner's bark, or by leaves of trees, or by horse-dung. The third and most expensive, but the most effectual method to ensure an early crop, is called peach houses, the roof to the south being glazed wooden frames, and the house warmed by the influence of fire heat carried through the house by means of flues. These different means of assisting the natural heat of our climate having been carried into practice, there remains no doubt but that by a judicious application of either of these three methods, they cannot fail of being the means of ripening choice exotic fruits, and may enable the trees to continue in a healthy fruitful state for a greater length of time than if they were wholly exposed to the open air.

No methods hitherto contrived that I have heard of, are so well adapted for protecting and forcing fruit trees as glass frames, and fire heat carefully applied; and if peach houses be well constructed, and the trees planted in enough of good earth, I believe they will, provided they be well managed and not forced unseasonably contrary to nature, last longer than in any other situation they can be planted in in this country. Trees forced to ripen their fruit, or to bring their wood to maturity for the production of fruit the succeeding year, should have the artificial heat applied to them in the fore part of the season, so that they

may begin to grow before those of the same sort planted against walls in the open air. Whether trees in forcing-houses have fruit on them or not, if they be designed to produce fruit early the following year, they should grow in a climate capable of ripening their fruit. If trees in a peach house, or on open walls, bring their fruit to maturity, their young wood for bearing the ensuing year will be sufficiently matured without the application of fire heat in the autumn. Nevertheless, after the fruit of peach and nectarine trees is ripened on the open walls, it may happen that the months of October and November may be so wet and mild, that the wet and mildness of the season causing the trees to grow so quick, the young wood may not come to such a degree of ripeness or firm texture as when the weather in autumn happens to be more dry and cold; but where there are peach-houses, the trees in them may and ought to be protected, by being covered with the glass frames after the month of September, if the weather happen to be very rainy or uncommonly cold.

The reason why very wet autumns are unfavourable to choice fruit trees, is because in such seasons their roots grow very fast; and on account of the damp atmosphere the evaporation of the trees is not in proportion to the quantity of sap drawn into them by the great growth of the roots, so that the wood is left too full of undigested food; and hence, as the trees are not in a state so able to resist the winter colds as if their wood had been better ripened, diseases, imperceptible for a time, may be begun and be in progress, by which the trees are injured, and may prevent their fruitfulness in some degree till they recover their strength by kindly weather and good management.

Trees for forcing should especially be planted in fine loamy well prepared earth of a medium texture, neither very light nor of a strong binding quality, and the earth and some good manure should be remarkably well mixed, so that a distinction may disappear; and it would do it good if the whole of the earth were run through a coarse screen, which process will mix it effectually, freeing it of stones and other things which might somewhat hinder the roots in their progress. The border for planting the trees in had best be made four feet deep, and as broad that the roots cannot get into bad soil; it is better to

shorten the roots of fruit trees, than to suffer them to run into earth not adapted to nourish them with wholesome food.

The names of peach trees fit for forcing are the Magdalen, the Montaubon, the Royal George, and the Noblesse; and of nectarines, the Scarlet, the Temple, the Murry, and the Red Roman.

Before a house for forcing peaches and nectarines be built, trees to plant in it had best be got in readiness; and if they be growing on the premises it will be an advantage. If it can be avoided, no tree should be planted in a forcing house until the fruit of it have been seen and tasted. The trees should be well trained ones, four or five feet high: indeed it is of no consequence what their age be, provided they be healthy, well rooted and in a bearing state: and if they have been transplanted several times since they were budded, they will be the fitter for transplanting again; and if the work of taking them up and of planting them in the peach-house be carefully and methodically done, the trees by their removal will be but little retarded in their growth.

When every thing in a forcing house is got in readiness for the reception of the trees, loose them from the wall to which they were fastened with nails and shreds, and dig a wide semicircular trench four feet distant from the stem of each tree, and a little deeper than their spreading roots; then by little and little with a pointed stick work the earth out among their roots, taking care to break as few of them as possible: in this manner the roots of the plants are to be divested of earth in a careful manner, so as to undermine the stem, that the tree may be lifted out of its place without straining the roots of it. Having holes previously prepared, about eight or ten inches deep, and four feet wide, set the trees into them one after another, training their roots out in a regular horizontal manner at full length, and after the ends of the roots be cut so as to take the raggedness off, cover them no deeper than about six inches at their extremities, and at the stem of the tree about four inches. This work may be done at any time when the weather is open, between the months of October and March. The glasses should be put over them in the month of February. Let the thermometer in the house be kept to about 55, and increase the heat progressively as

the days lengthen. With sun heat the air in the house may be kept nearly to the degrees of heat advised for forcing fruit trees established some years in the ground. The borders should be kept in a moist state; and when the trees be ready to break forth into blossom, prune them, cutting the young shoots, and laying them in a little thinner than if they had not been newly transplanted; and for the first season the fruit should not be left thick upon them.

I disapprove of the method of planting dwarf trees in forcing houses between those that are wearing out, and of turning these wearing-out or decaying ones into standards till the dwarf ones grow up. They who recommend this method seem to do it merely on theoretical principles, which may indeed appear very eligible to men of little experience, but it is likely, when this method is put in practice, that it will not turn out profitable nor satisfactory. When fruit trees begin to wear out, or rather to decay, it is a sure sign that the vegetative powers in the border is in an exhausted state; and as a peach house, by the methods which I have described, can be soon replenished with capital trees in a bearing state, it is the best way to remove the decaying ones, and either make an entire new border of earth, or turn over the old one, mixing with it manure of an enriching nature, picking out the remains of the old roots, and breaking it well, or screening it, which is the best method to free the mould of any thing which might affect the roots. The best season to prune fruit trees, whether in the forcing house or against open walls, is in the spring, when they be so forward in growth that blossom buds can be easily distinguished from shoot buds. Luxuriant shoots and those that are destitute of blossom buds should not be suffered to remain on the trees, unless it be necessary to supply vacant parts that they may produce bearing shoots for the following year; but if it be possible, every part of the trees should be regularly filled with a sufficiency of well-matured shoots that have blossom buds upon them, and let them be left from seven to ten inches asunder, laying them in at full length, or shortened, as the tree appears to be able to sustain large or only small crops of fruit, which must always be left to the judgment of the pruner, who should be an experienced one. In the training of fruit trees, whether on a trellice or against a wall, the shoots should be laid in

nearly straight, and divided regularly shoot from shoot, so that no part of the wall be left bare, beginning about eight inches from the ground on each side of the stem, and finishing in the centre of the tree.

In regard to the management of fruit trees, whether under glass or upon open walls, the method of management is the same in every respect, excepting in the degrees of artificial heat, which can be applied to those covered with glass, and not to those stationed in the open air, and excepting those against south walls.

In respect to the apricot, it is but seldom that any other kind of artificial heat is applied to it to bring its fruit to maturity early, than planting and training it against walls of a south aspect. By this means the apricot, which is named masculine, which is a small fruit, ripens in the month of July, and the other larger sorts in August and September. Most kinds of apricots ripen very well on an east aspect; and in favorable seasons, where the situation is sheltered, they will ripen on standard trees planted in the open garden in the same form and managed in the same manner as apple trees are managed: those apricot trees called the Breda and the Brussels, are the best sorts for planting in the standard way.

Although the apricot tree will grow very well in earth of a less fertile nature than that which is most suitable for the peach and nectarine trees, yet when it can be conveniently obtained, it is the best way to plant it in good earth. When apricot trees are about to be planted in borders which have been appropriated to the growth of trees of any kind, the earth should be trenched three feet deep and well broken, and the stones and roots of the old trees picked clean out of it, mixing with it some vegetable mould or rotten dung. In trenching of borders for fruit trees, it should not be done in the common way of trenching ground for vegetables; the earth should be chopped and broken small, in the manner which turf from a common is served for the growth of melons.

The method of pruning apricot trees is the same as that which is recommended for pruning peach trees, excepting that sometimes it is necessary to leave short studs or spurs, which however should not in general be left longer than two or three inches, unless they can be drawn near to the wall by tying them to the main branch out of which they

project. Apricot trees may be pruned at any time after the leaves have fallen from them; but it is certainly the safest way to leave them unpruned till the buds be prominent in the spring, when it will be easily discerned which be the most promising shoots to leave for bearing fruit.

The sorts of apricots most worthy of cultivation are the Early Masculine, the Turkey, the Breda, the Brussels, and the Peach or Moor-park Apricot.

An easy and cheap method of forcing Peaches and Nectarines.

I once constructed and managed a pit with glass frames for forcing peaches and nectarines. In the clear I had it made sixty-four feet long, ten feet wide; the height of the back wall was four feet high, and the front five feet high, in pillars of brick-work four feet each in length, which supported the sill to support the frame for the lights to rest upon; so that there were in the front eight vacuities in width, four feet each between the said pillars, for the roots of the trees to extend into the border. In the inside of the pit I had a wall built the whole length of the pit, and thirty inches distance from the front pillars. The wall was nine inches thick, and three feet six inches high, about one foot lower than the pillars of brick. I then made a border of good loamy earth, mixed with some very rotten dung, four feet deep, which left a vacancy between the pillars and the sill of nearly one foot, which were filled up with the earth of the border, which reached to the nine-inch wall within the pit, so that thirty inches wide of the border was in the inside of the pit. I had the border made fourteen feet wide. When every thing was in readiness, in the latter end of the month of February I selected eight good fruit-bearing trees, the branches of which were about five feet long: these I had carefully taken up, leaving as many of the roots as possible four feet long, and planted one of them between each pillar, training their roots out into the border; and the branches were trained upon a trellice of laths about one foot from the glass. I got the floor of the pit paved with bricks, and in the back side, between the pavement and the trees, there was between five and six feet, so that a person had room to walk under to prune and manage the trees. In the west end of the pit, in the back side, I had a small door

made to go in and out when necessary. At the east end of the pit I had a small fire-place and a flue in the pit against the back wall, about three feet high, without a return. Every thing being in readiness, and the trees pruned, I began to force them about the middle of March, and had a moderate crop of fine well-flavoured fruit on them, which ripened in the month of July.

The number of trees planted in this frame were eight, and they were planted eight feet apart. These trees grew well, and produced fruit plentifully. In three years they overspread the whole surface of the frame under the glass, which was a space of upwards of six hundred superficial feet. I never began to force them till about the beginning of March. Had they been forced so as to ripen the fruit in the month of June, more heat of some sort would have been necessary.

CHAP. IV.

On the Culture of the Pear, of the Apple, of the Fig, of the Plum, and of the Cherry.

PEAR trees prosper best when they are planted in a strong, deep, loamy soil. To bring the finest sorts to perfection in this country, they require to be planted in a border close to a high wall, and to have their branches trained against the side of it, about nine or ten inches apart. The pear tree does not produce blossoms on the former year's wood, as the peach and several other sorts of trees do. Its blossom buds are formed upon spurs growing out of wood not younger than one year old, and consequently, projecting spurs all over the tree must be left for that purpose.

Plum and cherry trees grow and produce fruit best when planted in a brownish, moderately light, sandy loam, not liable to crack in hot dry weather, not less than three feet deep, on a dry bottom; and although most sorts of them ripen well in the southern counties of England, in the open air, in kindly seasons, it is safest, in order to obtain fine fruit, to plant some of the choicest

sorts against walls, which will also bring them in earlier than standing in the open garden unsheltered by walls; and if some of these kinds of fruit trees be planted and trained on walls of different aspects, ripe fruit of the same sort can be had in succession for some time longer than if all the trees stood equally exposed.

The Morella cherry bears fruit plentifully when planted on a wall of a north aspect; and as this sort produceth its fruit upon shoots of the preceding year's growth, in the manner peach trees do, it must be managed in regard to pruning and training in the same manner as is practised on the peach and nectarine, except that none of its bearing or blossom shoots must be shortened, but trained in at full length. Excepting the Morella cherry, all other sorts of cherries, and of plums and of pears, with which I am acquainted, produce their fruit on studs or spurs; and when these are trained against walls, the spurs should never be allowed to grow far from the wall, for in that case they would entirely keep the sun from shining on the wall to warm it for the benefit of the trees and fruit; and likewise, if the trees be crowded with fore-right shoots, they are in a fit condition for breeding and harbouring insects of various kinds.

When pear, and cherry, and plum trees are planted in the open ground, for standards or dwarfs intended to be let grow up and spread their branches nearly in a natural way, they require no other pruning than to keep them from being over-crowded with branches, to cut off any decaying or dead branches and luxuriant shoots which often spring from the old wood of healthy trees. By judicious pruning, the heads of the trees should be formed in a regular manner, not suffering the middle to become crowded with useless branches, and shortening some branches occasionally to make them send forth more shoots to fill up vacancies if any should happen. In short, by skilful pruning, the heads of the trees should be kept in a regular uniform state, which is pleasant to the eye as well as for the benefit of the tree and its fruit.

Land most suitable for the growth of the apple tree is brownish mellow loam, not of a lesser depth than three feet, on a dry bottom. Where land of this nature can be obtained in a sheltered situation, if the seasons happen to be genial, the apple tree will flourish and produce abun-

dant crops of fine-looking well-flavoured fruit. Apple trees will grow very well in any kind of land, if it be of a sufficient depth for the roots to run in, provided the climate be good. Before a plantation of apple trees be made, the ground should be trenched at least two feet deep, and after it is trenched and levelled, lay a covering of manure upon it, and dig it in a spit deep. If the land be of a strong clayey nature, sand and rotten leaves of trees, as they are both of an opening quality, will make a good dressing for it, and so would peat ashes and scrapings of roads. The method of pruning and of training of apple trees differs not from that directed to be practised on pears, plums, and cherries.

It is generally complained of, that the varieties of the apple celebrated during the last two centuries in most parts of England are growing worse, and that many will soon be completely worn out. This degeneracy has been attributed to different causes: I am inclined to think that one great and perhaps chief cause is for want of good management. In general there appears to be little or no labour bestowed on the cultivation of orchards, they are left to nature, the ground about the trees is never manured, dug, nor trenched, the only manure they get is by cattle being pastured among them. If orchards where cattle are fed were trenched once in five or six years, and the turf chopped and put carefully among their roots, it would do them good; and if a little good manure could be afforded it would farther benefit them. For several years the seasons in general have not been favourable to fruit trees. Warm weather suits them. We observe the apples and grapes look well this year, 1818, on account of the warm summer, though the spring was unfavourable.

The fig tree, though it prospers best when planted in a moderately light, warm, gravelly, or chalky soil, will grow and produce fruit in any sort of land in which other fruit trees grow, provided it be in a climate warm enough to bring its fruit to perfection. In some warm southern situations, it ripens its fruit in the open garden, being kept low and formed in the shape of a currant or gooseberry tree; but it is the best way to plant and train it against the south side of a high wall. This plant produces its fruit upon the shoots of the former year's growth, so that in pruning and training, every part of the tree ought to be furnished with

young shoots, which must not be shortened, unless it be necessary to make them produce a supply of bearing wood for the following year. The fig tree should not be pruned till the spring, and not until it is beginning to send forth its young shoots. Let it be remembered, that the fig is of a tender nature, its shoots being of a spungy, soft texture, so that it is unable to endure hard winter frosts if it be entirely exposed; therefore, before the commencement of winter, in the month of November or beginning of December, lay some sort of litter, such as long stable dung, fern, or such like, round its stem on the border above where its roots run, to keep the frost from penetrating into the border to its roots, which would hurt them; and then cover the tree all over with mats or straw, or any thing else, to prevent the frost from killing the young last year's shoots.

Fig.—The fruit of the fig tree being held in great estimation, it is not unfrequently put into forcing-houses, planted in a border of earth, and managed nearly in the same way as the peach and nectarine. Figs may also be ripened at an early season, by planting them in pots, and setting them into a hot-house or forcing-house. The plants should be low and bushy, so that they may stand on the curb of the tan-bed, or they may be plunged in a gentle tan heat, or in a bed of leaves of trees. The best way to propagate plants for this purpose, is to take layers or slips which have good roots: plant them in pots in good earth, one plant in each pot, and plunge them in a bed of tan or of leaves of trees, in which is a very gentle heat: a brick bed will answer the purpose very well; or they will do in the forcing-house, if there be room for them. Let them be put into the house in the latter end of February or beginning of March, and keep them sufficiently watered. When they are two years old, they will be able to bear fruit; the pots in that time having become full of roots. In the month of November or December, turn the plants out of the pots, and with a sharp knife pare off the outside of the ball, by which the plant will be divested of its roots matted against the inside of the pot: then place them into larger pots, filling up the vacancy round the balls with strong loamy earth. During the winter, let them be kept in the green-house, or in a glazed pit of a like temperature, till the month of February; then set them into the forcing-house, where it is intended they shall

ripen their fruit. In this manner let them be treated every year, which will be a means of preventing the fruit from falling off before it come to maturity. The fig tree is very apt to cast its fruit before it is half swelled, especially when it is forced.

CHAP. V.

On the Culture of the Mulberry, and of the Walnut, and of the Medlar, and of the Quince.

THE mulberry tree bears a black berry, which tastes very delicious; and is of such a delicate nature, that it cannot be handled without causing the juice to come out, which is of a reddish staining colour. The plants may be propagated by layers and by cuttings, which should be planted in the autumn or spring. The mulberry tree is slow in growth, but it lives to a great age, and spreads its branches widely. It prospers best in a moderately light loamy soil, of the depth of two or three feet, on a chalk or gravelly bottom. In England, the fruit ripens in the month of September. In the north of England, and in Scotland, it comes not to perfection. Being of a slow growth, it is a number of years before it bears any quantity of fruit. After it is planted and trained up to have a stem of five or six feet high, it requires very little pruning, only to cut off any branches that happen to die, and to keep its branches from becoming too crowded.

Walnut.—The sorts of walnuts commonly cultivated, are the thin-skinned, the double, the large, and the French. Walnut-trees may be propagated by layers, but the most expeditious and best way to raise them is from the nuts, which should be sown in the autumn, or early in the spring. They may either be planted in the earth one by one, or sown in drills, and covered three or four inches deep. Before they be planted in the place where it is intended they shall remain, to bear nuts, they should be transplanted once or twice, and stand in the nursery till they make stems seven or eight feet high.

The plant called medlar, bears a fruit of no great value. There are two sorts commonly cultivated: the one is called the great medlar; and the other, the Dutch medlar. The way to propagate plants of this tree is by laying down the young shoots in the autumn or in the spring, or by the cuttings of the young shoots planted in a shady border; they may also be raised from seeds, or propagated by grafting. After they have made good roots, they should be transplanted into the nursery, in rows; and when they are grown to the height of four or five feet, they may be planted in places where they are to remain. They will grow in any kind of land which other fruit trees, that produce fruit of a more useful nature, grow in.

Quince.—The quince tree is very beautiful in the spring, when it is in blossom, and also in the autumn, when the fruit is ripe upon it: and the fruit may be suffered to remain on it till they fall off of their own accord, which perhaps may not happen before the middle of October or November. The sorts are the Long, the Apple, and the Portugal. Plants of the quince tree may be propagated by grafting, or by laying the young shoots, or by planting cuttings of them; and they may also be propagated by budding, which I think is the best method, because they can be brought into a bearing state sooner than by the above-mentioned methods; and they have a chance of being more productive. In regard to the planting and the pruning of this tree, called quince, it should be treated in every respect in the same manner as I have directed for the management of the medlar.

CHAP. VI.

On the Culture of Filberts, and of Hazel Nuts, and of Barberries, and of Strawberries.

FILBERT.—The only difference between what is called filbert and the common hazel nut, which is produced abundantly upon plants growing in hedge rows and woods, is, that the filbert is larger and of an oblong shape. To

have them of the largest size, it is necessary to graft them on the hazel plant. Filberts are cultivated pretty plentifully in gardens in high lying chalky soils, in Kent, and in some other southern counties of England. They are planted in rows seven or eight feet plant from plant, and trained with open heads in the form of currant trees, and pruned yearly. Filberts may be planted here and there in the kitchen and fruit garden, or in shrubberies.

The common hazel nut may be raised in great plenty by sowing the nuts in drills, in the spring or autumn. The wood of the hazel plant is very useful for making hoops, for making hurdles, for pea-stakes, and various purposes in husbandry, and for fuel.

Barberry.—There are three sorts of the plant called barberry; the white, and the red, and the black. They are easily propagated from layers, but plenty of the plants of them may be obtained from their suckers, which grow from their roots annually. Barberry trees may be planted in the kitchen garden, or in the fruit garden, or in shrubberies, among flowering plants of other sorts. The barberry being a flowering shrub, it looks pretty in the spring; and in the autumn it has a beautiful appearance, when the fruit is ripe upon it. The plants will grow in any sort of earth, and by pains being taken with them, they will grow to a considerable height; but the general way is, to suffer them to grow no higher than common shrubs.

Strawberry plants are most generally propagated by slips taken from the old plants, and by plants taken from their runners, which make roots into the ground at every joint. They may be planted either in single rows, in the outsides of borders, or in beds about three feet wide. To obtain varieties of strawberries, the plants should be raised from seeds; to procure which, put a quantity of their fruit into a vessel among water, and break and rub the fruit with the hand till the pulp be dissolved, and change the water till nothing remain in it but the seeds; then take them out and dry them; and in the spring following sow them on a bed of light earth, and keep them sufficiently watered and weeded when they require it; and as soon as the plants be fit, transplant them into small beds, there to remain till the following autumn or spring, when they should be taken up and planted in rows to produce fruit.

The wood strawberry and the alpine strawberry grow and produce most plentifully, when planted in a good sandy loam. These two sorts should be often propagated from seeds; most other sorts prosper and do best when propagated from slips and plants of runners, and a strong loamy soil is most suitable for them.

Excepting the wood strawberry, which likes a shade in hot weather, all other sorts produce most plentifully in open airy situations; but to obtain a succession of the same kind of strawberries, some of them may be planted where they may be shaded from the sun-shine a part of the day. If the alpine strawberry be planted in a warm situation, and its runners allowed to spread and make roots, the plants which form themselves on the runners, will produce fruit in the autumn of the same year. This prolific kind of strawberry, when planted in land of a kindly nature, continues, in fine seasons, to bear until about the middle of October.

Strawberry plants intended for forcing should be planted in pots eight or ten months before they be set into the forcing-house, or strong plants may be taken up with balls of earth about their roots, and be potted and set into the forcing-house immediately; they will occasionally do well in a hot-house for growing the pine apple plant, but a heat sufficient to force peaches and nectarines is more natural to secure the obtaining of good crops of fine fruit. A good way of forcing the strawberry is to bring them forward in a gentle heat in melon frames, till the fruit be nearly about half-swelled, and then to give them a stronger heat to ripen them.

CHAP. VII.

On the Culture of Roses, and of causing them to blossom early in the Spring.

THE methods of propagating the rose tree, is by laying down the young shoots in the autumn or spring, and by suckers which arise from the roots of the plant. The rose, though produced by a rough prickly plant which can

scarcely be handled without pricking the fingers, is beautiful, and emits such a fragrant agreeable smell, that it excites considerable expence to be laid out by people of fortune who are fond of fine flowers; and it requires labour, skill, and attention to make it blossom in the winter and spring months. The china rose, which however has but very little fragrancy, can easily be made to blossom in most months of the year; but it is only bestowing labour and expence with little probability of success to try to make fine-flavoured roses come into blossom, contrary to nature, in the four gloomy months in winter, when the days are short, and the light and heat of the sun are greatly withdrawn from our climate.

Roses will blossom well in hot-houses where pine apples and grapes are cultivated. The pots of roses should be set upon the curbs of the tan-pit, or on the flues, where the fire heat is not too powerful for them. In the spring they may be forced successfully in glass-frames for melons, or in pits of a similar construction as that which I invented for forcing cucumbers, warmed by the influence of dung or leaf heat.

But to obtain a constant supply of fine roses and other flowers beginning at an early period of the season, a forcing-house should be entirely appropriated for them, for it is best that the house in which roses are forced should be kept to that degree of heat most congenial for producing flowers in a fine clean healthy condition. Indeed this rule should be endeavoured to be carried into practice in forcing, not roses only, but all kinds of choice fruits. This method, which I recommend, of having a forcing-house appropriated for one species of plants, is not meant to oppose the generally adopted method of forcing fruits, roses, and vegetables, and flowers of different kinds, together in one forcing-house, for it would be inconsistent to have a forcing-house not sufficiently stocked with plants of some sort or another, either for beauty, smell, or usefulness; but it should be ascertained what sorts of plants are best able to bear the heat required to bring to perfection those fruits or flowers for which the house is chiefly appropriated. For instance, the kidney bean, which in the open air comes to perfection in warm weather in summer, bears in the winter and spring months the degree of heat requisite for the production of pine apples.

One method of forcing roses where a constant succession of them is required, is to plunge the pots in a bed of warm tan, which, with the assistance of fire heat, certainly brings fine roses at an early season; but considering that it is unnatural for the roots of rose trees to grow in a greater heat than what is communicated to the earth by the influence of the sun, and to save labour and expence, I many years practised a method successfully, which I reckon preferable. Instead of plunging the rose pots in tan in the pit, I covered the old rotten tan with sand, and set the pots in rows upon the surface of it. This method I think is preferable to that of plunging, for the following reasons: the roots are not in danger of being hurt by bottom heat, and therefore they will bear forcing several years successively. To have roses constantly in blossom, it is necessary, at least once a week, to turn out of the house plants which have come into a blowing state, and those which happen to appear not to produce buds worth house room, and to bring in fresh plants in their stead, which cannot be done readily when the pots are plunged in bark; and the expence of tan and labour is saved by the method I adopted.

Any sort of roses may be forced; but for this purpose the moss provence, the cabbage provence, the monthly and the common provence, are the most preferable. A suitable time of the year to begin to force roses, that they may be in bloom early and blow well, is about the beginning of December; and if a regular constant supply be required, a few pots should be set in every week. The number must be regulated according to the size of the place allotted for them; so that by the time the place is filled with them, the first lot put in should be in blossom.

In forcing roses, as well as all other sorts of plants and fruits, it should be endeavoured to imitate nature as nearly as possible. The air of the house into which the rose plants are set may be kept from about 55 to 65, for about three weeks; but towards the end of December, the heat must be increased; the thermometer should be as high in the morning as 65, and in the course of the day to about 75; and when the sun shines, as high as 80. To prevent insects from breeding on the plants, the house should be filled with tobacco smoke once a week. The earth in the pots about the roots of the plants, should constantly be

kept in a moist state, and watered all over their leaves twice in a week at least; but the rose buds just ready to burst should be passed over, for water injures flowers in blossom or ready to come in blossom. Clean sweet water, about the degree of heat kept in the house, should only be used; and if the air about the plants be not kept to a strong heat, watering over the leaves had best be deferred till the days become pretty long, and the rays of the sun are more powerful than in the middle of winter. Let the rose-house be kept clean and free of any disagreeable smell; and when the flues are hot, sprinkle them with clean water occasionally, so as to raise a fine steam in the house among the plants, which will prove very serviceable to them, filling the house with a fine salubrious air, genial for the promotion of vegetation.

The flower buds of the rose tree are very liable to be destroyed by a small grub-worm, which rolls itself up in the leaves; and as there is no other way of destroying or getting rid of this troublesome hardy insect, that I am acquainted with, but by destroying it with the hand, the plants should be carefully examined every day, and when any leaf is observed to be curled up, it should be nipped off, for it is almost sure that one of these destructive insects is wrapped up in it, or the embryo of it.

The pruning of rose bushes to be forced, should be performed somewhat different to those in the natural air, which do not blossom before June. The shoots of the latter may be cut, in short, even to the old wood and lower, which will not prevent them from blowing; but if the former, that is, those for forcing, were to be pruned in this manner, probably many of them would produce no blossom buds at all, and of course no roses; therefore I have found it to be the safest way not to prune rose trees that are intended to be forced early, till after they have been in the forcing-house, and their buds become so prominent that a skilful person may be able to distinguish blossom buds from shoot buds. Short shoots of the preceding year's growth, which on beginning to push appear full, are likely to contain a rose bud; but for those not well experienced in this business, it is the safest way for them not to prune the plants till the flower buds can be clearly distinguishable from the shoot buds, when they may safely divest the trees of all unnecessary branches.

Those who intend to force roses, should look forward and take care to be provided with a succession of healthy plants. If rose trees be potted in good earth, and well watered in dry weather, they may be forced every year with advantage; but if rose plants be forced successively, they ought not to be suffered to blow in the summer or autumn after they are set out of the forcing house. When rose trees become weak by having been often forced, they should be put away out of their pots into the open borders, or be rested for twelve months. In case their branches have grown too high and naked of young shoots, they may safely be cut down shorter; for if they have good healthy roots, they will break forth from the old wood and produce plenty of bearing shoots. Every year, rich fresh earth should be applied to the roots of forced rose trees: to do this, scrape off the earth round the plants about three inches lower than the rims of the pots, and instead thereof, fill up the pots with rich earth. In the course of the summer, the plants may be watered occasionally with thick water from melon beds, or from dunghills in a state of fermentation.

Rose trees to force, should be potted in earth of a good loamy nature, well mixed with rotten dung; rich earth from the kitchen garden will suit them very well. Before rose trees are forced, they should have been growing in the pots twelve months at least.

CHAP. VIII.

On the Culture of the Currant, and of the Gooseberry, and of the Raspberry.

GOOSEBERRY and *currant* trees are very easily propagated. Take cuttings of the last year's wood, about eight or ten inches long; rub off the under buds, leaving only two or three at the upper end; plant them half-way in the earth, in rows, and in dry weather keep them watered. They may be planted any time in the autumn, winter, or spring months, before they begin to grow.

Gooseberry and currant plants may be raised from seeds, by which varieties of them can be obtained. They prosper best in a rich sandy soil; but if the ground be well prepared, they will do in any soil. It should be trenched about two feet deep, and manured with rotten dung. These plants do very well when planted in borders in the kitchen garden; but it is best, where many are required, to plant them in a quarter of the garden by themselves, in rows, six feet apart, and four or five feet plant from plant.

In pruning gooseberry and currant bushes, the first two years after being planted, head down the young shoots pretty close, leaving them longer and longer every time of pruning, as the plants gather strength, forming the branches out every way regularly to the height of three, four, or five feet, according to the strength of them, leaving the bearing branches from six to eight or nine inches apart; these should be divested yearly of their side shoots made the preceding summer, leaving spurs an inch or two long.

The gooseberry and currant trees require a regular annual pruning; and as they produce their fruit on the preceding year's wood, as well as on studs or spurs, the best and speediest way of pruning them is, with the left hand to lay hold of the branches one after another, that are appropriated for bearing the fruit; and, with the knife in the right hand, begin nearest the ground, and cut off quickly all the last year's side shoots, leaving only one or two buds to each, taking a little care not to rub off the former small fruit-bearing spurs: shorten the young leading shoot of each of the main bearing branches to a third of its length, more or less, according to the strength of the trees.

Currant trees in general shoot rather more luxuriantly than gooseberries, therefore their leading branches require to be cut in proportion, and the plant suffered to run to a greater height. Thus, by suffering the trees to extend in height gradually, and by keeping the bearing branches sufficiently thin or apart from each other, they produce abundant crops of fine clean fruit, and the bearing branches by these means becoming strong, are not liable to be borne to the ground by the weight of the fruit. If any of the bearing branches happen to become weak or sickly, cut them entirely out down to the ground, and let strong young ones come up to supply their place. This

method of pruning and of training has another good effect: it enables the bearing branches to throw out spurs on every part of them, so that fruit is produced on them, beginning at the bottom, to the extremities of the plants, with rarely a naked part or vacancy without fruit to be seen on them. There are some sorts of gooseberry trees which naturally bend to the ground and trail, somewhat like brambles; such should have three or four stakes drove into the earth, round about the trees, to support hoops, to which the branches may be tied regularly. To have plentiful crops of fruit, let the ground between the rows of plants be manured once in two years, and dug in carefully among their roots; the earth about the trees should be dug every year, either in the winter months or late in the autumn. To have early gooseberries, train some of the plants against the south side of a wall or paling. Currants will keep long on the trees after they are ripe, provided they are covered with mats or nets, to preserve them from birds, or from any other animals of the human or brute kind.

Raspberry.—Though the raspberry prospers best in a good deep soil, it grows very well in any kind of earth, if it be trenched about two feet deep, and sufficiently manured. Young plants are produced plentifully every year from the roots of the old ones. If the plants be well managed they will produce fruit plentifully, being planted in any part of the garden; but in dry hot summers they do best in a spot of ground which is shaded from the sun from about ten o'clock in the morning till about three or four in the afternoon. Raspberries may be planted on borders, three or four feet plant from plant; or a plantation of them may be made, setting them in rows four feet apart, and the plants three feet apart in the rows. The raspberry bears its fruit on the preceding year's shoots, which are produced plentifully from the roots of the plants; and if the ground in which they grow be kept in a good state in rainy moist seasons, some of the shoots will grow eight or ten feet high.

The method of pruning raspberries in the first place is, to cut off all the shoots close to the ground which produced fruit the former year; then cut down the weakest of the young shoots, leaving from three to five or six, according to the strength of the mother plant, for bearing

wood; these should be shortened a foot or more, as their strength or weakness may dictate. The plants may be pruned any time in winter, in open weather; but the safest way is to do it early in the spring, after the most severe frosts are over. In some hard winters I have had the shoots of raspberry plants partly killed after pruning, by severe frost, the ground being bare of snow, which often prevents frost from hurting the roots of trees and esculent vegetables. Let the ground round about raspberry plants be dug every year; and every other year it should be manured. If the bearing shoots be left long, it will be necessary to tie them to stakes, to prevent them from falling down upon the earth.

CHAP. IX.

On the Culture of the Cucumber.

THE cucumber, cucumis in botany, is a genus of the monecia syngenesia class. Its characters are these: It hath male and female flowers on the same plant, which are bell-shaped, of one petal, which adheres to the empalement, and is cut into five rough segments. The male flowers have three short stamina, which are inserted in the empalement; the female flowers have no stamina, but have three small-pointed filaments without summits. The germen is situated under the flower, which afterwards becomes an oblong fruit with three cells, containing oval flat-pointed seeds.

There are, I believe, only three species of the cucumber; the common, the white, and the long Turkey; but there are many varieties.

The green cucumber with black prickles, I think, is the best for forcing; which, when fit for the table, runs from six to nine inches long, and, when ripe, runs to about eighteen or twenty inches long.

I cannot tell of what climate the cucumber is a native, but I imagine it is a native both of Asia and Africa. It is above three thousand years since mention was first made of it; for in the eleventh chapter of the Fourth Book of

Moses, called Numbers, it is thus recorded: "And the mixt multitude that was among them fell a-lusting, and the children of Israel also wept again, and said, Who shall give us flesh to eat? We remember the fish which we did eat in Egypt freely, the cucumbers, and the melons, and the leeks, and the onions, and the garlic."

In England, and especially near large cities and towns, great quantities of cucumbers are raised. Not only gentlemen, but almost every tradesman who has a garden and dung, have their cucumber frame. In the summer time the market gardens round London produce vast quantities to supply that extensive metropolis.

A warm situation, sheltered from the winds by buildings, sheds, or thickets, and groves of trees, is of great advantage, and necessary for a cucumber bed to stand in; for were it fully exposed to, and unprotected from the high and piercing winds, especially in the winter and spring months, there would be but little probability of constant regular success. For when high winds are suffered to blow against a cucumber bed, they have a very powerful effect on it: for in that case the heat in a short time will not only be greatly abated, but also forced and driven into the corners of the frames, and consequently some parts thereof are rendered too cold, whilst other parts are made too warm; and of course the plants are all equally endangered, retarded in their growth, and perhaps some, if not all of them, totally destroyed. Therefore, when a cucumber bed is about to be built, the first object of consideration should be, to have it, as well as possible, sheltered from the high winds and boisterous stormy weather.

That the bed be not by any thing whatever obstructed from the genial or warm and nourishing rays of the sun, is another object of great importance. For although artificial heat will cause the seeds of cucumber plants to vegetate and spring forth, yet that vegetable can be brought to no degree of perfection without the influence of the sun, and even his rays are at times absolutely necessary. However, it will be found sufficient, if, in the shortest days in winter when the sun shines, he be not hindered from shining on the frames from about ten o'clock in the morning till about two in the afternoon.

It is also worth consideration to have the bed built in or near to the kitchen garden, so that it may be handy to

carry from thence the rotten expended dung to such quarters of the garden as may require to be manured. Regard also should be had that nothing stand in the way to hinder carts or waggons from bringing the warm dung near to the place in which the bed stands.

There are two sorts of earths or moulds, without which, or a part of one or the other, I apprehend, a cucumber plant will not grow vigorous, nor produce fruit plentifully. The one is animal mould, the other is vegetable mould, and which are in fact nothing else but the putrefaction of earth after it has been altered by passing through the animal and vegetable vessels.

What I mean by animal mould is the dung of horses or of cows, after it has undergone a fermentation by being used for the rearing melons or cucumbers, and has afterwards lain in a heap exposed to the sun and air, and been frequently turned and well worked, till it has become a black, light, rich mould. But among such moulds are always considerable quantities of vegetables, such as hay, straw, and perhaps weeds of different sorts, which have not passed through animal vessels; therefore it is a composition of dung and rotten vegetables. In this sort of mould cucumber plants will grow remarkably strong; but I think it is rather too rich, and therefore those who use it had better mix it with some light soil, which has no unpleasant or disagreeable smell.

That which I call vegetable mould is what is made of the leaves of trees. The method I took to make it was this: In the months of December or January, or when the leaves were in a decaying state and wet, I had them raked together, and laid in a heap as large as raised a moderate heat; and during the spring and summer months I had them frequently turned and well worked, and by October and November following they were rotten and fit for use: but if they be suffered to lie for a longer space of time before using, their mould is still better, because it will have become more rotten, and of a more solid texture, and therefore will not sink so much after being put into the frames, as if put in when less rotten.

The leaves of which I made the vegetable mould, were a mixture of the elm, lime, beech, sycamore, horse and sweet chesnut, spruce and Scotch fir, walnut, laurel, oak, evergreen oak, ash, &c. and among them were withered

grass and weeds of various sorts. This vegetable mould, without a mixture of any thing besides, is what I used for growing cucumbers in, and, by experience, I found it preferable to any other moulds, earths, or composts whatever, either in my new method of a brick bed, or in the old method of a bed made of hot dung.

Before I used the mould I had it run through a coarse skreen or sieve to free it of the bits of sticks, and of the cones and tree seeds, such as that of the horse chesnut, and of the spruce and Scotch fir.

Cucumbers will grow in almost any sort of mould, though not with the same degree of vigour, provided they be supplied with a sufficiency of heat, water, and air.

In Britain, especially in the winter and spring months, one of the principal causes, without which cucumbers cannot be produced, is deficient, and that is, heat. In every county, and in every parish, and in every month of the year, earth, water, and air, may be found; but in every part, even in the most southern counties of England, there is a deficiency of heat: for, as far I know, that vegetable called cucumber does not, in any part of this country, come to any great degree of perfection without some assistance of artificial heat. Therefore, as the natural heat of this climate is deficient in its production, those who wish to have it in perfection must have recourse to art to supply the insufficiency of nature.

Late in the spring, and in the summer months, the heat of tan, or of the leaves of trees, may do; but in the winter, and early in the spring, something that raises a more powerful heat than these is required.

A place could be so constructed that cucumbers might be cultivated therein by means of the steam of water; but it would, I apprehend, be attended with such expence that few would be willing to adopt the method, even supposing it were found to answer the purpose better than dung; which I am inclined to think it would not do, because I conceive that the heat which is produced by fire, cannot be kept so steady as that which is produced by the fermentation of dung.

Cucumber plants will grow in a hot-house where the pine-apple is cultivated; but they will not be very long-lived there, for that is not a healthy climate for them.

Dung is the only thing yet found out, by the heat of which the cucumber may be advantageously cultivated.

It is not possible, nor is it necessary, to keep the air in the frames always up to the same degree of heat; but extremes on either side are dangerous, and should be carefully avoided.

There is no necessity for having heat directly underneath the roots of the plants; for if the air in the frames be kept up to a proper degree of heat, that is sufficient. In climates where the cucumber naturally grows, I apprehend there is no heat in the earth but what is raised in it by the heat of the sun and the circumambient air, which seems to be warmed by the reflection of the sun upon the earth.

It is not only necessary that in the frames the air be kept up to a sufficient degree of heat, but it is absolutely necessary that nothing pernicious or unwholesome be conveyed into, or caused to arise in the frames among the plants by means of that heat. If the steam of the linings get in, it will hurt the plants: and if there be any thing which smells disagreeably in the mould or underneath the mould in the frames, the heat of the linings will cause unhealthy vapours to ascend from it, which in time will prove injurious to the plants. So that although there may be a degree of heat in the frames strong enough for the growth of the plants, yet, through means of that heat, something may arise in the frames which will become progressively, if not almost instantaneously, destructive of the plants, especially when they are young and tender. Care, therefore, must be taken that nothing be introduced into the frames among the plants but what is of a sweet wholesome nature.

If it were possible to keep the heat in the frames always to 80 degrees, with the concurrence of proper air and moisture, I am of opinion that that would be a sufficient heat for the production of the cucumber.

In the short days in winter little or no water is required, for the continual evaporation arising in the frames, and perspiration of the plants caught by the glasses, keeps dropping down again upon the mould, and in some degree, imitates a natural watering from the clouds, and which is of service to the plants. Hence it would seem that the plants are often partly watered with the same water.

The mould in the pits retains the moisture surprisingly, which perhaps may be owing in some measure to the pits being constantly surrounded with the moist steam of the linings; and the bricks of the pits, and the tiles that cover the flues, being porous for aught I know, moisture, by the force of evaporation or attraction, gets through them into the frames. But be that as it may, I know that nothing hurtful or unhealthy ever gets through the tiles or bricks into the frames among the plants. The quantity of water requisite to be given to the plants depends upon the heat of the bed, the strength and age of the plants, and also on the temperature of the weather. When the weather is cold, wet, or gloomy, and the air moist, they require less water than when the weather is clear, and the air more dry.

If too much water be given, or if water be given too often, it will hinder the fruit from setting and smelling kindly: and if too little water be given, the plants will grow weak, and the fruit hollow.

I seldom watered the plants with water warmer than 85 degrees, nor colder than 65; although, in general, I tried by the thermometer the warmth of the water I used, yet it is not necessary so to do. A good way to know if the water be of a proper temperature is to take a mouthfull of it, and when it feels neither hot nor cold, then it is in a fit state for accelerating the growth of the plants, or for making them grow fast. I made it a constant rule never to water the plants but with clean sweet water; and if the water be clean and sweet, I am of opinion it makes little or no difference whether it be pump water, spring water, rain water, or river water. However, it is a good quality in water to bear soap, and make a lather therewith, which rain and river water readily do: but the pump and spring waters are found too hard to do it; yet this may easily be remedied in them, by letting them stand a few days in the open air and sun's rays.

With regard to the time of the day in which the watering of the plants ought to be performed, I think it is not material, nor did I ever make any rule with respect to the time, but give them water at any hour of the day when I saw they stood in need of it, and when it best suited my conveniency. Those who have hot-houses may get their water warmed there, and those who have no hot-houses may get

some from the house, or from some other place where water is frequently heated. One gallon of hot water will properly warm several gallons of cold water. Late in spring and in the summer months the water may be warmed by exposing it to the rays of the sun.

A due proportion and continual supply of fresh air is at all times necessary, and more or less is required according to the heat of the linings, the temperature of the weather, and the thickness of the coverings put on at nights.

When I say, *give air*, I mean that the lights should be raised or tilted on the north side with pieces of wood made in the form of wedges, by means of which little or much air can be admitted at pleasure.

The lights or sashes of frames or boxes are seldom or ever made so exact as altogether to exclude the external air, or to hinder it from having a continual ingress and egress, or from going in and coming out of the frames continually. And as the frames get old they wear, and then let in more air than when they are new, so that new frames may require the use of the air-sticks when old frames do not; therefore, in giving air, these and such like matters ought always to be duly considered.

When the wind blows from the east and north-east, the current of air goes in at the westernmost light of each frame, and comes out at the easternmost one; and when the wind blows from the west and northwest, it is just the reverse, for it then goes in at the easternmost light of each frame, and comes out at the westernmost one. That being the case, it is sometimes advisable to give less air at the light where the air goes in, than at that at which it comes out; for when the wind blows strong from those quarters, as well as from the south-west and south-east, the end lights of each frame next to the quarters from whence the wind blows, will be the warmest.

The air and heat in the frames are always most regular and steady when the wind is calm, or the bed well protected, and when the wind is in the south or in the north; but when the wind blows strong from any of the other quarters, and is suffered to beat upon any part of the bed, the current of air will be irregular, and at times very strong: and if there then happen to be a strong new lining at the bed, and a great rank steam arising out of it, especially at the

north side, care, skill, and attention will be required, and must be exerted, for the preservation of the plants; for the steam being nigh to the place where the air is admitted, if much air be given while the wind continues high, the steam will undoubtedly be carried by the current of air into the frames, and if the steam be of a pernicious quality, the plants will certainly be hurt thereby. When such a case at any time happened with me, I gave but little or no air in the night time, and by frequent waterings I kept the steam of the linings down in the day-time; and this I continued to do till the winds subsided, or till the violent fermentation of the linings was somewhat abated. The same rule should be observed in the management of melon plants. But if the bed be well sheltered, such precautions will be unnecessary, for I have never experienced any hurtfulness in the steam arising out of the linings, except when the winds have been blowing strongly on the bed, and soon after the application of a powerful new lining of rank horse-dung, and when it was high up against the sides of the frames near to the place where the air was given; and even then the plants were not killed, but only some of their leaves injured.

As the steam rises out of the dung of the linings it is quickly dispersed and mixed with the common air, by which its pernicious qualities are almost instantaneously destroyed. It is, therefore, not likely that the steam arising from the linings on the outside of the frames should become hurtful to the plants in the frames, unless it were to pass immediately from the linings into the frames before its pernicious qualities were meliorated or destroyed. But as cucumber plants are delicate, to prevent the fear of their being hurt by steam from the linings, it is certainly the safest way to cast up the dung in a heap, and let it lie for a few days till its most pernicious qualities be passed off by fermentation. The steam of horse dung is unhealthy to human creatures; it is used in the process of making paint, and I am informed that the labourers employed in that business live but a short time; indeed all confined air is unhealthy to the human and to the brute, and to the vegetable creation; therefore, except the air among the cucumber plants be perfectly sweet and wholesome, there should be a continual ingress and egress of external air

permitted, as well as guarding against the effects of strong stinking linings.

In the frames there is a continual steam or evaporation arising; and as this vapour is of a sweet, healthy, invigorating nature, if too much air be given, it will pass off too rapidly, and that before it has had time to render to the plants that service which is necessary; and if too little air be given, the vapours will be retained too long, and become too thick, and thereby the free perspiration of the plants will be obstructed, which will soon render their state weak and sickly, and the fruit will neither set nor swell kindly.

In winter, when the heat of the linings is great, if care be not taken, the air in the frames will be rendered too dry. To prevent this, in no part of the frame should the mould be suffered to become dry and husky. When the heat is great, water should be frequently and plentifully poured upon the flues, which will keep the bricks and mould adjoining to them in a moist state.

In giving and taking away the air, do it gradually, that is, by little and little at a time, which, without doubt, is the best way; for, as I observed before, sudden changes are always attended with unpleasant consequences.

The linings are to be applied to the bed a few days before the plants are ready for finally planting out, in order that the mould and every thing in the frames may be properly warmed for their reception.

The dung of which the linings are to be made may either be cast together in a heap, to bring it to a heat before it be laid round the bed, or it may be laid round the bed as it is brought from the dung-yard; but whichever of these methods be taken, when the linings are making up, the dung should be well shaken, and laid up lightly, so that the heat of it may come up freely. As it takes some days before the linings are able to warm the earth in the bed sufficiently for the reception of the plants, the rank steam of new dung linings is evaporated, unless the dung came immediately from the stables, which seldom is the case.

The linings are to be made nearly three feet broad in their foundation, and tapered up to about thirty inches at the top, by which they will retain their heat long, and in sinking will keep close to the bed, which is what should at all times be paid proper attention to.

In the winter and spring months the linings should be trodden upon as little as possible, for treading on them would be the means of stagnating their heat. But should it at any time, in managing the plants, be found necessary to stand or kneel upon them, boards should be laid on their tops for that purpose; which will prevent the weight of a person from taking that effect on them which it otherwise would do.

As the linings sink, they are to be raised with fresh dung; but they should seldom be raised higher than about the level of the mould in the frames in which the plants grow, especially when there is a strong heat in them; for, when there is a great heat in them, if they are kept higher than the level of the mould, the heat dries the air in the frames too much. Nor should they be suffered to sink much below the level of the mould in the frames; for that, on the contrary, would cause too much moisture in the frames, especially in the winter and spring months.

When the heat begins to be too little, notwithstanding the linings being kept to their proper height, the fresh unexhausted dung on the top or upper part of them is to be laid aside, and the exhausted dung underneath to be taken away, and that which was laid aside put in the foundation, and fresh dung laid above it in lieu of that which was carried away.

Both the side linings may be raised at one time, but both of them should never be renewed together; for if both were to be renewed at the same time, it would for a time cool the frames too much, and when the heat of both came to its full strength, it would probably be too powerful for the roots of the plants when extended to the flues.

I seldom or never renewed the end linings, because I found the heat of the side ones fully sufficient; for as there are flues or vacuities in every part of the bed, the steam, being fluid, circulates in, and warms every part thereof. And for the very same reason there is no occasion for having a strong heat in both the side linings at one and the same time, except in very cold weather.

In making up and pulling down the linings, care should be taken not to injure the brick-work.

The covering the lights in the winter and spring is absolutely necessary; for, notwithstanding the heat of the

linings, it would be impossible to keep up a proper degree of heat in the frames for the plants without coverings. Therefore, the covering up in the evenings, and uncovering in the mornings, must be particularly attended to, and more or less put on according to the heat of the linings and the temperature of the weather. My method of covering up was as follows: in the first place I laid clean single mats on the lights, in length and breadth just or nearly to cover the sashes, taking care not to suffer any part of the mats to hang over the sashes on or above the linings, for that would be the means of drawing the steam into the frames in the night-time. On these mats was spread equally a covering of soft hay, and on the hay was laid another covering of single mats, upon which were laid two, and sometimes three or four, rows of boards, to prevent the covering from being blown off by the winds. The mats laid on next to the glass are merely to keep the seeds and dust which may happen to be in the hay from getting into the frames among the plants.

If the bed be high in covering up, steps or short ladders must be used by those whose office it is to cover and uncover; and great care must be taken not to break or injure the glass.

Some gentlemen have pits built in their cucumber and melon grounds. These they have built wide enough to make the bed in the middle, and room on each side of the bed for the linings. This is a very good method: but the building of such pits is attended with considerable expense: those who have them should take care that there be drains as low as the foundation of the beds, to carry off the water from them.

To raise cucumber plants from seed, make up a bed of good dung four feet high, for one light box; and when it is finished, set the box and lights upon it. When the bed has stood a few days, level the surface of it, and sow some cucumber seeds in a pot filled with rich earth, cover them about two inches thick, and set the pot into the bed, on its surface. The plants will come up in a few days; and when they have fully expanded their two seed-leaves, transplant them into small pots, three plants in each pot; set them on the surface of the dung in the bed, and let a little air be left at the light, day and night, to let the steam pass off freely. To raise cucumber plants by cut-

tings, cut off young shoots just below a joint, plant them two inches deep in pots filled with earth, shorten the shoots to one or two eyes above the earth, set them in a good strong heat, and give them water occasionally.

When the seedling plants have one or two joints, stop them, after which they generally put forth two shoots, each of which let run till they have made one or two clear joints, and then stop them; and afterwards continue throughout the season to stop the plants at every joint; and the method to do it is as follows:

When the plants shoot forth again after the second stopping, they seldom miss to show fruit at every joint, and also a tendril; and between this tendril and the showing fruit may clearly be seen the rudiment of another shoot; and when the leading shoot has extended itself fairly past the showing fruit, then with the finger and thumb pinch it and the tendril off just before the showing fruit; so that in pinching off the tendril and the shoot, the showing fruit is not injured. Thus stopping the leading shoot stops the juices of the plant, and is the means of enabling the next shoot (the rudiment of which was apparent when the leading shoot was stopped) to push vigorously, and the fruit thereby also receives benefit.

When the plants are come into bearing, if the vines are suffered to make two joints before they are stopped, at the first of these joints, as I before said, will be seen showing fruit, a tendril, and the rudiment of a shoot; but at the second joint there is seldom to be seen either showing fruit or the rudiment of a shoot, but only a tendril and the rudiments of male blossoms. It is therefore evident, and but reasonable, that the shoot should be stopped at the first of these joints; for were the shoot to be let run past the first joint, and stopped before the second, perhaps no shoot would ever spring forth at the said second joint, but only a cluster of male blossoms or leaves, which would serve for no good purpose, but would rather exhaust the juices of the plant, which ought to be thrown into the productive parts of it.

If the plants are suffered to bear too many fruit, that will weaken them, and in such case some of the shoots will lose their leaders, that is, the rudiment of some of the shoots will not break forth, the numbers of fruit having deprived them of their proper share of the vegetative

juices. The rudiments of some of the shoots may also be injured by accident, which sometimes prevents their pushing; but from whatever cause this happens, it matters not; for by the losing of its leader the shoot is rendered unfruitful, and therefore should be cut entirely off.

In the course of the spring and summer months several shoots break forth here and there from the old ones. When too many break out, cut off the weakest of them close to the old shoots, and those which remain, with regard to stopping, serve nearly in the same manner as young plants.

If the old shoot, from which the new one bursts forth, lie close to the mould, it sometimes sends forth roots from the same joint from which the young shoot proceeded, by which the young shoot is much invigorated, and the old plant, in some measure, renovated.

When this young plant is fairly formed on the old shoot, it somewhat resembles a young plant formed and struck root on a strawberry runner; and if the shoot were to be cut of on each side of the newly formed plant, and no part of the plants left in the frame but itself, by proper treatment it would soon extend itself all over the frame.

In winter, when the plants are young, and before they come into bearing, it sometimes happens that they send forth too many shoots: in that case cut the weakest of them off, not suffering them to become crowded and thick of vines, for that would weaken and prevent the plants from bearing so early as they ought to do.

Keep the leaves of the plants always regularly thin. The oldest and worst of them cut off first, and cut them off close to the shoot on which they grow. This is necessary and right; for if any part of the stem of the leaf were to be left, it would soon putrify and rot, and perhaps destroy by damp the main branch from which it proceeded.

It is the female blossoms or flowers that bear the fruit; but if they were not to be impregnated by the male flowers, they would prove barren and unfruitful.

The female blossoms are easily to be distinguished from the male ones, for the rudiment of the fruit is apparent at the bottom of the female flowers, and the flowers have no stamina, but have three small pointed filaments without summits: Whereas the male blossoms have not any rudiment of fruit about them, but in the centre of the flower are three short stamina, which are inserted in the impalement.

When the female or fruit blossoms are in full blow, take a male blossom which is in full blow, and holding it in one hand, with the other split and tear off the flower leaves or petals, taking care not to hurt the stamina or male part. Then hold the male blossom thus prepared between the finger and thumb of the right hand, and with the left hand gently lay hold of the female blossom, and holding it beween two fingers, put the prepared male blossom into the centre of the female blossom, and there the farina, polen, or dust of the anthera, clings or sticks to the stigma, and thus the impregnation of the fruit is effectuated, and the plants are thereby rendered fruitful, which, being in frames in a climate by art made for them, would otherwise in a great degree be rendered barren and unproductive; and which I have frequently known to have been the case, even when at the same time the plants were in a vigorous flourishing state.

Generally leave the prepared part of the male blossom sticking in the centre of the female one, and take a fresh male blossom to every female blossom. But if male blossoms run scarce, which seldom or never happens, make one male blossom do for two or three female ones.

When the frames are going to be set upon the bed, a layer of mortar is spread all round upon the upper course of brick-work on which the bottoms of the frames are to rest. Thus the frames are set in mortar on the bricks; and the flues are with a bricklayer's brush well washed, and rubbed with a thick grout made of lime and water, which stops every crack or hole, and prevents the steam of the linings from getting into the frames. This washing of the flues I had done once a year, for no crack or hole must ever be suffered to remain unstopped in the flues.

I found little or no trouble in keeping the flues perfectly close, nor is it indeed likely that they should become troublesome if the bed stands on a sound foundation, for the heat of the dung has not that powerful effect on the flues, as fire heat has on the flues of a hot-house; because the heat of dung is more steady and not so violent as the heat of fire; and besides, the flues of the cucumber bed are almost always in a moist state, which is a preventative in them against cracking or rending.

When the bed is first built, the pits are about three feet in depth below the surface of the flues. These pits I had filled

up about a foot high, some of them with rough chalk, some of them with small stones, and some of them with brickbats: this is to let the wet drain off freely from the mould of the beds. After this filling up with chalk, stones, and broken bricks, there is a vacancy in the pits about two feet deep below the surface of the flues; this vacancy I had filled to a level with the surface of the flues with vegetable or leaf mould; and in putting it in, it was gently pressed, to prevent it from sinking too much afterwards.

On the surface of the mould with which the pits were filled, under the middle of each light, and which is just in the centre of the mould in each pit, make hills of mould in the same form as is commonly done on a dung bed. These hills are to set the plants in, and are to be raised at first nearly close to or within a few inches of the glass. Raising the mould at first pretty nigh the glass is necessary on account of the sinking of it; for as the frames are set on bricks they cannot sink, but mould newly put in is sure to settle, and the measure of settlement will ever depend upon the lightness and texture of the mould with which the pits are filled. Therefore, these and such like matters must be left to the discretion of those who are entrusted with the direction and management of the frames. When the bed is thus finished, and ready for the reception of the plants, if the flues be strewed over with mould, so that their surface be just covered, to a stranger it is altogether a deception, for in every respect it has the appearance of a dung bed. *See the plan.*

The sashes of the frames which I used were glazed in lead; but if any person who rears early cucumbers have lights which are not glazed in lead, but are slate glazed, the vacancies between the glass had best be filled up close with putty, to prevent too much air from getting into the frames in the cold days in winter. The frames under my management were constantly kept in good repair, and painted over once every year. This method, I am clearly of opinion, is more profitable than if the frames were neglected for two or three years, and then have a thorough repair with two or three coats of paint. When frames are new painted, they should be suffered to lie and sweeten for some time, at least for two or three weeks, or until the disagreeable smell of the paint be somewhat lessened.

Although the frames I used were of a very good size, yet if they were a little smaller or larger, they would answer the purpose very well. Therefore those who intend to build a bed after my plan, have no occasion to make new frames merely for the purpose, but they may get the bed built to fit the frames they are already in possession of.

The common and general method of cultivating early cucumbers is the following: the seedling plants are raised nearly in the way as I have already directed. About three weeks before the plants are ready for planting out for good, a quantity of dung is procured, and cast up in a heap to heat, and let lie about a fortnight or three weeks, and during that time it is turned twice or thrice, and well worked. It is then made up into a bed of about four or five feet high, and the frames and lights set upon it. It is afterwards suffered to stand for a few days to settle, and until its violent heat be somewhat abated; and when it is thought to be in a fit state for the plants to grow in, its surface is made level, and a hill of mould laid in just under the middle of each light, and when the mould gets warm the plants are ridged out in it.

After this, if the bed has become perfectly sweet, and there be heat enough in it, and the weather prove fine, the plants will grow finely; but in the course of a few days the heat of the bed begins to decline, and perhaps the weather changes from fine, and becomes cold, wet, and gloomy; and in that case a lining of fresh dung to enliven the heat of the bed is undoubtedly required.

When this fresh lining is applied, it sets the bed into a fresh fermentation, and very frequently gives too much bottom heat, and it even often happens that the heat becomes too great under the plants before a lining is applied; for the heat of a dung bed is changeable, and is raised and lowered by the changes of the weather; and every person knows how variable the weather is in this part of the world.

When the heat becomes too powerful for the roots to grow in, the plants will shew it by their sick weakly appearance; and if the mould on the surface of the bed under the plants be examined, it will be found of a grey colour. When this happens, it is called a burning heat.

The only methods that I have yet learned, or ever heard of, either for preventing or for curing this burning heat of

the bed, are four. The first of these is, giving plenty of air: the second is, making holes in the sides of the bed to let out the heat; the third is, taking the burnt or overheated mould out from under the roots of the plants, and putting fresh mould in its stead; and the fourth is, pouring water into the dung of the bed to quench its fiery heat.

The first of these methods is the most simple and easy to be put in practice, but it seldom answers the desired end, for much air starves the branches of the plants, while the great heat in the dung of the bed hinders the roots of the plants from making due progress; and indeed the great heat of the bed would burn the earth, if there were no lights over it.

The second method, which is making holes in the sides of the bed to lessen the great heat of it, may be of some service, but it is rather precarious. The heat passing off on the outside of the bed certainly cools the bed; but by that means the air in the frames is liable to be made too cold, and it is not the heat of the air that is wanted to be lessened, but the heat immediately under the hills of plants.

The third method is attended with more trouble than the two former, and its operations are attended but with little better consequences; for the taking the mould out from under the plants disturbs their roots, and, in a few days after, if the heat of the bed be not declined, it becomes too hot again, and the same work is again required. Thus with these three methods I have kept on from October till March, and during that time have paid great attention, and exerted all my ingenuity, yet have been but little forwarder with my plants than if I had not begun to sow the seeds before the month of February; and this has not only been my case, but, to my certain knowledge, that of many others.

The fourth and last method of keeping the burning heat of the bed under, is that of pouring water into the dung of the bed. This method is the best and most effectual of the four, but, in its performance, skill, care, and attention are required; and it must be executed with such nicety and circumspection, that I freely confess I am not able to give such instructions concerning it as might at all be depended on. For if too much water be poured in, it chills

the bed, and creates noxious vapours therein; and if too little water be poured in, the burning will increase: so that by running to extremes on either side, the plants are exposed to danger, retarded in their growth, and perhaps attacked by insects and by complicated diseases, which, if not removed in a short time, will bring them to an untimely end. However, let the surface of the bed all round the hills be kept bare of mould, and loose, that the heat may arise freely, and keep a strong heat in the bed by means of linings, and feel with your hands into the dung here and there, and if burning heat begin to come up, keep it down by water. Let the earth in which the plants grow be of a rich light texture, so that it may take in water freely; and if the dung in the bed under the hills of plants begin to become dry or too hot, pour plenty of water in about the stems of the plants, which will bring the earth and dung under the plants to the same degree of heat as the water, which should be 80 degrees. In this way you must keep on, and adding a little earth to the hills as the heat in the middle of the bed will permit. In the winter and in the spring, except you keep a strong heat in the bed, and give plenty of water, the plants will not grow kindly nor produce fruit worth any thing.

The effect which the linings have on dung beds causes their sides to sink, and that unevenly, especially if the dung of which the bed be made, be not thoroughly worked before it be put into the bed; and in sinking, the bed is liable to rend and give way in its sides, and therefore it is difficult to prevent the steam of the linings from penetrating into the frames among the plants, so that care should be taken to have the linings in a sweet state.

In the winter, when the heat of the bed is much declined, it is a common practice to bore holes in the sides of the bed with a stake. These holes are to enable the heat of the linings to warm the bed properly; but as the dung of the bed is of a loose texture, through these holes the steam of the linings is apt to find its way into the frames among the plants.

When the dung of the bed gets old and rotten, it stagnates, corrupts, and becomes putrid; therefore the vapours which arise from it when in such a state, cannot be of a healthy nourishing quality, but, on the contrary, are certainly unhealthy, and slowly poisonous to the plants.

And if the dung of the bed become dry and husky, the vapours that arise out of it when in such a state are productive of little better consequences. Strong good linings will prevent the bed from getting into a stagnated state, and water will prevent it from becoming dry and husky.

It is well known that animals, which are fed upon sweet wholesome food, are the most wholesome food for man. And no doubt but the flesh of wholesome animals may be rendered somewhat unwholesome by the nature or quality of the food they are fed with.

Vegetables are, in many respects, similar to animals, and therefore may undoubtedly be rendered somewhat unwholesome to man by the nature of the food with which they are nourished.

I shall not, nor am I well qualified to enter into a philosophical disquisition of the food of plants, but shall only mention what I hinted before, that the food of the cucumber plant is contained in earth, water, heat and air, and the sweeter these elements are kept, from which the plants derive their sustenance, the more wholesome and palatable will their fruit be.

When I used to cultivate cucumbers on a dung bed, the fruit were sometimes watery and ill-tasted; but after I began to cultivate them on a brick bed, the fruit were constantly firm and well flavoured; which is certainly occasioned by the goodness and wholesomeness of the food with which the plants are fed or nourished.

The difference of climate, or temperature of the air, has a very great effect on plants of almost all sorts. The different degrees of heat is the great cause of these changes, and different degrees of moisture undoubtedly assist it. The American and African plants, which are said to be famous in medicine, when of the growth of their native soils, yet when they are removed and brought into our climate, though they grow, and even produce their flowers and ripen their fruit, which is the last perfection of a plant, when put to the trial, it is said by skilful men, they have always been found to want their proper medicinal virtues.

Many plants and trees, though natives of another climate, will endure the open air with us, and grow in our gardens, yet lose much of their strength and become dwarfs in proportion to what they were in their proper climate. But less violent changes than these are able to

produce the like effects in some degree; for different climates in Europe in time do alter the qualities of plants if transplanted, though they may grow naturally in each of them.

The differences made by varieties of climates upon plants are not always confined to distance of place, but even in the same country the climate differs greatly in different years by means of accident; and more or less heat, and more or less moisture, will do as much violence to plants sometimes as change of place, which operates only by means of the same agents. The effect of different climates in changing the nature of things produced in them, is not confined to plants only, but the animal kingdom also shares in it.

A cucumber plant delights to grow in a strong heat and in sweet wholesome air; but if the air in which it grows be contaminated, unhealthy, or impure, the plant will not continue long in a healthy flourishing condition.

Whatever is disagreeable to the smell becomes in time hurtful to the cucumber plant, therefore, whoever would wish to know if the air in a cucumber frame be of a healthy nature for the plants, should smell to it.

All the materials of my newly-invented bed are clean and sweet; and the flues being made perfectly close, no tainted or bad-smelling air can get through them into the bed, so that it is of little or no concern whether the dung of the linings be sweet or otherwise, or whether the linings be made of dung or of any thing else, provided there be a sufficient heat kept in them, and no pernicious steam be drawn in among the plants by the current of air.

The bed is so constructed, that the coldest place in it is exactly in the centre of each pit, and from this centre the heat increases on each side to the linings where the heat begins. The plants being planted in this centre or coldest part of the bed, their roots can never be hurt by the heat; and as it is natural for the roots to spread themselves horizontally, the heat, increasing on each side gradually, is in every respect suitable for their increase and extension. *See the plan of the bed.*

The heat in the centre of each pit, just where the plants are first planted, seldom rises higher than to about 80 or 85 degrees, nor does it ever rise higher in any part of the pits than about 96 or 97 degrees, nor do I believe it ever

can be raised higher than that, without scorching the plants by top heat or heated air: whereas in a bed made of dung, the heat in the centre of the bed, under the mould in which the plants are planted, frequently rises to above 120 degrees, when, at the same time, the air in the frames can scarcely be kept up to a proper degree of heat: this frequently happens in cold weather in winter.

The scorching heat of a hot-bed of horse-dung, when too hot for plants, is equal to 85 degrees and more, and hereabout is probably the heat of blood in fevers.

"The due healthy heat of a hot-bed of horse-dung in the fine mould, where the roots of thriving cucumber plants were in February, was equal to 56 degrees, which is nearly the bosom heat, and that for hatching of eggs. The heat of the air under the glass frame of this hot-bed was equal to 34 degrees, so the roots had 26 degrees more heat than the plants above ground: the heat of the open air was then 17 degrees." *Hales' Statics,* vol. i.

According to Dr. Hales, the heat of the human blood in high fevers is above 130 degrees of Fahrenheit's thermometer; the bosom heat, or heat of the skin, is from 94 to 98 degrees; the heat of a hen hatching eggs is from 103 to 107 degrees. It appears that 60 degrees of Fahrenheit's thermometer is equal to about 34 of Dr. Hales's thermometer; hence we may infer, that the heat of Dr. Hales's cucumber bed stood nearly as follows:—The heat of the mould in which the roots were growing 100 degrees, and the heat of the air in the frames 60 degrees. Now, as the surface of the mould, which was heated to about 100 degrees, must be exposed to the heat of the air in the frame, which was 40 degrees lower, I think it is but reasonable to suppose that the heat of the dung under the mould must have been at least 120 degrees.

I am inclined to think that Dr. Hales did not himself manage this cucumber bed: for, if he had, I think he would have favoured the public with an account of how long it continued in that due healthy state, and what methods he took to keep it in that state, and of the success attending his labours with regard to the produce of the plants.

The dung for the linings of the bed of my invention requires no more working than what is necessary to bring it to and keep it in a proper degree of heat, and to let some of its most rancid qualities pass off by evaporation; and

as soon as the heat rises in the linings, it circulates in the flues, and warms every part of the bed; whereas the dung for making a common cucumber bed must be turned and worked, and lie, till, by fermentation, its rank qualities be evaporated, and its violent heat be somewhat diminished.

In the course of the winter a dung bed sinks so low that it becomes difficult sometimes to get a proper heat raised in the linings; but my brick bed being always of the same height, such difficulty can never happen.

The linings of my brick bed seem to retain the heat longer than the linings of a dung bed do, and that because the flues are constantly full of steam; but a dung bed having little or no vacuity for the retention of the steam, the steam of the linings of it is perhaps more immediately evaporated, and consequently the heat of the linings is sooner exhausted than the heat of the linings of the brick bed.

To illustrate this a little farther, it may be observed, that there is a certain quality in dung which is the cause of its heating. While this quality, or any part of it, remains in the dung, it retains the heat in some degree; but when that quality is totally exhausted, the heat in the dung ceases.

There is another method besides that of fermentation by which dung may be deprived of this quality; and that is, by being exposed for some time to the sun and air, in spreading it thinly on the ground. In that state the dung's heating quality will be evaporated; and were it to be thus exposed, it would also lose much of its vegetative powers. Hence it would appear evident, that the steam, which undoubtedly contains the heating quality, being retained in the flues or cavities of the bed, and reverting to its first source, is the means of enabling the linings to keep the heat longer than they could do if there were no such cavities in the bed.

In the cultivation of the cucumber in the summer, under hand or bell glasses, the following method is generally practised: The seeds are sown some time about the middle of April in a cucumber or melon bed, and when they come up, they are potted out into small pots, two or three plants in each pot, and are kept properly watered, and stopped at the first or second joint. About the middle of May, a warm situation where the mould is very rich is

pitched on, and a trench is dug out about two feet deep, three feet broad, and the length is proportioned according to the number of lights it is intended for. This trench is filled with good warm dung, and when the dung is come to its full heat, it is covered over with eight, ten, or twelve inches deep of rich mould. The glasses are then set upon it about three feet distant from each other, and when the mould gets warm under them, the plants are turned out of the pots with their balls whole, and plunged in the mould under the glasses, and a little water given them to settle the mould about their roots, the glasses set over them, and after they have made roots and begin to grow, in fine days they are raised a little on one side to let the plants have the free air; and as the weather gets warmer and warmer, air is given more plentifully, to harden the plants, so that they may be able to bear the open air, and run from under the glasses.

When the plants begin to fill the glasses, they are trained out horizontally, and the glasses are set upon bricks or such like, to bear them from the plants. After this the plants require nothing more but to be supplied with water when the summer showers are not sufficient, and to stop them when they run too thin of branches, and thin them of leaves or branches when they are likely to become over-crowded.

In warm summers and in warm situations, by this mode of management, the plants will bear plentifully for about two months, provided they be not attacked by insects or weakened by diseases.

The cucumber plant may be kept on from year to year by cuttings. The method of sticking them is this: Take a shoot which is just ready for stopping, cut it off just below the joint behind the joint before which the shoot should have been stopped, then cut smooth the lower end of the shoot or cutting, and stick it into fine leaf or other rich mould about an inch deep, and give it plenty of heat, and shade it from the rays of the sun till it be fairly struck. By this method, as well as by that of laying, cucumber plants may readily be propagated.

Those who are desirous of having cucumbers early, had best sow the seeds about the 20th of October; they may be sown at any time of the year, but the spring and autumn are the best seasons. Cucumber plants may be made to

bear fruit plentifully from about the middle of March till the middle of September; but from the middle of September till the middle of March, their produce will be but scanty. Cucumber plants raised from seed in October will begin to produce fruit in February or March, and will continue to bear till the following month of October, provided they be kept in frames, and get plenty of heat and water. *See Gardener's Remembrancer.*

After the cucumber bed is set to work, heat and sweet moisture are the two principal agents required for promoting the growth and vigour of the plants; therefore, if there be a heat kept in the linings strong enough to keep the heat in the centre of the pits of mould fluctuating between 80 and 90 degrees, cold water may be poured on the flues twice or thrice a week. There is no danger of creating damps or impure air in the frames by watering the flues; for the water is no sooner poured on them, than it runs down their sides, and passes clear off through the drains of the bed; consequently water being poured upon the flues, gives only a momentary check to the heat of the frames; for the flues being at all times full of hot steam, when the watering is finished, the heat quickly resumes its former vivacity, and raises a warm vapour in the frames, well adapted for promoting vegetation, and for increasing the growth, and invigorating the plant in all its parts.

The mould round about the sides of the pits close against the inner sides of the flues, should be kept nearly on a level with the surface of the flues; and as it is the mould that joins to the flues which receives the first and greatest heat from the linings, it should continually be kept in a moist state; for if the mould against the flues be suffered to become dry and husky, air will be generated in the frames disagreeable to the plants.

During the winter and spring, in the mornings, just when the frames are uncovered, I never wished to find the heat of the air in the bed among the plants lower than 70 nor higher than 80 degrees; and during the same time I never wished the heat of the mould in the centre of the pits about six inches below the surface lower than 80 nor higher than 85 degrees. It appears, therefore, that, during the winter and spring months, the medium heat of the air in the frames should be 75 degrees, and the medium heat of the mould 80 degrees. I speak now of artificial heat, for

when the days are warm, and the sun shines, the heat of the air in the frames is often raised to a much higher degree. Reckoning the heat derived from the sun, the medium heat of the air in the frames may be about 80 degrees; and as the mould in the pits for two or three inches deep is more susceptible of heat and cold than at a greater depth, we may compute its medium heat to be nearly about the same degree as that of the air.

A brick-bed may be built and set to work immediately; the heat of the linings will dry the lime of the joints of the bricks. The evaporation in the frames, from the moist lime of the joints of the brick-work, has no bad effect on the plants; but when a bed is set to work before it be dry and steady, great care must be taken not to injure the brick-work in filling up the pits.

In the old method of raising melons and cucumbers, it is customary to shade the plants from the sun, because when he shines bright they flag. In excessive hot weather in summer, melon and cucumber plants are better for being shaded an hour or two in the heat of the day, that is, from about eleven o'clock to between one and two; but if the shining of the sun makes the plants flag, it shews that they are not in a good state; they want roots or water, or too much external air has been let in among them suddenly. If a melon or cucumber plant be in a good state of health, the sun may scorch a few of its leaves, which is of little consequence, but the plant will not flag: much heat makes its juices flow rapidly, and thereby the result is, that the vessels of the plant, being filled with vegetative sap, are distended, by which the leaves are caused to stand in an erect posture. *See Gardener's Remembrancer.*

CHAP. X.

On the Culture of the Melon.

THE fruit called melon grows on an annual creeping juicy plant very like the one which produceth cucumbers. There are great varieties of the melon in shape, size, and colour, but several sorts of them are not worth propagating.

that is, in the estimation of some persons; but there are some kinds of them, such as the early cantelupes and the rock cantelupes; which, when well ripened, are delicious in flavour and very wholesome in quality. Of the varieties, there are those called the rock cantelupe, the early small black, large black, the orange, the golden, the silver, the green, the carbuncled, the netted, the roman, the musk, and the scarlet cantelupes, and likewise the oblong ribbed, the smooth rined, the round white, the green fleshed, the water melon, &c. To ripen the best largest fine kinds of the melon as great an atmospherical heat, and a bottom heat to its roots also, is required as is sufficient to ripen the pine-apple in this country; but as the melon is produced from an annual plant, the seeds of which must be sown every year, it requires a different mode of culture.

Different methods of culture and various kinds of earths and of manures have been recommended and used successfully in rearing of melons. The great thing after planting is to give them plenty of atmospherical heat, and a sufficiency of external air and water. Those methods which are most simple and the least expensive, and best calculated to assist in making a suitable climate for the melon plant to grow in and ripen its fruit well, should be preferred. Melons will grow and produce fruit of a good flavour, if they be planted in any kind of earth not of too light a texture, whether it be taken from a quarter of the kitchen garden or from a corn field mixed well with good rotten dung; but earth of a loamy nature is the best, because it retains moisture longer than light earth. Earth dug from the surface of a common, where sheep and cattle have long been pastured, is excellent for the melon. It should be broken well, and lie a few months before it be used; and if it be exposed to a winter's frost, it will do it good. This sort of earth, if it be taken from the surface of the common, will require no manure the first year of using. I would here mention, that unless the earth which I used for the melon plants was very strong, I made it a practice, when the melon beds were wholly earthed up, to tread the surface all over, which makes the earth retain its moisture longer than if it were left loose.

For the purpose of raising melons early, for many years I cultivated them on a brick bed, on the same construction as that which I invented for rearing early cucumbers, ex-

cepting only that through the pit of each three-light box I carried no cross flues. In each three-light division I made the pit about three feet six inches wide, and ten feet long, and three feet deep below the surface of the flues. When this bed was first set to work, I had the pits filled level with the surface of the flues with well fermented dung, or with the dung of old linings from the cucumber beds. On the surface of the dung in the pits, I had laid about ten inches thick of good earth, in a ridge of about twenty inches wide, from one end of the pit to the other. When this was done, I made a lining round the bed, and as soon as the earth became warm, I set the plants into the ridge of earth, and gave them a little water, and kept a strong heat in the frames, and filled up the pit gradually as the roots and plants extended themselves. *See the plan.*

If a melon bed be built and prepared and managed in the way that I have described in this book, it will produce good melons. The dung or leaves of trees in the pit require not to be changed every year, neither need the earth for the plants be removed entirely every season, for by experience I found it to do very well by digging and mixing with it some fresh earth and manure in winter, and exposing it to the rains, the frost and the snow. To ripen melons not earlier than the month of August, I generally made beds of dung which had first been used for linings to the early cucumber and melon beds. For this purpose, this kind of dung is better than new dung, because it does not heat violently and for a considerable time keeps its heat. Leaves of trees make very good melon beds, but they do not produce heat enough alone for linings; but of whatever materials melon beds be made, the air in the frames among the plants should be kept sweet and strong, otherwise the plants will not grow freely. It may be known whether the air be sweet or whether it be not, by putting the head in under the lights and smelling it. But it frequently happens to be difficult to bring dung beds into a requisite state of kindliness for these delicate plants, for if the dung by any means get and retain too much water before its noxious vapours pass off by evaporation, it will stagnate and become sour, and until these pernicious qualities be removed, which requires time and patience, the plants will not grow kindly; and besides this, although corrupted stinking air hinders the growth of plants of the

melon kind, it greatly promotes the health and forwards the breeding of different kinds of insects which feed upon and otherways hurt fruits and plants and esculent vegetables of various kinds.

If melon beds be made of leaves of trees or of dung well prepared, eight or ten inches of earth laid on the surface is enough for the roots of the plants to run in, for if the bed under the earth be in a good state, the roots will grow into it and draw from thence considerable nourishment to the plants. The roots of the melon do not naturally run deep ; they extend horizontally not far from the surface, especially in forcing frames, where the moist warm air is more confined than in the open atmosphere.

When any person intends to build a brick bed similar to or according to my plan, if they have lights and frames already made, or if the frames be not in a good wholesome state, capable of preventing the steam of the linings from penetrating into the bed among the plants, or if the lights are to be new ones, it is the best, and in the end the cheapest way, to carry up above the flues, brick work four inches thick, and as high as is necessary, and to lay a frame of wood upon them for the lights to rest on : brick work not being liable to rot nor crack as wood is, it is more safe to prevent the steam of the linings from getting in among the plants, than boxes of deal boards.

Beds of dung or of leaves of trees made in winter for forcing asparagus, or beds made early in the spring for bringing forward more early than the natural ground does, plants from seeds of cauliflowers or lettuce, or of onions, or of carrots, or of potatoes, will do very well to plant melons on in the month of May or in June ; linings of hot dung being applied to these old beds at that warm season of the year, with glass frames over them, will give artificial heat enough to ripen melons of the best quality. By this easy method, there is no danger of burning the roots ; but remember that till the roots extend to the heat created by the linings, a powerful top heat must be kept in the frames ; by keeping the lights close, the great heat of the air among the plants by the influence of sunshine on the glass, will not scorch the plants, for if the earth be kept moist about them, instead of scorching them, it will cause them to grow very quickly and strong.

To raise melon plants, the seeds may be sown in the bed where they are intended to remain, and produce fruit without being transplanted; but the most common way is to sow them in pots and to put them into a hot bed till the plants come up, and the rudiment of the first rough leaf appear; they are then transplanted into pots of a small size, two or three plants into each pot, and after the plants have been stopped, and their roots have filled the pots, they are turned out of the pots with their balls entire, into the bed of earth where they are to produce fruit; the earth round the ball of roots should be pressed close to it, to make the earth equally as firm as the ball set into it. If the bed be in a good state, and the air in it amongst the plants be wholesome, from the time that the plants are planted till they have made good roots, which may be known by the erect posture of the leaves and their growth, the lights should be kept close shut down, to raise as great a heat as the warm linings and the influence of the sun on the glass can produce. It is best not to sow melon seed till it be two or three years old. It cannot be too old if it be sound and grow well. Young seed is apt to run too much to vine, and to shew more male than female blossoms. *See Gardener's Remembrancer.*

By looking at the plan of my brick bed, it may be observed that there is a flue or cavity round each pit under every light. In forcing melons early, the surface of these flues should be kept bare of mould till the days in the spring get long, which will let the heat of the linings arise freely to warm the air among the plants. In like manner the flues which surround the earth in each frame should be left uncovered till the month of May or June; indeed in growing melons upon the beds of dung or of leaves of trees, it is best to use a similar way by leaving unfilled up a space of about seven or eight inches wide in each side against the inside of the frames, immediately adjoining the hot linings. By this method the heat of the linings do more powerfully warm the air in the frames than if the earth was made level home to the sides of the boards of the frames to which the linings adjoin. But if melons be not planted earlier than the month of May, this precaution need not be attended to, unless the weather prove uncommonly cold and but little sunshine.

In the southern counties of England, in sheltered warm situations, the early sorts of melon ripen in the open air in warm dry summers. To forward these in the fore part of the season, they should have under them, when they are planted, a gentle hot-bed of dung or of leaves of trees or of tan; and till they make progress and the weather become warm, hand lights should be set over them, which may be suffered to stand over the stems of the plants all summer (letting the vines run out), in case the weather happen to be wet, which will help to prevent them from catching the mildew or the canker, which would probably destroy them, or at least prevent them from ripening their fruit well.

To prevent melon plants from being infested with insects, or injured by disease of any kind, no better method can be adopted than to keep the plants constantly in a healthy vigorous growing state; for this purpose they must be constantly attended to, giving them plenty of heat and water. In warm weather, in the spring and in summer, they should be watered occasionally all over their fruit and leaves, till the earth in which they grow be thoroughly moistened, and a stronger heat than usual kept in the frames about the plants for a few hours; also the lights should be shut down every afternoon, with a good strong heat among the plants. If there be sufficient moisture in the earth, the greatest sun heat in the afternoon will not hurt the plants, but it might scorch the sides of large fruit exposed to the sun beams operating upon the glass, which should be guarded against. The frames and lights should be kept clean, and painted over once every other year.

Melon plants are subject to be infected and hurt by the mildew and by the canker. These diseases come upon them because they are not in a good climate, they have not a sufficiency of heat, or the dung and earth of the bed is in a stagnated state. Melon plants are liable to be greatly injured by an insect called the red spider, which increaseth surprisingly in hot dry weather. As I said before, nothing will prevent plants from the inroads of disease and insects but heat, sweat, air, and a sufficiency of water, which sweetens the atmosphere and makes it healthy for vegetables as well as for animals. And nothing will radicate disease and insects from melon plants but good management, strong heat and plenty of water given all over them. Diseased plants, or plants much infested with insects, cannot produce good

healthy fruit. The mildew is a most pernicious disease to all sorts of plants. On melons it generally makes its first appearance on the oldest leaves and on the extremities of the young shoots. The cause of it, I apprehend, is, unhealthy nourishment comprehended in the elements, or their not harmonizing in the promotion of the growth of the plant; for by practitioners it may be observed, that when a dung hot-bed gets into a stagnated sour state, the plants do not grow kindly, the air in the frames is saturated with unhealthy particles, and so also must be the juices drawn into the plants by their roots. These must breed diseases, if preventive means be not applied. It cannot be reasonably supposed that plants of a delicate nature will continue in a healthy state, growing upon a heap of stinking dung, and in confined air.

When melon plants have become diseased, or much infested with the red spider, they should either be destroyed or effectual means used to cure them. To destroy the plants is easy; to cure them let the following methods be put in p actice:—Get plenty of horse dung thrown up in a large heap, turn it over once or twice, shaking and mixing it well, and let it lie till its rankness be somewhat evaporated, and if there be linings at the beds, take them entirely away; examine the dung of the beds, and if it be wet and has a bad smell, take a sharp pointed stake and make holes all round in the sides of the beds into their centre, in such a slanting way that the water may easily run out of them; then make a strong lining of the prepared dung all round the beds, and by occasional augmentations keep up the linings nearly to a level with the surface of the earth in which the plants grow. As soon as the linings have cast a strong heat into the beds, scatter some flour of sulphur all over the plants, and keep as strong a heat in the frames as the plant can bear; a heat of 120 degrees will not destroy them, if the steam of the linings be prevented from getting in among the plants; water the plants all over their leaves about once a week with clean water 100 degrees warm, and if the sun shine, keep the lights close shut down all day, and cover them up in the evening, leaving a little air all night at each light, to prevent a stagnation of air among the plants. Continue this process till the mildew and the insects disappear, and the plants appear to grow freely, and afterwards manage them in the

usual way, taking care to keep up a good strong heat in the linings. This method sets the old stagnated bed in a fermentation, which makes the moisture run out of it, and dries it so, that water given to the plants has free liberty to pass off. If the linings do not heat the air in the frames sufficiently, let some of the earth in the inside all round the sides of the boards be removed, to let the heat from the linings rise freely in the frame.

A great heat and plenty of water makes plants grow fast and strong; and if these be continued to be given long enough, their diseases will be healed, and the insects destroyed, or be obliged to change their habitation.

Great heat and much watering will destroy all sorts of insects without the use of sulphur; but as sulphur, being scattered over plants, does not hinder their growth, it may be used freely, for I apprehend the effluvia arising from it when it is in a heated state, forwards the destruction of animals, especially the red spider, whose body seems to be tender though not easily killed except by the hand.

When it is intended to force melons early on a dung bed, the seeds should be sown in January, before the main bed is made up. The following I think is the best method: Get together a large heap of good horse-dung to heat, shake it over two or three times to let the pernicious qualities in it pass off, make the bed up about four feet high, and after it has stood about a week, tread it down and make it level, and set the frames upon it, then lay in under each light a small hill of earth about one foot high, and when it gets warm, set the plants into the top of it, keep a little air at the lights constantly to let the strong evaporation pass out. Examine daily with your hand the heat of the bed, pushing your fingers into the dung immediately under the hills of earth in which the plants grow; and if you find the heat likely to be too powerful, pour cold water all round the bottom of the hills of earth, to lower the heat of the bed. Remember this must be daily attended to till the heat of the bed be so declined in the middle, that the roots of the plants be in no danger of being hurt by the heat of the dung under them. In case this necessary precaution has been neglected till the heat immediately under the stems of the plants has become too hot, pour plenty of water 80 degrees warm round about on the sides of the hills in which the plants grow, and among the stems

of the plants which will bring the earth and dung immediately under the plants to the same degree of heat as the water which is poured into it. When the heat in the middle of the bed becomes so cool that there is no fear of its being too great for the roots of the plants, watering that part of the bed to keep the burning heat down of course must cease, and as the roots of the plants extend, earth may be added to the hills. As soon as the heat of the bed declines linings must be applied to it, which will set it into a fresh fermentation, and then the surface upon the bed must be examined occasionally, by pushing the hand into it in different parts, and when a burning heat is felt, pour in some water as before directed. In this way you should persevere, still keeping a strong heat in the linings. Remember that the surface of the bed all round about the hills should be left uncovered with earth, and the dung should be loosened occasionally to let the heat rise freely to nourish the plants. *See Gardener's Remembrancer.*

CHAP. XI.

On the Culture of the Grape Vine.

FARTHER north of the equator than 50 degrees of latitude, the fruit of the vine does not ripen well, without some assistance being given to the natural climate. In the southern counties of England, when it is planted and trained against a brick wall of a south aspect, where the heat in sun-shine in summer is sometimes above 100 degrees, the finest sorts of grapes do not come to perfection for want of heat in the most favourable seasons, so that on account of the inefficiency of this assistance of the climate to ripen large sorts of grapes, or any good sorts of them early in the season, more expensive and more effectual schemes have been contrived and put in practice.

Houses built with brick and covered with glazed frames of wood have been built of different forms and sizes, through which cavities or flues are carried for conveying fire heat to warm the air in them in cold nights and gloomy cold weather; but after many expensive methods have been

tried, the failure of obtaining good crops of fine grapes is not unfrequently experienced, and perhaps the cause of being disappointed most frequently happens, because the vines are not planted in good earth of sufficient depth and width. It may be that unskilful management, such as bad pruning and not keeping the air in the house sweet, and to a proper degree of heat, may hinder success in some cases; but good earth and a good climate are the chief things required.

I have been informed by some persons, and have read in books, that in Portugal and some other warm countries where grapes are produced plentifully in the open fields, the best flavoured fruit is obtained from vines planted in shallow stony land on rocks of stone. I have been in France, and observed the grape vines there growing strongest in good loamy soil; and I have read in books that in some hot countries where grapes grow abundantly, they water them much by leading rivulets of water to run occasionally in their vineyards among their vines, where it can be done. But it should be remembered, that supposing fine grapes are produced in hot countries from vines planted in shallow thin soils, that there is much difference between a natural climate and one partly artificial in the production of fruits of any kind. I have seen better grapes produced from vines trained on open garden walls of a south aspect than could be obtained from forcing houses in the same garden; the plants on the open wall and the plants in the forcing houses being planted in the same kind of earth.

In the garden which was the first I had the sole management of, there were elegant hot-houses for rearing pine apples and grapes, &c. After my appointment to the management of them, I observed that the grape vines had been planted about five or six years, but they were in a weakly state, and had produced but few fruit; they were planted in a border in the outside of the houses. I examined the depth of earth in which they had been planted, and found it was not above ten inches deep on a dry chalky bottom. In the summer-time I got a large heap of earth from the foundation of an old hedge-row, in the corn fields lately grubbed. The earth was of a loamy, but not of a binding nature. I mixed it with good old rotten dung, and let it lie till the autumn, when I dug a pit three

feet deep, and six feet wide (intending to widen it when I could procure enough of good earth), digging out the chalk as near to the stems of the plants as could be done without disturbing the roots, about a foot from the stem, leaving as many long roots, divested of earth, as possible, and each plant standing on pillars of chalk. I then filled the trench up with the prepared earth, training the roots of the plants into it, and covering them about eight inches below the surface. It surprised me to see what growth the vine plants made the first year after this process, and the second year they made strong bearing shoots, upwards of twenty feet long.

The principal thing is, in the first place, to plant grape vines in good earth of a sufficient depth. On this depends chiefly the obtaining good crops of fine grapes. If there be depth and width enough of earth on a dry bottom, and it be well mixed with manure, vine plants will grow and produce fruit in land of any sort, provided there be in it a sufficient portion of sand; but they do best, especially for forcing early, in a strong deep loam, not destitute of a mixture of sand, and well manured with rotten dung on a dry bottom of hard clay, so drained that the surface water do not lodge in the border, which would sour the earth of it, and make it unkindly for the roots of the plants to run in. Before the vines be planted, if the land be of such a quality as I have described, all that is required is to trench it well about three feet deep, mixing with it a good quantity of rotten dung. If it be too strong of a binding clayey quality, sand, or the scrapings of roads, which in fact is chiefly stones ground into sand, should be mixed with it. Rotten leaves of trees is also good to mix with it, if in a moderate quantity so as not to make it too light.

As the nature of the grape vine is to live many years, and to grow very fast, and to produce fruit in abundance, the roots of it extend far and deep into the ground, therefore they require much earth to run in to draw sufficient nourishment from it to sustain the branches and fruit; therefore when it is necessary to make a border for the plants, it should be made not less than four feet deep, unless there be a dry clay bottom, such as I have described; in that case, three feet deep will be sufficient, and its width may at first be eight or ten feet, and increased before the roots get out of it into bad earth. I reckon that a grape

vine in a forcing-house extends its roots yearly, on an average, not less than three feet, making an allowance for occasional obstructions by the death of their tender extremities, which sometimes happen. The roots of the vine, in some seasons, especially when the plants are young and vigorous, will extend four or five feet into the border. This should teach every one that intends to build a grape-house, or to make a border for vines, to run into the pine-apple house, how necessary it is to chuse a spot of rich good land, or to make a good border for them.

To make a suitable border where it is required for the grape vine, provide a large quantity of earth of a loamy nature; that from arable land, or from a ridge in which a hedge row of hazel, maple, elm, &c. have grown many years, and have been grubbed, is good; or a spit deep from the surface of a common long pastured; or from the head or end lands of a corn field; either of these will do very well. If it be to be taken from a corn field, the part from which it is to come may be well fallowed during the summer, and manured. This is an excellent way to prepare earth to make the borders of gardens, for the earth about six or seven inches deep from the surface is meliorated by stirring, and by the sun and air, and is full of vegetable food for the growth of fruit trees. If the earth for the border be taken from a common, it will require more labour, for it must be broken and mixed with the spade. If earth from a common be mixed with rotten dung and put into a heap, in summer, it probably will get into a fermentation, which should be avoided; because in that state it becomes stagnated, and sour, and unfit for the growth of trees or vegetables, till it be again sweetened by being exposed to the influence of the sun, air, and rain. The earth for fruit trees, of all choice sorts, should be well examined, to know whether there is a sufficiency of sandy particles in it; and if there is not, let sand be mixed with it as before directed. In making borders for the vine, or for any other sort of fruit trees, care should be taken not to make them when the earth is in a wet condition, because when it got dry it would be in a kind of a baked hard state, not kindly for the roots to run in.

Pruning.—The best time to prune the grape vine intended to be forced, is in the months of November or December. Among practitioners there are different me-

thods of pruning this plant, and if either of them be practised by a skilful person, who practically understands the nature of the plant, they all do well, though some are preferable to others, on account of the ease in managing the plants. To produce good crops of fine grapes, more depends upon having them planted in good earth, and keeping them in a healthy climate, with a sufficiency of heat, than upon any peculiar methods of pruning or of training. *See Gardener's Remembrancer.*

After the grape vine is strong enough, there are three ways of pruning generally practised among gardeners. The first method is to cut all the young shoots, left on the plant for bearing wood, short, leaving on each three, four, or more buds, according to their strength, and to train the plant in an horizontal manner, in the form of a peach tree, leaving in every part of it a supply of fruit-bearing buds, which are to be found only on the last year's shoots; all the superfluous and weak shoots, whether old or young, are cut off, and the remaining branches laid in at a distance from each other of about six or seven inches; and during the summer a sufficiency of young shoots are laid in for the following year, after stopping them a short distance before the bunches of fruit. This is called the old method of pruning.

The second method of pruning the grape vine is, to train up leading shoots three or four feet asunder, cutting off the side or lateral shoots, in the winter pruning, leaving an eye or two close, or the nearest that can be had to the leading branches, and about eight or ten inches apart; and during the summer the young shoots bearing the fruit on the sides of the leading branches are stopped an eye or two before the fruit, excepting the leading shoot of each main branch, which is suffered to grow yearly four or five feet long; and in the winter pruning it is left in length according to the strength of the plant, and the room there is in the house for it to extend. This is called spur pruning, and is often practised with good success.

The third method of pruning the vine is as follows: Cut down all the branches which produced the fruit the preceding year, and having left the former summer two shoots to grow as long as nature led them, choose the best of the two for a fruit-bearing branch, and lay it in from six or twelve or more feet long according to its strength, and the strength of the mother plant; and if the plant be

strong and in a healthy state, almost every bud upon the young shoot will break forth, and shew one, two, and sometimes three bunches of grapes. These side or lateral shoots which shew for fruit are to be stopped occasionally all the summer just before the fruit, taking care to leave an eye or two before the fruit to break forth as a leader of the sap to nourish the bunches of grapes. If the vine plant be not very vigorous in growth, the branch which produced the fruit should be cut off as soon as the fruit is all gathered, which will be a mean of strengthening the young shoots intended to produce fruit the succeeding year. Some persons lay in the long shoots left for bearing the fruit straight, and others in a serpentine way, imagining that it will make them shoot stronger. Either of these methods will do very well, but the last method is the easiest performed, and it is the best, which should be adopted in hot-houses for pine apples and other plants which require the rays of the sun. The grape vine is trained up under and near to the rafters of the house, which prevents their leaves from shading the plants in the house under them. This third method of pruning is called the long or new mode of pruning, though I understand by books that it was in practice nearly one hundred years ago, and I saw it in practice forty years since.

Whatever methods of pruning are used, the grape vine, through the whole course of the growing season, requires constant attendance, so as not to suffer the plant to be crowded in any part with superfluous shoots or leaves, and no more fruit ought to be suffered to swell on the plant than it is well able to bring to perfection. The berries also on each bunch should be thinned, so that they may have room to swell without pressing too hard upon each other. *See Gardener's Remembrancer.*

It sometimes happens that the vine becomes unfruitful after having produced fruit for several years. This may arise on account of its roots having got into bad soil. To remedy this, take the earth out in the manner I have described, and give it a fresh border of good earth to grow in. I have also known the grape vine caused to become unfruitful by its stem and roots being buried too deep, the border having been covered a foot thick after the plants had grown in it many years, and produced plentiful crops of fruit.

The grape vine is a plant very easily propagated. It may be raised from seed, which will produce varieties, but not to be depended on for goodness till they be proved by their fruit. The surest and most expeditious manner of raising young plants, is by cuttings or by layers. To raise them from seed, sow the seeds in the spring in pots of good earth, and plunge them in a gentle bottom heat of tan, dung, or leaves of trees in the hot-house, or in a melon frame; keep the earth in the pots moderately moist, and in the course of the summer transplant them when they are grown three or four inches high, putting them singly into small pots, to be ready to plant whenever the proprietor may think fit.

To propagate the grape vine by layers, all that is required is to bend and fix down into the earth of a border, or into pots filled with earth, a part of the former year's shoot, turning the end of it upwards, and shortening it to two or three buds above the earth: it will be well rooted by the month of October, when it may be separated from the mother plant, or suffered to remain till the spring. To raise vine plants by cuttings, take shoots of the preceding year's growth: those parts well matured and short jointed are the best; cut them just under and above the buds into pieces, having three or four buds on them; plant them in the month of April, in a warm border of good earth, and keep them watered in dry weather. But to bring cuttings on quickly, let them be planted in pots and plunged in a gentle hot bed. The vine may also be propagated from single buds; to do this, cut off good full buds from the former year's wood, leaving one inch above and another below the bud, then plant them into pots of earth, covering the buds an inch over with the earth, then plunge them in a frame in a moderate heat of tan or dung, giving them a strong top heat and a sufficiency of moisture, and they will in a short time make roots and send forth a shoot from the bud. If young plants of the grape vine be propagated in a hot-house, or in a frame with bottom heat to them, they may be struck in February or March, and in the course of the summer they will make shoots of considerable length, which may produce fruit the following year in a forcing-house well managed.

Laying of the grape vine may be effected by leading the layer-shoot upward through a hole at the bottom of a pot before it is filled with earth. By this contrivance a layer

may be cut off in one year with fruit upon it, and carried in the pot to table, and afterwards planted out where intended it shall remain to produce fruit.

The grape vine is liable to be injured by several kinds of insects; the red spider, the mealy white bug, and the brown turtle insects, are the most injurious to it. These insects lodge upon the wood of the trees, and upon their leaves, and upon their fruit. To prevent accidental infection, care should be taken not to introduce infected plants into the house: keeping the air in the house among the plants sweet, and to a strong degree of heat, with constant admission of fresh air, are good preventatives against insects. To help to destroy insects on the vine, peel off, in the autumn, winter, or spring, before the plants begin to grow, all the loose outside bark, and wash, with soap water mixed with sulphur, the stem and all the branches, rubbing them well well with a spunge or brush, which will destroy the insects, and the spawn of them that have been deposited thereon. If they happen to be infested very much, after they are well washed with clean water, let the stem and all the branches be smeared with a mixture of sulphur, soot and water put upon them with a painter's brush.

To manage the grape in a hot-house appropriated for growing the pine apple, and for ripening its fruit, treat them in the following manner: In the month of November or December cut down all the old wood to about the height of the pit, leaving only two young shoots, the strongest that can be got, the strongest one to shoot from the buds and bear the fruit, the other to be cut short and to grow long shoots to bear the fruit the succeeding year. This is to be done successively year after year, leaving the old stem of the vine to grow, as the older the plant is the better. After the vines are pruned, tie them up nearly close to the glass with matting to iron rods or laths fixed to the rafters of the house. As soon as they begin to swell in their buds and shew themselves ready to break, let them down about a foot from the glass, so that they may receive the benefit of the warm air round about them, and not be liable to be affected by the frosts. If the buds burst strong and bushy, it is a good sign that they will shew fruit; but if weak, on the contrary; and if they miss shewing fruit on the fourth or fifth joint, they will shew none at all; and in that case the young shoot that does not shew fruit

should be cut off, as it would only take the nourishment from the others which have shewn fruit. Do not let more than one or two bunches grow on one bud, for if too many are left on the plant they will not swell well. If the vines be planted in the inside of the house, care should be taken to keep them sufficiently watered, and in dry weather, in the spring and summer, the border in the outside of the house in which the roots of the vines run, should get plentiful waterings. In order to keep the leaves and fruit clean, let the plants be washed occasionally with clean water, thrown on them by a tin squirt or engine, but take care that the decaying paint on the rafters be not washed down on the leaves and fruit, which would stain and hurt them. Should there be any danger of that, it will answer the purpose fully as well by filling the house full of steam now and then, by sprinkling water on the flues when they are warm.

Some modern writers on gardening, who profess to be practical gardeners, though their writings seem to prove that they are not, recommend that the glass frames of the grape house be taken off the vines as soon as the fruit is all cut: and also to take the vine plants out of hot-houses appropriated for the culture of the pine apple when the grapes are over. This, they tell us, is to ripen the wood and give the plants rest; for, say they, "the rest proper to be given to deciduous plants cannot be given to them if the branches are kept subject to the influence of a permanent heat after the leaves are fallen off."

I do advise that the glass frames of grape houses be suffered to remain over the vines all the year, excepting in July and August, and that grape vines in hot-houses for the pine apple should not be taken out to remain for any length of time at any season of the year. I have already said, that if fruit trees ripen their fruit well, the wood for bearing the following year will be sufficiently matured; but the plants, whether they be the grape vine, peach, &c. had best remain in that climate made for them artificial, all the year, for though the fruit be over, the wood of the plant requires protection. In the months of July and August, however, the wood will not be injured if the glass be taken off from these kind of fruit-bearing trees. But these theoretical writers, professing to be practical gardeners, tell us, that by withdrawing the vine from the hot-

house after its fruit is over, " the sap is no longer excited," and that " the plant will want no cover in this climate." It is a wonder that they do not tell us that cherry trees, &c. may be excited to blossom in the months of September and October, which are some years warmer than the month of April, when the cherry tree is in full blow, or that the Christmas rose may be excited by summer heat to blossom in July or August.

It is natural for the grape vine to produce only one crop in the year, and when it is accustomed to grow in a hot-house appropriated for the pine apple, its nature is not changed, nor will it offer to put forth its buds before January in hot-houses kept to a heat sufficient for growing the pine apple, when the pine pots are plunged in a bed of warm tan.

Some of the best sorts of grape vines for forcing, are the black Hamburgh, royal muscadine, white muscadine, white and red Frontignac, white muscat Tokay, black prince, white sweet water, black and white muscadel, Syrian, and Lombardy. For the common walls, the white muscadine, black cluster, &c. *See Gardener's Remembrancer.*

In case grapes be not wanted very early, where a house is appropriated for forcing them, the best time to begin to force is in the month of February. In beginning and continuing to force the grape vine, nature should be imitated, by increasing the heat as the days lengthen, but it should be remembered, that to ripen the best sorts of grapes, they require as great a heat as the pine apple does to ripen it in the summer; for the vine has no artificial heat to its roots: but if the tan bed in which the pine pots is plunged be in a good state, their roots are constantly in a heat of upwards of 85 degrees.

The grape vine to be trained against walls in the open air may be planted, pruned, and trained in the ways directed for those in forcing houses. If the walls be low, they may be pruned in the method called long pruning; but if the walls be high, they had best be pruned and managed in the old way, by which a larger crop may be obtained: for if the vine be planted in good ground, and have room of walling allowed it, it will spread its branches very extensively, and produce great quantities of fruit.

CHAP. XII.

On the Culture of the Pine Apple.

AMONG the numerous fruits which the earth produceth, the pine apple is reckoned the most delicious. Most sorts of its fruit are of a pyramidical shape, resembling the cones of the fir tree, whence it is supposed to take its name. It grows on a kind of an herbaceous plant, whose leaves are somewhat like the leaves of the aloe, but not of quite so juicy a substance. There are many varieties of the pine apple: those of them that are most worthy of cultivation are distinguished by the names of the queen, the sugar-loaf, the black Antigua, the Ripley, the black Jamaica, and the Montserrat. There are also the gold-striped and the silver-striped, which are beautiful in their leaves, and their fruit is very good flavoured; but they are slow growers, and require a great heat, so that they are not plentiful. The pine called the queen is the easiest cultivated sort I know, and the fruit is excellent in flavour, and grows to a good size.

The pine apple is a native of Africa and of South America, and if cultivated it will come to maturity in what is called the three first climates, which are included within 30 degrees of latitude on each side of the equinoctial line, where, on a medium, the heat of the air all the year is not less than 80 degrees of Fahrenheit's thermometer. Under the equator, and about five or six degrees of latitude to the north or to the south of it, the length of the day and night is nearly equal all the year; the sun in this climate being about twelve hours daily above the horizon; of consequence there is less variation there in the uniformity of heat than in any other habitable climate in the world. The thermometer is never lower in the night than 70, nor higher in any part of the day than about 90 in the shade. In this climate, I am informed, the rains fall plentifully at certain seasons of the year, and the pine apple is produced in the highest perfection. At a greater distance from the equator, and in parts of the world without the tropics, the

heat is sometimes greater, the thermometer occasionally rising to 100 degrees in the shade. In these hot regions, the heat of the sun on the surface of the earth raises the thermometer to upwards of 130, and the springs, and of course the internal parts of the earth, are all the year on a medium of about 80. To the north of the 50th degree of latitude the medium heat of the atmosphere, from that to latitude 56, doth not exceed 50; it therefore requires ingenuity, much attention, and some expence, to bring the fruit of the pine apple plant to perfection in a climate where there is so great a deficiency of natural heat for its growth.

The general heat of the climate in which the pine apple grows spontaneously being ascertained, gives an idea of what heat is requisite to bring it to perfection in Britain, where the deficiency of natural heat is so great. The pine apple, I am informed, has been cultivated in England upwards of one hundred years. The general method of rearing pine apple plants is to plant them in pots filled with earth, and to plunge them in a hot-bed of tanner's bark, in hot-houses whose roof to the south is covered with glazed frames made of deal timber; and in cold weather the air in these houses is warmed about the plants by the influence of fire heat, which is conducted through the houses by means of cavities or flues. And although some houses of this sort are better adapted than others for the culture of these plants, I have seen none which might not answer the purpose, provided their flues were properly constructed and kept in repair. If tan be used, I think the flues had best be separated from it by paths not less than twenty inches wide; the fire places and flues should be kept in good repair, and be cleared of soot once in two years at least; for if the flues be stuffed with soot, the fires will not have their due effect, and by the foulness of the flues the air in the house may be contaminated.

The pits in the hot-house, if for tan, need not be made deeper than three feet six inches, and if they be very wide, three feet will do; and to admit large fruiting pine plants, the surface of the tan bed will require to be five or six feet from the glass above it. When a pine pit is to be filled wholly with new tan, if it be late in the autumn or winter, the tan had best lie in a state of fermentation for some time before the pots be plunged in it. If pine plants in

pots be plunged in wet tan, it is apt to affect their roots, and if the roots be hurt, the plant must suffer.

One hundred degrees of heat, or about milk-warm, at the bottom of the pots, is heat enough for the roots of the pine apple plant to grow in; therefore the depth, whether of tan, leaves of trees, or dung put into the pit, should be proportioned according to the qualities of the materials in regard to raising heat. If the air in the house be kept up to a proper degree of heat, the roots of the plants will grow in a heat of eighty degrees, so that it is safer to have the pots stand for a time in such a gentle heat than in a heat of upwards of a hundred; but let it be remembered, that the heat of the bed, especially from its surface to eight or nine inches downward, is liable to increase and decrease in an uniformity, though not so quickly, with the variations of the heat kept up in the atmosphere of the house. But be this as it may, the heat of the tan at the bottom of the pots when the roots are there, had best not be warmer than about milk-warm, especially in winter, when, if the roots at the bottom of the pots be destroyed, there is not at that season of the year a kindly natural warmth in the house to cause young roots to spring from the stems of the plants to draw into them sufficient nourishment to sustain them; and farther, if the roots of fruiting plants be destroyed in winter, it will probably hinder them from shewing fruit in time to ripen, or make them shew weak.

The pine apple plant will grow very well in any sort of rich earth taken from a quarter of the kitchen garden, or in fresh sandy loam taken from a common long pastured with sheep, &c. If the earth be not of a rich sandy quality of darkish colour, it should be mixed well with some perfectly rotten dung and sand, and if a little vegetable mould is put among it, it will do it good, and also a little soot. Though pine plants will grow in earth of the strongest texture, yet I have found by experience that they grow most freely in good sandy loam not of a binding quality. *See Gardener's Remembrancer.*

Succession pine plants grow exceedingly well in pits covered with glazed frames, linings of warm dung being applied to them in cold frosty weather. The north wall of a pit for this purpose had best be only about four feet above the ground; and if about two feet high of it the whole length of the wall beginning just at the surface of

the ground four feet below the height of the wall, be built in the form of the outside walls of my cucumber bed, the lining will warm the air in the pit more easily than if the wall were built solid. The linings of dung should not be lower in their foundation than the surface of the tan in the pits in which the plants grow (for it is not the tan that requires to be warmed, but the air among the plants); and as during the winter the heat of the air in the pit among the plants, exclusive of sun heat, is not required to be greater than from sixty to sixty-five degrees, strong linings are not wanted: one against the north side, kept up in cold weather nearly as high as the wall, will be sufficient, unless the weather get very cold indeed, in which case a lining on the south side may be applied. In cold frosty weather a covering of hay or of straw, or of fern, can be laid on the glass above mats in the night time.

The brick bed of my inventing, for forcing early cucumbers, answers well for growing small succession plants. A pit built on the same construction, but of larger dimensions, without cross flues, is a suitable one for growing pine apple plants of any size; for by linings of dung the air in it can be kept to a degree of heat sufficient to grow and ripen the pine apple in summer, as well as it can be done with fire heat, only it will require a little more labour and plenty of dung. *See the plan in this volume.*

The method which I used to cultivate the pine apple is the following: The fruit being partly over, and a cucumber brick bed prepared for unstruck crowns and suckers, towards the end of August or in September, I planted them in rich earth in pots suitable to the size of the plants; I then had the pots plunged to their rims in the tan bed in which there was a good growing heat; the lights were then shut down close, and as great a heat kept among the plants as the heat of the tan and sunshine could raise, and when the sun shone long and very bright, the plants were shaded a few hours in the middle of the day. The plants were thus managed till they had struck root and begun to grow, when a gentle watering was given to them, and a little air admitted daily. About the end of October or beginning of November, if the state of the bed required it, a little fresh tan was added, and if the plants by growth had become crowded, some of them were removed into another

place, and the remainder plunged into the tan bed, in which they continued till February or March, when of course the bed required an addition of fresh tan, which was given it, and the plants plunged again into it at such distances one from the other as to give them room to grow; here they remained till May or June, at which time they were shifted into larger pots with the balls of earth about their roots entire, and at this shifting, if the tan bed wanted it, fresh tan was added to and mixed with the old, which in general enabled it to retain a sufficient heat till the month of August or September, when the plants, with their roots unhurt, were shifted into pots large enough to admit earth easily round their balls between their roots and the sides of the pots. In these pots I let the plants remain in general till the fruit were over. At this time of shifting, the rotten part of the tan was taken away, and a sufficient quantity of new tan added, which generally, with an addition to the upper part of it, retained its heat till the latter end of February or beginning of March ; at this time the plants were divested of a few of their lower leaves, to let young roots spring freely out of their stems, the surface of the earth in the pots cleared down to the roots, and fresh earth laid on, pressing it close to the stems of the plants. After this dressing, the plants needed not to be moved again till they ripened their fruit, unless they required more bottom heat. This is the general process which I used, though I found it necessary to vary according to occurring circumstances regarding the heat of the tan bed, the condition of the plants, and the state of the weather. But these matters are more fully pointed out in the following monthly remembrancer.

Some large kinds of pine apple plants require three seasons to grow before they can bring large sized fruit, such as the black Antigua, the Jamaica, the Ripley, &c.; therefore, in the month of April or May, after they have been planted upwards of a year, it is best to take them out of the pots, and to cut off all their roots close to the stem, or leave only a few which are fresh and strong, and then plant them again in good earth in clean pots, and plunge the pots in a tan bed with a lively heat in it. After this process, a stronger heat than usual must be kept in the house, till the plants have made fresh roots and their leaves

be perceived to grow, when a little water may be given to them, which, together with a good bottom and top heat, will make them grow finely.

Crowns and suckers taken from the parent plants later than October, should not be planted before the month of February or March; for in the winter time, probably, they would not strike root, but rot: they may be hung or laid in a dry part of the hot-house. By some writers on the culture of the pine it has been observed, "that any off-sets from the pine will succeed as well when planted in the hour they are taken off, as if laid by to dry till the wound be healed, provided the parent stock received no water for the ten days preceding." If off-sets or suckers be grown to such a size, so that they be easily separated from the parent plant, they may be planted immediately; for, in that case, it may be seen that they had begun to push forth roots, and required to be taken off and planted; but, withholding water from the mother plant ten, or even twenty days, will not bring its offspring to a state of maturity fit for planting the day when taken off. So that it is best to let unmatured young suckers and crowns lie unplanted, till their natural juices be so exhausted that there may be no danger of their rotting after being planted.

The brick beds of my inventing, in which I struck and reared pine apple plants many years, were close and warm, the crannies between the lappings of the glass being filled up with putty; consequently, in these close frames, especially in the short days and long nights in winter, when the sun has little influence, the moisture arising out of the tan lodges on the glass, and drops from it upon the plants; but, contrary to the opinion of some authors, who have advised to draw the water out of the hearts of plants when it falls into them in winter, I find, by experience, that it does them no harm, if the heat in the place where the plants be, is not too little. Indeed, if plants be kept in a climate which suits their nature, it is only reasonable to suppose that they are possessed of properties capable of disposing of water which happens to fall on them by accident or otherwise.

No vegetable substances that I know of retain heat so long, and of a less violent nature, than oak bark after being used by tanners; and, as the vapours arising out of it are of a wholesome nature to plants, it is well calculated for helping to make the pine apple plant grow vigorously.

Where the pine apple is wished to be cultivated, and tanner's bark cannot be procured, horse-dung well prepared, by shaking and breaking it small, will do. If plenty of the leaves of trees can be had, they are preferable to dung. When leaves cannot be collected plentifully, dung and leaves may be mixed together, and used successfully; and if it be ascertained that a good lively heat cannot be kept in the bed for want of good materials, let the heat of the flues warmed by fire, or linings of dung, be close or near to the pit, which will cause the heat in the bed to be more brisk and durable.

If it be intended to make a bed of leaves, they should be collected as soon as they have all fallen from the trees, and in a wet state, and thrown together in a large heap; and after fermenting a few weeks, they may be put into the pit for the pines. They should be well shaken and trodden down gently when they get into a fermentation, which will keep them from sinking quickly afterwards, and prevent them from heating violently. When the heat in the bed declines much, it may be increased by turning and shaking the leaves over with a dung-fork.

It sometimes happens that tanner's bark heats too violently; but when that takes place, it is either because there is too great a body of it put together, or because the heat of the flues is too close to the bed. If a tan bed get into a violent heat, it will not keep its heat so long as if it heated moderately; for it must lose its heat as hastily in proportion as it is deprived of its moisture by violent fermentation.

It frequently happens that pine apple plants designed to bear fruit do not shew their fruit early enough in the spring or fore-part of summer, to ripen their fruit before winter, when there is not sunshine enough to give the fruit any flavour. This may happen because the plants have not come to a proper growth, or their roots may have been injured by too violent a bottom heat, or by being overwatered, or they may have been shifted too late, or been put into pots too large for their roots to have filled them before the end of the growing season. To make pine plants shew their fruit at an early time in the spring, some authors have recommended the cutting off some of the roots at the autumn shifting; but long experience has convinced me, that cutting off the roots, or destroying them by any means,

instead of making them shew fruit, is an effectual mean to prevent them from shewing fruit till they have again made long roots. The fruit of the pine apple is formed probably not less than seven or eight weeks before it appears among the leaves; and if a plant be divested partially or totally of its roots, its growth is stopped till it has made roots of considerable length, when it will grow quickly. And, if before the roots were destroyed, the fruit had been formed in the hidden secret centre of the plant, the fruit will grow and shew itself when the leaves of the plant, excepting those on the stem of the fruit, will make no appearance of growing. This, perhaps, may be the reason which induces some persons to think that cutting off the roots of the plant causeth it to fruit sooner than it would do were the roots suffered to remain.

If pine apple plants, intended for fruiting the following year, be shifted late in the autumn into pots, which their roots do not fill well before the month of January, they probably will not shew fruit till late in the spring or summer months. For this reason it is advisable, when they cannot be shifted early enough in the month of August or beginning of September, so as to fill the pots with roots before the winter come on, to let them remain unshifted till the fruit appear, and the stem of it be grown to its full height, and then shift the plants into larger pots, in the manner before directed, disturbing the roots of the plants as little as can be helped. After the plants are shifted, they must not get much water till the fresh growth of the roots has somewhat exhausted the moisture of the fresh earth put round them. The method of watering the pine apple plant is pointed out in other parts of this work; see monthly directions. I would only here observe, that of the two evils, it is better to give the plants too little water than too much. But let it be remembered, that while the fruit is in blossom, and for some days afterwards, the plants should not be watered all over their leaves, neither should the plants be watered all over their leaves nor fruit after the fruit is fully swelled, nor should the earth in which their roots are be after that time kept very moist, for they do not require it, because the plant has nearly performed its office, which it never has to do a second time—it dies and leaves its offspring to succeed it. Gardeners, remember.

Although the pine apple plant is of such a nature that it will live upwards of six months without earth or water, yet to bring its fruit to perfection, a plentiful supply of both these is required. From the time that the plants are set in earth till they perfect their fruit, it should be endeavoured to keep them constantly in a clean healthy growing state; and when they be thus managed, they will not fail to shew fruit when they be grown to a natural size. For these reasons, I would advise that no methods contrary to nature, but methods to assist, be used to make them fruit at certain periods. If pine apple plants be planted in rich earth, and get a sufficiency of heat and water, they grow luxuriantly to a great size, and do not shew fruit so soon as they do when they are planted in a poor, hungry, or stiff soil.—Remember this.

When this publication was about being sent to the press, I received in writing from a gentleman the following account of the method of cultivating the pine apple, which he informs me is practised by an eminent gardener, reckoned one of the best growers of the pine apple in Britain, causing the plants to produce fine fruit of a large size. This method of his appears to differ nothing in principle from the methods I practised and herein have published; but we differ a little in practice, that is, in the manner of the application of the elements necessary to make the plants grow fast and vigorous, and to produce fine fruit; and likewise in the mode of disrooting and planting, which difference I conceive to be of little consequence. He grows his plants in good earth, enriched with plenty of well rotted manure. He keeps the plants in a strong heat, and gives their roots plenty of water. He sets his fruiting plants in a bed of tan in the month of September, and there it appears they are stationed till the fruit be ripened the following summer. Now, I think, a bed made up in September, is not able to retain a sufficient heat for the growth of the pine apple plant for so long a period of time.

Once, by way of experiment, in a small hot-house, I made up a bed in the pit of it in the month of October, and laid upon the surface of the bed one foot thick of good earth, and turned out of their pots fine pine apple plants, in-

tended to fruit the succeeding year, and I set the plants into the earth on the surface of the bed with the balls of earth about their roots undisturbed. In this situation they grew exceedingly well, and shewed fruit very strong, but the heat in the bed under them became too faint in the month of April: and with all the atmospherical heat that I could give them, the fruit did not ripen well for want of heat to the roots of the plants; and I was not able to contrive any method to recruit it, which required to be done in the month of March or April.

According to the following account, this celebrated and experienced gardener plants the suckers of the pine apple in the latter end of September, and he divests them of all their roots in the month of April. In this method of process I must differ from him, because the young plants have only six months (being the slowest growing months of the year) to make roots, and then these roots are entirely cut off, which considerably retards the plants in their growth. And according to his method, and mine also, the queen and some other sorts of the pine, ripen their fruit in a shorter period of time than two years after planting. He says, he never waters his pine plants in the broad-cast way over their heads and leaves. In this I also differ with him, for I think, giving the plants water all over their leaves occasionally, especially in hot weather, is of service to them, and which indeed is only imitating nature.

I say not that pine apple plants will not do well without giving them water all over their leaves, for if hot-houses be kept in a good state of temperature for the growth of the pine apple, the great evaporation of the tan bed, and of the moist earth about the roots of the plants, may supply the leaves sufficiently with water, especially in houses managed in the way this real practical gardener says he manages his pine plants; that is, his hot-houses are very close, and he admits no air at the roof, so that the moist air which ascends up, is thrown back among the plants. I would here remark, that when pine apple plants are watered all over their leaves when in fruit, the water should not be suffered to stand long in the heart of the crowns on the fruit, which it will seldom do if the heat in the house be good, but with a little care the plants may be watered all over their leaves, without letting it fall on the fruit, or the crowns of them.

He recommends that beds for the culture of the pine apple be built of wood: excepting it be oak, which is dear, other sorts of timber will not last long in such a situation; and therefore, for this and other reasons, which I have given in this publication, I think beds built of brick, in a similar way to the one I invented, are preferable, and in the end cheaper than those of wood. *See my plan.*

With regard to the method which this gardener useth to destroy insects on pine apple plants, it is a troublesome operation, and can be practised only on young plants, and indeed, according to his own account, insects on the pine apple may be destroyed in the course of their culture, which coincides exactly with the methods I used and recommend to be carried into practice by those who have the management of pine apple plants, and are troubled with insects. I have no doubt but his method of laying young plants in a hot-bed of rank dung, will effectually destroy the insects, though I think, however, they had best remain in the bed longer than one hour; but perhaps remaining even an hour, or a longer time, in such a dreadful situation, where I conceive no animal could long exist, might hurt the plants, if not destroy them. But let it be remembered, that if pine plants be perfectly free of insects, if they are put into a hot-house where the scaley or the bug insects be in the tan, or in any part of the house, the insects will find their way to creep to the pines and breed upon them; for these insects are natural to the plant.

If pine apple plants be kept in a strong vigorous growing state by giving them plenty of heat, and water applied occasionally all over their leaves, whether they be in frames heated with dung, or in hot-houses heated by fire, a few insects will do them little hurt. But if the methods which I have given for cultivating the pine apple plant be adopted, I am persuaded all sorts of injurious insects natural to these sorts of plants will disappear on them. *See* Chap. XIII.

When we see human creatures lean in body for want of a sufficiency of wholesome food, or for want of cleanliness, lice and fleas breed upon them; and poverty in cattle for want of food has the same effect on them. Similar causes in vegetables has a similar effect, so that when pine apple plants are in a state of poverty, for want of a sufficiency of good earth, or of heat, or of water, insects natural to

them, if there be any of them in the hot-house, will breed rapidly on them and hurt them. Those insects which naturally breed and live on the pine apple plant, appear to delight in a dry dirty situation. Where pine apples grow naturally and produce large fruit, they are not free of insects; and though plants be free of insects, they will not grow well, nor produce fine fruit, unless they get enough of good earth, sufficient heat, and be watered plentifully.

Take off the turf about six or eight inches deep from old meadow or pasture ground, and draw the whole together to some convenient place, and mix it with one half of good rotten dung, turn it frequently over in the course of twelve months, and then it will be fit for use. This is the only compost used for old and young plants. The beds or frames in which the young succession plants are to remain in the winter and in the summer, should be constructed of timber seven feet wide and seven feet three inches high at the back, the front being in the same proportion. To prepare the bed, observe the following method: Let the pit be sunk three feet three inches deep, and as long as you require, and sufficiently broad to admit linings on each side; make a good drain at the bottom of the pit to drain the water off; then take posts about six inches square, and set them up in the pit at convenient distances one from the other, about three or four feet post from post, according to the width of the lights, and case it round about with deal boards or planks one inch and an half thick. The succession frames or bed may be made about forty feet long and about seven feet wide, which will contain about two hundred and eighty square feet. A pit of this size will hold from the end of September to the month of April about three hundred and sixty pine apple suckers.

Take the suckers from the fruiting plants about the end of September, and lay them in a warm place for about three days, then pull off a few of their bottom leaves, which will make them ready for planting. In making your bed, lay three-fourths of new tan at the bottom of the pit, and lay old tan upon that, to reach within three inches of the top; on the surface of this, sift old tan to the thickness of three inches, beating it down well with the spade, then

plant the suckers in the tan about four or five inches apart, according to the size of the plants, placing the tallest in the back side of the frame, and the shortest in the front. In this situation let them remain till the month of April following; then take up the plants out of the tan bed, and divest them of all their roots; and remember that at any future transplanting the roots must not be taken off. Plant them in pots of five, six, and seven inches diameter, according to the size of the plants, but before planting let the pots be filled with the prepared compost already mentioned. About the middle of June following, when the pots are beginning to be filled with roots, take out the plants with their balls whole, and plant them in pots about nine inches in diameter, being filled with the same rich compost, replanting them into the bed, and let them remain there till the end of September. Be careful at each transplanting, while the plants are out of the beds, to have the beds put into a proper state by the addition of fresh tan, &c.

When the plants are out of the stoves in the month of September, prepare the pits in the same manner as directed for the succession beds, with three-fourths of new tan at the bottom, &c.; then shift the plants into pots about fourteen inches diameter at the top, and plant them at suitable distances for fruiting; plunge the pots at first half way into the tan, till the heat diminishes to a safe temperature, then fill up the interstices between the pots with tan, and as the plants are now stationed, let them so remain till they are fruited off for the table. The plants young and old had best be near the glass, and small stoves are to be preferred because they require less fire. The glass should be closely puttied, to keep out the cold air and to retain the warm.

The fruiting house during the winter should be kept at about seventy of Fahrenheit's scale. It may be left in the evening about seventy-five, and it will be found in the morning about sixty-five, so that no attendance during the night will be necessary. There should be three lids in the back of the forcing house to admit air, the dimensions of each to be three feet long and one foot deep.

There should be no water given to the young suckers from September till April, while they remain in the tan without pots. After they are potted they require to be

watered two or three times a week during the summer, according as the temperature may be. When they are removed into the fruiting house in September, they should be watered cautiously till towards February, and as the spring advances they will require a large supply. Never water the plants in the common broad-cast method, over their heads and leaves.

Give air in the stoves and frames, both in summer and winter, when the weather will permit, from the back and ends, but not from the roof.

Expeditious cultivation. The New Providence, Black Antigua, Jamaica, and Enville, and the other large sorts of Ananas, will require the cultivation of three years to bring them to perfection, but the Old Queen and the Ripley's New Queen may be brought to perfection in fifteen months. To effect this, it must be observed, that some of the plants will fruit in February or the beginning of March, and consequently that the suckers may be taken off in June, or the beginning of July; make then a good bed of tan with linings of litter round the outside to keep in the tan, make the bed to fit a large melon frame; put the suckers into pots of about nine inches diameter, filled with the compost; plunge them into the bed prepared in regular order, and throw a mat over them in hot weather for shade till they have taken root; let them remain till the end of September, and then shift them into pots of about twelve inches diameter, and plunge them in the fruiting house. He has had fine crops of pines raised from these suckers, many of them four pounds each, from plants only fifteen months old. This method, in point both of time and expence, has greatly the advantage of the common plan of raising pines in three years by fires, when the fruit at last is frequently small and ill-flavoured.

It is a peculiar recommendation of this plan, that the plants reared in frames without fire, the first year seldom or never run to fruit; whereas, on the contrary, when stoves are used first for a nursery for young plants, and next for succession plants, and lastly for plants for the fruiting house, it is seldom that one-third of the plants come to the forcing-house, because so many of them have run to fruit; and even those that stand are necessarily dried and stunted, being subjected to the attacks of various insects; not to mention the enormous care and expence

attendant upon a three years' cultivation. The above appears to me to be the most easy and economical plan to raise pines; one-third of the coals are sufficient, and less than one half of the labour and buildings required for that purpose.

A Recipe for destroying insects upon Pines.

As it is impossible for any plants to thrive while the insect or bug is in the house, I will mention the method of destroying it (and indeed all other insects), which he was fortunate enough to discover, after many fruitless attempts, about eighteen years ago. Take horse-dung from the stable, the fresher the better, sufficient to make a hot bed three feet high, to receive a melon frame three feet deep at the back; put on the frame and lights immediately, and cover the whole with mats to bring up the heat. When the bed is at the strongest heat, take some faggots, open them, and spread the sticks over the surface of the bed on the dung, so as to keep the plants from being scorched; set the plants or suckers bottom uppermost on the sticks; shut down your lights quite close, and cover them over well with double mats, to keep in the steam. Let the plants remain in this state one hour, then take out the plants and wash them in cold water previously brought to the side of your bed, set them in a dry place with their tops downwards to drain, and afterwards plant them. This treatment is sure to kill every insect. You will observe likewise, that if your suckers are kept in the frames all the winter, stuck in the tan without soil or fire, the effluvia from the linings are sure to kill all the bugs.

The crowns must be treated in all respects like the suckers, and they will produce fruit in the same time.

CHAP. XIII.

On the Means of destroying Insects which infest and hurt the Pine Apple Plant and other Plants.

GREAT ravages, in every age of the world, have been committed upon the numerous kinds of useful fruits and nourishing vegetables, by numerous tribes of various

sorts of insects, and authors have treated largely on the means likely to prevent their inroads, by hindering them from breeding, and of destroying them when bred.

After having studiously observed the nature and causes of the vigorous growth and healthfulness of plants, and of fruit trees of different kinds, I have been induced to believe that a fruit tree or plant of any sort requires nothing but proper cultivation in good earth, and in a kindly climate adapted to its nature, to prevent it from being injured by insects, or by blights of any kind, and to enable it to produce, of its kind, abundant crops. However, I wish it not to be understood that I disapprove of using means of any kind to destroy insects which are injurious to plants, but I conceive that all methods used for that purpose ought to be such as are conducive, to accelerate the growth of vegetables, by having at least a tendency to purify the air, and to make the circumambient atmosphere about them congenial to their nature, unless when the destruction of the insects by the hand is effected.

The natural open air, it appears, is often filled or impregnated with certain qualities healthful to insects, but not conducive to the health of vegetables, and so no less also frequently are the qualities of the air in hot-houses, though somewhat excluded from the changeableness of the external atmosphere. Methods, however, can be adopted in a hot-house which cannot take effect in the open air, to impregnate the air in it with particles not uncongenial to the growth of exotic plants, or of vegetables of any sort, but destructive of animals.

Insects are endowed with certain and determinate powers and inclinations, by which they seem arbitrarily, and without their own knowledge or consciousness, directed and impelled to the performance of those various operations which they execute with such unremitting industry. They have a natural disposition or sagacity, by virtue whereof they are enabled to provide for themselves, and know what is good for them, and are determined to propagate their species. This is instinct, and is put into action by the natural and primitive principle of self-love, or by a love of pleasure and aversion to pain, producing voluntary inclination to perform certain actions, which tend to their well-being and preservation. To the performance of these actions, they are particularly prompted

by their present sensations; by imagination, I suppose, supplying the place of memory, and other causes. The wonderful effects produced by these instinctive appetites, are further to be attributed to the exquisite construction in their bodily conformation, particularly in the structure of the various organs with which they execute their operations, and to the superior perfection and acuteness of their external senses, by which they are quickly and distinctly informed of those qualities of objects which most materially concern them. By this instinct, each tribe of insects have a strong propensity to refuse individually, and with their whole united power, whatever in food or climate tends to shorten their lives, or slacken their natural progress.

Every insect has its proper plant, or tribe of plants, which it naturally requires for its nourishment, and on which it generally lays its eggs, and that on the most concealed parts of the plant; and the plant and insect which attacks it are always natives of the same climate, and therefore endure the same degrees of heat and cold; consequently, when plants are attacked by their natural tribe of insects, it is an exceedingly nice and curious operation to exterminate them without injuring the plants, or stopping them in their natural growth. But observing that insects increase rapidly in hot dry weather, and that they appear impatient of moisture, was the means of inducing me to try which would bear the greatest heat and live.

Animals of all kinds are, I apprehend, possessed of the faculty of respiration, but vegetables are not. The blood circulates in animals, and by opening certain blood-vessels in them, the whole of their blood issues forth, and they unavoidably die, because the nutritive food of the animal cannot be digested fast enough so as to supply the hasty impairment which its body sustains in consequence of the quick diminution of blood. The sap in vegetables, it appears to me, does not circulate, nor can it be drawn forth out of them by incision, so as to destroy them, as far as I know, because they have a power of supplying themselves with nutritive juices from the earth as quickly as it is possible to impair them by the emission of sap. Some persons, however, do affirm that the grape vine plant may be killed by untimely pruning; but I never knew an instance of the kind, nor did I ever see a vine plant killed nor hurt by its bleeding, as it is called, though I have had vines under

my management which have bled copiously. When vines emit sap through their pores after cutting, it has been recommended to put plaster of different kinds upon the cut parts, and also sealing-wax, and others have recommended burning them with a hot iron to stop the bleeding; *very unnatural methods indeed,* which could do no good. A vine plant may certainly be killed by cutting, but not by bleeding. I have cut down old vine plants in the hot-house to within about four feet of the ground, and they bled copiously till the old stems sent forth shoots which shortly led the sap, instead of oozing from the cut part, to perform its natural office, that is, to the producing of strong shoots twenty or thirty feet long, from the middle of May, when the plant was cut down, to the month of October.

An animal can live a short time in a greater heat than that of the natural heat of its body; but if the blood, in which is the life, be raised to a higher degree of heat than what is natural, which is nearly, I believe, 97 of Fahrenheit's thermometer, its existence in that state, I suppose, will not be long. The sun is able to heat a dead tree to a degree which would destroy a living one; but the sun is not able to communicate to a living tree so great a heat as it can to a dead one, because the sap drawn from the earth by the roots of the tree necessarily and constantly fills its pores as fast as the influence of the sun turns the juices of the plant into the substance of the tree, or causeth them to perspire into the air; but a dead tree, having lost all the power of sucking moisture from the earth, has no means of resistance.

To ascertain what degree of heat a pine apple plant can endure without destroying it, I filled four vessels with hot water. The water in the first vessel was 130 degrees hot; that in the second 140; that in the third 145; that in the fourth 150. Into each of these vessels I put a few pine plants, divested of their roots, of their fibrous roots, and suffered them to remain in the water about an hour. The plants which had been immersed in the water heated to 140 and 145 degrees, were a little hurt in the extremities of their leaves, but after being dried in the hot-house, they were planted, and grew as vigorous as if they had not been put into hot water; the plants put into water 130 degrees warm were not in the least injured; but those put into water heated to 150 degrees were entirely destroyed.

By this experiment I ascertained that a vegetable can endure, without hurting it, 130 degrees of heat, according to the degrees on Fahrenheit's thermometer. I am inclined to think that no animal is able to endure such a heat and live. Undoubtedly, insects increase rapidly in hot weather in the open air, especially on the peach tree, and on other trees, against warm walls, both in the spring and summer months; and they increase most rapidly in dry weather; but the heat in the open air against walls seldom rises to 100 degrees. And in the hottest countries in the world, where vegetables and animals exist, the heat in the shade seldom rises to blood heat, which is about 97. Having considered these things, and ascertained that a plant can endure a heat of 130 degrees, I determined to try another experiment, that is, to ascertain whether heat and water would destroy insects, and keep plants alive. I therefore thought of, and determined to try, the following method:

In the month of June I selected about twenty large pine plants, some of which had green fruit on them, and their leaves, fruit, and roots were almost covered with insects. These plants I plunged in a tan bed, with a very gentle heat in it. The tan bed was in a brick frame designed for rearing succession plants: it was nearly five feet wide, twenty feet long, and the glass frames were close and in good repair. These plants I watered frequently and plentifully, sometimes twice a day, with water not less than 70 or 80 degrees, and sometimes 100, warm: in short, I kept the plants constantly in a moist air, by plentiful waterings without measure; and, excepting the time of giving water, I kept the lights constantly close shut down, even in the hottest sunshine, without shading the plants. In this frame I had no thermometer, but the heat was, I think, sometimes about two or three o'clock in the afternoon, upwards of 120 degrees. This great heat and much moisture caused the plants to grow most vigorously; and having subjected them to the said mode of management for a few weeks, the insects, in the course of that time, were totally destroyed, many of them lying dead on the leaves and fruit. In the spring-time, before this operation, the plants had been strewed with sulphur, which, at least, is a harmless dressing to plants of any kind, and probably may be of use in preventing insects from breeding numerously, or the means of depriving them of part of their

natural food. This circumstance, however, I just here mention, because, from experiments which I have tried since then, it is probable that the effluvia arising from flour of sulphur, being scattered on the leaves, or about in the hot-house, in conjunction with heated air and moisture, may more suddenly destroy insects than heat and moisture alone; but it ought to be remembered, that if sulphur be by any means set on fire in a confined place, among plants of any kind, it will either totally destroy or greatly injure them.

Being satisfied with my success in the above-mentioned experiment, of having totally destroyed the insects on these plants without hurting them, I hesitated not to begin to water the whole of the plants under my care, whenever they wanted it, all over their leaves and fruit, with water about 85 degrees warm. This process I continued to practise for several months, during which time I do not recollect that the thermometer was ever below 70, and in sunshine it was raised sometimes to upwards of 110 degrees. I continued this practice longer perhaps than was absolutely necessary, but I was determined to destroy the whole of the insects in the house, whether on the plants, or in the tan, or in any part of the house; and this I certainly did accomplish effectually. Thus, by this easy, and not unnatural, mode of management, the plants became perfectly free of insects; they were perfectly cleansed of all filth; they grew vigorously; and the fruit swelled fine to a good size. After this I had several times pine apple plants from abroad, and out of hot-houses at home, full of insects, which, by the means that I have, without reserve, described, I effectually destroyed, and made the plants grow very fast indeed.

In a recent publication on gardening, the author has not only imitated some of my methods on the way of forcing choice fruits, but has also given extracts from my Gardener's Remembrancer. For this freedom I find no fault with the author who ever he be, (his name appears fictitious), but I would in this place make a remark or two upon what he has written respecting my method of cultivating the pine apple, so as to promote its growth, and clear it of every injurious insect. After giving my method of culture, he says, "We must narrow the practice considerably on these grounds: 1. In winter the

expence of producing the degrees of extra heat would be very great. 2. A more serious objection respects plants that are not fit to be transferred to the fruiting house, and yet might be precipitated into fruit by a high degree of excitement. 3. Adult plants might thus be started into fruit a month or two sooner than is desirable, on account of the difficulty of maturing fine fruit in the mid-winter. With these limitations, Mr. M'Phail's remedy above described is excellent."

To these observations I answer, 1. To keep a hot-house to the degree of heat I have mentioned, it requires but little extra expence, for I do not recommend to try to have the heat in the hot-house higher in the morning than 70, nor to raise it in the course of the day above 85 by fire heat alone, without the influence of the sun, which affects the natural atmosphere a little, even in the shortest days in winter. 2. Pine apple plants are not precipitated into fruit by giving them as great a heat as they are able to bear, provided they have a good heat in the tan bed to their roots, and plenty of water given them all over their leaves occasionally. 3. Pine apple plants are not started into fruit before they become *adults* by great heat, but by being half starved, that is, for want of a good bottom heat to their roots, and sufficiency of water to keep them in a natural growing state. The fruit of the pine apple cannot be brought to maturity in the middle of winter; if it do happen to appear ripe, its flavour will be insipid; and therefore if pine plants shew fruit in September or October, they had best be cast away, unless there be plenty of room for them in the hot-house; in that case they may be retained by way of experiment, and to obtain young plants from them.

If the roots of pine apple plants be not put in too great a heat, it is a difficult matter to raise the heat in a hot-house to such a degree as is able to destroy the plants. In the brick bed of my inventing, a powerful heat can be raised by means of the linings of dung and the sun-beams, and in it the insects on pine and on other plants may be shortly destroyed by heat and water.

Some persons may think that the pine apple cannot bear to be watered all over its leaves in winter, because it is of a succulent nature, and able to live long in a hot-house without being planted in earth or set in water. But, for instance, the common house-leek is of a very succulent

juicy nature, and will bear the greatest heat of a hot dry summer on the warm tiles of a house: but it is well known that this plant thrives best when it gets occasional showers of rain. The case is exactly similar respecting the pine apple, and several other plants, of a similar nature. In regard, however, to the best method of cultivating the pine apple, there have been and will be persons who differ in opinion. I here give my opinion, which is founded on practice, that there is not the least danger in watering the plants plentifully all over their leaves in winter, or in any time of the year, provided there be a sufficient heat kept up in the tan bed and in the air of the house. But remember, I do not recommend watering the pine apple plants all over their leaves in winter as a general rule, only when it is necessary to free the plants from insects and filth; then the heat in the house among the plants must be kept strong, not lower than 70 in the morning, and raised to 85 or 90 in the course of the day.

It is indeed evident that some of the most able writers on the culture of the pine apple have wanted that experience which may by practice be obtained. They have asserted, that it is impossible to keep the pine apple plant throughout a severe winter without the assistance of fire. But ingenious practical gardeners have ascertained, that pine apple plants require nothing more than a gentle heat in the tan bed in which the pots of plants must be plunged, and a medium heat of air of about 60 degrees, to keep them through the most severe winters in England. To maintain this temperature of heat without the assistance of fire, is no difficult matter; it can be done by the assistance of horse dung; for a dry heat is not at all necessary to preserve the plants, and to keep them in good health, in the brick beds, in which I kept succession pines all the year round without the aid of fire heat. The sun for about two months in winter had very little effect to warm or dry the leaves of the plants, so that during the dull months in winter, the plants were continually in a moist state, and water standing in the hearts of some of them, and the heat of the air among them was from 55 to about 65; and I do not recollect of having any of the plants die for want of heat.

By many experiments which I made, some of which I have in this treatise mentioned, it is evident, I think, that

in the process of managing and cultivating the pine apple, all injurious insects may be destroyed, and prevented from breeding on them, by a judicious application of the elements necessary, though in a less degree in regard to heat, for the production of any vegetables or fruits whatever. That this is true, may be proved by a reference to the state of fruits and vegetables growing, either spontaneously or assisted by cultivation, in every part of the kingdom, without the aid of artificial heat or impregnated air. For instance, the strawberry, the raspberry, and some other fruits, which grow naturally in some parts of this country, and peas, beans, cabbage, and cauliflowers in gardens, and the different sorts of corn and grass in the fields. These, in unkind seasons, we see affected by blights and by insects of various kinds, which prevent them from coming to good maturity, and make them less productive than we wish them to be. But in propitious seasons, the earth being refreshed occasionally by showers of rain, they are preserved from the inroads of insects and from blights, and are enabled to produce abundant crops, for the use of man and beast.

The methods which I used, and which I have described, for the destruction of insects on the pine apple, will destroy them on all other sorts of plants in a hot-house, but it is too powerful to be applied to them in blossom or in fruit. The exact time it takes to destroy them I cannot tell; it may be that they die a lingering death; and it is necessary that their spawn or eggs, which are deposited in hidden places of the plants, be destroyed also, otherwise I apprehend the heat will hatch them. I have set tender and curious sorts of exotic plants into a brick bed covered with glass, and have given them the degrees of heat I have mentioned, watering them over their leaves every day, and in the course of a fortnight it evidently appeared that the insects were destroyed on them.

The temperature of heat, with much moisture, which I applied to the pine apple and other plants for the destruction of insects, will not destroy any kind of vegetable immediately, but it would in a few days draw up most sorts to a state of feebleness.

CHAP. XIV.

On the Construction of Hot-houses for Pine Apples, and for forcing the Grape Vine, &c.

HOT-HOUSES are built not only for the purpose of forming an artificial climate for bringing to maturity such fruits as the natural heat of our own country is not able to effect, but also to bring to maturity some kinds of vegetables, and to ripen some sorts of fruits (which do ripen in this country in the open air) at an earlier season than they generally do ripen. Various are the constructions, external and internal, in which these houses have been built.

Heat being one of the most essential elements for the growth of plants and maturation of choice exotic fruits, when a hot-house is about to be built, the first object of consideration ought to be to build it in a sheltered warm situation, not shaded by trees or walls from the rays of the sun in the spring, summer, and autumn months. During six or seven weeks in the dead of winter, the sun has but little effect on the growth of plants in the hot-house, though his light be necessary to keep the plants from losing their natural colour. As a hot-house is designed merely to assist nature in the formation and ripening of fruits, it ought to be constructed in such a manner so that as little fire-heat as possible may be wanted. To accomplish this end, I think a good method is to make it into one or more divisions of about 40 feet long, and about 16 feet wide, and it should stand fronting the south. The front wall may be built about five feet high, in pillars of about four feet long, nine inches thick, leaving five openings; and if the house be designed for rearing the pine apple, when the outside brick and timber-work is finished, these five openings may be built up with four-inch brick-work on a line with the inside of the pillars, leaving an aperture at the top, just under the timber beam in the centre of each, to admit grape vines to be led into the house. The back or north side wall should be built about thirteen feet

high, and on the front wall upright sliding windows are to be placed, which, together with the timber-work, will raise it to about nine feet in height to the cornice. According to these dimensions the slope in the roof will be about four feet.

If the earth on the spot where the house is to be built be not of a good quality, the foundation of the walls ought to be laid as near the surface as a sure foundation can be obtained (and that need not be sought far after, for it may be built on the surface, if the earth about it be not afterwards disturbed so as to undermine the brick-work), which will give an opportunity of making a good border of earth, at the front and ends, sufficiently deep for any sort of plants to grow in. Supposing a hot-house built in the form and nearly according to the dimensions here given, and the border of earth prepared and made to a proper depth in the front and at both ends of the house, the brick-work below the sill, above the border, will be about seven or eight inches, which is sufficient, consequently the stems of the vines will be very easily covered up in winter, to keep them from being affected by the frost. In case there be two divisions in the house, a door should be made in the partition which separates them, and a door in the back wall into the shed where the fire-places are to be built, and a door should be made in each end parallel with the path in the back side. The surface of this path will be on a level with the thresholds of the doors at each end, and about four feet above the level of the front path, consequently in each end of the house there must be steps up from the front path to the back one.

The roof fronting to the south, and both the upright ends and the partitions, should be glazed frames of wood, made strong and neat, but not clumsy. Let each light be about four feet wide, and the glass put into the sloping frames cut into pieces about seven inches by eight, and in putting it in, it ought not to be strained down by brads, but only bedded in putty all round its edges, filling up the crannies between the lappings close, excepting an aperture to each, to let the wet run out which lodges on and runs down in the inside of the frames; this method of glazing will prevent the frost from breaking it.

A hot-house glazed in this way being very close, it is easily warmed either by sun or fire, therefore due attention

will be required to admit air into it in warm days, when the sun shines. The sliding windows must be made and adjusted so that they can be opened and shut easily. In consequence of the constant attention necessary to keep hot-beds and forcing-houses to a required temperature, schemers have held forth that they have contrived an *artificial gardener*, or self-regulating apparatus, by which giving and taking away of air, they say, may be performed so as to keep the thermometer in hot-houses, &c. to the degree of heat required, more correctly than it can be done by a real living gardener. If such a thing could be invented, it would certainly be a great acquisition, but I am inclined to think that it cannot be done.

A hot-house of eighty feet long will require two fire-places, which should be placed on the north side, one at each end, under an inclosed shed, not less than ten feet wide, the length of the house, and as high in the upper part of its roof as the wall of the house. This shed will not only be useful for sheltering the house from cold northern winds, but also will be convenient for other purposes, such as shifting the plants in cold wet weather, and for holding garden utensils, and for a mushroom bed. If the house be designed for the growth of the pine apple, the flue in each division should be carried round about the inside, stretching from the fire place across the end and along between the path and the front wall, leaving a cavity of four or five inches wide between the flue and the wall, to admit the heat to rise freely, and to prevent the roots and stems of the vines planted in the border against the front wall from being too much heated. At that end of the division farthest from the fire, after going across the house under the back path, the flue must rise above the path, and go along close against the back wall communicating with the chimney, which stands at the end corner of the wall just above the fire-place. The flue from the fire-place along the front wall to the opposite end of the house, is to be made nearly three feet deep, seven inches wide, and when it riseth above the back side path against the back wall to the chimney, it should be about three feet six inches deep of brick, on edge two inches thick, besides the plastering, and covered with inch thick tiles closely joined with fine mortar to prevent the smoke from getting

into the house among the plants. The mouths of the fire places should be about sixteen inches wide, twelve inches deep, and the doors and their posts may be made of cast iron. The grates should be thirty inches long, and their bars of uncast iron made to take out at will. Some have the fire-places wholly of cast iron, one or more inches thick, in form of a square funnel about three feet in length. This appears to be a good method, because they keep in repair several years, whereas the sides of the fire places built of brick generally require repairing yearly.

Hot-houses constructed in the way I would recommend, or in a better way, having the earth for the vine plants raised high, and a good shed in the north side, will not be very expensive in building nor in keeping in repair, nor in fuel, and they will be found useful, not only for rearing the pine apple and grapes, but for kidney beans, &c. And by carrying the flues through the house in a different manner to what is necessary for the pine apple, the houses may be advantageously employed for forcing peaches, nectarines, cherries, or figs. In that case, a border for the peach trees may be made in the inside of the house, which by taking down the four inch brickwork between the front pillars, the border will join that on the outside of the house. The flues, when it is intended for pine apples, are directed to be built in a simple and commodious manner without a return, so that no difficulty will occur in the cleaning of them, for by taking off a few tiles on different parts of them, a person with a long-handled wooden hoe can readily clear them of soot whenever they require it; and if they be cleaned only once in two years, the fires will constantly draw well. The cleaner the flues are kept, the more easy will the fire heat them, which is of no little consequence, not only for warming the houses regularly, and helping to keep a healthful heat in them, but also for the saving of fuel. That a hot-house, when the flues are built in the manner I have described, can be warmed easily without making violent fires, I think, will appear evident when it is considered, that in a house of about eighty feet long and sixteen feet wide, there is a surface of about one thousand superficial feet of brick, heated by the influence of two fires, and as the flue of each division passeth across the house exactly in the middle, separated only by a four

inch wall, the heat rises nearly as strong in the end of each division, as it does at the ends where the influence of the fire begins.

In cold exposed situations perhaps two fires for a hothouse of eighty feet long may not be able to heat it sufficiently; in that case the house must not be made so large, or more fires put to it.

To force peaches and nectarines with dung heat, build a bed of any length, and about seven or eight feet wide, in a similar form to that which I invented for forcing cucumbers (a plan of which is in this treatise given), excepting that the lining of dung is to be applied only to the back side, I mean the north side. In the south side, build the wall solid of brickwork, nine inches thick and about four feet high, make a border of good earth for the trees adjoining to this wall, and let the trees be planted in the border on the outside of this wall, and lay their branches into the bed through holes in the upper part of the wall, and train them on a trellice of laths or wire rods about eight or nine inches from the glass. The trees may be pruned by removing the lights; but as there is no occasion for dung nor earth in the bed or brick frame, it will be the most convenient way to make a small door in one end of the bed, to creep in to prune, train, and manage the trees and fruit at all times when they require it.

The grape vine may also be forced in the same way as above described for forcing the peach, with dung heat. And in forcing either the peach or the vine by the said means, if it should happen that the heat of the linings decrease too much, so as not to raise a sufficient heat in the bed, a fire-place may previously be built at one end of the bed and a chimney at the other end, so that a fire may be made occasionally, when the heat of the dung fails. This will not only supply any occasional want of heat that may occur, bnt also revive the declining heat of the lining. The lining being kept close to the wall will prevent the smoke and heat from escaping at any other place except the chimney, for the dung closes up all the holes left in the brickwork to admit into the flues the heat of the dung.

When potatoes, or lettuce, or radish, or onions, or carrots, or small sallad, is intended to be forced on the brick bed, the pits must be filled up in a similar manner as I have directed them to be for melons, and in the same way for

raising early the seeds of cellery, cauliflower, tender annuals, &c. If peaches or nectarines, or cherries or figs or rose trees, in pots, be forced in them, the lights must be raised high enough to let the plants stand without touching the glass. Strawberries and kidney beans may also be forced in these beds by dung heat. They should be planted in pots, and set upon the flues and on the surface of the pit, it being filled nearly on a level with the flues with tan or leaves, or earth of any kind.

With respect to hot-houses and forcing-houses, we who are practical gardeners make some difference between them. Hot-houses we consider as places to make plants grow which are too tender to live and grow in any country in which they are built. Forcing-houses we consider to be artificial gardens, for forcing fruits and esculent vegetables which will grow in the open air; by the assistance of which we obtain crops earlier in the season than the warmth of the natural climate is able to bring them. Hot-houses we consider as substitutes for hot climates. Forcing-houses are to make our summers earlier. The heat of the air in hot-houses must be continual, resembling the temperature of hot climates, in which the pine apple plant grows and ripens its fruit in the open air. The temperature of forcing-houses may be suffered to fluctuate farther from a common medium; but the construction of forcing-houses is often made so like that of hot-houses, on account of the culture required for plants of a mixed nature, that the difference between them and hot-houses is but little.

CHAP. XV.

On the Culture of the Mushroom.

ONE of the first things to be done is to provide spawn, which is a white fibrous substance, running like broken pieces of thread in old dry dung-hills, or in the path of a mill worked by a horse, or in any other horse-tract under shelter, or in the decayed dry linings of hot-beds. It may also be collected from sheep pastures, where mushrooms

are observed to spring naturally. Mushroom spawn sometimes originates in sheep and in cow dung mixed with litter and earth, but it is more frequently generated in old dry horse dung after it has been fermented. The month of September is the best time to look for it.

When a dung-hill or any other place is found which contains mushroom spawn, let the parts which appear to be impregnated with it be taken up in whole pieces, carried to a dry shed, there to lie till they are wanted. If the pieces be wet, they should be laid out to dry, or put up in hollow piles, that the air may pass freely among them. When pieces of dung or earth, containing mushroom spawn, is perfectly dried, the spawn will keep good for two or three years. Much moisture will soon destroy mushroom spawn.

Propagation of Mushroom Spawn.

About the beginning of the month of May collect a heap of nearly equal quantities of cow, horse, and sheep dung; add to it some rotten fern leaves, or rotten dry dung, somewhat resembling spawn, from the linings of hot-beds; mix the whole well together, in the way a bricklayer's labourer makes mortar; spread it on a floor, in a cool dry shed, where it cannot dry too hastily, making it about five or six inches thick; beat or tread it firm; and as soon as it is in a fit condition, cut it with a sharp spade into pieces in the form of bricks; set the pieces to dry till they can be conveniently handled; then with a knife make a hole in the middle of each, and put a little piece of good mushroom spawn into each hole, closing it up with a bit of that which was taken out; then pile the impregnated pieces up in a heap, in a hollow manner, so that the air may pass through the heap freely among the pieces, to dry them gradually; and if the shed be light, cover the heap with mats, or any other light covering, to keep it dark. When the spawn has extended itself through every part of the prepared pieces of the mixture, lay them out separately, that they may be perfectly dried, which will prevent mushrooms from growing out of them; which, if suffered, would exhaust the spawn so, that it would be much weakened. In a dry state the spawn, thus propagated, may lie till it be wanted in the autumn or following spring. If such pieces of spawn be

continued in a dry state, the spawn will remain good for a long time.

Another way, similar to the preceding, to make mushroom spawn, is as follows:—Sometime in the month of May or June, collect about two cart-loads of dung from the fields, or take it from the stables; separate it entirely from the straw; add to it six barrows of fresh loam, two barrows of soil scraped from the road, and one barrow of coal ashes sifted fine: mix these well together; then spread the mixture on the floor of a dry shed, give it a gentle watering, and spread over it a quantity of spawn from an old mushroom bed; after this tread it as firm as possible, and continue to do so two or three times a week. In this situation let it remain till it is turned into a solid mass of spawn, which generally is about the end of August; then cut it into lumps, and lay them up edgewise to dry.

In the course of my practice I have used different methods in raising mushrooms, as well as other gardeners. Beds may be made for producing them in the open air, or in covered sheds: in gardens where there are hot-houses, the following is a good method for the propagation of them: In a shed built against the north side wall of a hot-house or green-house, let a flue of brickwork be carried through the middle of it lengthwise, under and on a level with the surface of the floor, covering it with paving tiles. This flue may be warmed occasionally by a flue branching from the hot-house or green-house flue or fire-place. In this shed may be made five small mushroom beds in succession: one bed may be made on the floor, in one side of the house or shed against the wall; and another bed in the opposite side against the wall; and three may be made upon shelves, two of them the one above the other against the wall, in the highest side of the shed, and one on a shelf in the lowest side of the shed; all three of them against the walls, above the beds made on the floor of the shed. These shelves must be made of boards, supported by posts, in a similar way as shelves are made to preserve apples in winter. The width of the shelves must be regulated according to the size of the shed, and be boarded in the front about one foot high, to keep in the dung. The dung to make the beds in this shed should be well prepared, by turning, shaking, and mixing it, till its rancid pernicious qualities be evaporated. Make the beds on the

shelves about one foot thick in the front, and about twenty inches in their backsides, against the walls of the sheds. When the heat of the beds is fallen to a proper temperature, which, near the surface, should not be above 65 degrees, set into the surface of them, in rotation as they were made, small pieces of mushroom spawn, about three or four inches apart, and cover the whole surface, nearly two inches thick, with rich strong loamy earth, beating it down firm with the spade. If the shed be not very light, there will be no occasion to cover the beds; but if it be light, they had best be covered with some slight covering, to keep them dark.

Whoever has plenty of spawn by them, may make a mushroom bed at any time of the year; but the common time is in the month of September; perhaps because at that time spawn is found most plentifully, after a hot dry summer. To make a mushroom bed, as before mentioned, let the dung be well prepared, by laying it together in a heap to ferment, and by turning and mixing it well, shaking the outside of the heap, which is cold, and the inside, that is hot, together, so that every part of it may be equally fermented and deprived of its noxious quality. When the dung is in a fit state to make into a bed, which it will be in about three weeks or a month after it has been put together to ferment, let the bottom for it be marked out about seven feet wide, and as long as you chuse to make it; let the foundation on which it is made be dry, and let it be worked up in a sloping manner, so as to terminate with a narrow roof-shaped ridge along the centre, about four feet or more in height. In making the bed, shake and mix the dung well together; beat it down well with the fork; and, if the dung be long and dryish, tread it down as you proceed.

When the bed has been some time made, and the heat sufficiently declined, the spawn may be put into it; but, for fear of the heat being too great in the upper part of it, it had best be at first spawned only half-way up all round; take the spawn in small pieces, and stick it into the sides of the bed, in rows about three or four inches, piece from piece, so that the spawn and earth about to be laid on may meet. When the bed is spawned as high up as it is thought the heat of the bed will not injure it, take good strong rich earth, of a loamy quality, and cover the spawned

part of the bed with it, about two inches thick, beginning to lay it at the bottom of the bed, beating it firm with the spade. The earth should be in a pliable state; not wet, nor over dry.

An easy way to make a mushroom bed is thus:—Take two cart-loads of fresh stable-dung, to which add an equal quantity of old dry linings from melon or cucumber beds, mixing them well together in a heap; and after letting it lie about a fortnight, it will be in a fit state to make into beds. Some think that mushroom beds do better in the open air than in covered sheds. This I have frequently experienced to be the case. In sheds, mushroom beds are apt to become too dry; in the open ground, the humidity of the air, and a little wet sinking through the covering, keeps them in a damp state. In general, mushrooms are very delicate things to force. When the earth is dry, they will not grow; and when it is very wet, it destroys the spawn.

The best of mushroom spawn is frequently to be found in dung-hills which have lain a long time without turning, and which had been formed of horse-dung, scrapings of roads, and turf cut up about the sides of roads or commons. The heat of the summer months having dried the dung-hill, when rain comes about the latter end of August or in September, mushrooms of a good quality may often be seen beginning to form themselves on the surface, like large peas. When these are observed, it is time to take out the spawn, which is generally in hard dry lumps of dung, the spawn having the appearance of whitish coarse pieces of thread.

Unless mushroom beds be in dry sheds, they seldom want water. When they are watered, it must be given to them very carefully, and the cold chill should be taken off. It should be about fifty-five degrees warm. In watering, it is a good method to lay a thin covering of soft short hay over the bed, and sprinkle the hay all over with water, which will filter through the hay gently, as a shower of rain does through the covering of a mushroom bed in the open air, and moisten the earth gradually.

Mushrooms have been long used for ketchup and in different forms of cookery. We are informed that they were highly esteemed by the Romans, and they are so now by the French and Italians, and are held in esteem among the higher classes of society in Britain. The ancient

writers on medicine seem to agree that mushrooms are in general unwholesome, and some modern writers concur in the same opinion. Instances are on record of their fatal effects, and some authors maintain that they are fraught with poison. But I think it evident, from the number of them which are eaten, that the true kind of mushroom is not of a poisonous quality. I have already observed that the right sort is gendered in rotten sweet dung, and in fields pastured with sheep and other cattle. The spawn is stringy and white, and has an agreeable smell. The mushroom at first appearance is like a pea; when older and beginning to spread, the under part is of a livid flesh colour, the upper outside brownish; the fleshy part is thick, and when it is cut it is very white. It smells sweet, and is so agreeable to the taste that it may be eaten raw.

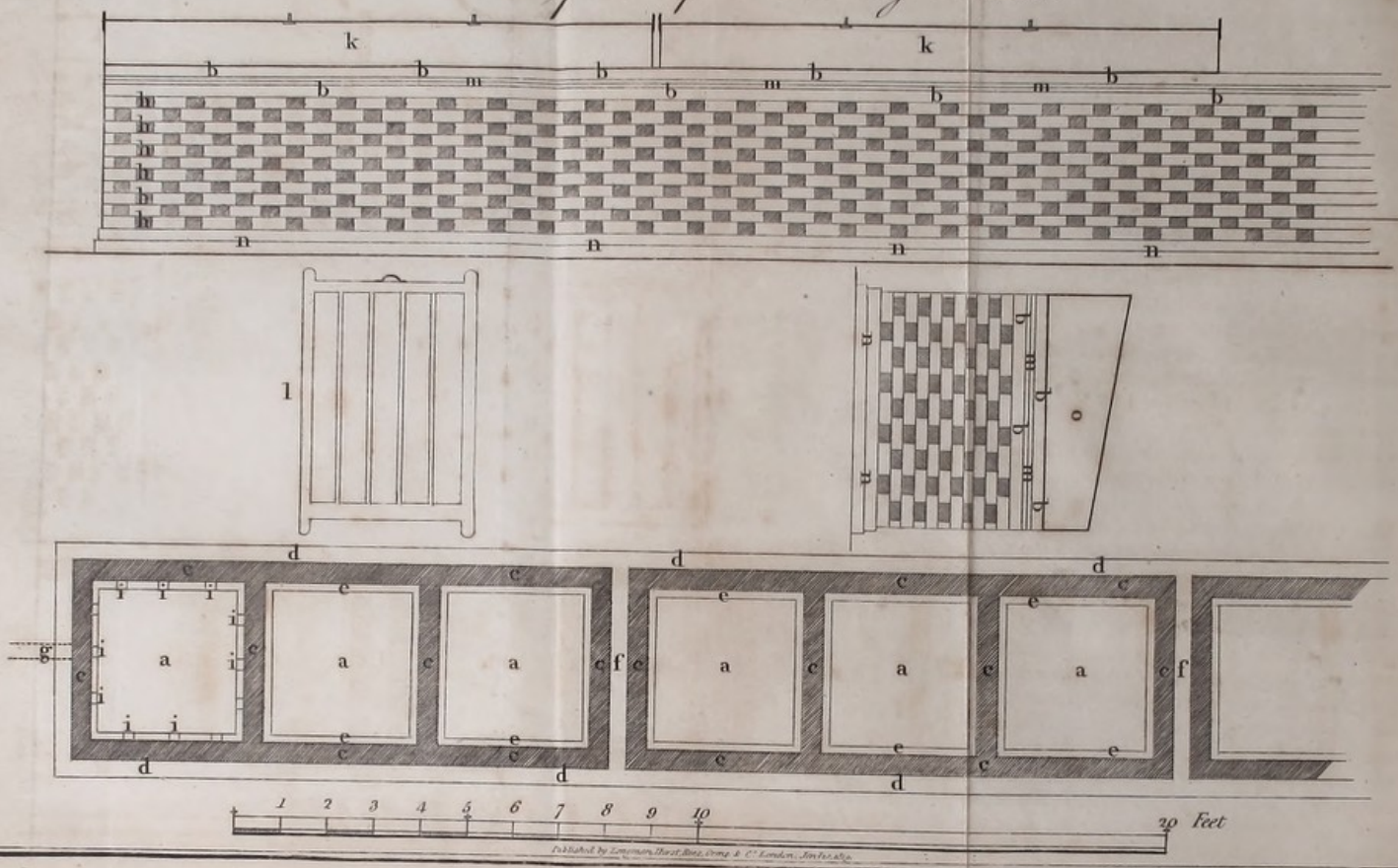
There are a few sorts of wholesome mushrooms; but there are a numerous tribe of them called fungi, of a very unwholesome nature certainly. The evil quality of some of them is indicated by a nauseous sickly smell, although some injurious sorts are so far without any thing disagreeable in the smell, as to make any standard drawn from that alone very unsafe. But the wholesome kinds all send forth an agreeable rich scent.

I am of opinion that no sort of dung ought to be made into a bed to produce mushrooms before it has been strongly heated, turned over, and shaken frequently, so that all kinds of spawn in it may be, if possible, destroyed: and those employed in gathering mushrooms in the fields, or in collecting spawn to plant in beds, ought to be cautious lest they should collect such as are absolutely of a poisonous nature. I would advise that no spawn be planted till the mushroom is seen beginning to grow from it, and then a skilful person will be able to ascertain whether or not the spawn be of the right sort.

On this subject of propagating mushrooms, some may have an opportunity to observe how widely authors differ in their opinions. A late writer on gardening advises that a mushroom bed be made gradually of fresh dung from the stables, without undergoing any kind of fermentation, and that mould of decayed leaves of trees be mixed with it and layed between the layers. He recommends that no spawn be put into it, alleging that of itself good spawn will be gendered, from which mushrooms will proceed; but he has

forgot to inform his readers whether or not it is to be covered with earth. I have no experience of this way of raising mushrooms; but I believe it is not to be depended on that a bed made, and no spawn put into it, will produce mushrooms; and if it do, I apprehend there can be no certainty what quality they will be of. Mould of rotten leaves of trees will certainly gender spawn, but I never knew good mushrooms spring from it. In plantations where leaves of trees fall in the autumn and rot in the winter and spring seasons, in the following autumn plenty of mushrooms will be found growing, but not of a good quality. I never knew good mushrooms grow naturally under or near trees, or saw dung-hill mushrooms of an unwholesome nature, or toad-stools grow frequently.

A Plan of a Forcing Frame.



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CHAP. XVI.

Description of the Plan of a Brick Forcing-Frame for the Culture of the Cucumber, the Melon, the Pine Apple, &c. and of an Apparatus for warming the Air of Hot-Houses, &c. by Steam.

a—The pits to hold earth for the plants to grow in.
b—The surface of the flues in the inside of the frames.
c—The flues which surround the pits.
d—The outside foundation carried up four inches thick, full of holes.
e—Brick on edge carried up close.
f—Four-inch brickwork carried up close.
g—Drain to carry off the water.
h—Holes to let the heat of the linings into the flues.
i—Holes to let the water out of the pits.
k—Height of the front above the flues.
l—One of the lights.
m—Two rows of tiles which cover the flues.
n—The foundation of the pit.

THE plan here given and described, is an exact specimen of what I first invented and got built for forcing cucumbers and melons early, and it answered my expectation. But I understand some who have put it into practice failed to accomplish the desired end, which is not at all to be wondered at, for the best methods practised even in common gardening have failed, and may fail, nor is it to be expected that any invention whatever, for the forcing of fruits, will always succeed, even with all the skill and close attention of the very best of gardeners; neither is it to be expected that my new method of rearing cucumbers, melons, &c. will effect the designed purpose, unless managed by or under the direction of a person that knows the nature of the plants to be forced, and the heat necessary to bring their fruit to perfection at an early season of the year. But I shall here farther observe, that although the rank steam of horse-dung, which is destructive of cucumber and melon plants, cannot get into the frames

among the plants through the brickwork, nor in any part except at the crevices between the glass frames and the wood which supports them, and at the place where outward air is admitted to the plants; and in windy weather undoubtedly the steam of the linings will be driven in among the plants through these crevices: it is safest, therefore, not to put linings of very rank new dung to the bed, but first to cast it up in a heap for a few days till the most rancid pernicious parts of it be evaporated. The steam of horse-dung will not hurt peach trees, nor nectarine trees, nor cherry trees, nor fig trees, unless it be long confined about them without sufficient openings to allow the free ingress and egress of the external air.

When a brick-bed or frame is set to work for the culture of the melon or cucumber plant, dung of the most rank nature for linings may be applied round it, for by the time the earth in the frame is sufficiently warmed for the reception of the plants, the most rancid effluvia of it will be evaporated; see Chap. IX. The steam of dung, in its most rank state, does not hurt the pine apple plant. If pine apple plants be cultivated in frames with the influence of dung heat, if the steam is let in among the plants, it will in the course of a short time clear them of insects, if they happen to be infested with them.

The plan of the bed which is here given and described, is only the principle, or, as it were, the model of my scheme. It may be, and indeed has already been, on the same principle enlarged, and may be adapted or applied not only for the forcing of fruits and flowers, but of several kinds of useful vegetables, such as potatoes, kidney beans, lettuces, &c. Unless it be for melons and cucumbers in the dull cold months of winter, and early in the spring, the cross flues may be dispensed with; I mean the two flues which pass through the middle of the pit in each three-light box. And for rearing pine apple plants, and other sorts of plants that require a strong heat, tan, well prepared horse-dung, or leaves of trees, may be put into the pits. It is an excellent method for the propagation of pine apple plants, for, with a very gentle lining of dung, or of leaves of trees, the plants can be kept on through the winter. This is very easily effected, because of the conveniency of covering them in cold frosty weather. I am speaking from long experience, and I am persuaded no person in the kingdom ever made pine apple plants grow quicker than I have done,

by keeping them in a great heat, and giving them much water.

If much room be wanted in the inside of beds, constructed upon my principle here exhibited, the bed may be built wide, and raised to any height required. In such case the flues need not stand projected into the pot, but the brickwork may be carried up upon and above the flues nine inches in thickness, and to any height required. This scheme of mine is also adapted for growing melons, and for forcing peaches, nectarines, figs, and strawberries in pots, and roses and flowers of different kinds, as I have before mentioned.

Lately some gentlemen have been at considerable expence in erecting steam engines, by the power of which they intend to force into maturity, at an early season, all sorts of fruits and esculent vegetables which are reckoned worth the expence. A steam engine for this purpose is nothing more than a caldron or boiler, made in a round or square shape, of cast iron, and set upon and surrounded with brickwork, and under it a furnace to make a fire to cause the water put into it to boil. It is then about three-fourths filled with water, and when the water boils the steam of it is forced into the forcing-houses through pipes which are laid in them, to warm the air, for the promotion of the growth of different sorts of fruit trees, esculent vegetables, and exotic plants. This method is substituted instead of the heat of coals or of other fuel, conducted in flues of brick through different kinds of forcing-houses and conservatories by the current of air. I have seen several of these sorts of machines, of different sizes, all on the same principle, but carried into practice in different ways, as the directors of them imagine they will operate most effectual. I have not yet seen any of their effects that would justify me in recommending them to general practice as a substitute for fire heat without water, or instead of the heat of dung or of tan ; however, I do not condemn the scheme, for I have no doubt but it will answer the intended end if properly managed by a skilful practical gardener ; but the query is, when considered in every point of view, whether it will be more beneficial in its effects than fire heat, without the expence of setting water a boiling before any heat in this way can be thrown into the hot-houses and forcing frames. I once placed above a hot-house fire in the shed,

a copper with water in it, and carried from it a pipe to conduct the steam into the hot-house, but I found that it took so much fuel and time to heat the water, that I could warm the air in the house for the plants sooner by fire heat alone than by the steam of boiling water; consequently I discontinued the practice. But the small experiment which I made was insufficient to convince me whether or not this steam plan would prove effectual; and as I had plenty of dung to force succession pines, melons, cucumbers, &c., I did not ask my master to be at the expence of erecting a steam apparatus.

Not long since I saw a large house for forcing peaches and grapes, which had one of these engines placed in the middle of it, from whence a pipe of cast iron, about five inches diameter, was carried on the surface of the border to each end of the house, and at each end is a cistern of water, and a small pipe soldered to the ends of the large one, and inserted into the water with a turncock on it, which the gardener said he never turned, but left this small pipe constantly open with the extremity of it under the water, which let the steam condensed into water run out of the large pipe, and also the overcharged cold and hot air, which he said prevented the boiler and pipes from bursting by the force of the confined hot steam. The gardener who manages this peach-house told me, that it takes two bushels of coals and two hours time to make the water in the caldron boil, so that no artificial heat can be raised in this forcing-house till after the water begins to boil.

I have also lately seen one of these steam engines in a gentleman's garden, which I was informed has been at work four years. The gardener says he approves of it, though it appears he has not yet come to any settled method of carrying on the process. He has got a lesser boiler than the first one he adopted, with the influence of which, and the assistance of one fire warming the brick flues occasionally, he forces a small hot-house for pine apples, a peach house, and six lights of cucumber framing. Last autumn he was making further alterations; he was carrying a brick flue to be warmed by fire heat through the middle of the said cucumber frames, to be covered with dung under the earth, for the plants to grow in, because, he said, he had too great a damp in his frames carried into

them by the steam from the boiler. I observed he had his fruiting pine plants in a hot-house warmed by the influence of fire heat in the common way of forcing.

I have lately seen another of these engines, for forcing fruit and esculent vegetables. It is erected and carrying into practice at great expence; as good a description of which I shall here give as I am able. It is a complicated apparatus, which requires the assistance of an engineer to construct. It is erected at a distance from the hot-houses and forcing frames, which are numerous. The boiler or caldron is made perfectly close, and joined to the upper part of it there is a pipe of about four inches diameter, which stands erect about one foot above the boiler; to this pipe there is another pipe screwed, which turns downward, and is laid under the ground, from which proceeds numerous branches of pipes led into every hot-house, forcing-house, and forcing-frame in the garden. These carry the hot steam from the boiler into the pipes laid in the forcing-houses. Above the boiler there is a cistern of water, which constantly keeps up the water in the boiler to a certain height, as the hot water is carried out of it in steam. The pipes are all of cast iron, joined one to another by screws, and are similar to those pipes laid in the streets for conducting water into dwelling-houses, or like those for conveying gas to enlighten the streets in dark nights. The pipes are of different sizes from about two inches to six inches in diameter. The largest ones are laid into the largest forcing houses, and into the houses where the plants are which require the greatest heat, and so on in proportion to the size of the houses and forcing frames, and the nature of the plants intended to be introduced into them.

In some of the hot-houses intended for the fruiting pine apple plants, double pipes are laid all round about the pits by the sides of the paths. Upon different parts of the pipes there are stop-turn-cocks to turn the steam off and on at pleasure, so that it may be let into the pipes of one forcing house or frame, and be hindered from passing into others, as may be judged necessary by the gardener to warm every house, according as the nature of the plants may require. In small forcing frames, single pipes only are carried through them under the lowest ends of the

lights, southward above the surface of the bed for the plants to grow in.

The pits in the hot-houses for fruiting pine apple plants, which had formerly been filled with tan, are now filled up about three feet in height with earth, in which in the north side of the pit grape vines are planted; and from this bed of earth in the pit, there are open subterraneous arches of brickwork; these communicate with the border made in the front of the house southward, and are filled with earth, so that the roots of the vines may run out of the hot-house into this border of earth. About seven or eight inches above the surface of earth thus put into the pits, there is laid a close covering of oak plank, bored full of small holes about three inches apart. The ends of these planks rest on the brickwork of the sides of the pit on each side of it, and lie on a gentle decline to the south, as the common method is in laying the surface of a tan bed for pine apple or other plants. By this description it may be observed, that there is a vacancy of about seven or eight inches, and the whole length and width of the pit, under the perforated plank covering, between the surface of the earth and it: this vacancy is for the purpose of holding hot steam from the boiler to warm the earth to be laid above it upon the covering of oak plank, for the roots of the plants to grow in. To introduce the steam into the said vacuity there is a pipe of about two inches diameter, which is laid on the surface of the bed of earth in the lowest side of the pit under the covering of oak plank, and in this pipe there are small holes perforated about three inches apart, to allow the hot steam from the boiler to issue forth to fill the vacuity, to warm the oak covering and the earth above it, to make the roots of the plants grow. Upon the said covering of oak boards there is laid about one foot thick of earth, and in this earth the pots with the fruiting plants are now plunged; but I was given to understand, that it is intended to turn them out of the pots when they shew fruit, into this bed of earth, that their roots may run without interruption. On the seventh day of November 1818 I saw one of these hot-houses, and the plants in the state I have described. It was about eight of the clock in the morning, the heat of the air in the house was then at 64; and a thermometer plunged in the earth between the pots,

of pines was at 96 degrees. The steam engine was not at work that morning, but it had been at work the previous evening. The heat in this hot-house, both in the atmospherical air and in the bed for the roots of the plants to grow in, was in a good state of temperature at that time of the day and year. The gardener told me, that he can, by the influence of steam from the boiler, raise the heat for the roots of the plants and the heat of the air in the house to any degree he thinks proper; and that he is of opinion, that, by the power of this engine or apparatus forcing the hot steam wherever pipes from it are laid, all sorts of fruits and esculent vegetables may at an early period of the season be brought to the greatest perfection that can possibly be done by the influence of artificial heat.

The proprietor of this apparatus, and of the hot-houses and forcing-houses and frames and fruits, and plants therein reared, has now some of his succession pine-apple plants in beds constructed according to the plan of my inventing, warmed by linings of dung; but he says he thinks of doing all his forcing by this his steam apparatus, the power of which, when set a-going and kept a-going by a great fire of coals, forceth the rarefied air filled with particles of water to the utmost extent of all the iron pipes laid from it into every forcing house, pit, and frame in his garden. When the water in the caldron of this apparatus boils, and the steam begins to fly off into and through the pipes, it appears that there must be an opening at the extremity of the pipes, to suffer the cold air to pass out, to give room for the heated air; and as soon as the steam is perceived to issue forth at the open extremity, it is stopped by the turning of a cock. When the steam thrown into the pipes condenseth into water, it is allowed to run forth by the turning of a cock or cocks in different parts of the pipes.

Excepting in the vacuity which I have described, into which the steam is suffered to issue through the little holes in the small pipe to warm the earth, for the nourishment of the roots of the pine apple plants, the hot steam is not admitted into the houses for the purpose of warming the air which circulates among the plants. The air in the houses of every description for the growth of the plants is intended to be heated by the heat arising from the surface of the iron pipes, made hot by the steam forced into them

by the powerful operation of fire, which causeth the water to boil. But by turning of cocks which I believe are in every compartment where the steam pipes are laid, the steam may be let out to circulate in the houses among the plants occasionally. At one part of the pipes I observed a valve, which I was informed burst open occasionally when the steam acted powerfully, and closed again when its force abated, which allowed the steam condensed into water in the pipes to run out.

This is certainly an ingenious scheme, which by skill and great attention may answer the intended purpose. But let it be remembered, that this scheme, or any other methods or schemes whatever which have been or may be contrived, for forcing fruits and esculent vegetables, will require a good practical experienced gardener, who understands the nature of the various kinds of fruit trees, plants, vegetables, and flowers intended to be forced, to manage and conduct the business; and he may, especially with such a complicated apparatus, sometimes fail of accomplishing the desired end.

To make this invention effectual, I imagine it will be necessary that a man sit up all night in cold weather to augment the fire, so as to keep the water in the caldron constantly boiling to a greater or less degree, according as the temperature of the weather may happen to be, for it should be remembered, that excepting the vacuity under the bed of earth for the pine-apple plants, the heat of which ought not to be raised many degrees above one hundred, there is no other surface immediately heated by this steam plan, but the surface of the iron pipes, which is not large, and the body of iron in them not great; they consequently will sooner lose their heat than a large surface of flues of brickwork heated by the influence of fire without water, the nature of which is to subdue and quench fire heat. And it may be further observed, that the pipes which branch off to warm each separate compartment run a great distance under the ground in the open air, so that they come in contact with the cold wet earth, which certainly must lessen the heat of the pipes caused in them by the hot steam from the boiler.

In this new method of forcing fruits of different kinds by the intervention of this apparatus called *steam engine*, when the water in the caldron ceases to boil, something twitches

a wire which rings a bell in a room intended for a man to sleep in, which is meant to be a signal to call him up to augment the fire and regulate the heat of the different forcing-houses. And when by a large fire the water in the caldron is caused to boil too powerfully, the steam of the water recoils or rushes back into it, which would burst it or the pipes, provided it could get no vent; and therefore a lid or valve is contrived and placed in the upper part of the boiler, which is bursted open when the water is heated over much, so that the steam vents itself into the open air; and when the heat of the water in the caldron is somewhat subsided by the exhaustion of the steam, the valve closeth down again. There is also what is called a damper, which of its own accord shuts back the fire from the boiler when the heat is too great.

As it appears to me that there is yet no fixed plan for conducting the steam raised by this apparatus in the most economical way, for forcing fruits and esculent vegetables, I would here suggest, that perhaps an improvement might be made, by introducing the hot steam from the boiler into the brick flues heated by fire, or by laying the iron pipes into them, leaving holes here and there in the flues, to permit the heat to issue forth from the heated pipes into the house. An experiment of this kind might easily be made, to try to heat a greater surface in the house than that of the iron pipes. For this purpose, without injuring the brick flues, they might be closed up at both ends, to prevent the heat of the hot pipes from getting out of the flues in any other way, excepting into the forcing-house.

At present, I must freely own, that I have some doubts both of the cheapness and the superiority in other respects of this new scheme of forcing fruits, flowers, and esculent vegetables, by the influence of hot water, over the generally adopted methods of the influence of fire, dung, and tan heat; and especially of substituting steam heat instead of tan heat for the roots of pine apple plants. From an experiment which I tried, an account of the result of which I have given in Chap. XII., I think it is evident that pine apples cannot be brought to so good perfection, without the assistance of artificial heat, even in summer, to their roots, as well as to their leaves and fruit. Now, in this new scheme of giving under heat to the roots of the plants by steam from the boiler, to effect this, the engine, by the

force of fire, must be set a-going once a day, or once in two days, I suppose, to warm the bed under the plants, when there is no occasion to warm the air in the hot-house, either by fire heat, or by heated steam from the boiler.

I have no doubt but the air in all manner of hot-houses, forcing-houses, forcing-frames, and conservatories, may be sufficiently warmed by the influence of steam forced into iron pipes laid in them; but I think it is not yet ascertained whether forcing by the new steam scheme, or by the old method of fire heat, be the best and cheapest way. But provided the steam apparatus, after a sufficiently long trial, be found to answer the purpose of forcing fruits, flowers, &c. better than fire alone, which I much doubt, it will only, I apprehend, be adopted in gardens where there is much forcing, and therefore, of course, the more simple methods of forcing by fire, dung, and tan heat, will be continued in moderate-sized gardens and in small ones.

With regard to the idea, that forcing by the heat of steam is more congenial to plants than fire heat, it is a mistaken notion. The heat raised in a hot-house, from bricks or stone heated by fire, is equally as salubrious to plants as the heat arising in a hot-house from iron pipes heated by the steam flowing from boiling water. But some inexperienced persons may probably think that the air in hot-houses for forcing of fruits of different sorts, is to be warmed by the hot steam from the boiler being let in among the plants; but this is not what is intended by the use of the steam apparatus, nor indeed would it answer the purpose: it would be pernicious to the plants. All the steam which in general is requisite in forcing any kind of fruit-bearing plants or esculent vegetables, is the steam or the evaporation which ariseth out of the borders in which fruit-trees and all sorts of plants grow, and out of the pots of earth, and out of the tan bed in which the pots of pine apple plants are plunged.

Whoever intends to substitute the water-heating apparatus in the forcing way, instead of fire heat without water, had best, in my opinion, not take away, out of their hot-houses, in the first instance, the brick flues, till they are fully assured that they shall have no further use for them. And I would also caution them not to discontinue the use of the tan, dung, and leaf-beds for the culture of the pine apple plant, &c. until they have experimentally ascertained

that the effect of these fermenting juicy bodies may be dispensed with.

If these powerful complicated apparatuses, set a-going by fire heat, happen to be pretty generally adopted, for the purpose of cultivating the pine apple, the melon, the cucumber, the peach, &c., it will be no wonder to me if more accidents happen, even with the best and most careful gardeners, than happens in the common way of forcing with the assistance of fire, dung, tan, and leaf heat. But until it can, by experimental practice, without partiality, be ascertained whether hot steam from boiling water, or hot air issuing from fire alone, is most powerful in communicating heat to any given body, whether of iron, or of stone, or of brick, and in keeping either body longest in heat, we shall not, I apprehend, be able to know exactly which is the easiest and least expensive method of warming the air in forcing-houses, for the growth of plants, and for bringing their fruit to maturity, by the influence of fire heat; which, indeed, is the moving cause of both schemes. We do know, that if a copper of any strength be filled with water, and made close, so that no air can pass out of it, if the water be caused to boil by the efficacy of fire heat, the water will burst the copper: it cannot be confined, because the particles of air in it are expanded by heat. And we also know, that a fire will not burn without a constant current of air. We also know, by experience, that the most choice exotic fruits have been brought to perfection in this country by the assistance of fire, dung, tan, and leaf heat; but we are yet to learn that pine apples have been brought to good maturity here, by the assistance of steam alone, or by any other artificial methods, without the assistance of fire heat, or of the heat of bodies in a state of fermentation, though I doubt not but it may be done by skill and attention.

On a review of the scheme for forcing plants into fruit, by means of the apparatus which I have here described, I am inclined to think that the safest and the cheapest and the easiest way of growing pine apple plants, and of forcing melons and cucumbers, &c. will be to continue for these purposes the use of horse-dung and tanners bark. The former retains a steady heat for a long time, and is therefore well adapted to give a bottom heat to plants of different sorts. The former raiseth a powerful heat, which continues in it for several weeks, consequently it is suitable

for making linings to brick frames, and to old dung or leaf-beds; also, when horse-dung is well prepared by mixing and shaking of it, it makes good beds for forcing various sorts of plants. In forcing plants of any kind by means of the steam engine, or by fire-heat without water, daily augmentations of fuel is requisite; but it is otherwise when plants are forced by the heat of dung, or of tan, or of the leaves of trees.

THE

GARDENER'S REMEMBRANCER.

On the HOT-HOUSES,

For January.

THE month of January being cold and often windy, the hot-houses demand great attention to keep them to a due degree of heat for the pine apple and other plants in them, at this season of the year.

If there be not, for the accommodation of a married head gardener, in or near to the garden, a house, which a good garden ought never to be without, there should be at least one room decently furnished, for one or two men to sleep in, that the hot-houses and other matters may be duly attended to, night and morning.

Some of the pine plants will now probably be shewing their fruit; but whether this be the case or not, they require a good heat in the tan bed to keep them in a gentle growing state. The heat at the bottom of the pots had better be for some time as low as about 80, than to be many degrees above 100, or blood heat. But remember, if much water be given to the plants when the heat in the tan bed is low, it will destroy the fine white tender roots, whch will injure the plants as much as if their roots were destroyed by an over-heat in the tan bed.

Examine the tan, and if the heat in it is not sufficient, with the hand, or a handy hoe, draw out from among the pine pots the exhasted tan, nearly as low as the bottoms

of them, and fill up the empty space to the rims of the pots with well-fermented sweet new tan, which had lain in a dry place in a ferment about three weeks, and mixed once or twice during that time. See that the tan is put perfectly close to the pots, that no vacuities be left about the sides of them, which would let the heat of the tan escape. Level the pots, and make the surface of the tan-bed smooth and neat among them.

In this month, the gardener, knowing the state of his hot-houses, ought to make preparation of tan and other articles accordingly, which may be wanted the ensuing month.

If there are succession pines in a hot-house or pit warmed by fire heat, it is likely they may require watering once or twice this month; but those warmed by dung heat will want none. Let the succession pine plants have about the same degree of heat to their roots in the tan-bed, and in the air of the house about them, as I have recommended for the fruiting plants, which, if they be attended to in watering and other matters, will make them grow finely.

To make the following monthly tables, the thermometer was hung in the middle of the hot-house, shaded from the direct rays of the sun, and the height of the degrees on the thermometer was regularly taken by myself or by the under gardener. They are not given as an exact rule for gardeners to follow; for an experienced gardener can tell whether or not the hot-house be in a proper degree of heat for the pine apple by going into it. I do not say that the pine apple cannot be ripened in a different degree of heat than I have described and recommended; but I maintain, that if the heat in the tan-bed, and in the air of the hot-house be kept nearly as warm as I have taught, it will bring the fruit of the pine apple plant to good maturity, provided, however, that the plants be properly managed in other respects. Had I kept a register of the thermometer another year, and compared it with that which I kept for twelve months, and have herein given, there would have been a difference; the heat of every day, nor of every week, nor of every year, would not have been alike; nor to cultivate the pine apple, nor any other plant, is it necessary that it should be so.

Height of the Thermometer in the Hot-house, shewing the temperature of the air in it, for January.

Under D is the day of the month—under M is the height at which the thermometer stood in the morning—under N that at which it stood about noon—under E the height at which it stood in the evening. During the intervals it might vary, and be sometimes higher, and at other times lower.

D.	M.	N.	E.	D.	M.	N.	E.
1	63	68	65	17	66	78	68
2	63	70	70	18	60	72	68
3	64	75	70	19	66	75	74
4	65	72	70	20	64	72	65
5	63	70	70	21	64	74	66
6	65	76	68	22	62	72	67
7	60	74	68	23	63	70	61
8	65	70	66	24	61	92	65
9	62	72	66	25	64	70	66
10	63	80	66	26	63	85	66
11	65	75	70	27	65	71	68
12	62	68	63	28	66	90	65
13	63	68	65	29	62	98	67
14	64	74	70	30	63	85	64
15	68	85	68	31	60	68	66
16	65	93	68				

No certain rule can be laid down for the exact quantity of water that must be given to the pine apple plant, or how often; nor is it necessary to be particular. These and many other matters must be left to the gardener, who has the care of the plants.

Examine the tan-bed frequently, and if the heat in it be getting rather too weak, fill up the spaces between the pots full as high as their rims with fresh tan; and if that do not raise a sufficient heat, the plants must be set out, and the tan bed renewed by an addition of new tan. For the method, *See February, and* Chap. XII.

To water the fruiting pine plants in winter, in gloomy weather, when it is best not to water over the leaves, a

small-sized watering pot, with a long tin pipe, and a flat rose on the end of it, should be in readiness. Eighty degrees is the medium heat of the water with which pines should be watered. I would advise never to water them with water under seventy, unless in very warm weather, when the earth about their roots will soon regain its natural warmth. The fruiting pines and succession plants in the fruiting-house will probably require water two or three times in the course of this month, but that will depend on the temperature of heat kept in the hot-house, both in the air and in the tan-bed.

In cold gloomy weather, heat will be required in the flues constantly; fires should be made regularly every evening and morning, if there be not the appearance of sunshine, to warm the hot-houses sufficiently.

The kidney beans planted last month will probably now be in blossom. Let them be attended to in watering, and keep the pots clear from weeds. Sprinkle the leaves of them occasionally with water, not less than 70 degrees warm. This will promote their growth, and be a mean to prevent them from being infected with insects. But when they are in blossom at this season of the year, they had best not be watered all over their leaves.

If cucumbers were planted in boxes in the hot-house in August, perhaps a few fruit may be got from them this month; therefore let them be watered when they require it.

Where there is room in a hot-house, and they be desired, a few roses in pots here and there on the cribs of the pit will blossom well, if they are in good mould and get plenty of water.

If there are any other exotics in the hot-house beside the pines, keep them clear of decayed leaves and weeds, and sprinkle them occasionally with water to cleanse them from dust. Hard-wooded exotic plants require water frequently, but succulent plants, such as the cerus, melon, thistle, and aloe, require very little.

Sow kidney beans in pots for a succession. Cress, mustard, and rape seeds may also be sown twice a week: sow the seeds of these in pots, in rotten tan or vegetable mould, covering them well and lightly, and set them in any part of the hot-house; as they are cut young for sallading, they require no water; it would cause the plants to damp off.

If there are grape vines in the hot-house to run up the rafters, probably they will be shewing their fruit this month, therefore great care must be taken of them. If they are planted on the outside of the house, see that the stems be secured from frost. In case the stems stand naked out of the ground, roll soft hay bands round them, and cover the border where the roots run, with dry litter of any kind, to keep the frost out, for if it get at the stems or roots, it will destroy or injure the crop and vines.

On the GREEN-HOUSE,

For January.

The green-house will require attention this month. Make such fires in it as are sufficient to prevent the frost from killing or injuring the plants. Open the sashes to admit air every fine day. The plants will not require much water at this season of the year. The pots, however, should be examined every other day, as some sorts require water oftener than others.

Decayed leaves should be taken off, the pots cleared of weeds, the house kept free from dust, and clean and sweet in every part.

Smoke the plants with tobacco once a fortnight or three weeks, which will destroy some sorts of insects with which they are liable to be attacked, or prevent them from breeding.

Though the weather in this month may happen not to be frosty, yet it is necessary to make fires occasionally, to keep the plants from damping. If the frost be kept from the plants in the night-time, it is sufficient; but if a thermometer be kept in the house, it should rise in the course of the day to about 50 or 55 degrees.

As they can conveniently be covered up from the frost, green-house plants may be kept all the winter in cucumber or melon frames. If set into a brick bed with flues, a very gentle lining of dung, or of leaves of trees, will be useful to preserve them in a good state.

On the FORCING-HOUSES,

For January.

The fruit of the grape vine, forced early, will be set this month. All due attention must be taken to make the fires at proper times, and regular, to keep up a sufficient heat. The air about the plants in the house, ought never to be under 55, and the thermometer should rise gradually every day, to between 60 and 75, and a little higher with the sun heat, if there be air at the house. Take off the tendrils from the long shoots, and tie them up when they want it. Stop the shoots before the fruit, leaving a joint or two to break out for a leader.

Pots of cherries, strawberries, and figs, may now be set into the houses, to bring them forward early.

Put the glass frames on the cherry-house, if it was not done last month. Make a little fire in it, but do not let it rise higher in this month than about 50, and keep plenty of air at it constantly, night and day.

To have a regular succession of roses, set in some pots every three or four days. The plants of roses that have done blowing in the forcing-house, may be carried out to make room for them to come in. Search among he shoots and flower-buds every day, and pick off all grubs that can be found. Tie up any tree that may want it, and cut off all dead shoots or leaves as soon as they appear.

If the thermometer is not below 55 in a morning, the house is warm enough, but let it rise in the course of the day to 75, and sometimes higher, with plenty of air at it, if the weather permit, and the sun shine on it.

About once or twice a-week in the evening, when the flues are hot, sprinkle them with water till the house is filled with steam. Give the plants a sufficiency of water, otherwise the roses will not be fine.

When the buds of a rose-tree appear ready to burst open, if it be set into the green-house it will blow fine. If the heat in the house in the morning be at or above 70, the leaves of the flowers will expand too hastily, which will somewhat injure their beauty; and so will water, if it fall on them in that state.

Many kinds of flowers may now be taken into the forcing-houses, such as honey-suckles, Persian lilacs, hyacinths, narcissus, jonquils, anemonies, carnations, pinks, stocks, sweet-williams, &c.; these may be put into a gentle tan heat, or set in convenient parts of the house.

Begin to force tuberoses. These bulbs must be planted in pots, and plunged in tan or dung, in which is a good growing heat; but give them no water till they make roots, and begin to grow.

Sow the seeds of stocks, mignonette, tomatoes, sweet marjoram, sweet and bush basil. Sow the seeds in pots in light earth, and set them into the forcing-house in an airy situation, to keep them from the damp.

The fruit of the peach and nectarine trees intended to ripen in May, will in this month probably be set and swelling a little. Endeavour to keep the air in the house about 60 with fire heat; when the sun shines, let it rise to 65 or 70, with air at it; give the house air every day, whether the sun shine or not.

Take the opportunity of fine sunshine mornings to wash the trees with clean water, warmed to about 60 degrees of Fahrenheit's thermometer. Divest the trees of useless shoots and leaves, and keep the house clean and sweet. To have any certainty of a crop, this is too early a season to have peach trees in such a state of forwardness; but some will run the risk for curiosity.

Peach and nectarine trees now in flower, will demand great attention. Let the medium warmth of the air in the house be 55 degrees; and while the trees are in blossom give them no water, but fill the house full of tobacco smoke once a week, or oftener, if there be the least appearance of the green insect on any part of the trees.

Examine the trees frequently, and if there be any appearance of mildew, dust a little sulphur on the infected parts.

If the gum or canker be seen on the shoots, or any part of the trees, open the bark and cut out the dying wood.

On the FORCING-FRAMES,

For January.

To have early melons, sow some seed about the middle of this month, and for fear of want of success, sow some more a few days afterwards. Sow the seeds in rich earth in pots, and set them in a good strong heat, which will cause them to vegetate quickly; but take care, after the plants are come up, to keep air at the frame, to prevent them from being drawn up weak. When the seed leaf is fully expanded, transplant them into small pots, two or three plants into each. If a brick cucumber bed is at work, set the pots in a row on the back flue, where they will have heat enough, and not be liable to be destroyed by the damp.

Those who rear melons early on a dung bed, should begin to prepare the dung for it about the beginning of this month, for dung for this purpose must probably lie four weeks in a ferment, and be shaken over two or three times, before it be fit to make into a bed; and after the bed is made, it must lie till its violent heat is over, before the plants can be safely planted in it. *See* Chap. X.

Gardeners, who are allowed and approve of the brick-bed, and have the idea of managing it properly, will save some labour, and perhaps a good deal of trouble to themselves by adopting it.

Where there is no forcing-house, sow small sallading in a gentle hot-bed.

Force asparagus. This is done on a hot-bed of dung, or with fire heat in a flued pit; which last is the best method where a succession is required. Fill the pit up about three feet with leaves of trees, or with dung well prepared, to raise only a mild heat. Lay upon the surface of it all over, about five or six inches thick of vegetable mould, rotten tan, or light rich earth of any kind. The roots of full-grown plants being taken up, carefully trim their roots well, and plant them as close as they will go together, and cover them over four or five inches thick, with the same kind of mould as that directed to be put under them. *See November.*

Make hot-beds on which to sow the seeds of radish, cauliflower, lettuce, carrot, onion, and early york cabbage. Cover the surface of the beds eight or ten inches thick with rich earth; sow the seeds regularly, and cover them full half an inch thick with fine sifted mould. When the seeds begin to appear, take care to give them plenty of air, to prevent them from being drawn up too tender.

Plant in a frame on a gentle hot-bed, mint, tansy, and any other herbs of like nature, that are required before they grow in the open garden, or if you have them in pots, set them into the forcing-house.

Cauliflower and lettuce plants in frames or under hand-lights, to preserve them through the winter, should have air in mild weather; and as they appear let all the decayed leaves be taken off, and when any weeds happen to grow among them, let them be picked out.

Take care of auriculas, carnations, and other such like plants that are in frames; give them air in fine days, and keep the pots free of weeds.

Pine apple plants, in frames or pits, should be attended to. Cover the glass well in cold nights, with mats and any dry litter that can be procured. The heat, unless for a short time, ought not to be lower than 65.

Mushroom beds in forcing-houses should be attended to. Let the heat of the air in them be kept up from 50 to about 60, by making gentle fires when necessary.

A mushroom house is an inclosed thatched shed of any dimension required. Sometimes the flue for the fire is carried round the inside close to the wall, and the bed is made in the middle of the house. Some carry the flue under the floor of the house a little distance from the bed. This introduces the heat gently to the bottom of the bed, as well as to the air which surrounds its surface. *See* Chap. XV.

Peas in frames should be attended to. They must be covered in severe weather, to keep them from being destroyed by the frost. Take the glass off in fine sunshine days.

Plant an early sort of potatoes on a hot-bed of well-worked dung, or in a pit warmed with fire, or on a brick bed heated with linings of dung.

Potatoes may be planted in small pots, one in each pot, and set into the forcing-houses, and when their roots fill the pots, turn them out with the balls whole, into a frame to produce fruit early.

If you have cucumber plants on a brick bed, take care and keep up a strong sweet heat in the linings, and water the flues and the earth adjoining and near to them about twice a week. The earth should constantly be kept in a moist state, which being heated by the heat in the bricks, will constantly throw up a fine sweet evaporation of moisture, conducive to the growth and health of the plants.

As the earth in the hills for a short space round the stems of the plants will seldom be above eighty-five degrees warm, the plants will require little water this month. The heat of the air in the bed among the plants in the morning, when the glass is uncovered, should not in general be below seventy nor higher than about eighty degrees, though I have sometimes had it about ninety. At this season of the year, the heat will fall in the course of the day, which cannot be helped, unless the sun shine bright, for the plants must have light to keep them green. Let a constant draught of air be admitted, day and night, at the north side of the frames.

If you have cucumber plants on a dung-bed, for their treatment, *See* Chap. IX.

Sow the seeds of melons and cucumbers in pots, and set them on the flues of the cucumber bed.

The following monthly tables shew the degrees of heat in the cucumber frames among the plants at three different times of each day for twelve months. By the heat described in these tables and plenty of water, the cucumber plants, the seeds of which were sown on the twenty-second day of October, were maintained in a healthy fruit-bearing state in the brick frame of my inventing from the month of January to the beginning of December. The melon plants in the management of the author were kept in about the same degree of heat which he has given for the culture of the cucumber in the forcing-frames; and he ventures to predict, that if any person keep melon or cucumber plants in nearly the same degrees of heat as are set down in the following plain tables, and manage the plants well in other respects, the way to do which he

thinks he has clearly pointed out in this treatise, he is persuaded they will not fail of having success.

I observe a writer on gardening says, it is matter of regret to Mr. M'Phail that his method has failed of success. The method which I invented and have published did not fail of success with me, so that I regret nothing about it. If it failed with him, who it seems condemned my method to get his own applauded, I apprehend it was his own fault, and not the inefficacy of my plan, which is generally approved of and now in practice by numbers of the best gardeners in the kingdom. As a proof of its utility, there are market gardeners in the neighbourhood of London now erecting brick frames on my principle and plan of brick-frame-forcing, the effects arising from which, when better known, will bring it into more general practice, I apprehend.

With regard to what an author has published about my method of brick-framing impoverishing the kitchen garden, his reflections on me in that respect are insignificant, and not worth answering: for, contrary to his ideas, some say that my brick-frame for the culture of the cucumber, the melon, the pine apple, &c. require more dung for linings than a bed of dung does. But be that as it may, I shall only here say, that whatever method be used for forcing choice fruits and esculent vegetables, plenty of heat must be given to the plants, otherwise it is of little use to attempt to cultivate or rear them in any place excepting in the natural climate, which is too cold in Britain for the production of many sorts of choice fruits of different sorts, useful to mankind, and which are imported into our country in a manufactured state, at much expense.

Height of the Thermometer in the Melon and Cucumber Frames, shewing the Temperature of the Air in them, for January.

Note.—Under D. is the day of the month; under M. is the height at which the thermometer was in the morning when the frames were uncovered; under N. is the height at which it stood about noon; under E. the height at which it stood in the evening. At other times of the day it might be a little lower, and sometimes higher.

D.	M.	N.	E.	D.	M.	N.	E.
1	80	63	60	17	78	68	57
2	74	70	66	18	70	70	63
3	76	67	68	19	72	76	68
4	76	70	62	20	85	75	68
5	70	69	67	21	86	73	69
6	76	77	70	22	82	76	68
7	82	68	67	23	78	68	62
8	78	76	70	24	79	77	66
9	80	82	75	25	78	68	62
10	70	68	67	26	80	83	68
11	75	60	54	27	79	77	68
12	69	70	67	28	84	88	77
13	75	85	73	29	72	76	70
14	78	67	65	30	70	64	71
15	80	65	57	31	70	75	70
16	58	56	54				

On the KITCHEN-GARDEN,

For January.

If the weather permit, sow radish and lettuce towards the latter end of this month, on a warm dry border of well-prepared earth.

Peas of different sorts may be sown this month. Sow the charlton and the early frame, in drills, four feet row from row. Sow also the large marrowfat and patagonians, in drills, six feet row from row.

Peas sown in the former months which are come up, may, in a dry day, have a little earth drawn lightly to their

stems. This will be a mean to preserve them from the frost.

Plant broad beans to succeed those planted in December. Let them be put four feet row from row, and four or five inches distant from each other. They do best in sandy loamy earth trenched two feet deep and well manured.

In open weather earth up late-planted celery, to blanch, and to help to keep it from the frost.

About the latter end of the month, spinach may be sown: sow it in drills between the rows of peas or beans; it will come early enough in this situation to succeed the winter spinach.

If the stems of brocoli stand high out of the ground, earth them up as high as can be done.

Towards the latter end of the month, let a succession of cabbage plants be put out. The early York and sugar-loaf are fit sorts to plant at this season of the year; they delight in ground not too heavy, and well enriched with manure. Red cabbage plants may also be planted.

In frosty weather, dung may be wheeled from the melon ground to such quarters of the garden as stand in need of it.

Dig the ground between the rows of gooseberry and currant bushes, and if there is any work to do that could not be done in December, let it be set about, as soon as possible, the beginning of this month.

In the latter end of the month, if the weather be open, lettuce seeds of different sorts may be sown; the black-seeded hardy green, the Egyptian and the brown Dutch, are the best for this time of the year. Sow them on a warm sheltered border.

Radishes may also be sown; the early short top and the salmon are the best. Take care that the sparrows do not eat the seeds; to prevent them, lay on a light covering of straw or fern till the plants begin to come up. This sort of coverings will also keep the frost from them, but the plants must be uncovered in fine days.

In mild weather, if it be necessary, tie up for blanching the leaves of endive; but a better way is to nearly bury the plants in a bank of dry earth, sloping to the south, or they may be set in earth in an open shed.

This month is a good season to trench and manure vacant pieces of ground, to be in readiness for sowing or planting in the succeeding months.

On the FRUIT GARDEN,

For January.

In open weather, prune apple and pear trees of all sorts, in the orchard; cut out any rotten or decaying branches, and reserve the best young shoots to grow up, to fill any part of the trees that may seem to be getting too thin. This month is a good time to dig or trench about, and manure apple and other fruit trees in orchards.

Prune and nail plum, cherry, pear, and apple trees, on walls and espaliers. Cut them in such a manner as that the bearing spurs do not extend too far from the leading branches. Take off all tyers or shreds that are rotten, and clear the trees of dead leaves, cobwebs, or any thing else that do not belong to them. Nail the branches fast and regularly to the walls, so that they be covered equally from bottom to top. *See* Chap. IV.

To forward the work in the spring, peaches, nectarines, and apricots may now be pruned and nailed; but it would be better to let this work alone till the trees are ready to push, if time can be spared from other work to do it at that season.

If not completed last month, endeavour to finish the cutting of gooseberry and current bushes, that the ground may be dug among them before the roots begin to grow. *See* Chap. VIII.

Plant cuttings of apple, pear, and plum trees; the plants from these will, if permitted, come into bearing soon: they do not grow so luxuriant as those from grafting.

Grape vines against walls in the open air may now be pruned; but the safest way is to let them be till next month, for fear of hard frost.

Make plantations of currants, raspberries, and gooseberries, when the weather will permit.

If the weather is open, all sorts of fruit trees may be planted.

Tie new planted standard trees to stakes driven fast into the ground, to prevent the wind from breaking them.

Protect the stems of apple and other young fruit trees from having their bark bit off by hares. For this purpose,

stick bushes, or roll old mats round them, or any thing else that can be contrived.

If the weather be open in this month, all sorts of hardy fruit trees may be planted or transplanted, if the ground be not too wet. Defend newly planted fruit trees by laying about their stems long litter of any kind, or leaves of trees, to keep the frost from their roots. Let the roots of the fig trees be well covered. Its branches also should be covered with mats, or any thing else that can be contrived, to keep the frost from them.

On the PLEASURE or FLOWER GARDEN,

For January.

The different kinds of flowering shrubs may in this month be pruned. Cut out all luxuriant and straggling superfluous shoots; and those that are crowded should be thinned, so that the sun and air be not prevented from having their due effect on them. Some kinds, if permitted, would grow high and unseemly; therefore, when they appear to be getting into that state, cut out some of the tallest branches entirely, and let not the branches of one shrub interfere with those of another.

After the pruning is finished, clear off the cuttings, and take up from about the shrubs all suckers which have grown from their roots, and then dig the ground among them neatly, so that the whole shrubbery may be clean, and have the appearance of uniformity.

Plant flowering shrubs and herbaceous plants of every kind, when the weather is open.

In order to form screens, to break off cutting winds from quarters of the garden that may require it, hedges may now be planted. The kinds of plants which may be planted for this purpose, are hawthorn, beech, hornbeam, privet, elder, willow, poplar, yew, &c. Of any of the plants of the deciduous tribe, hawthorn makes the best hedge; it is durable, and when properly trained and kept clipped, it has a neat appearance.

In this month, edgings of box and thrift may be planted in dry soils. Lavender, thyme, southern-wood, daisies, and several other low growing plants, may likewise be planted for edgings. The box is most generally preferred, for its neatness and durability.

Forest trees of all kinds may be planted in open weather.

The best sorts of tulips and hyacinths should be attended to. If they are in beds, in frosty weather cover them with litter of any kind, or with mats upon hoops, and as soon as the frost is gone uncover them.

Bulbous roots, which have been kept out of the ground till this time, should now be planted. The sorts generally reserved for this purpose, are anemonies, ranunculus, narcissus, jonquils, iris, crocus, snowdrops, fritillarias, tulips, &c.; these may be planted here and there in the flower borders, or in beds.

On the NURSERY GARDEN,

For January.

Plant cuttings of all kinds of shrubs, fruit, and forest trees, which can be raised by this method.

If the weather be open, young forest trees, and shrubs of all sorts, may be transplanted safely.

Make plantations of stocks for budding and grafting upon; plant them in rows, from two to three feet apart, and about eighteen inches plant from plant.

Young plants and seedlings of arbutus, cypress, cedar of Lebanon, and many other evergreen and deciduous plants, will require to be protected from severe weather, which frequently happen in this month. They may be protected by putting frames over them, or by arching them over with hoops and mats on them. If in pots, they may be plunged in rotten tan, leaves of trees, sawdust, or light earth.

There are various kinds of hardy trees and shrubs which require to be propagated by laying; and when the weather is open, it may be done this month. The way to do it is to chuse branches that will easily bend to the ground, fasten

them down with hooked pegs, and divide the last year's shoots equally; bend them into the earth four inches deep, and make them fast in it with pegs; cut off the ends of the laid shoots, which should stand out of the ground about six inches, more or less, according to the sorts.

When the weather will allow, prepare ground by trenching or digging, for planting and sowing trees and shrubs, and seeds of different kinds.

If the weather be open, forest trees of most kinds may be with safety transplanted, and trees and shrubs of all sorts may be pruned any time when the weather will permit.

On the HOT-HOUSES,

For February.

If the fruiting pine plants are in such a forward state as is desirable, many of them will, by the middle, or toward the end of this month, be shewing their fruit; but whether this be the case or not, every endeavour and means must be used to keep the plants on in a growing state. It is likely that the heat of the tan will be much on the decline; if that be the case, it must therefore be recruited, and it, and the plants, managed in the following manner:

Having a quantity of new tan in readiness, take the plants, one by one, out of the pit, and, with matting, tie up their leaves carefully, and set them out of the house into an airy dry shed; then carry out of the pit all the tan from the surface and sides which appear exhausted. Level the tan left in the pit, and fill it up with fresh bark to its proper height. When this is done, take a quantity of tan, as much as is sufficient to make a large opening, out of one end of the pit, and lay it down at the other end: proceed then to turn over the tan, taking care to mix the old and new well together in equal proportions, which will probably be about a foot deep of each sort. *See* Chap. XII.

When the tan is mixed and levelled, tread it down equally all over the surface, and loosen it again as deep as to allow the pots to be plunged easily.

Having got the tan bed in readiness, take the pots of plants one after another, and with the fingers scrape off a little mould from the surface of each; pull off carefully a few of the undermost leaves, if the stem be in a hard matured state, ready to put forth roots, and then lay a covering of fresh rich earth on the top, close to the stem of every plant.

During the dressing of the plants, a man or two may be employed in plunging them in the tan bed, so that the job may be completed in one day.

If there is any likelihood of the tan becoming too warm, the pots ought not to be plunged to their rims. This, however, must ever be left to the judgment of the gardener. If the roots at this season be injured, the fruit will not swell well; it is best, therefore, to be on the safe side, and not to plunge the pots lower than about half way into the tan, till it come to its full heat, and then put tan among the pots, or forbear, as circumstances may dictate.

The heat of the bark bed in which the succession pine plants are, should be examined, and if it be not sufficient, it ought to be increased: it may be done in the same manner as directed for the fruiting pines.

To ascertain the heat of the tan bed, sharp-pointed sticks should be pushed into it about eighteen inches deep. Those who are not good judges, by feeling the sticks occasionally, may plunge the tube of a thermometer in the tan bed, nearly as deep as the bottom of the pots of pine plants. If the temperature of the bed be in a good state, it will raise the mercury in the thermometer nearly to about 100 degrees. It will do for a time if it be about 90, but it ought not to be allowed to fall at any time to 80, unless it be for a short time after the tan has been changed, or when tan cannot be had to recruit it in due time.

Keep the houses sweet and clean, and the flues in good repair, that no smoke may have access in among the plants.

Water the pine-apple plants this month, if there be a good heat in the tan and houses, two or three times, if they want it. Those in pits without fire heat may, perhaps, require a little water if the sun shine often, otherwise they are safer without it.

Admit air, in fine days, into every place where pine plants are, and take care to cover up those well at night which are in frames, or pits warmed with dung.

Height of the Thermometer in the Hot-House, shewing the Temperature of the Air in it, for February.

D.	M.	N.	E.	D.	M.	N.	E.
1	64	70	68	15	66	82	65
2	65	68	61	16	65	75	65
3	58	92	61	17	64	85	64
4	58	69	65	18	65	70	63
5	60	70	67	19	66	76	70
6	62	70	65	20	73	80	70
7	61	70	67	21	66	92	66
8	61	72	66	22	64	90	68
9	61	88	60	23	68	85	68
10	64	90	68	24	66	78	65
11	64	72	62	25	65	86	67
12	58	90	67	26	61	70	68
13	63	71	66	27	67	74	69
14	65	92	66	28	65	84	69

Grape vines in hot-houses, in this month, demand constant attention; stop and tie up those shoots that want it; train them up the rafters without suffering them to shade the pines but as little as can be helped.

Plant kidney beans for a succession: mould of a rich light nature suits the kidney bean best. Take some fine garden earth and vegetable mould, mix them well together, fill good-sized pots with it, and set them in rows in the hot-house on the flues, or on shelves that do not shade the pines; lay four or five bean seeds, of the speckled dwarf kind, in a row, on the mould of each pot, and with your finger push them into the mould about an inch deep, that they may have moisture enough to enable them to vegetate freely; give them no water till they appear above the earth; when they make two or three joints, stop them or not, as you think best.

Kidney beans require no other management besides what I have mentioned, but to tie them up, and give them plenty of water, to cause them to produce fruit plentifully in a house kept to a degree of heat necessary for bringing the pine apple to maturity.

In hot-houses, where exotic plants are plunged in tan, the bed should be examined; and if the heat in it is much declined, set out the plants and turn the tan, mixing a little new bark with it; afterwards the plants must be plunged into the bed again.

Examine frequently all plants in the hot-houses, and give them water when they want it: sprinkle them over their leaves occasionally in sun-shining days, and shut up the glasses immediately.

Sow the seeds of exotic plants of various sorts in pots, in loamy earth, and keep the earth moist, that the seeds may vegetate.

In this month cucumber plants may be set in the hot-house in boxes of good rich light earth, placed where the sun can shine on the plants. In this situation they may sometimes succeed, but the air in the hot-house is too dry for them, and not warm enough to make them grow well.

On the GREEN-HOUSE,

For February.

Plants in green-houses should have the lights opened every fine day, that fresh air may circulate among them freely. Look over the plants frequently, and give those water that require it. Hardy-wooded plants, such as oranges, myrtles, &c. will require water oftener than soft-wooded ones, such as the geranium.

Keep all the plants free of dead unsightly leaves, and the paths and every part of the house clean.

Make fires in frosty nights, and in cold damp weather, which will be of much service to the plants. If insects appear on them, which sometimes happens, smoke them well with tobacco; this will effectually destroy a green soft insect which frequently infests the plants.

During this month it will be necessary to make fire in the green-house fire-place every evening, and in the mornings if there be no appearance of sun-shine. A per-

son accustomed to manage the green plants will have no occasion for a thermometer; but if one be used in the green-house, it had best be as high, in the course of twenty-four hours, as fifty, fifty-five, or sixty degrees; and if the sun shine bright, a little higher.

On the FORCING-HOUSES,

For February.

The grape-house will require much attention this month. Fires must be made in due time every evening, and in cold mornings; and if the days prove cold and cloudy, gentle fires will be wanted all day. Endeavour to have the thermometer about 55 in the morning, and let it be raised gradually to about 70, and if the sun shine, to 75 or 80, with a little air at the house.

If grapes were set last month, they will now be swelling. If the berries on any of the bunches are too much crowded, with a small pointed scissars thin out some of them.

Tie up carefully all long shoots, and stop any of them that require it. Keep the leaves moderately thin, so that they do not lie on the fruit, nor shade them too much.

In some houses, the border, or part of the border in which the vine is planted, is in the inside of the house; where that is the case, let it be watered and sprinkled now and then, to keep it in a moist state.

Water the flues sometimes when they are hot, which will produce a fine steam, very beneficial to the plants in promoting their growth, and in preventing them from being infested by the red spider. Steam, however, should not be used too copiously. If the border for the vines be in the house, or if there be plenty of plants in pots of earth in it, the evaporation arising from the moist earth is generally sufficient to moisten the air properly; and besides, there is a continual draught of external air coming into the house among the plants; and it is known that the common atmosphere contains moisture at all times, especially in

cold weather, when the ground is full of rain from the clouds.

Pay attention to all other sorts of plants in the house in pots, such as dwarf peach and cherry trees, &c. Strawberry-pots should be kept perfectly clear of weeds; all their runners constantly cut off as soon as they begin to appear, and their leaves well thinned.

Keep all sorts of plants in pots sufficiently watered, and fill the house about once a week full of tobacco smoke, which will prevent the plants from being infested by some sorts of insects. To smoke forcing-houses, &c. some use a smoking bellows, but that is a troublesome way. My method was to put some tobacco into a garden pot with a hole in the side of it close to the bottom, and to cover the tobacco with a pan or piece of tile to keep it from blowing out of the pot, then set fire to it, and with a common bellows blowed upon it in at the hole, which shortly filled the house with smoke.

Plum, cherry, peach, nectarine, apricot, fig, gooseberry, currant, and raspberry plants in pots, may now be taken into houses or frames, to try to ripen their fruit early in the season.

Cherries are much esteemed for their beauty and delicious taste: on these accounts, houses for forcing them are by some appropriated entirely for that purpose.

In the former part of this work, I have given a description of a house which will do to force cherries, or any other sort of fruit trees. The flue, which is directed to be run along in the front of the house when it is intended for pine-apple plants, may be carried on an arched wall, or on the surface of the border, any distance from the front that is thought necessary, for the cherry or grape vine, which will let the border in the house communicate with that on the outside. If the house be not high enough for cherry trees, it may be raised. *See* Chap. XIV.

To plant a cherry-house, take light, sandy, rich mellow earth, of a darkish colour, and make a border of it the whole width of the house, and four feet deep; then get fine young mayduke cherry trees, in a bearing state, of different heights, and plant them in rows, beginning with the tallest in the backside, reserving the shortest for the front, letting them slope to the south gradually, somewhat in the form in which plants are set in a green-house.

Cherries set, or in blossom, will in this month require great attention. Like rose buds, they are liable to be destroyed by a small grub worm, which rolls the leaves round itself, occasionally, for a covering: it preys on the leaves as well as the fruit. The trees should be searched once or twice a-day, to destroy them with the hand as soon as they can be observed. Whenever a leaf appears to begin to curl, be sure there is an insect in it, or the embrio of one.

No tree forced for obtaining fruit early, is more liable to fail of a good crop than the cherry; the blossoms are apt to fall off before the fruit is set, and the fruit will keep falling off before and after they are as large as peas. This is occasioned by a kind of stagnation of air about them, which affects the tender blossoms and young fruit.

The sloping and upright lights of a cherry-house ought to be so constructed, that the air may be allowed to have a free ingress and egress whenever it is necessary, which is always.

While the trees are in blossom, do not water them over their branches or blossom. Let air be at the house day and night, and have gentle fires night and morning, and in damp gloomy days. Such methods as these will suit the nature of the cherry-tree, and be the means of securing a crop of fruit.

If the thermometer in a morning is as low as 35, there is no danger; but it should rise in the course of the day, to imitate nature as near as possible. In the month of March, the thermometer in the open air in the shade seldom rises above 55. In the month of April it seldom rises above 65. But it is observed, that when the sun shines on a cherry tree or other trees in the open air, the heat on them is higher than in the shade. The cherry tree is of such a delicate nature to force, that it is impossible for any person to write down the exact temperature of the air, which would insure a crop of fruit from it in the forcing way.

Fig-trees may be planted and forced in the same way as directed for cherries, except that they require a greater degree of heat to bring them to maturity, or they may be trained on a trellice like a peach-tree. *See* Chap. IV.

Pay due attention to the rose-house; fires must be made in it evening and morning, and in cold gloomy days they

must be continued all day. Let the thermometer be about 60 in the morning, and rise gradually to 70 and 75, with air at the house. Water the plants frequently, but see that it has a free passage through the pots, otherwise it will stagnate and hurt the roots. Examine the leaves and flower buds daily for insects. Smoke the house about once a week with tobacco, to prevent the green fly from attacking the roses. Look over the plants carefully every day to pick off the grubs; where you see a curled leaf on it, or near it, you will probably find one or more of them.

Set in rose pots once or twice a week, and some of all other kinds of flowers you mean to force, such as narcissus, hyacinths, jonquils, pinks, carnations, honeysuckles, persian lilacs, scarlet lychnis, sweet-williams, &c.

You may also sow the seeds of various sorts of sweet flowers, such as stocks, mignonette, &c. Sow them in fine mould in pots, and after they are come up well, transplant them into pots, three or four plants into each; they will do to blow in the pots, or to be turned out into the borders in April.

The forward peaches and nectarines must have constant attendance in making the fires regularly evening and morning, and in giving air every fine day. Let the heat be about 50 in the morning, and rise gradually as the sun does. Sprinkle the flues now and then with water to raise steam, and wash the trees, after the fruit are as big as nuts, about once a week, with clean water not too cold.

If the border in which the peaches and nectarines are planted be in the house, water it as often as it requires to keep it in a moist state.

Smoke the trees occasionally with tobacco to prevent insects from breeding on them.

Trees in forcing-houses had best not be washed all over, till the fruit are set, and as large as peas.

As soon as the least mildew appears on a tree, scatter flour of sulphur on the affected part.

Trees that are inclinable to be affected with the mildew, should be narrowly inspected, particularly when the fruit is in its infant state.

The royal george, red magdalene, and some other sorts of peaches and nectarines, are very liable to be affected with the mildew. It comes sometimes not only on the young shoots, but on the fruit, when in their infant state, and

often causes them to drop off before they cast off the blossom; and, in this case, the mildew is so minute that it requires a person of good skill and practice to discover it. *See* Chap. IV.

The branches of trees which are known to be liable to be affected with the mildew early in the season, should be dusted with sulphur, before they come into blossom; and when they are in blossom, a little should be scattered gently all over them. If this method be practised, and the house kept in a good state, in regard to heat, air, and cleanliness, I doubt not but it will have the desired effect.

To have a constant supply of small sallad, sow the seeds of mustard, cress, and rape, twice a week, in pots, in the manner directed last month, under the management of the hot-house. Set the pots in any of the forcing-houses, in a dry place, otherwise the plants will damp off.

On the FORCING-FRAMES,

For February.

If you be forcing cucumber plants which were reared in October, if they have gone on well, they will in this month be strong and able to bear fruit. Stop the plants when they require it; and if any of the shewing fruit be in blossom, set them in the manner which I have described in chap. ix.

If it be intended to have early cucumbers, a strong heat must be given to them. If a constant ingress and egress of healthful air be admitted to the plants, too much heat cannot be given them: there is no fear of burning their roots, if they are on the brick bed; but care must be taken that the steam rising out of the linings be not of such a quality as to hurt the plants, if it happen to be drawn in among the plants by the current of air from the outside. The plants will require a plentiful watering all over their leaves, about once a-week or ten days; the water should be about 80 degrees or more, and the earth against the flues must be kept moist constantly. The frames should be

uncovered about eight or nine o'clock in the morning, when the heat in the bed ought to be from 70 to 80, and sometimes higher. In this month, if the sun shine, his beams will warm the air in the frames a little.

Height of the Thermometer in the Melon and Cucumber Frames, shewing the Temperature of the Air in them, for February.

D.	M.	N.	E.	D.	M.	N.	E.
1	84	77	74	15	72	72	67
2	88	74	63	16	79	80	71
3	69	75	67	17	82	76	70
4	76	80	70	18	80	70	70
5	80	78	73	19	79	85	76
6	82	80	72	20	79	90	84
7	80	85	75	21	80	86	80
8	72	70	66	22	75	90	80
9	73	70	68	23	78	84	70
10	68	70	68	24	78	83	76
11	77	80	72	25	78	70	68
12	70	78	70	26	74	80	79
13	81	75	68	27	80	70	58
14	74	66	70	28	70	84	77

The melons sown last month should be duly attended. Stop the plants after they have made a rough leaf or two. Those not transplanted from the seed-pot, should some time this month be potted out, in small pots, two or three in each. Set them in a warm place in the hot-bed, where they can be shaded from the sun, till they have struck root, and give them a little water, with the chill off, to settle the mould about their roots. *For their general culture, see* Chap. X.

Sow a few melon seeds at two different times in this month, to raise a succession of plants.

Cucumber seeds may be now sown, and let the plants which are beginning to produce fruit be well managed.

Take care of potatoes in frames: give them plenty of air every fine day, keep them free of weeds, and water them occasionally.

Make a hot-bed of dung or leaves, and plant potatoes on it, to succeed those planted last month.

You may plant potatoes in small pots, and set them in the forcing-house till they are so rooted that they will turn out with the balls whole; then, having a bed ready, turn them out into the earth, about eight inches apart, covering the balls of them about two inches with the earth: give them water immediately, and a sufficiency of air every fine day.

Plant asparagus in a pit, with fire heat, or on a well prepared dung-bed. *For the method, turn to November and January.*

Cauliflower, radish, carrot, onion, and lettuce seed, should be sown early in the month, on beds of warm dung or of tree leaves.

Sow celery on a hot-bed, or in pots, to set in frames.

Plant, in a frame on a hot-bed, herbs of different kinds, such as mint, balm, tansy, &c. These may likewise be planted in pots, and set in frames, or in the forcing-house.

During this month the lights must be still kept on tender cauliflower and lettuce plants, in frosty nights and snowy weather; but they should be taken off in fine open days, and when the sun shines.

Cauliflower and lettuce may be planted on gentle hot-beds of dung or leaves, to bring them in before those in the open ground. They should have glass frames set over them in cold, frosty, or rainy nights; which may be taken off in fine days, or a great deal of air given to them.

Mushroom beds in the shed, warmed by fire, will require attention. Make a fire occasionally, and examine the beds often. When they begin to get dry, give a gentle watering, and keep them covered with a light covering of hay if the shed be light. Let the heat of the thermometer be from 50 to 60. If mushroom beds be in the open air, keep them well covered up with soft hay, straw, and mats; examine them occasionally, to know if there be any fruit on them, and uncover them in a fine day; gather the mushrooms; clear the beds of damp rubbish of any kind; and, as soon as this is done, cover them again, putting a little soft dry hay close to the earth all over the bed. *See* Chap. XV.

Early peas in frames, if they be getting high, should be supported by stakes, and packthread run between them.

Carnation, auriculas, and other plants in pots, in frames, should have air every fine day, and water when they begin to get dry.

On the KITCHEN-GARDEN,

For February.

Sow the different kinds of peas. The low growing sorts require about four feet between the rows, and the tall growing six feet row from row.

Radish and lettuce seeds should be sown at two or three different times in this month.

Plant broad beans in rows, four feet apart. Before this crop is planted, those sown in January should be beginning to appear through the ground.

If the spinach, which was sown last month, appear coming up, sow some more to succeed it.

Towards the end of the month, sow a few of the different sorts of cabbage and savoy seeds.

Plant out cabbages of all sorts in the beginning, middle, and about the end of the month.

Sow some seeds of the early horne carrot on a warm border, or on a hot-bed.

If the weather be open, parsnips and carrots may be sown about the end of the month. These roots prosper best on a sandy, light, deep soil; and if it be well trenched in the course of the winter or autumn, before sowing, it will be a mean to make them run long rooted.

If the weather prove open, the month of February is a good time to sow a full crop of onions. The ground for this purpose should have been manured in autumn, and laid up in ridges during the winter to soften. It should now be levelled, and dug small, mixing the dung and it well together; then sow the seeds regularly; and if the land is not of a strong loamy nature, tread it all over with your feet, and afterwards rake it smooth.

Sow common and curled parsley in drills, on the edges of borders or on quarters of the garden, about twenty or thirty inches row from row.

In the latter end of the month, you may sow Hamburgh parsley, salsafy, and scorzonera; but the month of March will be early enough for them.

Horse-radish may be planted any time this month. Dig trenches, as if for blanching celery, a foot or eighteen inches deep, and after having dug the trench, take slips or buds of the roots, and plant them in a row, three or four inches apart. As they advance in growth in summer, earth them up in the same way as celery is earthed, taking care to break the earth, and lay it to the plants light, that they may easily grow up through it. This method produces fine sticks of horse-radish.

Another method to grow good horse-radish is to make holes with a stick, eighteen inches or two feet deep, and drop pieces of the roots of the plant into them.

Shallots and garlick should now be planted. Dig a piece of good ground for them, make it out into beds, and put them a foot row from row, four inches plant from plant, and three or four inches deep in the ground.

Towards the latter end of the month, plant potatoes for an early crop. Dig a piece of rich ground. If it was not well manured last year, let it be well dunged now. Take an early sort of potatoes, and cut them into two or three parts, and plant them twenty inches row from row, and ten inches plant from plant. They should be five or six inches deep in the ground.

About the end of the month, the seeds of marigolds, angelica, burnet, loveage, borage, cardus, chervil, and coriander, may be sown.

Mushroom beds, in the open air, should be uncovered about once a week. Gather off all the mushrooms that are fit, put some soft dry hay next to the bed, and take care to give it a thick covering of straw and mats above the hay, to keep it warm, and prevent the rains from getting in to make it too wet. *See* Chap. XV.

Early Dutch turnip seed should be sown about the end of the month.

Jerusalem artichokes may be planted any time this month. Cut the roots in two or three parts if they be large, and

plant them in rows three feet asunder, a foot plant from plant, and four or five inches deep.

Small sallad may be sown in a shallow drill between the rows of peas or beans.

Sow hyssop, summer and winter savory, thyme, marjoram, sweet and bush basil, fennel, sorrel, &c. At this season the basil and marjoram should be sown in pots, and set into a hot-bed or forcing-house.

Towards the end of the month some of the strongest cauliflower plants may be taken out of the frames, and planted in rich deep ground, in a warm sheltered situation. Plant them in rows nearly three feet apart, and about twenty inches plant from plant.

Now is a good time in open weather to earth up sea-kail, to blanch. The plants having been planted in light, deep, dry soil, six feet row from row, stretch a line down between the rows, and with the spade make a space about thirty inches wide, exactly in the middle between the rows, chop it small with a spade, and lay it lightly on the plants, covering them about six inches thick. If you choose to force the plants, dig a trench all round them about three feet wide and thirty inches deep, fill it with hot dung, and as it sinks raise it. This will make the plants grow, and if hand lights are set over them, it will accelerate their growth.

If you have any vacant ground in the garden, you may trench it, to be in readiness for putting any kind of crops into it next month.

On the FRUIT GARDEN,

For February.

The peach, nectarine, and apricot trees, which are not intended to be finally pruned and nailed till some time in the month of March, should be examined, and all shoots or branches, which are luxuriant, dead, or evidently of no use to let remain on the trees, should be cut off.

Inspect the stem and every part of each tree, and if there appear to be canker in any part of the bark, or if the gum be oozing out, cut off those parts of the bark which are dead or infected; and if the wood, or a part of the wood, under such dead or affected bark, be rotten or beginning to decay, cut it out also. This will assist the natural efforts of the trees, in casting off the crude undigested juices, which, if confined in them, would in a short time destroy them, or some part of their branches. *See* Chap. III.

Cherry, plum, pear, and apple trees, that were not finished last month, should be pruned and nailed some time in this month.

Grape vines on open walls ought to be, in the course of this month or beginning of next, pruned and nailed. If it is your method to train the tree on the wall, in the form of a peach tree, cut out any old feeble naked branches, and cut in the young wood of last year to four or five eyes, as the strength or weakness of the shoot may make it expedient. If what is called the new method be followed, cut out all the old wood which bore fruit the former year, and train up, crooked or upright, as many of the strongest young shoots as you think the roots are well able to sustain, and bring the fruit which it is supposed will be on them to maturity. Remember, some of the last year's shoots should be cut near to the ground, to throw forth bearing wood for the ensuing season.

Raspberries may now be pruned in the manner already directed. When they are finished, clear away all the cuttings and other litter, and then wheel in dung among them, to be dug in, the first opportunity. If the weather be cold, these plants had best not be pruned till next month.

Any time this month fruit trees of all sorts may be planted with safety. Those transplanted from one part of the garden to another, if carefully dug about, may probably be removed with balls of earth at them, and in that case the removing of them will not retard their growth so much as if no earth hung to them. However, if trees are taken out of ground not so good as that into which they are about to be put, they had best lose all the earth which may incline to adhere to their roots.

In this month raspberry, gooseberry, and currant bushes may be planted, and cuttings of them put into the ground to raise a supply of young plants. *See* Chap. VIII.

If it is necessary, new plantations of the different sorts of strawberries may yet be made. The old beds should be cleared of the runners, and of every sort of useless stuff; and if it be wanted, lay some fresh earth among them; then loosen the ground between the plants, mixing the fresh earth in among the rows.

Manure and dig the ground about every kind of fruit-tree that requires it.

Standard fruit-trees which have been lately planted should be securely supported with stakes, that when their heads get heavy they may not be blown down by the wind.

If gooseberry and currant trees were not finished pruning the former months, it should be done about the beginning of this month, and the ground manured and dug about them as soon as possible. *See* Chap. VIII.

Plantations of standard fruit-trees, as cherry, pear, plum, and apple, should be particularly attended to, the first three or four years after planting, so that their heads may be formed in a regular manner, which is to be effected by cutting off any luxuriant irregular shoots which may arise in summer; for if shoots of this sort are suffered to remain, they will draw much of the nourishment from the other shoots; therefore it will be proper to take such out or shorten them, in order to assist the others, that they may branch out regularly in every direction, according to their natural growth. In trees also of a more advanced age irregularities will arise, which, by judicious pruning, should be regulated every year. *See* Chap. III., &c.

This month is still a good time to trench the ground round about apple and other trees in orchards, and if manure be dug in about their roots, it will be the means of making them grow well, and of producing good fruit.

On the PLEASURE or FLOWER GARDEN,

For February.

Any time in this month when the weather is open, plant edgings of thrift, box, hyssop, winter savory, lavender, suthernwood, pinks, daisies, &c.

Roll and mow grass walks and lawns, and cut the edges of grass neatly with an edging iron.

This is a good time to lay turf wherever it is wanted, either to mend old work or make new walks or lawns, for with very little trouble it will grow freely at this season of the year.

About the middle or latter end of this month, cedars, lauristinus, firs, cypress, junipers, hollies, yews, evergreen oaks, arbutus, pyracanthus, phillyreas, with almost all other sorts of evergreen trees and shrubs, may be planted if the weather be mild.

The pruning of all kinds of flowering shrubs should be finished this month. As soon as the shrubs are pruned, tie up those that require it, and clear the borders of cuttings, and every thing that would hinder their being dug neatly.

Shrubberies and flower borders would be better to be manured once in two or three years; and this is a good month to do it in. Vegetable mould, or very rotten dung, is the best manure for flowers and shrubs. Wheel it to the side of the border in barrows, and with a shovel or spade cast it on about the plants, and dig it in among their roots, leaving the borders neat and uniform.

Beds of fine ranunculuses, hyacinths, tulips, and anemonies, should be defended from excessive rains and frost. They should be arched over with hoops, and in frosty or rainy weather mats or canvas laid over them.

Plant hypaticas, polyanthus, rose campion, columbines, daisies, gentianella, saxifrage, scarlet-lychnis, sweet-williams, rockets, canterbury bells; and many others of a similar nature may now be planted.

Seeds of auriculas and polyanthus may now be sown: they should be sown in pots, or on a warm border in the common ground.

About the latter end of the month many kinds of hardy annual flower seeds may be sown, such as sweet peas, lupins, convolvulus, sunflower, lavetera, candy tuft, hawkweed, &c. They should be sown in patches in the borders, here and there, where they are to remain to produce flowers.

Towards the end of the month it is time to sow the seeds of stocks on a warm border. Some of the ten-week may be sown in pots and set in a forcing-house or hot-bed,

which will bring the plants forwarder than the open ground, into which they can afterwards be transplanted. It blows pretty, and makes a fine appearance in beds, or in clumps in the borders.

Tender annuals should be sown in pots and set in the forcing-houses or in a hot-bed, for the purpose of bringing them forward early. The best kinds are the globe amaranthus, double balsams, tricolors, coxcombs, iceplant, eggplant, and china asters, with a variety of other sorts.

In this month all sorts of bulbous roots, kept out of the ground for a late bloom, should be planted to succeed those put into the ground the former months. Plant them in a light dry soil formed into beds about three feet wide. Bulbous roots of the common sorts may be planted in the flower borders among other plants in patches, four or five together; small sticks should be set beside these patches, that it may be known where the roots are planted.

On the NURSERY-GARDEN,

For February.

At any time in the month make plantations of stocks to bud and graft different sorts of fruit trees on. Plant them in good well-trenched ground, thirty inches or three feet row from row, and about eighteen inches plant from plant. This distance is to be understood of large plants that are to stand to be grafted on. The small plants should first be planted out in beds, about three feet wide, and four or five rows in each bed, with the plants six inches apart in the rows.

Fruit and forest trees of all kinds may be transplanted any time this month, when the weather is open.

Sow in the latter end of the month the seeds of apples and pears, and the stones of plums and cherries, to raise stocks for budding and grafting on. Sow them in beds three feet and a half wide, leaving a foot or eighteen inches for alleys between them. Cover the seed of the pear and apple an inch deep, and the stones of the plum

and cherry two inches deep. If the ground is of a light nature, tread the surface, which will enable the beds to retain the moisture longer than if it were left light.

In this month all kinds of nuts, seeds, or berries of various hardy forest trees and shrubs may be sown; lay bushes or something else over the beds, to hinder the birds from eating the seeds, till the plants begin to appear.

Trees and shrubs of all kinds may now be propagated by layers and cuttings.

Flowering shrubs of all sorts may be in this month transplanted with safety.

Dig the ground between all sorts of young trees and shrubs that are not intended to be removed this season.

Prune fruit and forest trees, and flowering shrubs of all kinds.

Towards the latter end of the month fruit trees may be grafted, if the weather be open; but the month of March is a better season.

Last year's layers and cuttings, which are sufficiently rooted, should be planted in nursery beds.

Seedlings of the arbutus, cypress, cedar of Lebanon, firs, and pines of the tender kinds, with other young evergreens and deciduous plants from warmer countries than this climate, require in their infancy protection from severe frosts and snow, by coverings of mats or glass frames. The pots should be plunged in old tan, rotten leaves of trees, or light earth. When the weather is open, the coverings should be removed.

Tender seedling plants in beds should be sheltered in bad weather, by being arched over with hoops, and mats thrown over them.

On the HOT-HOUSES,

For March.

In this month, if the fruiting pines have been kept on in a growing state, and the plants large enough, several of them will be shewing fruit strongly; and those that may have come up in December and January, will be swelling as fast as can be expected at this season of the year.

In case the plants were not dressed, and the heat of the tan-bed increased last month, it ought to be done about the beginning or middle of this month. *For the manner of performing the work, look at the directions given for that purpose in February. See also* Chap. XII.

If the bark bed was augmented last month with new bark, let it be now examined, and keep the tan close to the sides of the pots, that the roots may have the advantage of the moist heat of the tan; and if the pots stand above the surface of the bed, examine well the heat in it, and if you are sure the plants will bear more bottom heat, lay in a layer of tan among the pots. Set the pots level that they may hold water, and make the surface of the bed level among them. *See* Chap. XII.

In this month the plants will require to be watered, if the weather be tolerably mild and much sunshine, once or twice all over their leaves. Do this in a fine morning, with water about 85 degrees warm. Wash them well, till every part of them be perfectly clean, and keep up a strong heat in the house all day; but take care not to water the fruit while it is in blossom. If there be a sufficient heat kept in the bed, and in the air of the house, the plants will want water three or four times in the course of this month. Let the water not be less than 80 degrees warm.

If any fungous stuff grow up in the tan about the pots, clear it away, and keep the surface of the bed and pots free of weeds.

If you have any succession pines a year old or more, they may be shifted in this month.

Having a bed prepared for them, strong enough to raise a good heat, take the plants and tie their leaves together carefully; then turn them out one after another, and cut

all their roots off close to the stem; and if the stems of them be bare of roots, or appear rotting or black, cut a part of them off up to the quick. Rub the mould clean from the stems, divest them of a few of the lower leaves, and pot them in good rich mould, in small pots suitable to the size of the plants, and plunge them in the tan up to their rims.

Let all this work be done in one day, if it be convenient. Keep a strong heat about them, and give them no air nor water till they have struck root and begin to grow; but, remember, the earth should be moist in which they are potted, for no plant can make roots without moisture. Plant now any crowns or suckers which were taken off late in the autumn. *See* Chap. XII.

To make some of your fruit swell very large, prevent all suckers from growing on the plants. You may destroy them by twisting out their hearts with a sharp-pointed stick, or a piece of iron about eighteen inches long. This, however, should not be made a general practice. It is contrary to nature; and I never knew it to make the fruit swell much larger than if the suckers had been left to grow. If pine apple plants be in a good growing state, as soon as the fruit shews itself, one or two suckers may be observed coming up beside its stem. If more than two or three suckers begin to grow out of the stem, they should be destroyed, unless they are so near the earth as to make roots into it, which will strengthen them without robbing the fruit.

Take care of the succession pines. Keep a good heat in the tan bed, according to the directions given in the former months, and water them when they want it. In this month, if the weather prove fine, sprinkle water, warmed to 80 degrees, all over them, till their leaves be thoroughly cleared from dust.

The succession plants in pits, without fire, should be attended to daily. Cover them up in the afternoon about five o'clock, and uncover them about seven or eight in the morning. See that there be always a kind growing heat in the tan, for they should be kept growing constantly.

Examine the linings, and if the heat be much declined, lay off any fresh dung on the top, and wheel away the rotten; then bring hot new dung, and mix up with that which came from the top.

Height of the Thermometer in the Hot-House, shewing the Temperature of the Air in it, for March.

D.	M.	N.	E.	D.	M.	N.	E.
1	68	90	69	17	67	72	66
2	65	94	68	18	64	90	66
3	65	90	65	19	63	90	65
4	63	90	65	20	68	75	67
5	65	95	64	21	65	80	66
6	61	65	62	22	71	74	70
7	60	66	62	23	71	90	68
8	62	87	62	24	70	90	70
9	62	68	65	25	66	90	70
10	65	90	65	26	70	74	65
11	65	78	70	27	65	74	68
12	66	88	68	28	65	74	67
13	65	84	68	29	60	90	65
14	60	74	68	30	65	73	62
15	68	70	67	31	78	65	62
16	69	87	72				

The grape vines will now and then require examination. Take off any useless shoots or leaves, and tie up those shoots and bunches that want it. If the berries set too thick, thin out some of the smallest of them with a pair of scissars.

Plant kidney beans in pots, to succeed those planted last month.

Kidney beans that are in full bearing will need plenty of water. Sprinkle them over the leaves frequently with clean water about 70 degrees warm.

If the kidney beans in bearing get crowded with leaves, thin out the oldest ones regularly.

Do not neglect to examine the exotic plants daily. Those on warm flues will need water frequently.

Take dead leaves off all kinds of plants, and keep the houses constantly in a clean sweet condition.

Open the glasses every fine day, to let fresh air in among the plants.

In the hot-house may be sown, in pots of earth, the seeds of annual exotics, such as balsam, tricolor, sensitive plant, egg plant, globe amaranthus, &c.

If there are any fig trees in pots in the hot-house forcing, give them plenty of water, and keep the earth in the pots free of weeds.

On the GREEN-HOUSE,

For March.

About the middle of this month a hot-bed may be made for seeds of green-house plants. Sow them in pots in light earth, and plunge them in the bed in old tan, and put the glasses on them.

Sprinkle the pots frequently with water, and when the plants begin to appear, give them fresh air daily, to bring them up as hardy as they can bear.

Green-house plants may now be raised. Plant four or five cuttings in each pot, and plunge them in a frame. Till they begin to grow, let them have as great a heat as the sun can raise, without any air being admitted.

If it can be done conveniently, it would do the green-house plants good to put some fresh earth on the tops of the pots. Loosen a little of the earth on the surface of them, and take it off; then fill the pots nearly full of fresh earth, leaving only about half an inch deep empty all over, to hold water.

Lemon and orange stocks, which were budded last summer, may, if the buds appear to have united well, be headed down in this month. The buds of these would be forwarded greatly, if the pots were plunged in a tan or dung pit, in a gentle heat.

Myrtles, orange, lemon, and other kinds of trees and plants in the green-house, whose heads have become irregular, may be cut down, and pruned in such a way as to endeavour to cause them, in the course of the summer, to form a regular shape.

The plants will require to be often watered in this month. Examine them every day; for there are some sorts which require water more frequently than others.

If the nights are frosty, make a gentle fire in the evening, and give plenty of air in fine days.

In rainy days, when people cannot work out of doors, wash, with a sponge, the leaves and stems of orange, lemon, and other hardy-leaved plants. The leaves of green-house plants in gloomy houses are liable to contract filth during their confinement, particularly if insects are

suffered to harbour on them. In fine weather it would do the plants good to wash them occasionally, in a morning, all over their leaves with clean water, out of a squirt or engine.

On the FORCING-HOUSES,

For March.

As the days get long the grape vines will grow quickly; they will therefore be wanting something done to them frequently. Train up the long shoots neatly, stop all those that require it, and thin the leaves regularly, so that the fruit may not be hindered from growing by a superabundance of leaves or shoots. Let the thermometer be not lower than about 60 in the morning, and rise up in the course of the day to 75 and 80, and higher with sunshine and air at it.

Water the borders in the house, and sprinkle them and the flues now and then with sweet clean water. If this be attended to, and air given in fine days, the house will be kept in a sweet state.

The vines may sometimes be watered all over; but if this kind of watering is practised, it should be done carefully; for I have seen grapes much hurt with the decaying paint having been driven from the rafters and other parts of the house on them, by the force of the water.

If the paths, flues, and borders in the house be sprinkled and watered occasionally as I have directed, grape vines will do without giving them water over their leaves and fruit, at this season of the year; though I by no means disapprove of washing them well, now and then, all over, leaves and fruit, provided it be done with clean water, and no filth driven on them from any part of the house.

Pots of peaches, nectarines, cherries, &c. in the grape house, should be attended to. See that they be duly watered, kept clean of weeds, and that insects do not hurt them.

The leaves of the strawberry plants in pots should be thinned, and their runners cut off, as soon as they appear,

and give them water when they begin to get dry. Smoke the house with tobacco once in eight or ten days, or before the insects begin to breed on them.

Plants in pots of the cherry, peach, nectarine, fig, currant, &c. may still be taken into the forcing-houses when there is room: if they do well, they will ripen before those in the open ground.

The cherry-house will now require much attention. Still continue to look over the trees carefully, and destroy all sorts of insects that can be catched with the hand. Nip off all curled and decaying leaves, and keep the house clean of dust and all kind of filth.

Give the house plenty of air; and if the stones in the fruit are become hard, the trees may be washed all over occasionally with clean water, not too cold. Let this be done in a fine sunny morning, and take care not to spatter the fruit with any kind of dirt.

Make a fire in the evenings and in cold days, and give the house plenty of air.

The trees will bear a little more fire-heat now than in the former months.

The forward peaches and nectarines will now be swelling fast, and their shoots for the ensuing year making a rapid progress.

The heat of the house should not be lower than about 55 in the morning, and rise up progressively to about 75 in the course of the day, if the sun shine, and plenty of air be given at the same time.

Wash the trees now and then all over with clean sweet water, and raise the heat of the air in the house, for a short time after watering, a little higher than it usually is at other times.

Water the border in the house when it is in want of it, and the flues and paths with water occasionally, to help to keep the air sweet.

Make fires whenever the house requires artificial heat, and fill it full of tobacco smoke once a-week or ten days, to destroy any tender kinds of insects that may have come into it.

Inspect the trees every time in the day that you go into the house, and if any mildew begin to appear, dust a little flour of sulphur on the affected parts.

If the fruit are fairly stoned and hang too thick on the branches, thin them regularly. It is, however, the safest way to let more than is wanted remain on the trees till the stones in them become perfectly hard, after which it is seldom that many fall off till they are ripened.

Tie up the young shoots straight, cutting out all luxuriant and superfluous ones; and if the trees get too crowded with leaves, nip them off that they may not lie upon one another, nor hinder the sun from shining on the fruit in some parts of the day.

During this month, let the fig-house be kept nearly in the same state, with regard to heat and air, as the cherry-house. The fig-tree is not liable to be hurt with insects as the cherry is, though in dry seasons it may be attacked by the red spider. To prevent this, sprinkle the borders and flues of the house frequently with water, to keep the air in it wholesome and sweet; and give air every favourable opportunity, so as not to lower the heat too much.

Cherry, plum, and other fruit trees in pots in the fig-house, as also strawberries, and pots of flowers, or herbs of any kind, should be attended to in giving them water, and in keeping them clean and free of weeds.

Take care of the rose trees in the forcing-house, give them plenty of water, heat, and air, and they will blow fine. Smoke the house with tobacco occasionally to keep the green fly from them. As the days get long, those not in bloom should be washed two or three times a week all over their leaves, with clean water, from a fine rosed pot. Fires must be made every evening, and in cold gloomy days. Examine the shoots and flower buds every day, to see that insects do not hurt them. Set in fresh rose trees once or twice a week, and flower plants of such kinds as you are desirous to force into blossom early in the spring.

Grape vines in the rose-house will require constant attendance to keep them in order: they should be kept under the rafters that they do not shade the roses and other flowers; keep them moderately thin of leaves, stop the shoots before the fruit, and let the long shoots for next year be tied up straight.

On the FORCING-FRAMES,

For March.

About the beginning or middle of this month, the melon plants raised in the former months will be ready to plant in the frames, where they are to produce their fruit. Turn them out of their pots with the balls entire, and plunge them in the earth as deep as to let the ball be covered about an inch, and give them a little water to settle the earth about the roots. Keep the lights, if the air in the frames be sweet, close shut up till the plants appear to grow, and then begin to admit air, more or less, as the weather will allow. Cover up the beds well every evening, and uncover them about seven or eight o'clock in the morning. *For their general management, see* Chap. X.

Early forced cucumber plants, if they have come forward kindly, will in this month be producing fruit; they will require daily attendance. Let the shewing fruit in blossom be set, and the leaves thinned when they are too thick, and if there be any weak vines, that can be spared, cut them close home to the mother branch. The plants should not be allowed to produce too many fruit, so as to weaken them. Whether the plants be growing on a brick or on a dung bed, a strong heat must be kept up in the linings, and they should be kept as high as a few inches below the surface of the earth in which the plants grow. Do not change the linings at both sides of the bed at one time, which would cool the bed too much. Increase the earth to the roots of the plant as they extend. Give the plants a plentiful watering once a week all over their leaves, and keep up a strong heat among them. Cucumber plants may now be ridged out. If this be not done till towards the end of the month, a dung bed will do very well for them. *For the method, see* Chap. IX.

Height of the Thermometer in the Cucumber and Melon Frames, shewing the Temperature of the Air in them, for March.

D.	M.	N.	E.	D.	M.	N.	E.
1	83	68	64	16	81	85	70
2	70	82	64	17	74	83	75
3	62	82	68	18	70	89	70
4	75	85	68	19	72	82	80
5	75	85	78	20	70	77	72
6	78	88	69	21	76	74	72
7	75	80	70	22	76	75	79
8	72	85	70	23	70	88	78
9	74	90	70	24	70	65	62
10	70	75	70	25	70	74	68
11	68	68	62	26	74	67	73
12	70	87	80	27	72	80	72
13	78	78	72	28	76	87	84
14	79	88	85	29	80	88	80
15	79	89	72	30	80	87	82
				31	82	90	78

If you think you shall want them, sow melon and cucumber seeds, to succeed those sown in the preceding months. They should be sown at different times in this month, to produce a regular succession, where that practice is followed.

Take care of the asparagus in frames, and to have a regular supply, a bed should be made about the beginning of the month, and planted in the manner directed in November.

Lettuce and cauliflower plants, forcing in frames, should be attended to. The lights may be taken off in fine days, and put on in the evening, about five or six o'clock, if there be the appearance of fruit.

The frames may be entirely removed from the lettuce and cauliflower plants preserved in them during the winter. Of the lettuce plants, as many may remain to come to perfection as there is room for. Transplant the rest.

The mushrooms produced by the assistance of fire heat will probably this month come in in abundance. The fire

had best be continued in cold nights, and the bed will require some water to keep it from being too dry.

Peas in frames will require a great deal of air in fine days, and water occasionally. When a gentle shower of rain comes, take off the glasses to let it fall on them.

Plant tuberose roots in pots in rich earth; they require a bottom heat to strick them, therefore let them be put in a tan or dung bed. If the mould is moist, they must get no water till they have good roots and begin to grow.

On the KITCHEN GARDEN,

For March.

Peas and beans of all kinds must be sown in this month. Sow them at different times, to make a regular succession. When the last sowing appears coming through the ground, sow again. If this method is adopted, a constant supply may be expected.

If the spinach sown last month begin to appear, make another sowing. Draw drills between the rows of peas, drop the seed in the drills, and cover it about an inch deep.

Twice in this month sow the different sorts of cabbage seed. Sow them in beds, each sort by itself. Rake the beds, and if the ground be light beat them down with the back of the spade, or roll them with a light roller.

Now is the best time to sow a full crop of carrots. They like a deep sandy rich earth best. You may sow them in beds or otherwise, just as you think best. When they are sown, if the ground is not of a heavy stiff nature, tread it with the feet all over, and afterwards smooth it with the rake, and gather the large stones off, if there be any.

Sow a full crop of parsnips. These, though they grow best in good land, will do in any sort of ground, if there be depth for the long roots to go down. If the land be not of a binding quality, tread the seeds in before the ground is raked, or roll it after it is raked with a light roller.

This is a good time to sow onions and leeks. Sow their seeds on rich well-manured ground in beds, or broadcast. Rake in the seed and roll the ground, if it is not too wet. If you have not got a roller, tread the earth with your feet, which will do as well, only it takes more time.

Horse radish may be planted any time this month. For the method turn back to February.

Sow curled parsley. It may be sown in drills on the sides of borders, or in rows in any part of the garden. Make the rows about eighteen inches asunder, cover the seeds about an inch thick, and tread or beat them down with the rake or a spade, to keep the ground from drying too quickly, which might hinder the seeds from vegetating.

Plant garlick; and old onions which are beginning to grow for scallions.

Shallots may be planted the beginning of the month, but they generally do best when planted at an earlier period.

Potatoes of different sorts should now be planted. Being a large-rooted plant, it is an impoverisher of the ground, which should therefore be in good heart, or well manured. Cut the roots in pieces, and plant the small sorts about twenty inches or two feet row from row, and about ten or twelve inches plant from plant. Let the large sorts be thirty inches or three feet row from row, and sixteen or eighteen inches plant from plant.

Sow the seeds of chervil, coriander, cardus, borage, lovage, burnet, angelica, marigolds, &c.

Plant Jerusalem artichokes. Their roots may be cut into three or four parts, and planted about the same distance as large sorts of potatoes, two feet asunder.

Sow cress, mustard, and rape, for sallading. Sow them in drills on a border, or between the rows of peas or beans. When the last sown begin to appear, sow again, which will ensure a constant supply.

To have a regular supply of turnip, sow the seeds of the sort called the early Dutch, two or three times in the course of this month.

The mushroom beds in the open air may be uncovered every eight or ten days; pick off any weeds or litter that may be found on them; gather the fruit if there be any, and cover up the beds well to keep out the cold winds. *See* Chap. XV.

If they are required, fresh mushroom beds may now be made. The spent dung from the melon or cucumber linings, will do well for this purpose. Shake it well and make the bed about six feet wide at the bottom, tapering it up gradually to the top, that earth for the mushrooms to grow in may lie on the sides of it.

Sow the different sorts of radish once a week, to keep up a constant supply. The turnip sorts should now also be sown.

At two or three different times this month, sow the different kinds of lettuce seed. Sow them on little beds of rich earth, from which they may be transplanted at different times.

Plant cauliflower in ground well dunged, set them in rows three feet apart, and nearly two feet distance in the rows. Rows of spinach, radish, lettuce, or any other sort of low-growing plants, may be sown between the rows of them, they will be off before the cauliflower grow large.

Brocoli seed may be sown in this month for an early crop, a small bed of it will be sufficient.

Sow green and yellow savoy seed, for an early crop, and red cabbage.

Transplant lettuce of different sorts. Plant them in beds well enriched with dung, one foot row from row, and about six or eight inches plant from plant.

Now is the time to sow the seeds of sea-kail. Sow them in light sandy deep land, if you have got it, in drills about five or six feet apart, and cover them about too inches thick. In this situation they are to remain to grow to produce blanched suckers for use; when the plants come up, thin them.

About the middle of the month, sow the seeds of Brussels sprouts, green and red borecole. Sow cardoons; these may be sown in trenches, or on a bed, and transplanted into trenches in the manner that celery is done. If the seed is to be sown in the trenches, let them be about six feet row from row; make the trenches twenty inches wide, and the same depth; lay the mould up equally on each side, dig some dung into the bottom, and sow the seeds in a row, covering them about an inch deep. Some time after the plants are come up, thin them, and keep

them clear of weeds. Before they are begun to be earthed up, which is to be done in the same way as celery, let them stand about eight inches plant from plant.

When cardoons are sown in trenches, April is early enough to sow the seed; but I think it is best to sow them on a border, and transplant them into the trenches some time in summer.

In this month, sow salsafy, scorzonera, and skirrets: sow them in beds in an open situation, and if the ground be light, tread it, and rake them in, as directed for carrots.

Sow large-rooted or Hamburgh parsley. It may be sown in drills eight or nine inches apart; and when it gets strong, leave the plants three or four inches asunder.

Early in the month sow the seeds of tomatoe or love-apple. They had best be sown in pots, and set into a hot-bed to bring them quickly forward, for they will not ripen well without some kind of artificial heat; they require to be planted and trained against a wall or paling, otherwise it will be late in the season before they are ripe, in the warmest situations.

Sow capsicums for pickling: these are so hot that they can scarcely be tasted. Bring them forward like the love-apple, and plant them out in beds in the open ground, where they will ripen in the autumn.

Plant chives; this is to be done by taking off slips from the old plants; make beds for them nearly four feet wide, and plant them about seven or eight inches distant from each other.

Make new plantations of mint. This plant is propagated by slips; take them up when they are about three inches above the ground, make beds for them about three feet wide, and plant them five or six inches apart.

This month is the time to sow nasturtiums or Indian cress. The seeds may be sown in clumps, or in drills three feet asunder; put them in three or four inches seed from seed. It is a climbing plant; therefore, when the plants begin to run, they should have sticks set in the ground near them, to let them climb on, or they will creep on the ground like cucumber plants.

In this month plant cuttings or slips of wormwood, lavender, southernwood, rosemary, &c.; a shady border is the best place for them. Plant them six or seven inches

apart, and by watering them in dry weather they will make roots, and begin to grow in the course of the summer.

Any time this month plant slips of camomile, feverfew, pennyroyal, tansey, burnet, balm, &c.

Sow the seeds of buglos, orach, smallage, clary, fennel, marigolds, borage, &c.

Green and golden purslane should now be sown. Dig a bed three feet wide, and sow the seeds broadcast, and rake them in to cover them sufficiently; the seed may be sown in drill, if you choose it; they will be easier kept free of weeds.

About the beginning of the month, sow celery in a bed, on a rich warm border. The seed of this plant is very small; cover it lightly, just to let the seed vegetate, beat it gently down with the flat side of the spade, and sprinkle it frequently in dry weather with clean water. When the plants are able to bear it, transplant them into beds three or four inches apart; keep them watered in dry weather, and when they grow stout plants, set them in the trenches where they are to be blanched. I think solid celery is the best sort.

Towards the latter end of the month, or sooner, artichoke plants will require dressing. Level down the ridges of earth which were made to preserve them from frost, then proceed to take off all the superfluous suckers, leaving from four to eight of the strongest to produce fruit. When this is done, lay, if they want it, some manure among them, and dig it in cleverly about their roots. The best of the artichoke slips that were taken off, will do to make a new plantation, if it be required.

Artichokes require a rich deep soil. Before they are planted, trench the ground well about two feet deep, and put plenty of dung on it if it be poor; they love as rich a soil as any herbaceous plant I know. When the ground is dug and levelled, mark out the rows five feet apart, and set the plants in clumps, three or four in each, two feet asunder; give them water, and keep them watered in dry weather during the summer.

This month is a good time of the year to make plantations of asparagus. Young plants may be set in the beds, or the seeds sown in drills; but before this is done, the ground must be well prepared, for if asparagus is not

planted in good land well prepared, it will not produce plentiful crops, and the grass will be small.

The kind of ground which suits asparagus best, is a mellow deep loam of a brownish colour, rather of a sandy nature, not binding.

In the course of the autumn or winter before planting, let plenty of manure be laid on the ground, seven or eight inches thick is not too much; it may be rotten dung alone, or a mixture of dung and vegetable mould. Take an opening out at one end of the ground about three feet six inches deep, and three feet in width, and lay it down at the opposite end; then begin and trench the ground, which should not be trenched in the common way, but it ought to be turned over, and mixed in the manner that a dunghill is mixed, or as new and old tan are mixed in a pit for the pine apple; the labourers will, therefore, have to stand and work in the bottom of the trench, and they should chop down the dung and earth together, mixing them well as they proceed; and if there is time in frosty weather in winter, it would do it good to give it a second turning.

When the asparagus is about to be planted, level the ground; and if, from the nature of the soil, it appear not to be rich enough, put another layer of dung upon it, and dig it in as deep as the spades will turn it.

The ground being in readiness, divide it into beds four feet wide, with alleys three feet wide between the beds. Plant four rows of roots in each bed, eight inches row from row, and about the same distance plant from plant; let the plants be fine young ones of the former year from seed.

Stretch your line lengthways, beginning at the middle of the bed, and with a spade cut out a trench close to the line, about six or eight inches deep; and when one trench is opened, plant it before you open another, proceeding in this way till the whole is finished.

Keep the plants well watered in dry weather, and the beds perfectly free of weeds at all times.

If, instead of planting the roots, the seeds of asparagus are to be sown in the beds, which perhaps is the best method, draw drills, the same distance as is above directed for the plants, four inches deep; sow the seeds in them, and when they are up out of danger, thin them, leaving them about five or six inches plant from plant. Keep the

beds clear of weeds, and water the plants when they require it.

Any time this month, sow asparagus seed to raise a supply of young plants; sow them in drills two inches deep, and five or six inches apart; or the seeds may be sown broadcast, treading them in with the feet, and smoothing the beds afterwards with a rake.

In this month fork asparagus beds. Take a dung-fork, and with it dig the beds as deep as you do not injure the plants; let the earth lie fine and light, and some of it should tumble into the trenches between the beds; then rake the beds, leaving the plants covered with mould, about four or five inches thick.

Plant Indian corn. For this purpose, dig a bed of rich earth; stretch a line lengthways in the middle of it, and, at two feet distance, dig holes a foot wide, and nearly the same depth; fill them up with rotten dung to within four inches of the surface, and cover the dung four or five inches thick with mould; then, in each part above the dung, plant four or five seeds, give them a little water in dry weather, and keep them clear of weeds.

Plant slips of taragan, about six inches apart, in beds three feet wide.

In the latter end of this month, in little beds, sow the seeds of sweet marjoram, basil, and summer savory; rake the seeds in fine.

This is the time to plant liquorice: deep light ground is best for it. Trench it two feet deep, and take some slips or cuttings, growing near the surface of the ground, from the old plants; divide them into lengths about six inches long, and plant them with a dibber, about twenty inches asunder, in lines, and about ten inches plant from plant in the lines, placing them straight down, a little below the surface, and rake the ground smooth, to fill the hollows that the dibber may have left.

In this month, a full crop of onions should be sown. Sow them on rich ground, and, if it be not of a stiff nature, tread them in well with the feet; sow also parsnips, and red and white beet-root.

On the FRUIT-GARDEN,

For March.

Apricot, peach, and nectarine trees ought, in this month, to be pruned and nailed. Care should be taken in pruning and nailing these trees, that as few blossom buds be broken off as possible. Cut out carefully all cankered useless wood, and endeavour to leave a regular supply of good bearing shoots in every part of the tree. Nail the branches at regular distances, and shorten the bearing shoots, or lay them in at full length, as may appear expedient, on considering the nature and vigour of the different kinds. In whatever parts of the trees the gum, or canker, begin to appear, open the bark, and cut out the affected parts. *See* Chap. III.

If grape vines were not pruned and nailed last month, let them be finished early in this month. This plant may now be propagated either by cuttings or layers. Let the cuttings be shoots of the last year's growth, well ripened, and having their joints not far apart, and if it can be done, leave a knob of old wood at the lower end of each cutting, which should be about ten inches long; they may be planted against walls, or in a warm part of the kitchen-garden. Put them full half way into the ground, and make it firm about them, to prevent the air from drying them; water them in dry weather.

The vine may also be propagated by bending down a young shoot, and pegging a part of it a few inches into the earth, turning the point of it up five or six inches above the ground.

When cuttings of vines are designed for forcing-houses, they may be planted where they are to remain, or put singly into pots and set into a frame or forcing-house. They may be propagated by single buds, or raised from seed, which brings varieties. *See* Chap. XI.

If there are any gooseberry, currant, or raspberry bushes unpruned, it had best be done about the beginning of this month. *See* Chap. VIII.

The suckers of fig-trees may be planted, to have young plants in readiness to plant when they may be wanted.

If pear, apple, plum, or cherry-trees were not pruned and nailed the preceding months, they should be done now as soon as possible. *See* Chap. IV.

Any time in this month, fruit trees of all sorts may be planted; the fore part of the month, however, should be preferred.

If you have any kinds of fruit trees which are propagated by grafting, and that do not produce fruit of those kinds you like, you may now put grafts on them, of such sorts as you approve; and when they unite and grow, you may cut away the shoots of the original tree. By this method, you will soon have the sorts of fruit you desire. Fruit trees of every kind, before they come into blossom in the spring, may be propagated by cuttings. To effect this, cut young shoots of a moderate size, from the sort of trees desired to be propagated; cut off with them, from the parent plant, about half an inch of the preceding year's wood; smooth with a sharp knife the ends of them; then shorten the cutting to about nine or ten inches, and plant them in good earth, in small pots, one cutting in each pot; plunge the pots in rotten tan or vegetable mould, in a hot-bed, taking care that the pots be not in a heat above 80 or 85 degrees; keep them constantly in a moist state, and let the temperature of the air in the frame be kept up to as high a degree as the influence of the sun will raise. This method should be put in practice about the beginning of March. A brick cucumber bed is well adapted for this purpose, or for striking cuttings of any sort of plants which require artificial heat; because the frame is warmed by linings only, and consequently the sorts of plants in these frames cannot be hurt with too much bottom heat, unless the pits were filled with tan or dung in a state which would gender heat by fermentation. After the cuttings are well rooted, and begin to grow, begin to admit a little air gradually to the plants, to strengthen and harden. In the month of June, if they have rooted freely, their roots will have filled the pots, when they may be shifted into larger ones, or be turned out and planted in the open air. Fruit-trees propagated in this manner will do well to be kept in pots for forcing, as they do not grow so luxuriant as those grafted upon crab stocks. They will also do well for planting against low walls, or in small forcing-houses.

When the buds are beginning to push, young planted trees, against walls, or in any other situation, should be headed down, and left shorter or longer, according as the strength of each may dictate.

Strawberry plants may be planted. It is a very good time to plant the Alpine: if good plants of this sort are now planted in good ground, they will take root freely, and keep bearing all summer, if they be watered in dry weather, and are of the right kind. *See* Chap. VI.

Plantations of raspberries may be made any time this month, if they are required. If the weather happen to be dry, water them as soon as they are planted.

Dig the borders about all sorts of fruit trees that require it.

Early flowering fruit trees against walls will be coming into bloom the latter end of this month, if not before; therefore endeavour to protect them from cold wet weather as well as you can. Various kinds of coverings for them have been recommended, such as nets, mats, canvas, branches of yew, fir, laurel, hurdles, &c.

There are different opinions respecting the utility of these coverings; some preferring the one before the other, and some maintaining that, on the whole, coverings of any kind, unless they keep the blossom dry, do more hurt than good.

Those coverings that keep the trees dry, while in bloom, I think ought to be preferred; for it may be observed, that trees always set their fruit best in dry seasons.

If the blossom be fully expanded, and the fruit, which, at first, is no larger than the head of a small pin, be fairly impregnated, there is, I apprehend, less danger of its being destroyed by frost than by rain; for the minute fruit, in its most infant state, is wonderfully protected by its natural coverings, and as these are of a soft spungy nature, they resist the frost better than rain.

When wet gets at the rudiment of the fruit in its most tender state, after the opening of the flower, it is not easily dried, on account of its thick coats of covering; therefore, if there happen not to be a sufficiency of sun, heat, and air, to push the tree strongly forward in its growth, and to dry the blossom in the course of a day, it is probable that the minute fruit, even if it has received

the impregnation, will be destroyed, and drop off some days after it has been wetted.

In this month, sow the seeds of gooseberry, currant, and raspberry plants. Dig little beds of rich earth, and sow the different kinds of seeds separately; cover them with mould nearly an inch thick, rake them smooth, and beat them down with the spade flatwise; keep them watered in dry weather; transplant them the following autumn, and let them be about a foot or eighteen inches asunder; head them down early in the spring, and let them remain there till they have fruit on them, when you may make choice of the best sorts.

If you follow this method every year, you will probably obtain some valuable sorts, worthy of propagating for a general crop. This is the only way to obtain fine new varieties.

On the PLEASURE or FLOWER GARDEN,

For March.

The carnation layers which were taken off last autumn, and kept in the frames all winter in pots, may, about the end of this month, be planted in large pots to produce their flowers.

Carnations will grow in any rich loamy sandy soil; but the compost recommended by florists is to be made with the following ingredients: one half rotten horse-dung one year old, or that has been used as a hot-bed for melons; one third fresh, sound, loamy earth; one sixth coarse sea or river sand; these are to be mixed together in autumn, laid in a heap, about two feet thick, in an open exposure, and turned three or four times during winter.

When the plants are about to be potted, run the mould through a coarse sieve, then put some of it into the pots, and turn the plants out of the small pots in which they stood all the winter, taking care that the earth adhere to them in a ball about their roots; and after rubbing off about half an inch of the surface of the old mould round about the plants, cleaning them, and cutting off the decayed

leaves, the ball is to be placed in the centre of the pot, and the space filled up, between it and the sides of the pot, with the prepared mould. After the plants are all potted, set them in a warm airy part of the garden, and put an arch of hoops over them, that in case of frosty nights, drying cold winds, or heavy rains, mats may be thrown over them. It will be necessary when the carnation flower stems are eight or nine inches high, to support them with sticks thrust into the centre of the pots of earth.

Auricula plants in pots should be protected in sharp frost and rainy weather, or else their tender flower buds will be injured. Let them be protected either in a frame under glasses, or with hoops and mats cast over them; earth up, after cleaning, the surface of the pots with fresh mould, and in dry weather give them gentle waterings. Sow auricula seeds in fine mould, in pots.

The latter end of this month is a fit time to transplant most sorts of evergreens. Endeavour to take up the tenderest kinds with a ball of earth sticking to their roots.

About the beginning or middle of the month, all kinds of flowering shrubs and forest trees may be planted with safety, for ornament, either in whole plantations or scattered about in the pleasure ground.

Anemonies and ranunculuses may be planted to succeed those planted last month. As these will be in blow in warm weather, they may be set in a part of the garden where some part of the day they be shaded from the sun.

Sow now all sorts of biennial and perennial flower seeds. These may be sown in little beds separately, and raked in cleverly so as to cover the seeds sufficiently. Fresh earth should be given to the pots of scarlet lychnis, double sweet-williams, campanulas, rose campions, stocks, double wall-flowers, which were potted last autumn.

In clumps on the flower borders sow all sorts of hardy annual flower seeds, such as sunflower, lavatera, flos adonis, sweet sultan, hawk-weed, lupins, sweet peas, lark-spur, candy-tuft, dwarf lychnis, convolvulus, snails, caterpillars, &c.

Less hardy annuals may, in the beginning of this month, be sown in pots, and set in a frame or on a gentle hot-bed. India-pink, china-aster, marvel of Peru, French and African marigolds, palma christi, chrysanthemum, amaranthus, persicaria, convolvulus major, and stramoniums, require

some artificial heat in the early part of the season, to enable them to blow well in summer.

Transplant annuals that were sown in February; prick them into pots and set them in frames till they are well rooted, and then plant them in places where they are to flower; if they be hardy kinds, give them plenty of air and water when they want it.

Sow the seeds of foxglove, shrubby mallow, broad-leaved campanula, tree primrose, French honeysuckles, honesty, hellebore, hollyocks, &c.

In the borders of the flower garden or in beds, plant pinks, sweet-williams, golden rod, bachelor's button, double feverfew, French honeysuckles, Canterbury bells, foxgloves, monk's hood, tree primrose, London pride, violets, hypeticas, thrift, gentianella, double camomile, polyanthus, and others of the like kind.

If not done in the former months, dig the ground in borders or clumps between evergreen and flowering shrubs.

In this month may be planted roses, honeysuckles, dwarf almond, double flowering cherry, Virginia dogwood, candleberry myrtle, sumac, bladder nut, Persian lilac, syringo, &c.

When the weeds begin to come up, hoe and rake the borders in the shrubberies.

Edgings, when wanted, of box, thrift, thyme, daisies, pinks, lavender, suthernwood, or such like, should now be planted.

Roll gravel walks once or twice a week, and keep them free of weeds and all sorts of litter.

To make grass walks or lawns, which may be now done, having levelled the ground, sow it with rib grass, white clover, and nonsuch, rake the ground fine, and roll it well in a dry day.

New lawns and grass walks may be turfed, which gives an immediate sward: but turf cannot in many places be procured.

Grass walks and lawns should now be kept clear of worm-cast; to do this the grass must be often swept, or scatter the worm-cast about, with a pliable ash or hazel pole, and roll it frequently.

The grass on lawns will now begin to grow; it had best, therefore, be mowed before it get too long, otherwise it

will be bad to cut, and will not look well till it get two or three mowings.

The seeds of tender annuals, such as balsams, cocks-combs, globe amaranthus, double stramoniums, &c. should be sown in pots, and set into a frame or forcing-house.

Mignonette is an annual sweet plant; it should be sown in pots in the green-house, or set in frames to bring it forward early. When it is sown in the autumn, it can be preserved all winter in the green-house or in frames. All the warmth it requires is to keep the frost from it. If it be planted in the autumn and preserved through the winter, it will blossom early in the spring. It should be sown in rich, light, sandy earth. When the plants come up leave only three or four in a pot, and lay a little fine mould about them, close to their stems. They do well to transplant into pots, being set in a shady place till they have struck root.

Sow mignionette in patches on the flower borders. The beds of ranunculus, tulips, hyacinths, and anemonies, should be protected from frost, high winds, and heavy rains. Put hoops over them, and lay upon them, when required, mats, canvas, or any thing else that can be contrived. Also get some sticks prepared to support the stems of the finest of them. In putting the sticks into the ground, take care not to hurt the bulbs.

On the NURSERY-GARDEN,

For March.

Now is a good time to sow the seeds of firs, pines, cypress, evergreen oaks, cedar of lebanon, juniper, and other kinds.

In the latter end of this month, or sooner if it be a forward spring, the trees which were grafted the preceding year, should now have their shoots, which were produced last summer, shortened, that they may, the ensuing summer, make branches, to form a regular head.

Propagate all kinds of shrubs and trees, by layers and cuttings.

Trees and shrubs of all sorts may, in the course of this month, be transplanted.

In this month, the seeds of deciduous trees and shrubs may be sown. Those that bear seeds for sowing are ash, laburnum, birch, elder, larch, Scotch fir, sycamore, and many other sorts; sow them in beds separately, and cover them, according as their sorts require, about one or two inches deep: the large sorts may be sown in small drills. If the ground be light and dry, tread it after the seeds are sown, and smooth it with a rake.

Propagate vines by cuttings: plant them in beds six or seven inches apart, and water them in dry weather.

Dig the ground between the rows of trees and shrubs; and if there is any vacant ground, dig or trench it, that it may be in readiness to plant or sow.

If the spring is forward, and the weather mild, towards the end of the month, the heads of the young stocks which were budded with fruit the preceding summer, may be cut off: observe to cut the stock about four inches above the bud.

Trees of all sorts that require it, should be grafted this month.

For grafting fruit-trees, stocks raised from seed are generally preferred, although those raised from cuttings, layers, and suckers, may be used. It is generally allowed that the stock and graft should be of the same species.

The method of grafting is to cut off the head of the stock, in a sloping manner; then prepare one of the grafts with about four or five eyes; proceed to cut a slit in the stock downwards, and another in the graft upwards; thrust the graft into the stock, taking care to join the bark of each close together at one side; tie them firmly together with bass matting, and immediately cover the grafted part with well prepared clay, in an oval form, and close it securely, to prevent the sun and air from drying the parts put together before they are united.

To prepare clay for grafting, take a quantity of good clay, and mix it with some new horse and cow-dung, and a little straw cut small, and beat it well to make it tough.

There are several methods of grafting, besides the one I have described, which is called whip-grafting; cleft-grafting,

crown-grafting, root-grafting, and grafting by approach. These are not so often practised as the whip method.

Cleft-grafting is performed on stocks, from one to three inches or more in diameter. Cut off the head of the stock with a strong knife or small saw; then make a cleft in the stock, long enough to admit the graft, and keep it open with a wedge. Prepare the graft by making the lower end of it in the form of a wedge, and place it in the cleft, taking care that the rind of the graft and that of the stock meet exactly; the wedge may then be removed, binding up the part with strong bass, and putting a good covering of clay round, to keep out the wet and air till the stock unite with the graft, when it may be removed. More than one graft may be put into one stock.

In this month the seeds of sweet brier may be sown; and you may also, if you choose it, sow the seeds of many kinds of roses; by so doing, you will have a chance to obtain some new varieties, perhaps of beautiful colours.

On the HOT-HOUSES,

For April.

If the pine-apple plants intended for fruiting are in such a state as could be wished, the greater part of them will be shewing their fruit. The state of the bark-bed should be examined, the pots kept level, and the tan close to the sides of them, that the heat of the bed may not escape unnecessarily.

If the tan among the pots be sunk below the rims of them, it may be made up, if it would not make the heat at the bottoms of the pots too warm for the roots. This ought to be particularly attended to, for if the plants receive a check at this time, by destroying the roots, the swelling of the fruit will be retarded. However, let it be observed, that if the plants have had time, and really have

made strong roots, from the stems near the surface of the mould, since the tan-bed was renewed and the plants had their dressing, unless the heat be violent, there will be little danger of burning their roots; for after pine plants have been potted upwards of eighteen months, the roots that were first made begin to decay, and if the plants are kept in a vigorous growing state, fresh roots are constantly, during the spring and summer months, sprouting from the stems immediately at or near the bottom of the under leaves; and indeed, if the mould be up to the leaves, the roots will push from under them into it. In this month the fruiting pine apple plants should be watered all over their leaves, with water from 80 to 90 degrees warm, to clean and refresh them. And in this month, they will require to be watered about four or five times, if they be in a good state of growth; but the person that manages them will be the best judge how often they require watering. If the tan-bed be very warm, and likely to burn, that is, to turn of a whitish and dry colour, water may be poured into it between the pots, which will keep it from burning, and cause it to send up among the plants a healthy steam or evaporation.

A method to make some of the pine apple fruit grow very large, is not to suffer any sucker to grow on the plants. They may be destroyed by thrusting a sharp-pointed stick or iron into the centres of them, and twisting it round will destroy their hearts. This method should be but little practised: it destroys a supply of young plants, and is of no great benefit to the fruit. However, when too many suckers arise, some of them had best be taken off, or destroyed, by thrusting a sharp-pointed piece of iron into the hearts of them, twisting it about.

Give the plants water when they want it, and air every fine day. Make fires in the evening, and in cold gloomy days, keep fire-heat all day.

Height of the Thermometer in the Hot-House, shewing the Temperature of the Air in it, for April.

D.	M.	N.	E.	D.	M.	N.	E.
1	60	90	65	16	68	76	66
2	61	80	68	17	60	84	65
3	62	90	64	18	65	86	65
4	64	92	68	19	67	80	64
5	66	94	73	20	62	86	64
6	67	75	66	21	62	72	66
7	68	66	66	22	63	72	66
8	67	82	66	23	75	80	65
9	70	92	68	24	65	72	67
10	60	78	72	25	66	84	66
11	67	94	68	26	72	78	68
12	78	88	68	27	68	80	70
13	70	78	68	28	68	85	70
14	60	88	60	29	64	75	65
15	61	96	73	30	70	74	68

If the large succession pine plants, which have been planted a year or more, and it be desired that they should not fruit before the succeeding year, were not shifted and disrooted last month, let it be done in this month. Tie up their leaves, and set them out of the house. Take the rotten tan out, and carry in some new bark, to mix with the old, left in the house. Mix the old and new well together, to the depth of two feet or more, if it be necessary to do so to raise a sufficient heat.

As soon as the bed is thus prepared, proceed to shift the plants. Turn them one after another out of their pots, shake the mould from them, and cut all their roots off close, and a bit off the bottom of the stems, if they are found bare of roots, or beginning to decay. Pot the plants in rich earth, and plunge them immediately in the tan-bed, up to their rims. Keep an extraordinary heat in the house, till the plants make roots and begin to grow, then give them water, and a little air occasionally.

Large pine suckers planted last year, in August or September, may perhaps by this time have filled their pots with roots: if that be found to be the case, they had best

be put into larger pots, to prevent them from receiving a check, which probably would throw them into fruit in the summer, which would be a great disadvantage.

Get a sufficient number of pots in readiness; let them be as large as will permit mould enough to fall easily between their sides and the ball of earth about the roots of the plants; then set the plants out of the house, tying their leaves up first, to prevent them from being broken. When this is done, proceed to take the exhausted tan from the surface of the bed, and take it out, down as low as the tan which appears fresh and a good heat in it, carry in new tan to fill the pit up to its proper height, then take out an opening of the new and old tan mixed, and lay it down at the opposite end of the pit. The opening should be at least as deep as to let an equal quantity of new and old tan be mixed together. When the tan is turned and made level in the pit, tread it equally all over, and dig it deep enough to let the pots be plunged easily.

Having rich fine mould, and every thing else in readiness, proceed to shift the plants. Take off carefully a few of the bottom leaves, and turn the plants out of their pots, with the ball of mould about their roots perfectly whole, and set them in the larger pots, filling the vacancy up with the fine mould over the surface of the ball above the roots, about an inch thick, to the bottom leaves. Plunge the pots up to their rims in the tan, and when the heat in the bed rises to its full strength, give the plants a little water, to settle the mould about their roots; after this, they will need but little water till the roots are extended through the fresh mould to the sides of the pots. *See* Chap. XII.

The crowns and suckers of last year, which have not been shifted at this time, ought not to be forgotten; give them water occasionally as they appear to require it. If they are in brick pits, without fire heat, let a sufficient heat be kept up in the dung linings. Cover the glasses up in the evening about five o'clock, and uncover them in the morning about seven.

If there are grape vines in the hot-houses trained up the rafters, let them be kept in good order; keep them trained under or near the rafters, that they do not overshadow the pines. Thin the berries in the bunches, if it is required, and stop the shoots before the fruit; and train

up straight from whence they proceed the young shoots, intended to produce fruit the ensuing year.

Carry out of the hot-houses the kidney beans that have done bearing, and plant more to keep on a succession, till they come in, in the natural ground.

Water the kidney beans well that are in bearing, sprinkle their leaves frequently with clean water, if they are in a part of the house where it can be done. This will be a great mean to prevent them from the inroads of insects.

Kidney beans in a hot-house, if they be well managed, grow very strong, and keep bearing long; therefore if the leaves are not kept regularly thinned, the blossom and fruit is injured, take care then to cut off some of the old leaves now and then, as they appear to want it.

Examine exotic plants, if there are any in the houses; put a little mould on the surface, to refresh the roots; keep them free of dead leaves, and give them moderate waterings, when they require it.

If there are peach, fig, or any other kind of fruit trees in the houses in pots, in keeping them clean and giving them water, they must be attended to daily.

The seeds of exotic plants, both annual and more durable, may be sown in this month.

Take the opportunity of every fine day to give the hot-houses air. If the weather be gloomy, that it cannot be given without making the air in them too cold, keep fires occasionally in the day-time, you may then admit a little air without running the risk of lowering the heat too much.

The successions that have not been disrooted, if the weather prove fine, should be watered, about once a week or ten days, with clean water, from 75 to 80 degrees warm.

If you have any crowns or suckers, which were taken off the plants late in autumn or in winter, let them be planted in pots of rich earth, and plunged in a warm bed of tan, and they will soon strike root and grow freely.

On the GREEN-HOUSE,

For April.

The green-house plants may now be shifted if you choose it. Having light loamy earth, not of a stiff binding nature in readiness, in a fine day begin at one side of the house, and set out into some convenient place, in the open air, as many rows of plants as you can finish in one day. Then begin and trim the plants, cut off straggling naked shoots, and head down any of them that require it. Turn the plants out of their pots, and reduce the balls of earth about their roots, more or less, as may be found expedient. The outside all round the balls of those that are much matted may be shaved off with a long-bladed knife. Put them in pots large enough to let mould go easily between the pot and the roots. Tie up the branches neatly of those plants that require it, and place them in the house again in a regular manner.

Proceed day after day till they are all shifted, give them a gentle watering to settle the mould about them, and keep them for a few days a little warmer than usual. On examination, if it be found that some of the plants do not require shifting, take a little mould off the top, and replace it with fresh earth.

After the plants begin to grow, give the house plenty of air in the day-time; and when the weather is warm, leave air all night at it.

Let all kinds of plants in the green-house, such as stocks and mignionette, be taken care of; keep the mould about them free of moss and other weeds, and water them moderately occasionally, as they appear to want it.

About once a week, in fine mornings, sprinkle the plants all over till their leaves are wetted with clean water: this will clear them of dust, and accelerate their growth. If there is the appearance of the green insect on any of them, fill the house full of tobacco-smoke.

Grape vines in the green-house will now be shooting: see that they do not break by running against the glass.

On the FORCING-HOUSES,

For April.

If you have the grapes in a forcing-house in such a state of forwardness as to ripen them in the month of May, they will now be swelled to a size that you can hardly perceive them to grow larger, till the black sorts begin to change colour, and the white ones to appear of a more bright colour than at an earlier period of their swelling.

From the time that the grapes are in the state above described, till they are ripe, they will swell considerably; therefore the bunches should be examined, and if the berries on any of the bunches be so thick that they will not have room to swell, thin them carefully by twisting some off with your finger and thumb, or with a pair of pointed scissars.

Make fires every evening and morning, and in gloomy cold days keep them up all day. Sprinkle the flues now and then with clean water, and let the borders, if they are in the house, be watered plentifully.

Give air at all times when you can without lowering the heat of the house too much; a strong heat must be kept in it. It should not in general be lower than about 60 in the mornings, and it ought to rise to 75 and 85 with sun-heat and plenty of air.

See that the vines be kept in a regular state of training, and that their leaves do not become too crowded, so as to hinder the grapes from the influence of the sun beams.

Stop the shoots agreeably to the mode of management you have adopted in pruning them. If the wood that bore the crop the preceding year was all cut out, take care that long shoots be trained up from the bottom for bearing wood the ensuing year. Stop the shoots, if they require it, before the bunches. *See* Chap. XI.

Take care of all kinds of plants in pots. Peaches, figs, and cherries, require examining every day, to see if they want water, or if any of the shoots need tying up.

Strawberries in pots require water often. Their leaves should be well thinned, and the runners taken off.

Take good care of the cherry-house; give it plenty of air. The cherries will now be grown large. Give the border a good watering now and then, which will enable the trees to swell their fruit to a good size: by keeping them in a healthy growing state, the fruit will be fine-flavoured, and the trees will make strong flower buds for the ensuing season. If the fruit are not ripening, wash the trees occasionally, in a fine sunshine morning, with sweet clean water. Inspect the leaves and shoots constantly when you walk in the house, for fear that any kind of insects breed upon them.

Smoke the house once a week or ten days, which will prevent the trees from being infested with a blackish kind of insect, frequently very hurtful to cherry trees of all sorts. Make fires in the house every evening, and in cold mornings.

Peaches and nectarines designed to ripen in May will now be forward; the stones in them will have got hard, and the fruit will appear to have swelled but little for a considerable time. A good heat must be kept in the house; from 55 to 70 with fire heat is not too much, with air at the house; and in sunshine days it should rise a little above 75 degrees.

Keep the young shoots tied up regularly, and see that the trees do not get too full of leaves to hinder the fruit from the rays of the sun occasionally.

With an engine wash the trees well in a sunshine morning, with sweet clean water, about 65 degrees warm Examine the shoots frequently, and if there be the least appearance of mildew, dust the parts well with sulphur.

Make fires in time every evening, and in cold days. Do not forget to fill the house full of tobacco smoke at least once a fortnight, or oftener if you see need for it.

If the fruit are too thick on the trees, it is not too late to thin them till they begin to swell for ripening; and if the border, or any part of it, be in the inside of the house, where the rains cannot get at it, let it be kept in a moist state, by being well watered about once a week or fortnight.

Fig trees in the forcing-house will now, if the weather be fine, be bringing their fruit forward apace. The fire heat may be increased a little, and they will bear a good strong sun heat, if care be taken to keep a free circulation of air moving out and into the house.

If the border in which the fig-trees grow be in the house, keep it sufficiently watered, and keep the house in a sweet wholesome state; and if this be done, I do not think the trees need to be watered over their leaves before the following warm month.

Train the shoots to the trellice regularly, and do not suffer the trees to become over-crowded with leaves.

In case there are in the fig-house pots of peach, cherry, plum, or other kind of dwarf fruit-trees, water them before they get too dry, and endeavour to keep them clean in their leaves, and free of weeds in their pots.

Pay attention to the rose-house. The roses will blow plentifully now, the days having got long, if they are well supplied with water and other necessaries. As fast as the trees begin to blow, set them out into a cooler place. Many ladies set rose-trees in their rooms and windows, when they are in blossom; and if they were taken care of when in these situations, it would not hurt the plants: but it frequently happens that in such places they are starved for want of water, or overwatered by setting them in pans constantly full of water. In such cases all that can be done, is to pot plenty of rose-trees every season for a succession.

About this time of the year, some sorts of insects begin to be hatched, by some means, and creep out of their winter habitations. When rose-trees begin to shoot in the natural ground, if they are narrowly inspected, insects may often be seen in great numbers on them; it is therefore the safest way to smoke the house every time fresh roses are put into it: and when the rose-buds begin to push, it is a good method to examine them bud after bud, for fear a little grub make its nest in the end of any of them. *See* Chap. VII.

Make fires in the flues of the rose-house every evening, and in cold days, and give the house as much air as can be done, so as to keep it to a proper degree of heat, to cause the rose plants to grow vigorously. Keep the pots sufficiently watered, but always take care that it have a free passage through the bottoms of them.

In the rose-house, if there is room, many other kinds of flower-pots may be set to make them blossom, before they come in the open ground. Carnations, pinks, and a variety of herbaceous plants, and low-growing shrubs of different

sorts, may be forced in it; but rose-trees require the air in the house to be kept sometimes in a state to make them blow very fine, which is not suitable for many of these. However, no unnecessary space in the house ought to be left unoccupied. Several sorts of flowers will blow in the rose-house, though some may not do well; and these things will, in forcing all kinds of flowers as well as fruits, frequently happen.

Whatever sort of plants are in the rose-house, they demand daily attention, to keep them in a growing state. If you have grape vines in it, manage them the same way as those in the hot-houses. *See* Chap. XI. *page* 75.

On the FORCING-FRAMES,

For April.

If the melon plants, which were planted out early in March, have met with no interruption, but have continued in a vigorous growing state, it is likely that towards the end of this month the fruit will be set and swelling. To forward the fruit as it ought to be, to have it fine flavoured and well swelled, a strong heat must still be kept up in the linings. Examine them, and if the heat is not sufficient when the linings are kept to their full height by fresh dung, get a quantity of new dung in readiness, and having pitched on the coldest side lining, begin to carry away all the exhausted dung, laying aside those parts of it unexhausted, to mix among fresh dung. When the rotten dung is cleared away, apply the dung to the bed, by shaking it and mixing the old and new dung well together; make the lining of a width capable to raise a strong heat. When the heat rises in it, it will sink quickly; so that care must be taken to keep it to a proper height, by additional quantities of dung. *See* Chap. X.

The linings of a melon bed should never be raised above the level of the surface of the earth in which the plants grow, unless the heat of the linings is no warmer than what the air in the bed about the plants ought to be, on a medium.

Keep the melon plants moderately thin of leaves; stop the shoots a joint or two before the fruit, and cut off all superfluous shoots. If melon plants have plenty of heat and water, and be growing kindly, if their fruit do not set freely, impregnate the female blossoms in the same manner as I have directed for inducing cucumber plants to set their fruit, *see* Chap. IX.; give the plants plenty of water, about once in ten days; let the water be about 80 degrees warm, if you can get it; and let the earth be thoroughly wetted down to the dung, through which it will drain off, if it be not in a stagnated condition, which is not congenial to the plants; give as much air as you can, taking care not to lower the heat too much. They will bear a great heat. Sometimes between the great waterings sprinkle them all over with clean water, and shut them up with a strong heat: this will help to keep them on in a growing state, and prevent the red spider from hurting them. Insects are generally found thickest on plants in a weak sickly state.

Plant out more melons for a succession, and sow melon seeds to raise plants, to plant out next month.

The mushroom beds in the forcing-house will be better to have a fire made two or three times a week, if the nights are cold.

Seedlings of any kind, in melon or cucumber frames, should be attended to in giving them water, and keeping them clear of weeds.

The early forced cucumber plants will now be producing fruit, unless any misfortune has happened to them, which will sometimes happen with the management of the best and most careful gardener. Still the great thing is, to give the plants plenty of sweet healthful air and plentiful waterings, about once a week, with water about 85 degrees warm, in sunshining days, and shut the lights down immediately, which will give them a powerful moist heat, of a very reviving and nourishing nature to the plants and green swelling fruit. Whether the plants be on a dung or brick bed, the linings must be kept up to good heat, otherwise the plants will languish. When it is necessary to give more heat, having some fermented dung in readiness, take away one of the side linings, reserving that part of the dung which is unexhausted to mix with the supply of fresh; shake them both together, and make up a good lining, which in a few days will enliven the heat of the air among the plants.

If the plants be in a vigorous growing state, they will want going over at least three times a week to stop the shoots and thin the leaves; and if fruit blossoms be expanded, they should be set every day. The forenoon is the best time to do it. *See* Chap. IX.

Height of the Thermometer in the Melon and Cucumber Frames, shewing the Temperature of the Air in them, for April.

Under D. is the day of the month; under M. is the height of the thermometer in the morning; under N. is its height at noon; under E. is its height in the evening.

D.	M.	N.	E.	D.	M.	N.	E.
1	78	68	65	16	72	89	72
2	75	68	66	17	72	76	64
3	73	87	82	18	70	74	74
4	82	84	80	19	75	81	70
5	83	91	82	20	72	87	85
6	82	90	80	21	78	90	86
7	79	87	80	22	70	86	80
8	78	80	78	23	72	87	79
9	79	87	85	24	75	84	80
10	82	83	76	25	72	77	75
11	78	77	76	26	69	82	72
12	78	78	72	27	70	77	74
13	79	93	90	28	84	80	82
14	81	82	76	29	70	78	68
15	67	75	66	30	69	80	70

Sow cucumber seeds to plant under hand-glasses, and take care of the plants that are now producing fruit.

Take care and look forward to have a supply of warm dung in readiness for linings, or to make new beds for any kind of plants that require it.

This is a good time to plant tuberose roots in pots, to set in the frames to strick them, or to plant them on a gentle hot-bed, having about eight inches deep of rich earth on the surface of it. Before these plants are planted, break off the side suckers, and cut off all the last year's roots. If you choose you may plant the suckers to raise bulbs; but they are mostly brought from Holland every year, I believe.

On the KITCHEN-GARDEN,

For April.

In this month peas in the open ground will require to have earth drawn to each side of them, to make them stand upright, and when they begin to run, stake them, which will enable them to bear a larger crop than if they were suffered to trail on the ground. Observe to put the shortest stakes to the early short growing peas.

Remember to continue to sow a crop of peas whenever the last sown are appearing through the ground. By observing this rule you will have a constant supply of green peas, if the mildew or some other disease do not prevent.

Likewise observe the same rule in sowing beans of different sorts. The ground between the rows of forward sown beans will require to be hoed, and earth drawn to the stems of them.

Sow twice in this month the different kinds of cabbage seed, for a succession, and plant out young cabbage plants once a fortnight.

This month is still a good time to sow carrots and parsnips. Sow them on good ground, tread in the seeds, and smooth the ground afterwards with a rake. Also onions for a general crop may yet be sown.

Sow now the different kinds of brocoli: the seeds should be sown in beds, on a border of rich earth. If the ground is not of a stiff clayey nature, tread them in, and rake the beds.

Sow the seeds of savory, Brussels sprouts, Jerusalem kail, and red and green borecole, and red cabbage.

Sow radishes of different sorts. Some are fond of the black-rooted turnip radish; it is a good time to sow the seed of it any time this month.

To have a succession of spinach, observe to sow the seeds for a crop as soon as you see those come up which were last sown. It may be sown in drills between the rows of peas or beans.

Continue to sow, in shallow drills, turnip, radish, rape, and white mustard for sallading.

Onion and leek seeds may be sown about the beginning of this month. Tread the seeds in well, and rake the ground afterwards.

To have a constant supply of young carrots and onions, a few of their seeds should be sown two or three times a month during summer and autumn.

Cardoons may be sown about the beginning of the month on beds to transplant, or in trenches, where they are intended to be blanched.

Artichokes not yet dressed, should be done early in this month. Slip off all superfluous suckers, leaving the strongest on the stools to produce fruit, and dig in about the stools some good manure. Make a plantation, if it be wanted. Plant them in rows five feet apart, and set three or four plants in patches about two feet distant. Keep them well watered, and perhaps they may blow in the autumn.

If asparagus beds were not forked last month, they ought to be done in the beginning of this month. Asparagus seeds may still be sown.

Celery, sown early on a hot-bed, or in pots, may now be pricked out in beds of rich ground, three or four inches plant from plant, and take care to keep them well watered.

Kidney beans may be sown in this month. Draw shallow drills for them, three or four feet asunder, and put the seeds in the rows three or four inches apart. Cover them lightly, about two inches deep, and smooth the ground; but do not tread on the seeds at this period of the season.

Transplant cauliflower. Plant them in well enriched ground, trenched or dug deep: put them in rows three feet apart, and about eighteen inches plant from plant. You may sow between the drills any sort of low-growing seeds, such as radish or lettuce. Sow the seeds of brocoli for the autumn crop, let them be sown on a bed of good rich earth, and keep them watered in dry weather.

A little cauliflower seed should be sown at two different times, to make a constant succession of plants. Sow it on a rich bed of earth, and rake it carefully in.

Sow curled parsley. The best way is to sow it in a shallow drill, where it can easily be kept free of weeds, and covered in winter in hard dry frosts, when there is no snow on the ground. About the beginning of the month,

or in the middle of it, sow red and white beet-root, the seeds may be sown in drills about eight or ten inches apart, covered about two inches ; and when they come, thin regularly the plants in the rows, and keep them free of weeds.

Sow summer savory, borage, chervil, burnet, and any other seeds of herbs that may be wanted.

Raise gourds, pumpkins, and patagonian cucumbers. This last grows long and very large. To propagate these, a trench may be made in the garden, about twenty inches deep, three feet wide, and as long or short as you please. Make a bed of warm dung in the trench, about twenty inches high. When the heat is come up well, tread it and make it level, then cover it about seven or eight inches thick with rich earth, and plant the seeds four feet apart in patches, and set hand-lights on them. When they come up, thin the plants, leaving two or three in a patch. Give them water when they want it, and when the weather gets warm enough, set the glasses off.

Sow turnip seeds twice this month, that you may have a constant supply. Tread or roll the ground well after sowing the seed, and when it is coming up, if the fly begin to eat the tender plants, strew a little fine soot over them. Thin, by hoeing, the early sown crops of turnips.

Transplant lettuce every eight or ten days, and that you may have plants for this purpose, sow a few seeds every week.

If not done last month, sow as much salsafy and scorzonera and skirret seed as you think will be wanted.

Sow purslain and nasturtiums ; they are used in sallads by some people.

Now is a good time to plant slips or cuttings of sage, thyme, hyssop, lavender, suthernwood, &c.

Some of these are more easily propagated by seeds. Plant also slips of tarragon.

You should observe if the seeds of any sort of plants sown last month have failed of coming up, to replace them by sowing again the beginning of this month, or as soon as you perceive they are wanted.

When they want it, thin the early crops of onions, carrots, &c. This may be done by hand-hoeing or weeding, as you think best.

The seeds of sea-kail may still be sown : for the method turn back to March.

This is a good time to plant a full crop of potatoes. Choose a piece of good ground for this purpose, and in planting them, pick those for seed that are sound and free of disease.

Potatoes in general do not prosper in a binding soil, unless plenty of opening manure be put into it. Where the land is of a binding nature, make trenches, about thirty inches or three feet apart, and put a layer of long dung into each, and set the potatoe cuttings on the dung, in a row about twelve to eighteen inches distant, according to the sorts, cover them about four or five inches deep. The best way to do this work is to stretch the line along one side of the ground, after it has been trenched or well dug, then make the trench and finish it before you begin another; by this means you will not harden the ground by treading on it after it is planted.

There have been complaints made of, and rewards offered to cure, a disease in potatoes, called the curl. There are some sorts of potatoes more liable to be affected with this disease than others: the best way is not to plant many of such sorts, and, when any of them are planted, keep them by themselves.

I have not found out, nor have I heard of a better method to prevent disease in potatoes than to plant well ripened uninfected ones, in rich or sufficiently manured ground, as suitable to their nature as can be found; if it be winter and spring fallowed, it will meliorate it, and destroy some sorts of insects in the ground which frequently hurt potatoes. If this method is followed, unless in unfavourable seasons, there is little danger to be apprehended from disease of any kind.

To be a help to prevent infection too, I would advise that the seed be changed from one climate to another once in two or three years. In most parishes throughout the kingdom different climates are to be found, occasioned by the nature and situation of the soil.

This practice of changing the seed, which I strongly recommend as a mean to prevent disease, is opposed by a late writer on gardening. He says, "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 they 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 perchance he shall plant in land exactly similar to that in which his seed was produced?"

This is the opinion and reasoning of one who calls himself a practical gardener. How long he was in the practice, he does not say, nor do I know; but he condemns methods in general practice in England, among those gardeners who rank among the first in successful practice, without giving satisfactory reasons for doing so.

If it were right to follow his opinion in not carrying a change of potatoe-seed from one district to plant in another, it would apply to seeds of every description.

Experienced farmers are careful to procure a change of seed from other districts now and then, and gardeners have a change of seeds of most sorts every year. To be sure, potatoes are not improvable like wine; but they may be improved in a similar way as the plant which produces wine is improved. The seed produced on the stem of the potatoe may be sown, and if attention be paid in selection, some superior sorts and kinds, not very susceptible of infection or disease, may be obtained from it. That commonly called potatoe seed is the root, and not really the seed of the plant.

It is generally allowed that a change of sound potatoes for seed, from one parish or district to another, is a mean to prevent them from degeneracy; consequently they vegetate stronger, and are more able to resist disease. The reason of this, I apprehend, is the change of situation, either from a warmer to a colder climate, or the reverse. The climate, or external air near the ground, is often affected by the nature of the soil. This is evident, for it is known that some parts of the country produce crops earlier than some other parts, which are two or three degrees of latitude nearer the south.

This author, as a farther reason for not changing potatoe seed, says, "The curl has frequently been brought to places where it was never known before, by this mistaken notion." This may have happened, but that is not a sufficient reason for discontinuing the practice of changing

the seed. The curl in potatoes appears in the stems and leaves, and it may arise from the effect of the air, as well as from the seed or nature of the soil; and as the appearance of the potatoe is affected by the disease in the stem, no person should plant potatoes unless they appear sound. That author, who resided most of his days in Scotland, may have seen in that country a considerable change of climate within the compass of a few miles. In the valleys, peaches and nectarines may be seen ripe on the open walls, and wheat and other grain in perfection in the fields, while at the same time, not many miles thence, snow lies in abundance. Between two such extremes, variation of climate in which potatoes grow must subsist; these, doubtless, will have some effect on their growth when changed from the one to the other, and that effect may be the prevention of disease.

On the FRUIT-GARDEN,

For April.

All kinds of fruit-trees may be pruned and nailed in this month. The only objections I know against the practice are, a very forward spring, and that the blossoms are liable to be rubbed off. The first is a sufficient objection; but if they are in blossom before they be nailed, it must be done by a careful person; and trees in a good bearing condition can well spare a few blossoms. There is also another objection: when trees are intended to be covered, it cannot be done with some kind of coverings that are used, till they are nailed. The coverings should certainly be begun to be applied just before the blossoms open.

Fruit-trees of all kinds may now be planted. It should be endeavoured not to keep them long out of the ground, and they ought to be watered as soon as planted.

Head down all sorts of young trees lately planted, and to keep the earth moist about the roots of new planted trees, lay a little dung, not over rotten, round their stems.

About the end of the month, it will probably be time to begin to thin the fruit on apricot trees, if they be too thick;

leave more on, however, than you wish to remain, as some may drop off, and you can thin them next month, when they will be fit to make tarts, before the kernels are hard.

If the spring be forward, toward the end of the month, the vines against warm walls will have made some shoots; look over them, and break off any useless ones.

Cuttings of vines may be planted the beginning of this month, before they begin to grow.

Trees may yet be grafted if the season be backward. Late kinds of apples, plums, and pears, are the sorts that will be most likely to unite freely at this season. The wall trees should be looked over carefully, and if any mildew begin to appear, strew a little sulphur on the affected part; and if the green insect begin to make its appearance on the shoots, you may strew them over with a little fine snuff. After the fruit is set and the blossom decayed, wash the trees now and then, if the weather be dry, with clean water in fine days; this will help to invigorate them, and be a mean to prevent infection.

Keep fruit-tree borders perfectly free of weeds, and do not plant or sow any sort of vegetables near the stems of peach and nectarine trees; if you do, it will impoverish them.

Let the beds of strawberry plants be kept clean, and if the weather prove dry in this month, water them well occasionally.

If you have abundance of strawberry beds, you may mow down some of them when they are in blossom, and clear away the mowings; water the beds in dry weather, and they will put forth fresh leaves and blossoms, and you will have a chance of fruit from them after your strawberries of the same sorts are over.

If you did not sow last month the seeds of raspberry, gooseberry, and currant bushes, you may do it this month.

When coverings for fruit-trees are used to take off and put on daily, they should be put on in the afternoon, between five and six o'clock, and taken off in the morning about seven, or as early as the sun shines on them. In very cold or wet days, it would be best to let them remain on all day.

This is the best time to prune fig trees, cut out all old useless branches, and train in regularly the most promising

young shoots, about eight or ten inches apart, without shortening them.

In warm situations the early sort of figs will ripen on standards. Plant them in a row, and do not suffer them to run higher than about four feet. Secure the roots in winter from frost by long litter, and cover their branches with mats. You may drive in stakes to support the coverings.

Pear, cherry, plum, and apple trees, that are much cankered, and do not produce well, may now be headed down, if you intend not to destroy them.

On the PLEASURE or FLOWER-GARDEN,

For April.

In dry days, take the opportunity of hoeing and raking the flower borders, and pick out the weeds with the hand, where the hoe and rake cannot be conveniently used.

Edgings of box, thrift, and daisies, may still be planted; and this is the best season to clip edgings of most sorts of plants, as they are not liable to be hurt by the frost. If lavender and some other plants used for edgings are cut in the winter, if hard frost succeeded, probably it would kill them.

In dry weather, gravel walks should be turned. If their edges are bounded with grass, it should be cut even with an edging iron, and the walks swept clean, then turn the gravel so deep as to bury the surface of it, and let all that is turned be trodden and well rolled the same day.

Grass walks and lawns should be frequently rolled, and mown as often as they want it. This will produce a fine sward, and prevent worm-cast from making much appearance.

New walks and lawns sown with grass seeds in the former months, should be rolled occasionally in weather when the ground will bear the roller well.

Many flower plants of the herbaceous kind, and others, will now require to be tied up, to keep them from being broken by the wind.

If carnation layers of last year were not potted out last month, let it be done about the beginning of this month. *For the method, &c. see March.*

The seeds of carnations and pinks should now be sown. Sow them in little beds of rich earth, cover the seeds about half an inch thick, and if the ground be light, beat the surface of the beds with the spade turned flat-wise, give them water in dry weather, and keep them free of weeds.

Mignionette and stock, sown early in the spring in pots, after being previously set in the open air a few days to harden, may be planted out in beds each sort by itself, or on borders in patches among other flowers and low-growing shrubs.

Auriculas coming into bloom ought to be protected from high winds, rain, and too much sunshine. If they were left unprotected from these, the mealy dust which covers the surface of the blossoms, and is no small beauty to the flower, would be washed or blown off.

That these pretty flowers may be viewed to advantage when in bloom, a stand should be erected facing the east; the back part of the stage should be some wall or paling; it must also be covered in at the top, but the front and ends should be left open, and covered only occasionally with mats. There ought also to be five or six ranges of shelves, about six inches wide, on which the pots are to be placed; each shelf should rise a sufficient distance above the other, so that when the pots of plants are set upon them they may appear uniform.

Tender annual flowers, sown the former months in pots, in frames, or in the forcing-houses, should now be pricked out one by one in small single pots, or five or six in each pot, to be separated afterwards.

Tuberoses, which are begun to run, should be supported; they require long sticks, as the stem grows sometimes four feet high. To have a succession, more roots should be planted this month.

On the borders or vacancies in the front of shrubberies, sow the seeds of hardy annuals, to succeed those sown in the former months. Sow them in patches, and put a stick or some mark to each patch, to shew where the seeds are sown, to prevent their being cut up when the borders are hoed.

Beds of tulips, ranunculus, hyacinths, and anemonies, which are in blossom or coming into blossom, ought to be well protected from rains and hot sunshine. Tie up with short sticks the stalks of tulips and hyacinths, if they are likely to fall. Keep the beds clean of weeds, or of any thing else that may have an unsightly appearance.

If there are any plants of the herbaceous or perennial kinds, which have been in pots through the winter, let the earth on their tops be loosened and taken off, and some fresh rich earth put on in its place; give them gentle waterings two or three times a week, as they may require.

All kinds of shrubs in pots should now have fresh mould on the surface of them, be pruned and cleared of dead unsightly branches, and supplied with water in dry weather.

Let all the rose-trees in pots be pruned about the beginning of the month. After pruning, loosen their earth down to the roots, and take it all off, and replace it with some fresh rich earth, and keep them well watered in dry weather.

The seeds of biennial and perennial flowers may still be sown; sow them in little beds, each sort by itself, and water them occasionally in dry weather.

Plant the different kinds of evergreen trees and shrubs. If it be practicable, let them be taken up with some earth at their roots, place them upright in holes previously dug, break the mould fine, and lay it in among the roots; when the hole is filled up, tread the earth over the roots, and give them a good watering. Tall trees and shrubs should be tied to strong stakes, to prevent them from being blown down by the wind.

In the beginning of the month, various kinds of deciduous trees and shrubs may be planted. They must be watered constantly in dry weather during the summer, to keep them alive.

If it was not done in the latter part of last month, sow the seeds of double stramonium, egg-plant, globe-amaranthus, double-balsam, sensitive-plant, ice-plant, tricolors, cockscombs, &c. In the early stage of their growth, most of these require forcing. When they are brought forward to begin to blow in warm weather in summer, they will do in a sheltered place in the open air, or in the green-house.

Balm of gilead is a plant of the perennial kind; it may be propagated by slips or cuttings, but the general way is

to sow the seeds in pots, and set them into a forcing-house or frame. When the plants are two or three inches high, transplant them into single pots; and when they grow strong, they will stand in the open air all the summer, and in the green-house in winter.

You may now sow in the beginning of the month, if it was not done in the former one, the seeds of the tobacco plant. It grows tall and broad leaved. You may sow it in patches here and there in the shrubbery, or in a bed in the kitchen-garden. I have had the seeds of this plant shake out of the pods in autumn, lay in the ground all winter, and come up in the spring.

On the NURSERY-GARDEN,

For April.

Fruit-trees may be grafted about the beginning of the month, if they have not begun to shoot.

Hollies may be grafted with cuttings of the variegated kind; it is best to graft these on the plain holly four or five years old from seed.

The stems of trees that are required to be trained straight, ought to be done while they are pliable; tie them with bass to straight stakes, in such a way that when shaken by the wind it do not gall them.

The weeds should be hoed up every where, and picked out of the beds of young seedlings with the hand.

Plant stocks for budding and grafting upon.

In dry weather, trees and shrubs of every sort planted this spring, would be better to be watered once or twice a week.

Now is a good time to transplant phillyreas, alaternas, laurels, lauristinus, Portugal laurels, magnolias, rhododendrons, cedars, spruce firs, Weymouth pines, &c. if the weather be dry, give them water as soon as they are planted.

There is a kind of grafting called inarching, which is by some practised on trees which do not unite readily; this is a good time of the year to do it in.

The method is to have the stock planted near the tree from which the graft is to be taken, or bring it near in a pot; then take one of the branches intended to be inarched and bring it close to the stock; then in the parts of the branch and stock where they will most readily join, pare away the bark and part of the wood about three inches in length, so that the two cuts may join exactly; cut a slit upwards in the branch about an inch long, and another downwards in the stock to receive the wedge or tongue of the branch, join them so that the bark of the cut parts of them may unite; tie them together closely with strong bass, clay the part over, and when this is done, fasten the branch to a stake until they are united, when the graft may be cut from the parent plant.

The seeds of tender trees and shrubs may be sown; the beginning of this month is, by some, reckoned the best time; the seeds of the arbutus, cedar of lebanon, cypress, &c. are generally sown in large pans or boxes, for the conveniency of moving them to such situations, at different seasons, as is thought best adapted for their growth.

The seeds of sweetbrier, and roses of different kinds, may now be sown. Sow them in beds, and cover them about an inch deep, and keep them watered in dry weather.

On the HOT-HOUSES,

For May.

For those gardeners who have the management of pine apple plants, and have the opportunity of doing it, this month is a good time to begin to prepare earth of a good quality to plant them in. The following is a method which I practised with success. Make choice of a spot of old meadow land, of a loamy but not of a strong binding nature, on which make with hurdles a fold for sheep, and let them be folded on it every night for about two months, or till the surface be well enriched with their dung and

urine. Then take off the surface about six inches deep, and lay it up in a ridge, but not so large as to make it heat. When it has lain till it begin to rot, turn it over and break it well to pieces with the spade. By turning it over and breaking it occasionally, in about half a year it will be reduced into a fine mould very good for the growth of the pine-apple plant, and for orange and lemon trees, &c. Before it be used for the pine-apple plant it should be run through a coarse wire sieve.

The fruiting pines will now demand particular attendance; fires must be made in the house every evening, unless the nights are so warm that the thermometer be above 60 in the morning; and if mornings are gloomy, and no appearance of sunshine, fires should be made. The fruit will not swell well, unless a good strong heat be kept up in the tan bed also. It is better to have the pots stand out of the tan a little than to be the least deficient of bottom heat, for besides causing the roots to grow, a strong sweet heat in the tan bed raises a constant effluvia among the plants, very nourishing to them; and less fire will be wanted if a strong heat is kept up in the tan than otherwise.

On this subject of effluvia or vapours which arise in a hot-house among the plants, the publication called "Practical Gardener," said to be edited by Mr. Mean, gardener to Sir Abraham Hume, Bart, says, "To combine the support of a regular course of artificial heat with ventilation at all times of the day, and in every season of the year, is yet a desideratum. There is another imperfection attendant on a glass-case with a close-puttied roof. The vapours which escape from plants by perspiration are carried up by the volume of heated air to the top of the house, are there condensed, and fall in drops on such plants as happen to be underneath; the plants cannot but absorb some share of these excrementitious particles; and it must undoubtedly diminish their health and vigour. Every day's experience shows that the inmates of a house can be kept alive under this inconvenience. The common contrivances to which recourse has been had to prevent reabsorption of the vapours are exceedingly troublesome, and but in a small degree effective: the best of them is to *suspend flannels at night under the glazed roof to catch the vapours*; which flannels in the morning are found charged

with a part of the moisture, and are accordingly taken away. A safe evaporator is therefore a second desideratum. The device for ventilating the house and for taking away foul vapours, is suggested by the editor confessedly on theoretical grounds, and before it is entertained, it should be vigorously weighed, as a thing new and untried."

Surely the whole of the above paragraph has been written by an untried theorist, which may mislead some persons not well acquainted with the art of forcing plants into fruit by the assistance of artificial means. Now myself and other practical gardeners are quite of a different way of thinking respecting the effect of vapours arising in hot-houses among the plants therein cultivated. *See* Chap. IX. *and* Chap. XII. *page* 83 *and* 87, 88. Long experience has demonstrated that we are right in this essential branch of cultivating the pine, the melon, and the cucumber plants. If all the materials in a hot-house be of a wholesome nature, whatever moisture is raised in the air of the house by evaporation from the tan bed, from the earth, or from the perspiration of the plants, is of an agreeable salubrious congenial nature with the plants: if the temperature of heat be sufficient, it greatly promotes their growth.

When the moisture in, and the vapour or steam arising out of the fermenting bodies, whether of tan or of dung, or of leaves of trees, in hot-houses or in melon frames, or in cucumber frames, are of a sweet-smelling wholesome nature, and the temperature such as is required for the growth of the plants, there is then in each of these departments an artificial independent salubrious atmosphere, and therefore no artificial ventilation nor outward air is wanted for them till it be necessary to admit air from another atmosphere, that is from the natural one, to prevent the artificial temperature, or atmosphere, or climate, in which the plants are, from being too warm.

The leaves, nor the stems, nor the branches of plants, do not absorb moisture to feed themselves. Washing them with clean water cleanseth them, which helps to accelerate their growth, but the moisture or sap of them is taken in by their roots. They receive their food from the earth saturated with water and air. I have, in my Preliminary Instructions, shewn that there is an analogy between vegetable life and animal life. Now if a man be hungry or thirsty, let him smell to victuals or be rubbed all over with

them, or be washed with drink of any kind, they will do him no good in respect to food. These necessary articles must be received by the proper channel, the mouth, and be digested in the stomach. Besides having a number of hot-houses and forcing-frames under my management, I have seen a great many about London and in different parts of the country; but till our Practical Gardener has announced it, I have neither seen nor heard of flannel being used to prevent the condensed vapour in hot-houses from falling on the plants. I suppose the rain which falls upon the earth from the clouds is condensed vapour. It would be silly to use flannel to prevent its falling on the herbs of the field.

To exclude air from plants in a hot-house or in forcing frames of any kind would be a difficult matter. The beds of tan or of dung, and the earth in the houses, are full of air. Also the external air has a continual ingress and egress, even at the key-hole of the door, and at crevices about the frames of wood. The brick frames in which I kept pine-apple and cucumber plants all the winter, were as close as could be made, and the plants in them in winter were often covered up with four or five inches thick of mats and hay, eighteen hours in twenty-four; and when the air was in a wholesome state in the frames, I never found any ill effect though they were full of vapour from the moist tan and dung in a state of fermentation; the heat in them being about 90 degrees, sent up a continual vapour.

Examine the tan bed, and if you find the heat much on the decline, you had best give it an augmentation of fresh tan. Tie the leaves of the plants up carefully, and set them out in the open air or in a sweet dry airy shed. Carry out any much exhausted tan, and fill the pit up with new bark. Mix the new and old as deep in the pit as you think will raise and continue a good heat till the month of September, when most of the fruit will be ripened; for if it can be avoided, the plants should not be moved again till the fruit is over. Do not plunge the pots to the rims, nor above three parts of their depth, if the roots of the plants are at the bottoms of the pots. In short, you ought to put them in the tan such a depth only as you are sure the roots cannot be over-heated. The weather, some years, gets very hot in May, which causes

the tan to heat greatly, if there be a heating substance in it. Before the pots are set in the tan-bed, if it be required, pull off a few of the under leaves of the plants, and put some fresh earth on the surface close round the stem of each plant.

You need not give the house much air till the heat in the bed come up, when you may water the plants; and in this month they should be watered all over the leaves and fruit with clean water, not less than 80 degrees warm. Take care to give plenty of air and heat, otherwise the fruit will not swell well. *See* Chap. XII. *and p.* 90, 212, &c.

If the heat of the tan bed get very strong, pour some water into the middle of it, where the heat is greatest, which will prevent the tan from becoming dry; and by being moistened, it will send up a fine evaporation, which will do the pine apple plants good as well as grape vines, and any other kind of plants in the house.

In this month the pine plants should, once or twice at least, be well watered all over their leaves, and over the surface of the bed, which will cleanse them and accelerate their growth. It is likely they will require water four or five times in this month, if there happen to be much sunshine.

Let it be remembered that the heat of the tan bed at the bottoms of the pine apple plants had best be about 100 degrees warm. If it fall to about 90, a little tan may be laid in among the pots on the surface of the bed. But take care not to over-heat the roots. However, you have no need to be afraid if the heat at the bottom of the pots do not get above 110 degrees; but when it is about that height, give the plants a good watering all over their leaves occasionally, and keep a strong temperature of warm air in the house, which you may see exhibited in the following table for every day of the month. *See also* Chap. XII. *and* XIII.

Gardeners well acquainted with the culture of the pine apple will have no need for a thermometer in the tan bed, nor in the hot-house in the open air of it. To know the right heat in the tan bed without a thermometer, have a smooth stick in the tan, exactly as low as the bottom of the pots; pull it out occasionally, and taste it. If it be a little warmer than your mouth, it will do.

Height of the Thermometer in the Hot-house, shewing the Temperature of the Air in it, for May.

D.	M.	N.	E.	D.	M.	N.	E.
1	65	90	66	17	70	90	70
2	68	92	67	18	67	90	71
3	70	88	70	19	71	90	72
4	67	90	66	20	70	90	71
5	68	92	68	21	66	80	70
6	68	96	74	22	73	92	72
7	70	94	70	23	71	90	72
8	70	92	70	24	66	94	70
9	68	75	70	25	66	94	72
10	68	88	70	26	66	87	70
11	68	90	70	27	68	90	73
12	68	92	70	28	62	88	70
13	67	86	70	29	72	98	75
14	68	75	64	30	71	75	70
15	67	77	75	31	68	92	74
16	66	92	70				

The succession plants should be attended to. If those that were disrooted in any of the former months have begun to grow, give them gentle waterings as you find they require it. If there are any plants sickly, which will uot be the case if they are in good mould, and get enough of heat and water, it is not too late to cut the roots from them in the way which was directed in the preceding month.

As the sun is long above the horizon and powerful, this month is a good season of the year to begin to destroy insects on pine apple plants. Those who rear their pine plants in pits where no grape vines are, which is the best and cheapest way, may effectually kill every insect on them in the course of two or three weeks. *See the method described in* Chap. XIII.

If plants infested with insects be in hot-houses where there are grape vlnes, the heat necessary to destroy insects on plants, and on their roots, and among the tan, would be too powerful for the vines, so that in that case, not to hurt the grape vine, the insects must be got rid of in another way in the course of managing the plants. *For which see also* Chap. XIII.

Any suckers or crowns potted in the autumn, and which remain yet in the same pots, will now, if they have grown as they ought, require shifting into larger pots. Having some good mould and pots in readiness, and all other materials you want, sufficient to complete the job, begin in the morning of the first fine day you have to spare, and carry out the plants, and take all the exhausted tan out of the bed, putting in as much new as may raise the bed to its proper height. Then mix the old and new tan well together, tread it on the surface, and level and dig it up again a spit deep. Take the plants one after another, scrape the loose mould off the surface of the pots, divest the plants of as many of their bottom leaves as you see necessary; turn them out of the pots with the ball whole, put them into such sized pots as may allow of mould to fall down easy round the balls, and then plunge them regularly in the tan bed up to the rims. Keep a little stronger heat than usual in the house till the heat come up in the tan, then give plenty of air, heat, and moderate waterings when they require it; only observe that plants after fresh potting do not want so much water as they did before, till the roots begin to be matted in the new mould.

Some writers recommend that a less heat be given to succession plants than to fruiting ones. I can see no reason for making the difference, nor did I make a practice of doing it, except to young plants in winter, in pits without fire heat, which at that season could not at all times be kept to that degree of heat which might be done by the influence of fire. When succession plants are kept in a less degree of heat than that necessary for fruiting them, they require a longer time to bring them to a proper size for producing large fruit; and of course the expence of rearing them is greater than when they are kept in a vigorous growing state. Nothing better suits a pine apple, nor any fruit-bearing plant, than to keep it in a vigorous growing state, from the time it is planted till it ripen its fruit.

A heat should still be kept in the linings of those pits of pines worked with dung heat. Cover them every night with mats, to keep the cold damps from them. Plant any crowns or suckers taken off in the autumn or winter.

Set out kidney-bean plants in pots that have done bearing, and make a fresh plantation of French beans, to keep a constant supply of that vegetable.

Take care of all kinds of exotic plants in the hot-houses; this is a good time to shift any of them that want it, and to propagate them by cuttings.

If you have grape-vines in hot-houses, in a good state of bearing, the fruit will now be far advanced toward perfection; perhaps some of them may be ripe about the end of the month. All that can be done to these now, is to stop any shoots that require it, and not to suffer the bunches to become overcrowded with leaves. The berries of younger grapes will require thinning.

Keep all the hot-houses clean and sweet, and sprinkle the paths and flues occasionally with water, to give them room to swell.

If you have pots of figs, peaches, or nectarines, in either of the hot-houses, endeavour to keep them clear of insects and mildew, and give them gentle waterings as often as they want it. Nothing that I know of is a more effectual preservative against the inroads of insects than to keep a good temperature of heat in the house among the plants, giving plenty of external air in fine weather, and refreshing waterings of clean soft water.

On the GREEN-HOUSE,

For May.

If the green-house plants were not shifted last month, you may do it in the beginning of this, or let them remain till you set them out for the summer. But I think it is the best way to shift them, and let them stand about three weeks in the house before they be finally turned out into the open air for the summer months.

Pick all the dead and decaying leaves off the plants, and keep the pots free of weeds. The plants will want water frequently, if they are in good health; and the house in the day-time will require all the air you can give it; leave some air at it all night, more or less, as the warmth of the nights are.

In some warm sheltered situations, green-house plants may be set out about the middle of this month; but I have known green-house plants set out about that time, even near London, which got greatly hurt by the frost afterwards. To be safe, it is best to let them be in till after the twentieth of the month, and in cold situations till the beginning of June.

This is a good time to raise green-house plants from cuttings. Many sorts will do well by planting them in pots, and setting them under hand-glasses: put six or seven in each pot, of about six inches in diameter; plunge four or more pots close together, in old tan or leaves of trees, put a hand-light over them, let the mould be watered now and then, and keep the glasses close shut till the cuttings begin to grow, then begin to give air to harden them. If they are kept moist, they ought not to be shaded in the hottest sunshine, it will not burn them. Cover them in the evening, to keep them warm during the night. Those who have frames to spare, may put cuttings in them, where, as they can have a greater heat, they take root sooner. If they be plunged in a tan, leaf, or dung bed, about 85 or 90 degrees warm, it will forward them considerably.

If orange seeds, sown early in the season in pots in a hot-bed, to raise stocks to bud on, be come up four or five inches high, they may be transplanted into single pots; put them in rich loamy earth, not of a strong binding nature, keep them in a gentle hot-bed, and water them now and then.

If it be required, any time in the month is a good season to thin, the heads of orange trees, or to head down any of them which are in a weakly or unseemly state. After orange or lemon trees are thus served, and shifted in good earth, a little bottom heat of tan or leaves of trees would benefit them.

Orange and lemon trees may be inarched, by bringing the stocks in pots near enough to the branches of the tree. *See the method described on the Green-house for April.*

If you have any seeds of green-house plants to sow, it should now be done. Sow them in pots in light earth, and keep them in the green-house, or in a frame.

Smoke the green-house with tobacco occasionally, to keep the plants free of some sorts of insects, which they are liable to be infested with.

Grape vines, in the green-house, will now be shewing fruit; break off all useless shoots, and stop any shoots, before the bunches, that may require it.

Those who have green houses with glass roofs fronting the south, or the east, or the west, should have grape vines in them: they answer very well for a late crop of grapes. When the green-house plants are set out in the beginning of summer, the air in the house from that time may be kept to a degree of temperature sufficient for ripening grapes.

On the FORCING-HOUSES,

For May.

Grapes that have been forced, so as to get the fruit ripe the latter end of this month, will require constant attention. That air enough may be admitted, fires must be continued to be made, evening and morning, (unless the weather be warm, but in the month of May and about the beginning of June the nights are frequently cold,) and kept gently up throughout cold gloomy days. Stop the shoots and tie them up, and keep the leaves moderately thin.

If you have vines in another house, begun to be forced in February or March, they will require constant attendance also; the bunches will probably require to be thinned of some of the smallest berries. Keep the house in a sweet growing temperature; the heat in the morning may be from 55 to 65, and rise up in the course of the day to 75, with the influence of artificial heat without sun. If the border, which sustains the plants, be in the house, take care that it be well supplied with water; or if it be in the outside, it may, probably, in dry warm weather, require a good watering now and then. The air in the house should be about 60 in the morning, and rise up in the course of the day to between 80 and 90 degrees, with air at it, provided the sun shine bright. *See* Chap. XI.

Peaches, nectarines, figs, and all other sorts of plants in pots, in the forcing-houses, should, by keeping them clear

of weeds, and insects if possible, and by frequent gentle waterings, be carried on in a growing state, to enable them to bring their fruit to perfection.

Smoke the houses with tobacco, about once in ten days or a fortnight, to destroy any insects that may be beginning to breed on the trees.

If you have had good success with your cherries, they will be swelling off for ripening. Give up watering them over the fruit, and give the house as much air as you can every fine day. The grubs will be gone; but it is likely the birds will fly in and eat them, if you do not contrive nets, or some other method, to keep them out.

Peaches and nectarines, begun to be forced in December or January, will, some time in this month, begin to ripen: if that be the case, they should not be watered all over their leaves and fruit, till after the fruit be gathered; give them plenty of air every day, and let fires be continued to be made in the evening, and in damp days, just to keep them in a dry moderately warm state.

Nectarines and peaches, begun to be forced in February or March, should be thinned of all superfluous shoots, and the shoots left for the following season trained out regularly, and tied up so as not to interfere with the fruit; and the trees should be so thinned of leaves, that air may have a free circulation to every part of the tree. Water the trees well in fine mornings; let the water be clean, that it do not stain the leaves or fruit. *See* Chap. III.

If you have had good success, the figs in the forcing-house will be making progress; leave no unnecessary wood on them; if any of the leading shoots be getting on before the others, or faster than you wish, nip off the tender end with your finger and thumb. If the weather happen to be hot and dry, water the trees all over with clean water; it will be the means of keeping the spider from the leaves. Keep the border, if it be in the inside, well watered; and in long continuance of dry weather, you may water it, even if it be in the outside.

Take care of pots of plants of any sort you may have in the fig-house; they should be kept free of weeds, and watered frequently in warm weather.

As the roses have done blowing in the forcing-house, they should be turned out, and more set in, if you think you want them to keep on a supply, till they begin to

blossom in the open air. Keep the plants clear of insects, by smoking with tobacco, and by watering them all over now and then, when they are not in blossom. If there are vines in the house, keep them to the rafters, and stop them as they require.

If you find it necessary, make a fire in the evenings and in cold gloomy days. Keep the rose-plants, and all other sorts of plants in the house, sufficiently watered, and free of dead leaves and weeds. *See* Chap. VII.

Transplant any young seedlings you may have raised in the rose-house, and you may sow in it the seeds of tender exotics, in pots.

On the FORCING-FRAMES,

For May.

Melons will now demand constant attention; they still require a good strong heat kept in the linings, to make the fruit swell kindly. Stop the shoots of them, and cut out all superfluous and weak ones. Let the leaves be kept moderately thin, observing to take off the decaying and oldest ones first, and suffer no weeds to grow among them.

In case they be required, the seeds of melons may be sown at any time in this month. They may either be sown in pots, to transplant, or in the place where they are intended to bear fruit. In the latter case, let the seeds be sown on a gentle hot-bed, made of leaves of trees, or of dung partly expended, by having been applied for linings to melon, cucumber, or pine beds.

If there be any frames of melons, the earth in which has not been trodden, let it be done now, if the plants be extended a foot or more.

Cover up the glasses at night with mats, and uncover them in the morning, about seven or eight o'clock, or as soon as the sun shines on them.

Water the melon plants when you perceive they want it; they will not do well, unless you give them enough of water, heat, and air. If the weather happen to be warm and dry, sprinkle them occasionally all over the leaves and fruit with

clean water, about four o'clock in the afternoon, and shut the lights close down. This method will be a mean to prevent the plants from being infected by the red spider; this destructive insect will not hurt the plants, if they are kept in a vigorous growing state. The heat among the melon plants in the morning should not be lower than 70, and in the course of the day it ought to rise as high as 85 and 90, if the sun shine. A good soaking watering all over the plants once in eight or ten days will be sufficient in general. *See* Chap. X.

To bring the best large sort of rock melons to good perfection, they require as great an atmospherical heat as the pine apple.

Remember, when the melons set and begin to swell, to put a piece of tile or slate under each, to preserve them from the damp of the earth in the bed.

If you think you are not able to keep your melons, already growing, in a bearing state all summer, you may plant out more melons to keep a succession; though bottom heat would do them good, you had better have none than too much; the plants will not grow kindly, if there is burnt earth under their stems. When the earth is what is termed burnt, it appears of a greyish colour, and does not smell sweet. The best way, at this time of the year, is to plant out melon plants on a cool, sweet bed, and make linings when it wants them; keep, if you can, a strong sun heat in the beds, for a few days after the plants are put out, and give them water as you find they want it. If you keep them moist, the greatest sun heat you can give will not injure, but make them grow quickly.

After melon plants, or cucumber plants, or plants of any kind whatever, have been shut up close for some days in a strong heat, to cause them to make roots and grow quickly, their leaves, when outward air is begun to be admitted to them, and the sun shines, are very liable to be hurt; therefore, in that case, they should be shaded with thin mats an hour or two in the heat of the day.

Give all the melon plants that require it, air every day, and in warm nights you may give them a little all night; but take care that the rank steam in the linings do not penetrate into the frames in any part where you give air, or at the bottoms of the frames.

If the fruit do not set kindly, impregnate the blossoms in the way I have directed, to enable cucumber plants to set their fruit, in Chap. IX. Melons, planted in the spring, will keep bearing all summer, if they be kept in a vigorous growing state, and too many fruit are not suffered to grow on them at one time.

In some warm parts of the country, early sorts of melons will ripen under hand-glasses. The method is to make a bed in a trench in the ground; dig the trench out about twenty inches deep, three feet wide, and as long as you have glasses to cover it; make a bed of good dung, about thirty inches high; when the heat comes up well in it, tread and level it, and lay about eight or ten inches thick of good earth all over it, smooth it with a rake, and stretch a line along the middle of it; then set the plants four feet apart, put the lights on them, give them water and a little air when they want it. When the weather comes warm, train the shoots from under the glass on fern, or tiles, &c.

Sow melon seed, to have plants to plant out next month, that you may not want a succession of them.

Remember to look forward to have always a preparation of dung in readiness for linings, or other purposes for which it may be wanted. The linings of the melon and cucumber beds will require to be raised at least once a week, to keep a sufficient heat in the frames for the growth of the plants.

To have a constant supply of cucumbers, a good heat must still be kept up in the linings, otherwise the fruit will not swell kindly. If there be a sufficient heat kept in the bed, the plants will require plentiful waterings all over their leaves about once a week. The water had best be not less than 70 degrees warm, and the lights should be shut down with a strong heat about the plants. The heat in the frames in the mornings should be about 70 in general, and rise up in the course of the day to 80, and sometimes much higher. Look over the plants frequently, stop their shoots, set the fruit in blossom, and thin out the oldest of the leaves, so that the plants do not become crowded.

In this month cucumbers should be planted out under hand glasses to bear in the open air in July and August. For this purpose choose a spot of rich ground; dig a trench in it, about three feet wide, and nearly two feet deep, and

as long as you choose; fill it up about two feet deep with warm dung. When it heats and is settled, cover it over eight or nine inches thick with rich earth, then set hand lights upon it three feet apart, and plant three plants under each light; give them a little water, and but little air till they begin to grow.

About the beginning of this month gourds, pompkins, and patagonian cucumbers, may be planted in the same way as above directed for cucumbers.

More cucumber seeds should be sown about the beginning of the month, to raise plants for planting next month, if you think they will be wanted. *See* Chap. IX.

Height of the Thermometer in the Cucumber and Melon Frames, shewing the Temperature of the Air in them, for May:

D.	M.	N.	E.	D.	M.	N.	E.
1	70	75	70	17	73	87	80
2	70	72	73	18	73	81	77
3	67	85	68	19	70	82	83
4	73	83	73	20	71	87	90
5	72	80	75	21	74	90	93
6	69	87	66	22	74	85	75
7	74	80	77	23	74	85	80
8	77	83	76	24	72	85	90
9	68	81	71	25	72	89	90
10	72	80	75	26	74	90	74
11	71	81	68	27	72	90	75
12	70	90	82	28	79	85	81
13	70	89	83	29	73	81	81
14	69	85	68	30	77	80	74
15	73	85	74	31	78	84	95
16	70	84	78				

Let the cucumber plants which were raised from seeds last month, be planted some time in this month under hand-lights. For this purpose choose a rich spot of ground in a sheltered situation. Dig out a trench about thirty inches wide and one foot deep, and as long as you please. In this trench make up a bed of good warm dung, about two feet

high. When it comes to heat, and is sunk a little, cover it about eight or nine inches thick with good rich light earth, if there be one fourth part of rotten dung or rotten leaves of trees mixed with it, so much the better. When the earth is a little warmed by the effect of the dung under, set the plants in a row in the middle of it, about three feet apart and three plants in a patch together, and keep them very warm till they have grown four or five inches long; and after that, give them a little air and increase it gradually: of course you will not forget to give them some water when they want it. Stop the plants so as to make them spread their vines horizontally.

In this month, seeds of the cucumber may be sown in the open ground. In warm situations, where the soil is of a warm light texture, they produce plenty of small fruit for pickling, when the summer season is not wet and uncommonly cold. The seeds may be sown in rows about four feet apart: they may be deposited about three inches apart; and when the plants come up and get strong, they may be thinned, leaving the strongest. Near Biggleswade, in Bedfordshire, at a place called Sandy, the early sorts of cucumber grows very well in general in the summer months. But towards the latter end of August and beginning of September, they are very liable to be affected with the mildew. This is for want of heat, I apprehend.

On the KITCHEN-GARDEN,

For May.

If it was not done in the latter end of last month, sow kidney beans, of different kinds, the beginning of this. Sow the dwarf small kinds, three feet row from row, and set them in the rows about three or four inches seed from seed. The speckled dwarf, as it grows strong and bushy in good ground, should be planted three and a half, or four feet, row from row.

Plant the scarlet and the white running French beans; they ought to be planted five feet apart in the rows; and they

may be staked with long stakes, to let them run up upon; the scarlet is the best bearer. Either of the sorts will do very well without staking, if the runners are kept constantly cut off; they will bear plentifully by using this method, and the scarlet looks very pretty, as it keeps putting forth its blossom all the summer, on conical spurs, from three to five inches long.

To have a constant supply of green peas, sow a crop as soon as you observe the last sown come fairly up above the ground. The tall growing sorts are the best for sowing at this time of the year.

Hoe the ground between the rows of peas, and if the weeds have got long, rake them off. Stake all the peas that require it; pick out the tallest stakes for the highest growing sorts, and put the stakes in firm, that the wind do not blow them down. If the ground be light in which peas are sown, tread with the feet the rows.

Set broad beans when you see the last planted come up, and hoe and draw up earth to the stems of those advancing in height. If the forward-sown beans are in blossom, cut the top of them off, which will be the means of making the beans fill quicker than if they were left unstopped. When beans are planted in light ground, tread them in well with the feet.

Plant out cabbage two or three different times in this month, to have a constant supply of fine young cabbage. If red cabbage were not planted out before, remember to plant some out about the beginning of this month.

Sow cabbage seed twice in the course of this month: all kinds of it may now be sown.

If red and white beet-root were not sown the latter end of last month, sow some the beginning of this. They may be sown in drills, about eight or ten inches apart, and covered about two inches deep; if the weather prove dry, water them now and then. If you wish them to stand thicker, sow them broadcast.

To have a constant supply of young carrots and onions, sow a few of the seeds of each about once a fortnight.

To have a succession of brocoli as regular as can be, sow the seeds at two or three different times in this month. Sow them in beds, each sort by itself; and if the land is not of a binding nature, tread in the seeds, and rake the beds afterwards.

Savoy, red and green borecole, Jerusalem kail, and Brussels sprouts, may now be sown.

Keep sowing the round-seeded spinach, to have a constant supply of it, whenever you see the last sown come through the ground. Sow it in shallow drills, between the rows of peas and beans.

Radish seed should be sown every eight or ten days; a bed of ground, shaded some part of the day, will suit it well at this time of the year, if the weather prove warm, and much sunshine.

As often as you appear to want it, to keep a constant supply, sow the seeds of white mustard, rape, cress, and turnip, for sallad. It will do best now on an east or west border, where it will be shaded a part of the day.

Prick out celery plants in beds, and water them well in dry weather. If you think you will be too scanty, sow a few celery seeds the beginning of this month; they will do to plant out in the autumn.

In this month, in warm situations, asparagus will be fit to cut. It should be observed, that when the shoots of these plants are four or five inches above ground, they are in a fit state for cutting. If the buds be covered four or five inches thick with earth, the plants may be cut when they are about three inches high. In cutting them be careful to thrust the knife down close to the side of the shoots which you intend to cut, taking care not to injure young buds that are coming up in succession.

Sow a small bed of cauliflower, every fortnight, in rich earth, and water it well in dry weather.

Plant out cauliflower once a fortnight, or every ten days, if you wish to have a constant supply of that delicate vegetable; plant them in deep rich ground, and keep them well watered.

Sow the seeds of curled parsley, draw a shallow drill for it, cover the seeds about two inches deep, and give them water in dry weather.

Transplant summer savory, borage, burnet, basil, marjoram, &c.; prick them in beds, or in pots; and set them in frames, if you wish to make them grow quickly.

Sow turnips every ten or twelve days, that you may have a constant supply of that vegetable; and thin with the hoe your former sown turnip crops. If the insects begin to eat the tops, I know nothing better than to strew a little

soot or lime over them, and water them in dry weather; the ground should be well rolled any time before they begin to make bulbs; but it is the best way to roll or tread the ground when the seeds are sown.

Some time in this month, probably, your crops of carrots and parsnips will want hoeing; cut the weeds up clean, and where the plants are too thick, cut up some of them, leaving the strongest healthy plants a regular distance from one another. The parsnips should be left seven or eight inches apart. If the carrots are to be used while young, leave them only three or four inches asunder; but if they are to remain to grow to their full size, they should be thinned to stand about six inches asunder. Let the beds of onions be thinned, hoed, or weeded with the hand, and sow some onion seeds about once a-fortnight, to keep a constant supply of young plants.

Sow the seeds of lettuce as often as may supply you with lettuce plants to plant out every week. Plant them in beds a foot, row from row, and eight or nine inches plant from plant; give them plenty of water in dry weather, and you will have fine tender lettuce, if they are planted in rich ground. Endive for an early crop may now be sown about the beginning of the month.

If scorzonera, salsafy, skirrits, &c. were neglected to be sown last month, they may be sown in the beginning of this. It will be best to sow them in drills, as you can then easily cover them well, so that they may vegetate freely, without being scorched by the hot sunshine; water them if the weather prove very dry.

If required, you may, about the beginning of the month, propagate by slips the following herbs—camomile, penny-royal, balm, mint, hyssop, savory, sage, thyme, sorrel, &c.; and you may propagate by cuttings, lavender, rosemary, rue, southernwood, &c.; plant them under a shady wall, and give them water.

If your capsicums, sown in the preceding months, are grown strong hardy plants, you may plant them out in a bed of good earth, about the middle, or toward the end of the month; if the weather prove dry, give them water.

In some families, tomatoes, or love-apples, are used for pickling when young, and for soups when ripe; they will not ripen well unless you train them up against a warm wall, or paling. Plant them in good ground, and nail them

up as they grow, and they will produce fruit plentifully: they are a great impoverisher of the ground; I would therefore advise not to plant them near peach or nectarine trees.

If you have saved any plants, to produce seeds of superior sorts, of brocoli, cauliflower, lettuce, radish, early cabbage, &c., tie the plants to stakes, to keep them from being blown down by the winds, and when they come into seed, endeavour to keep the birds from them.

In dry days, take the opportunity to hoe up weeds every where in the garden, and rake them off the borders. Weeds, if possible, ought never to be suffered to produce seeds; there are some sorts, as chickweed, groundsel, &c. which seed very early in the spring, and if they get leave to stand till they drop their seeds, the ground is not soon cleared of them.

Beds of mint may be planted the beginning of this month; draw the plants, for this purpose, out of the old beds, taking such as are about five or six inches long; take them up with roots, and plant them in good ground in rows, six or seven inches asunder, and give them water to settle the earth about their roots.

Uncover mushroom beds once a week; gather any fruit that may happen to be on them, clear them of weeds and any wet litter, put a little clean hay next the bed, and a sufficient covering on them, to keep the cold out in nights, and heavy rains from wetting the bed too much.

Plant out slips of tarragon; let a bed of good mould be dug, mark out the bed, three feet wide, and draw shallow drills in it, about a foot asunder, and plant the slips of tarragon in the drills, about seven or eight inches apart.

This is still a good time to plant potatoes, if you have not already planted enough.

On the FRUIT-GARDEN,

For May.

Let any trees which were budded last summer, be frequently looked over; take off all shoots that arise from the stocks as soon as they make their appearance; if any of these were suffered to grow, it would hinder the shoots from growing vigorously. However, if any of the buds have failed, or been broken off by accident, let a strong shoot be left to come from the stock, which may be budded in August. Tie up the shoots of new budded trees, with a bit of bass, to the part of the stock left above the bud, this will prevent their being broken by the winds till they have become strongly united to the stock.

New-grafted trees should be examined; there is no more occasion for the clay, when the graft and stock are well united; this will probably be effected by the latter end of this month, when the clay may be taken off after a shower of rain, and the bandages untied, if there is no danger of graft and stock being disunited by high winds. In cold parts of the country, the stock and bud do not unite so early in the season as in warmer parts, so that the clay on grafted plants should be suffered to remain on till the union has effectually taken place.

Keep strawberry beds clear of weeds, and in dry weather give them plenty of water.

Grape vines, against warm south walls, will now be growing fast; they should be divested of all useless shoots. Grapes do not ripen well every year on the best walls in the most sheltered situations; but they should be assisted as much as possible, by stopping the shoots at proper distances before the fruit, and nailing the shoots to the walls as soon as it can be done, and by not suffering the trees to become crowded with superfluity of leaves. Fore-right and all other shoots which are not fit for present or future bearers should now be cut off, that they may not weaken the plant or hinder the fruit from setting and swelling.

If your vines are managed in the manner practised by some, of cutting out all the old wood every year, you must take care to train up, from the bottom, a sufficient

number of young shoots, to be bearing wood for the ensuing year; and do not neglect to keep the shoots, on which your bunches are shewing, constantly stopped two or three eyes before the bunches. If they are managed in the other way, you will observe to leave enough of good shoots for bearing next season.

About this time of the year, fruit trees are often hurt by snails; they come creeping from their holes in evenings and mornings, and feed upon the young fruit and leaves of the trees. The trees should be looked over at those times, and these, and other insects, carefully picked off.

Where apricots have set too thick, they may now be thinned; if the fruit be taken off before it be stoned, it makes good tarts. All useless shoots ought to be taken from apricot trees, leaving a sufficient supply of young wood for next season. When the shoots will bear nailing, let them be trained regularly, and suffer not the trees to be overcrowded with leaves.

Apricot-trees are liable to be hurt by a grub, which rolls itself up in the leaves; they should be often looked over, and the grubs picked off, or the curled-up leaves taken away. In dry weather, wash the trees occasionally with clean water; and if the mildew begin to appear, strew a little flour of sulphur on the affected shoots.

Peach and nectarine trees ought to be carefully attended to; they should be looked over frequently, and all the fore-right and back-right shoots taken clean off, and the side shoots thinned regularly, leaving only, in every part of the trees, a sufficient number of young ones to lay in for next year's bearing wood; nip off curled leaves, for in them are probably the nests of insects. Wash the trees with clean water out of an engine, in dry weather, in fine mornings. These methods will help to keep the trees from disease and insects, by invigorating them in their growth.

It frequently happens in this month, and sometimes at an earlier period of the season, that the green fly hurts many sorts of plants, especially fruit trees. Peach and nectarine trees and cherry trees against wall are sometimes overrun with it, and it hurts rose plants and some other shrubs very much. If the smoke of tobacco could be confined about the trees for a short time, it would destroy them. In a calm evening or morning, take garden mats or canvas

cloth, which being close is the best, fasten its edges to the wall with nails, and then blow in under the cloth, with a bellows, tobacco smoke, which perhaps may destroy this kind of insect. If the weather happen to be pretty warm, the trees may be washed the morning after with an engine.

Some gardeners have recommended the washing of trees with an infusion of tobacco. The way to do it is as follows: Take about four or five pounds of tobacco stalks, boil them in three gallons of water; then fill an engine nearly full of clean water, and mix it with some of the tobacco infusion, and wash the infected trees all over with it.

As I never used this method of destroying insects, I cannot say whether it be an effectual one; but be that as it may, I think it ought not to be put in practice when the trees are in blossom. It should be remembered, that not only fruit trees of all sorts, and melons and cucumbers, and strawberry and gooseberry and currant plants set their fruit best in dry warm weather. When plants are in blossom, if wet get to the embryo of the fruit before it be impregnated with the dust of the male blossom, I conceive it will destroy it. Indeed the young fruit of peach trees, &c. are liable to be hurt by wet till they be about as large as peas. It is surprising and worth examination to observe how well the fruit of trees are sheltered and protected in their imperceptible infant state, by the wonderful parts of the flower.

If you observe the least appearance of mildew, strew some sulphur on the infected parts. If this is carefully attended to, it will stop the mildew in its progress a little.

Peaches, nectarines, apricots, cherries and plums, should be carefully looked over frequently, and all cankered parts cut to the quick. On whatever parts you see the gum making its appearance, open the bark with your knife, to let it have a free passage.

Keep the fruit borders perfectly clear of weeds by frequent hoeings and rakings; and neither plant nor sow any sort of vegetable near stems of peach and nectarine trees.

Cherry, apple, pear, and plum trees, against espaliers or walls, should be looked over towards the end of this month, and be divested of all useless and unhealthy shoots. All shoots that are produced backright or foreright, should be cut off, leaving some of the best side shoots where you

have room to train them in, in case you want some of them at next winter's pruning. You must also observe to leave all short shoots, which appear to be forming themselves into bearing buds.

If your fig-trees were not pruned last month, it may be done the beginning of this. Cut out all the weak and superfluous wood, leaving the most apparently fruitful young shoots for bearing; lay them in about eight or ten inches apart, and put the nails and shreds on them no thicker than to keep them from breaking from the wall.

If this month prove dry, all kinds of new planted fruit trees should be watered as often as they require it, to keep the earth about their roots in a moist state.

The alpine and wood strawberry may still be planted; they will probably bear in the latter end of summer, if they are kept well watered.

Those strawberry plants that were forced early, and the fruit be over, may be turned out of their pots into a bed in the open ground, and watered in dry weather, they will, perhaps, give you a second crop when others have done bearing.

If you have a superabundance of strawberry beds, it will be worth while to mow down a few of them when they are in blossom: rake all the leaves away clean, keep them clear of weeds, and watered in dry weather, and they will put out leaves and blossoms again. By this method, perhaps, you will obtain a crop of strawberries, after the sorts of the same kind you cut down are over.

The beginning of this month, if it was not done last month, is a good time to head down any old plum, pear, cherry, or apple trees, that do not produce good crops of fruit. If, the autumn before, fresh mould had been added to or dug in about their roots, the old exhausted having been removed first, it would contribute to their productiveness, for it is the want of good earth and unkind seasons, which are the chief causes of barrenness in trees.

On the PLEASURE or FLOWER-GARDEN,

For May.

If auricula plants have done blowing, this is a good time of the year to fresh pot them, which should be done annually.

The best mould for auricula plants is that of a light sandy nature, of a blackish colour, mixed with perfectly rotten dung, and a little vegetable mould, if you have got any.

A noted florist recommends a compost for auricula plants, to be made of the following ingredients: one half rotten cow dung, two years old; one sixth fresh sound earth, of an open texture; one eighth of rotten leaves; one twelfth of coarse sea or river sand; one twenty-fourth decayed willow-wood; one twenty-fourth peaty or moory earth; one twenty-fourth ashes of burnt vegetables. It should be turned over once or twice, and as often pass through a coarse screen or sieve, that it may be well mixed; let it lie a year, to have the air, frost, and sun, during which time, turn it two or three times. Having clean pots, about six inches diameter in the clear at the top, in readiness, begin to shift the plants; turn the plant carefully out of its pot, take off any unnecessary suckers, and shake the earth clean from its fibres, which should be shortened, if very long; and if the main root be long, or any way decayed, cut off a part of it. Examine each plant carefully, and if any unsound part appear, cut it out with a sharp knife: if the lower leaves are yellow, pull them off; fill the pots about three parts full of the prepared mould, and place the roots thereon, spreading them regularly, so as nearly to reach the sides of the pot, which is to be filled up with the compost mould, striking the bottom of the pot gently, two or three times, on the board on which you are shifting the plants, to make the soil firm about the roots of them; fill the pot up with earth, to within half an inch of the top. Thus proceed till they are all finished, and place the pots in an airy shady situation, free from the drip of trees or houses, till they have struck root. Plant any offsets that have been taken off the old plants; give them all a gentle watering, to settle the mould about their roots.

If you are afraid that worms get into the pots, which are hurtful to the plants, make a bed of coal ashes, half a foot thick, set rows of bricks on it, and set your pots of auriculas on the bricks, in rows.

If they are fit, you may now plant out seedling auriculas and polyanthuses; they may be pricked out in a box, or in large pots, about two or three inches apart; water them with a fine rosed pot. The seeds of polyanthus and auricula may still be sown.

For a succession of annual and biennial flowers, you may sow now heart's ease, candytuft, the white and purple, sweet allyson, hawkweed, sweet peas, convolvulus, nolana, &c.; sow them in patches in the flower borders.

Those of a less hardy kind may now be sown in the borders, such as Indian pink, French and African marigolds, marvel of Peru, chrysanthemums, persicaria, &c.

Towards the end of this month, many kinds of annuals may be planted, that were raised in the forcing-frames or houses in the former months.

Plant out in small beds, or in patches about the flower borders, stocks, mignionette, India pinks, wall-flowers, &c.

If not sown last month, sow now sweet-williams, wall-flowers, pinks, carnations, campenalas, foxgloves, hollyhocks, scabious, &c.; water them, if the weather prove dry.

Beds of curious ranunculuses, anemonies, hyacinths, and tulips, should be defended from the scorching sun, as well as as from high winds and heavy rains; when the sun shines, cast the mats over them, about ten o'clock in the morning, and take them off again in the afternoon, about four or five. If there is the appearance of rain or high wind, put them on in the evening. When this shading and sheltering is practised, it will preserve them in beauty a fortnight longer than if they were left unshaded, and the flowers will be finer.

To make a covering for hyacinths, &c. at little expence, get stakes four feet long, stick a row of them into the ground in each side of the bed eighteen inches apart; drive them a foot into the ground, and tie rods between them to reach across the bed, which will support the coverings.

Much covering, however, is not good for the bulbs of these plants: and therefore, there should be a medium observed, not to overdo them with covering.

I am informed that it is the practice in Holland, to take up the hyacinth bulbs about a month after the bloom is over; they take up the roots, and cut off the stem, but leave the fibres to it; then they place the bulbs on the bed sidewise, with their points towards the north, and cover them about an inch deep with dry earth or sand, in form of a ridge, over each row; in this state, they remain three weeks, to dry or ripen gradually, during which time, the bed is preserved from heavy rains and very hot sunshine; the bulbs are then taken up, and their fibres, which are become nearly dry, rubbed off; they are then placed in a dry room for a few days, and afterwards cleaned from any soil that sticks to them, their loose skins taken off, and the offsets that can easily be separated. This dressing being finished, the bulbs are wrapped up in pieces of paper, or buried in dry sand, where they remain till the season of planting.

Clear carnation pots of all weeds, and pick off any dead leaves from the plants; the stalks of them will now be running up to flower, they should be supported with straight stakes; thrust them into the most convenient part of the pot of mould, and tie the carnations up to them with little bits of bass, in such a way as they may run up without being bent. Examine them frequently, and if you perceive the bandages too tight, ease them a little.

Carnations are liable to be hurt by the green insect; when you find it beginning to breed, you must take care to destroy it with your finger and thumb, unless you set them into a house, and smoke them with tobacco.

Double scarlet lychnis, double rockets, double sweet-williams, and several other kinds of perennial flowers, may be propagated by cuttings. When the stalks are advanced in growth, before they begin to flower, cut some of the most promising, whose joints are pretty near each other, close down to the ground; divide them into lengths of three or four joints to each, cut them over straight, just below a joint at the bottom, plant them halfway in, in good earth, put hand-lights over them, give them water, and shade them a few hours in the middle of every hot sunshine day. If you can get slips from these kinds of plants, they will come on faster than cuttings.

Double stocks and wall-flowers may likewise be propagated by cuttings, when they cannot be readily obtained

double from seeds; if cuttings of them, four or five inches long, be pricked into little pots, in rich earth, six or seven in each, and set into frames, or under hand-lights, they will take root in a short time, if they are kept moist, and shaded a little in the middle of hot days. The seeds of wall-flowers and stocks should be sown in this month.

Tuberoses should now be taken care of; the stalks of those first sown will be advancing in height, they should have long straight sticks to support them; tie them to the sticks slackly, that they may easily run through the tyers. If you wish a succession of tuberoses, you must plant more roots, this month, in pots, and set them into a hot-bed to strike root. Those that are forward will do among the roses in the rose-house, or in the green-house, when the plants are set out. These plants are very subject to the red spider; draw their leaves now and then through your hand, which will destroy the spiders and their eggs; you may also with your hand gently rub the stalk in parts where it is hardened.

If not done before, stake all kinds of trees and shrubs that were planted last winter or spring, and keep them watered well in dry weather, otherwise you will have a chance to lose many of them.

When it is necessary to make a blind, or fill up a gap, you may yet venture to transplant some sorts of well-rooted trees and shrubs; but you must resolve to keep them well watered, and do it too, or else you need not trouble yourself to move them.

Every kind of seed lately sown, if the ground be not sufficiently moist to cause it to vegetate, will not come up in dry weather, unless you water them: but they will lie in the ground several weeks, and come up after rain.

Water, in dry weather, all sorts of flower plants lately put out, and not struck root.

If gravel walks were not turned last month, this is a good time to do it. If the edges of the walks are grass, cut them neatly, sweep all rubbish clean off the gravel, take out an opening at one end, and carry to the other; if the walk be hard, that you cannot dig it easily, loosen it with a pickaxe, and set on as many men as have room to dig; turn it over just only as deep as to turn in the surface; have a man or two to tread, level, and roll it, as fast as it is turned. This work must be done in a dry day, when the gravel is not too

wet. Remember to roll it well, as soon as you can stand upon it, after the first shower of rain.

Keep all your flower-beds free of weeds, by frequent weeding; and if you can, let no weeds make much progress among your shrubs, or on your flower borders; hoe them clean, and rake them neatly, whenever they require it.

Let the grass lawns and walks be mown when they require it. To keep them in good order, they will want mowing once a week in dry weather, and twice a week in wet weather.

Hedges of hawthorn, privet, lilac, syringo, laurels, laurustinus, elderberry, and of all other kinds of shrubs or trees, may now be clipped, to keep them in good order.

About the end of the month, you may take up any bulbous roots whose leaves are decayed; such as crocus, anemonies, snowdrops, &c.

Pots of seedlings, of any kind, should be moved into a shady situation, during the middle of hot sunshine days.

When the leaves of Guernsey lilies decay, their roots may be transplanted.

On the NURSERY-GARDEN,

For May.

The trees which were grafted in the spring should be examined, and if the grafts shoot freely, the clay may be taken off after a shower of rain; and if the bandages pinch the stocks, they should be untied, and tied again, if the graft is not firmly united to the stock. In windy situations, when the grafts shoot vigorously, it may be necessary to tie them to stakes. As soon as they appear, cut off all shoots that arise from the stocks below the graft; this should be duly attended to, that the grafts be not deprived of due nourishment. If any of the grafts have not united, or any accident happened, leave a shoot to come from the stock near the ground, which you may bud or graft upon next season.

Let the trees be looked over which were budded last summer; tie the shoots that spring from the buds, with a bit of bass, to the part of the stocks left above the buds; this will keep them from being broken off by the winds. Cut off all shoots that arise from the stocks as soon as they appear; for if they were suffered to grow, it would deprive the bud of its nourishment, and make it grow weak. If any of the buds have failed, leave a shoot from the stock to be budded next season.

There are some kinds of shrubs which strike most freely from layers of young shoots of the same, laid down the beginning of summer; the shoots of some sorts will probably be long enough for that purpose by the latter end of the month. Bend down some of the pliable branches that have made the strongest young shoots, fasten them down with strong pegs, and lay the young shoots into the earth, covering them two or three inches deep, and leave three or four inches of the top of each shoot above the ground; when they are laid, give them water, and continue to water them in dry weather. If you find the shoots are too tender, defer this business till some time next month.

Plantations of trees and shrubs of all sorts, made in the course of the spring, ought to be watered in dry weather. Cover the ground with moss round the stems of very tender shrubs; this will prevent the sun from drying the earth too fast about them.

In the middle of hot sunshine days, the seedlings of arbutus, pines, cedars, cypress, &c., would be better to be shaded.

Beds of young American plants lately transplanted, would also be better of shading in hot days; and they should be often moistened with water.

Several kinds of American tree seeds may still be sown; sow them in blackish ground not of a binding nature, cover them about an inch thick, and water them in dry weather.

Some kinds of evergreens may yet be transplanted, such as the rhododendron, arbutus, magnolia, cypress, evergreen oak, cedars, &c.; let them be well attended to in watering.

Inarching may, in this month, be practised on exotic trees, such as orange, lemon, and others, which do not readily unite by grafting. *For the method, see last month.*

If the weather be kind, great plenty of weeds will now be rising almost every where; take every opportunity, in fine days, to destroy them; a man in a day will hoe up a great many weeds in their infant state, but if the weeds are suffered to grow strong, they are not so easily destroyed; so that by cutting up the weeds when they are young, labour is saved, and the ground is not exhausted by the production of weeds.

On the HOT-HOUSES,

For June.

In this month the fruiting pines will make great progress, if the tan-bed be in a good state, and the plants well managed in every particular.

Examine the pots, and see that they stand level in the tan; if it be sunk much from the pots, raise it a little with fresh prepared bark; but inspect the heat of your bed well, that you do not have your pots plunged so deep as to injure the roots of them. If the heat of the tan at the bottom of the pots be not much above 100, it will not injure them; but it is better to have the heat about 85, than to hurt the roots by too much. A plentiful watering all over the plants and tan-bed, will bring the heat in the tan at the bottom of the pots to the same degree of heat as the water which is given it for a short time, till the heat in the tan resume its former strength. The fruit will not swell off well unless they have a lively bottom heat, and a sufficiency of water, together with a strong top heat, and plenty of air.

If the thermometer stand not below 60 in the morning and sunshine days, you will have no occasion for fires; but if the nights are cold and the days cloudy, you must have fires, otherwise you will not be able to give air enough and keep the air in the house up to a sufficient degree of heat.

Besides watering the mould in the pots in which the roots grow, water the plants and fruit all over now and

then, with water about 80 degrees warm: you may do it about eight o'clock in the morning, or in the afternoon about four or five. If you water in the afternoon, take care that there be a good heat in the house during the night.

If the weather be hot in this month, probably the plants will require water five or six times in the course of the month, if a sufficiently strong heat be kept up in the tan-bed and in the air about the plants.

Height of the Thermometer in the Hot-House, shewing the Temperature of the Air in it, for June.

D.	M.	N.	E.	D.	M.	N.	E.
1	66	83	71	16	66	85	70
2	72	94	72	17	72	98	75
3	72	90	71	18	72	100	80
4	69	90	68	19	74	102	82
5	66	94	72	20	75	98	77
6	70	95	74	21	75	97	76
7	75	97	76	22	71	98	76
8	75	98	76	23	71	90	73
9	71	100	77	24	65	95	75
10	73	98	75	25	73	98	77
11	70	97	74	26	70	90	74
12	75	98	76	27	75	94	76
13	72	96	72	28	71	92	76
14	73	93	73	29	70	91	73
15	67	90	70	30	68	100	77

The fruit when it gets large should be supported with sticks to prevent it from falling, and to make the crowns grow upright on the fruit. Were the fruit permitted to lean to one side, the crown in growing would force itself upright, and when the fruit was ripe, the crown would stand crooked on it.

If any of the fruit that showed early are ripe, set the plants out of the fruiting-house, and replace them by any that may have shown fruit among the succession plants.

Attention must now be paid to the succession plants. If those whose roots were cut off have begun to grow, give

them gentle waterings. Keep a good strong heat in the tan-bed, and admit plenty of air to them in fine days. Sprinkle their leaves occasionally with clean water, not less than 70 degrees warm, and shut them down in the afternoon with a strong heat in the house. The speediest way to know if water be of a good temperature for the pine apple and for the melon and cucumber plants in frames, is to take a mouthful of it, and if it feel neither hot nor cold, it is in a good state upwards of 85 degrees. When plants of the above sorts are watered sufficiently with water of this degree of heat, and a good atmospheric heat kept round them, they grow finely.

When large succession plants have been divested of their roots, and potted in the month of March, they will probably by this time have filled the pots with roots, if so, they ought to be shifted into pots a size larger, just large enough to admit of mould falling easily round their ball. If they were not shifted, when the roots begin to get matted, it would check them, and probably make them fruit in August or September. *See* Chap. XII.

When you water your pines recollect that some sorts require less water than others; the sorts called the queen and the sugar-loaf require rather more water than those called Antigua, black Jamaica, and some others of the large growing sorts.

Any time in this month is a good season to begin to destroy insects, which often infest and injure the pine-apple plant; this may be done by a course of good management. Upon plants in fruit I would not advise the great temperature of heated air and much watering to be practised, which I practised and recommend for the destruction of them upon succession plants, which may be easily effected in two or three weeks. *See* Chap. XIII.

If all the succession plants potted out in the autumn have not yet been shifted, let it be done about the beginning of this month. Shift them into pots just large enough to let mould go between their roots and the fresh pot. Plunge them in a bark bed, in which there is plenty of heat: give them, when they begin to grow, gentle waterings, and plenty of air and heat, and they will make good progress in growth.

If you have pines in pits, warmed with dung heat, you had best let the linings remain at them; they will keep out

the cold at nights; and if there is some heat continued in them, it will do the plants good. Continue during this month to cover them up with mats at night.

Keep your pine-houses all perfectly clean and sweet. Sprinkle the flues and paths now and then with clean water in the afternoon, and shut up the houses with a strong heat in them.

Examine all your tan-beds, and consider what time you will be in want of tan, that you may make preparation accordingly.

Whatever exotic plants are in the houses, let them be taken care of. The kidney beans in pots will be bearing plentifully; they will require plenty of water, probably once every day. Look over the plants daily, and gather those beans that are fit, before they become stringy or tough.

If you have any grape vines in hot-houses, they will be forward; take care of them. Stop the shoots before the fruit, and tie up those shoots that are appropriated for bearing next year. The vines should be kept under the rafters, and not suffered to shade the pine plants. If the weather happen to be warm and dry, the border in which the grape vines are planted should be watered plentifully. If the border have naturally a dry clay under it, it will not want so much water as if it have chalk or gravel under it. Large vines will extend their roots forty or fifty feet in search of food, if they be in good land, and be permitted.

It is a custom to have gravel walks in front of the houses in which grape vines are growing; this is not a good practice, for it hinders the rain and waterings from moistening the border, and also the roots of the vine run into the gravel and are stopped in their growth; and it hinders manure from being dug in among the roots of the plants.

To make some of your fruit grow uncommonly large, you may destroy the suckers on them; but take care, in doing it, not to hurt the plants. This method will probably make them grow a little larger than if the suckers were left, but no great deal.

On the GREEN-HOUSE,

For June.

All the green-house plants may now be set out, except very tender ones.

If the green-house be a good one, orange and lemon trees would do best to remain in it all the summer; they might have plenty of air, and there would be an opportunity of screening them from cold nights, heavy rains, and windy weather; but this method prevents the pleasure of seeing the trees standing about in the pleasure garden, and on that account must be dispensed with. After being set out of the green-house, orange and lemon trees frequently, if the weather be cold and wet, lose the green colour of their leaves, which they do not regain until the following spring, and their young fruit are apt to turn yellow and drop off. When these trees are set out of the green-house, let them stand in a sheltered situation if you have got one, and where they may have a shade in the heat of the day. If the trees do not require shifting, scrape the surface of the mould off the roots, and cover them about an inch or two thick with rich loamy earth, mixed with one-third of sheep's dung.

If orange and lemon trees require shifting, probably new and larger tubs may be wanted for them, and if the trees are large they will demand strength to shift them; perhaps a pully may be required. The earth should be, with a pointed stick, picked from the sides of the tub, to ease the ball, that it may come out of the tub nearly whole. But a better method is to knock the hoops off the tubs, and take them to pieces (a cooper can do it best), and put them together again, if the staves be sound.

Having got the tubs from the balls, shave off, with a large sharp knife, all the matted roots round the sides and bottom of the ball, and having a tub or a square wooden box large enough ready, put some mould into the bottom of it, set the ball of the plant upon it, and fill up the vacancy between the side of the tub and ball, covering the surface about an inch and a half deep round the stem of the plant. Let the mould be a rich strong loam, mixed

with some sheep's-dung well rotted, having lain to meliorate for a considerable time; or if sheep's-dung cannot be conveniently obtained, some-well rotted dung of hotbeds will do very well.

The following composition is recommended for orange and lemon trees: three eighth parts of cow-dung, which has been kept three or four years; a fourth part vegetable mould from tree leaves; one sixth part fine rich loam; and one twelfth part road grit: to this may be added one eighth part of sheep's-dung. This is certainly a rich mixture, well calculated for the growth of not only orange and lemon trees, but for the pine apple. But to go to such nicety, for which I conceive there is no occasion, it takes some years to obtain all the materials recommended.

In a garden, of which many years ago I had the management, there was a large conservatory, in which were two borders of earth, one on each side of a walk, through the middle of it, paved with stone. In these borders were planted a number of fine large orange and lemon trees, with other green-house plants intermixed. When I began to have the care of these plants, some of them looked a little sickly. To examine their state, I dug deep into the borders, and found the earth very dry about their roots. In the spring, I laid a coat of good manure on the borders, and dug it in among the roots of the plants, and afterwards gave them, and continued to give them, plentiful waterings, which revived them. They bore fine-looking fruit, but not so good in quality as those which are imported from countries where they grow naturally.

In the king's gardens at Paris, I have seen very fine orange and lemon trees, which are planted in large boxes of wood filled with rich loamy earth. They give them plentiful waterings in dry weather. The water is brought to them by a horse and water-cart, out of which the water is let run into the boxes about the stems of the plants out of a leathern pipe. On these beautiful orange and lemon trees, which in summer stand in public pleasure gardens, no fruit is suffered to grow; the blossoms are picked off, because, I suppose, if they were allowed to bear fruit, the people might break the trees in plucking off the fruit.

It appears, that from the time the orange tree is in blossom, it takes two years to ripen its fruit; and at the time it is in blossom, there is green fruit and ripe fruit upon

it. On this account it appears to me, that it cannot be forced by artificial heat, so as to ripen its fruit sufficiently. The fruit which orange and lemon trees produce in England in conservatories, or in green-houses, is far inferior to those which come from abroad.

In regard to the manner of producing their fruit, orange and lemon trees are similar to the juniper plant.

The strawberry tree blossoms in autumn, and its fruit is not ripe till twelve months afterwards.

Set all the green-house plants, if you can, in a sheltered situation, where they may have a shade in the warmest time of the day. If they were not shifted before, proceed to shift them the first fine day. Having pots, and good mould, not of a binding nature, ready, trim and cut down any of the plants that require it; then turn them out of their pots, one after another, shave the matted roots off all round the balls, and some of them may require farther reducing; put them in pots which will admit mould round the balls, cover them about an inch deep, tie the plants up neatly, and give them water to settle the mould about them.

If the fruit on orange and lemon trees be set too thick, thin them off regularly, so as not to leave the trees over burdened with fruit, which would weaken them in their growth.

In dry weather, continue to water the green-house plants moderately: see that it has a free passage through the pots, particularly the orange and lemon trees: there should be holes in the bottoms of the tubs to let the water out.

Most kinds of green-house plants may now be raised by cuttings. Get some pots and mould in readiness, then take shoots of plants from three to five inches long; let the wood of the lower end be pretty hard, and cut off just below a joint: cut the leaves from that part of them which is to be put into the ground. Prick them into the pots about two or three inches deep, according to the size of the cuttings; water them, put them into a frame or under a hand glass, and there they will take root, if they are attended to.

Several sorts of green-house plants will strike root, if they are planted in a shady border, and watered in dry weather.

When you intend to propagate succulent plants, such as cerusses, sedums, euphorbiums, indian figs, ficoidesses, &c. take the cuttings off, and lay them in a dry airy place for a fortnight or three weeks, before you plant them. In that time the cut parts will be dried, and the plants will not be so liable to rot as if they were planted immediately after being cut from the mother plant.

Transplant any seedling green-house plants which have been raised from seeds. If they are stout plants, set one into each small pot; but if any of them are small, prick three or four into a pot; give them water, and set them in a shady place in the green-house, or in a frame, till they have taken root.

After the plants are set out, let the green-house be well cleaned; and if you have got grape vines in it, give them a dressing; and you may now, as the green-house plants are out, keep it to a heat suitable for the vines.

If you have any green-house plants for which you have not room, turn them out of the pots into the borders; they will, if they are watered, live till the frost kill them; and, in the course of the summer, probably they may blossom.

Succulent plants, such as aloes, torch thistles, cotyledons, sedums, &c. do not want much water.

Orange and lemon plants raised in the spring from seed and those intended for budding, ought to be inured by degrees to stand in the open air in summer. If they are in hot-beds, they should have plenty of air, and be set into the green-house for some time before they are totally exposed to the open air.

Make cuttings of all sorts of sweet-scented green-house plants, such as the heliotropium, verbena, diosma, &c. and geraniums of different kinds, with a variety of heaths. Some of these last are not very easy struck, and therefore must be pricked into pots in sand, and bell glasses put over them. A great number of heaths are raised from seed, by the nursery-men, every year, about London.

On the FORCING HOUSES,

For June.

The grapes of the vines that were begun to be forced very early, will now be ripe; all then that is wanted to be done, is to keep the shoots tied up close to the trellice, or rafters, and give the house plenty of air: keep the air in the house dry, and endeavour to prevent the birds from getting in to eat the grapes.

Vines in a later forced house must be taken care of. Their berries will be swelling fast; if they are too thick on the bunches, thin them out carefully, which will enable the berries left to swell large, and help to make them better flavoured than if left too thick. Keep the shoots stopped a sufficient distance before the bunches, and let the long shoots, training up for next year, be constantly tied up. Thin the leaves so that they do not shade nor crowd the grapes too much. Keep the house clean and sweet. Give the plants plenty of air and heat. If the evenings are cold, make a fire in the house, and also in cold gloomy days. If the weather be dry, give the borders in which the vines be planted plentiful waterings, when you think they want it. If the grape vine be planted in the inside of the house, the rain cannot get at it, so that it must get a good watering about once a fortnight, or oftener if required.

Take care of all other plants in pots, let them be kept free of weeds, and watered when they want it.

Perhaps most of the early forced peaches will be ripe, and many of them gathered: take care of those that remain. Give the house plenty of air, and keep it dry. Tie up any of the shoots that may happen to need it: they should be tied so fast that when the trees are exposed to the open air entirely, the winds may not break them from the trellice.

The later forced peaches will demand constant attention. Let the shoots be thinned, and tied up regularly; and do not suffer the leaves to become crowded; let none of them lie on the fruit, nor on one another. The air should have a free circulation through every part of the tree. With

sun heat and plenty of air in the house, the thermometer may, in the course of the day, be let rise to 80 and 85 degrees. In the morning, if the air be not below 55, it is very well.

Wash the trees, by means of an engine, now and then, with clean water. Give the house plenty of air: and if the nights are cold and days gloomy, you had best make fires occasionally, as you find need for it. Water the border now and then plentifully, that the roots may grow freely.

Examine the trees often carefully, and if you observe any mildew, strew a little sulphur on the affected parts. Smoke the trees well with tobacco once in ten days or a fortnight, or oftener if you see need for it.

The cherries will now be ripe in the cherry-house. Let those that remain of them be taken care of. If it be found necessary, cherries will keep on the trees for some time after they are ripe, if you can keep the birds and insects from them. You may contrive to cover the parts of the house where you admit air with nets. If the meshes are narrow, the wasps and flies, as well as the birds, will be prevented from getting in. The wasps and flies mostly fly in, they therefore require room for their wings extended, otherwise they are repulsed in their attempt.

Give the house plenty of air, only do not let the rain fall on the cherries.

Keep the fig trees in your house in good order: let the shoots, if the trees are trained, be tied up neatly, and keep them moderately thin of leaves. Let the border be sufficiently watered; and the trees may, in warm weather, be watered all over their leaves: give plenty of air, and in cold nights you had best make a gentle fire in the house, taking care that the damp vapours arising from the flues may have liberty to pass freely out of the house.

About the end of the month perhaps some of the earliest sorts of figs may begin to ripen; when that is the case, you had best refrain from watering the trees over their leaves and fruit.

As the roses will, in this month, begin to blow in the open natural ground, there will be no occasion to take more pots of them into the forcing-house. Those that are in it, may be set out into the green-house, or put into any sheltered place in the open air.

If you choose to prune any of your early forced roses, they will blossom in the autumn, when most other sorts of roses have done blowing. Rose trees, when early forced, will blossom again in the month of July or August, whether they be pruned or not: but to allow them to do so weakens them of course, for it is not natural for these plants, nor any other that I know, to blossom twice in one year, unless it be what is called the double-bearing raspberry, which in the autumn bears a few fruit on the young shoots of the previous summer. Some plants however have ripe fruit and blossom on them at the same time, such as the alpine strawberry, and the juniper, orange, and lemon trees.

You will now have the rose-house at liberty for all kinds of exotic tender annuals, many of which will require to be transplanted into larger pots.

It will also be a good place to set your forward tuberoses: keep all kinds of pots of plants free of weeds, and give them gentle waterings, when they require it.

If there are vines in your rose-house, they should also be taken care of: keep them to the rafters, stop the shoots that require it, and those reserved for bearing next season tie up and train to a sufficient length before you stop them.

On the FORCING-FRAMES,

For June.

If your early melons have come on well, you perhaps will have had a few ripe fruit last or early in this month. A good heat must still be kept up in the linings to make the plants continue to grow freely. If the first ridged out plants have been kept in a healthy growing state, young fruit will be beginning to set on them, when the first crop are ripening. Give them plenty of air, and after the fruit is full swelled, you had best not let water fall on them: let them lie on dry tiles or stones, and let no leaves hang over nor lie against them; the air should have a free circulation round about them.

If you happen to have melon plants whose shoots have extended about one foot in length, tread with your feet the surface of the bed all round them home to their stems; this will hold fast the roots, and retain the moisture in the earth, so that the plants will not require water so often as if the earth was to be left in a loose hollow state.

Melons not in so forward a state should be well-managed: keep a good strong heat in the linings of the beds, and about once a week give them plenty of water all over their leaves; it should be poured on them out of rosed pots, till the earth or bed is wet, remembering that it ought to have a free passage through the beds, or else it will stagnate and send up unhealthy vapours among the plants, which will probably cause the mildew or canker to make their appearance on the shoots or leaves.

In dry weather sprinkle the plants sometimes in the afternoon about four o'clock, and shut the lights close down: continue to cover them with mats every evening, and take them off about seven in the morning. If the nights are warm, give them a little air all night; but take care that the mats do not hang down on the linings to draw the steam into the frames among the plants.

Seeds of the melon may be sown about the beginning of this month, they will ripen their fruit the latter end of the season; the seeds may be sown in the earth where they are intended to produce fruit. For this purpose make up gentle hot-beds; the dung of old linings from melon or other frames will do very well; make it as high as will raise a gentle heat, cover it over about eight or ten inches thick with good earth, then sow four or five seeds in a little hollow place under the middle of each light, set the frame and lights on, and when the plants come up, leave three of the best in each patch to produce fruit. Give no air till the plants make progress.

You should always take care to have dung in readiness to raise or renew your linings. If you have not heat enough by keeping them up to their due height, which should be a little below the level of the earth in the frames, lay aside the unexhausted dung that you may find in the linings, and when you carry away the rotten dung, mix that left and fresh dung well together, making a new lining of it. This should be done only to one side of the

bed, and when the heat in it begins to decline, you can renew the opposite lining in the same manner.

Impregnate the fruit in blossom if you think it necessary. *See the way in* Chap. IX. Cut out all superfluous shoots; stop the shoots before the fruit; and when any shoots run to the side of the frames, either turn them back or cut them off, as you think most fit. Do not let the frames be over-crowded with shoots or leaves.

In case you do not or cannot keep on your old early planted melons in a bearing state all summer, you may plant out some time in this month more melons for a late crop; they will now require no bottom heat. You may choose a bed on which was forced, early in the spring, radish, &c. Take the mould off, level it, and lay about eight or nine inches thick of good earth upon it; tread the earth gently down, set the frames on, and plant two or three plants in each light; give them a little water, put the lights on, and keep the air very warm till the plants make roots and begin to grow; then begin to admit into the frames a little outward air gradually, as you find it necessary to help to make them grow strong.

If need be, you may make a lining to the bed; but if the weather prove very warm, it is not likely that it will be wanted before August or the beginning of September; but a strong heat in the air among the plants must be kept up by some means.

In very hot days all the melons would be better to be shaded with thin mats about one or two hours in the heat of the day; they should be put on about eleven o'clock and be taken off about one o'clock. Melon or cucumber or pine apple, or any other kind of plants in frames, are only liable to be injured by powerful sun-shine at about eleven or twelve o'clock; the reason is, their being shut up in the night and exposed to outward air in the day-time, they are in a manner put into a different climate.

If you have melons under hand-lights, give them a little water when they want it; and air may be left at them day and night, which will harden them that they may be trained out about the latter end of this or the beginning of next month.

Let the cucumber plants be constantly attended to. A moderate heat in the linings must still be kept up, to enable

the plants to grow freely and produce fruit kindly. Setting the fruit in blossom must not be neglected, unless bees get in among the plants, which will probably convey the impregnating dust from the male to the female blossoms: the plants should be occasionally stopped and thinned of weak shoots and old leaves, but not so thin as at an earlier period of the season, when the influence of the sun was not so powerful. Give the plants plenty of water, and if the sun shine bright, shade them about one hour in the heat of the day.

If the weather be hot, the frames on the cucumber plants may be raised, and the vines trained from under them, regularly; keep them moderately thin of shoots, and watered once a week in warm weather. *See* Chap. IX.

Height of the Thermometer in the Melon and Cucumber Frames, shewing the Temperature of the Air in them, for June.

D.	M.	N.	E.	D.	M.	N.	E.
1	72	89	79	16	72	87	80
2	77	80	74	17	75	86	86
3	78	85	95	18	73	85	85
4	76	85	85	19	76	88	89
5	76	86	85	20	76	80	81
6	72	83	75	21	72	98	85
7	72	86	80	22	85	83	80
8	72	85	76	23	73	90	78
9	68	83	77	24	70	80	85
10	65	82	67	25	73	84	87
11	77	87	86	26	67	85	80
12	74	89	88	27	62	88	82
13	80	83	77	28	68	89	86
14	72	83	82	29	76	82	90
15	72	87	89	30	71	85	82

Cucumber plants which are under hand-lights should now be suffered to run out from under them. Let each light be raised upon three bricks, and train out the vines regularly, thinning out any weak shoots and stopping those which may be getting on before the others.

On the KITCHEN-GARDEN,

For June.

Continue to sow peas. The large patagonian and marrowfat sorts should now be sown. Sow them as before directed, when you see the last sowing through the ground. Put them in drills five or six feet asunder; cover them well in moist land that they may vegetate; if it be too dry, water the drills before you sow the peas, and if your ground be of a light nature, tread them in, which will prevent the hot sun and winds from drying the ground too hastily.

Hoe, rake, and clean the ground between your former sown crops of peas, and set stakes to any of them not yet staked.

Plant beans to succeed those sown the latter end of last month. The long-pod and mazagan are fit sorts for this plantation. Plant them about three feet row from row, and three or four inches plant from plant.

Hoe and rake between the rows of grown beans, and draw earth to the stems of any that require it.

In planting beans and sowing peas in the spring and summer, if in light dry ground, I have found it to be a good method, after placing the seeds in the drills, to tread them with the foot longwise before covering them, then cover them and tread and rake them afterwards.

In hot dry weather, peas and beans would be better to be watered.

Where small sallading is required, sow it once a week on a shady north border, or on the north side of a row of tall peas.

Endive may now be sown for a full crop. The green curled and batavian are the best kinds. They may be sown twice in this month to make a succession. Sow the seeds in beds of rich earth; tread them in, and smooth the ground with a rake; give them water in dry weather; and when the plants come up, weed and thin them if they are too thick.

Plant kidney beans to succeed those sown last month. They love a rich soil, not of a binding nature. Sow them in drills three or four feet asunder, and set the seeds in the rows three or four inches apart.

If the ground be dry, water the drills before you plant the beans; cover them about three inches deep; and if the ground be light, tread it gently with the foot above the seeds. Make two or three sowings this month at different times, to have a constant supply.

The running kinds of kidney beans should be sown four or five feet row from row; and if you have not got long stakes to let them run up upon, keep the runners cut off constantly as they appear. This method will make them bear well, and the rows will have a beautiful appearance, as the blossoms are pretty, particularly the red blossom kind, and they continue in bloom several months.

Turnip seed should be sown every ten days or fortnight. Sow it on good ground, and tread or roll in the seed well. When it is coming up, if the fly begin to appear on it, strew over the ground a little soot or lime; if this were done when the seed is sown, it would be a mean to prevent the fly.

Hoe and thin those crops of turnips that were sown the former months, and if the weather be hot and dry, the new sown turnips, as well as all of them in their different stages, should be watered every evening.

Lettuce seed should be sown so often as to have a supply of plants, to plant at least once every week. The kinds in general most preferable, are the black-seeded green coss, common green coss, spotted coss, the dutch brown and white cabbage lettuce. The black-seeded green coss is not liable to run so early to seed as some of the other sorts, and it is a fine tender lettuce.

Hoe and clean your beds of lettuce, so as not to let the weeds get high among them. Plant out some lettuce once a-week at least, and you will have a constant supply of fine ones, if you continue to water them in dry weather.

The seeds of savoys and cabbage should now be sown for winter and spring use. Sow them in beds, and if your ground be light and dry, tread them in, smooth the beds afterwards, and water them in dry weather. If they are planted on a border, which is shaded one part of the day, it will be a good situation for them.

Transplant cabbage of different sorts. Some of the early york and sugar-loaf should be transplanted every ten or twelve days, to have a constant supply of young fine cabbage.

Plant out now, if your plants are ready, brussels sprouts, red and green borecole, jerusalem kail, and any other of the like kinds.

Plant out some savoys for an early crop; plant them about three feet apart in the rows, and twenty inches plant from plant.

If you are scarce of ground, you may plant any of the cabbage tribe between the rows of early peas and beans, such as can be taken away before the plants planted between them are too much drawn up. You may draw drills for them, or dig the ground, as you think best.

Sow about the beginning and also about the twentieth of this month, brocoli seeds of different sorts, to succeed those sown in May. Prick out brocoli sown in the former months, and if you have any of the early sort forward enough, plant them out for an early crop; put them in good ground, about thirty inches row from row, and eighteen inches plant from plant.

Plant out cauliflower every ten days, to have a constant supply; water them well in dry weather; and see that they are planted in good ground, otherwise they will do little good.

Sow some cauliflower seed on rich ground twice this month; keep the beds weeded and watered in dry weather. Prick out young cauliflower plants in a little bed; they will make good roots for transplanting when you want them.

Every fortnight sow a few carrot and onion seed, to have a constant supply of young ones. Onions should be thinned and hoed in this month, and if the weather be dry, they should be frequently watered. When onions are too thick, they may be transplanted. Prepare beds of rich earth for them; take the plants up without straining the

roots too much, and plant them four or five inches apart, and water them sufficiently now and then when they require it.

Keep your carrots and parsnips free of weeds, either by hoeing or hand-weeding.

In this month, if your leeks in the seed-bed be strong enough, you may plant them out in beds. Draw little drills for them, eight or ten inches apart, and plant them about six inches plant from plant. Their roots should be shortened a little, and the hanging tops cut off.

Hoe the beds of salsafy and scorzonera, cut up all the weeds, and leave the plants about four or five inches apart.

If the cardoons in the spring were not sown in trenches, it will now be a good time to transplant them; choose a piece of deep ground, make trenches in it four feet apart, and about a foot deep; put some dung in the bottom of each trench, and dig it in; take up the plants with a spade; cut the ends of the top roots off, and the tops of the long leaves; then plant them about eight or nine inches apart, and give them water.

If burnet, summer savory, basil, capsicums, &c. were not planted out last month, let it be done the beginning of this month.

If any of your herbs are in flower, you may cut and dry some of them for winter use. Cut them in a dry day, and lay them in a shady dry place. Those now in flower will probably be balm, mint, pennyroyal, &c.

If you have any seeds of curious plants, gather them before they are so ripe that they fall out of the pods.

In this month asparagus will still be in maturity for eating. It should, however, be remembered, that it is not advisable to continue to cut it throughout this month, for fear of weakening the plants for next year's crop. So long as the cutting is continued, the plants send up new shoots. Some make it a rule to give up cutting asparagus when they begin to gather peas in the open ground. While cutting the plants continues, let the beds be hand-weeded: the hoe would break the ends of coming up shoots.

Keep the asparagus beds planted or sown last spring free of weeds, and if the weather happen to be very dry, they would be better to be watered occasionally.

Celery plants early raised will be fit to plant out in trenches this month to blanch. Choose for this purpose

a piece of good ground; mark it out three feet trench from trench, allowing about twenty inches for the trench; the rows will at that rate stand three feet ten inches apart. Dig out your trenches about a foot deep, and having laid some good dung in them, dig it in; then take up your plants, and cut the tops of the long leaves off, and also the long straggling roots, and plant them in a row, in the middle of the trenches, about four inches apart. Give them water to settle the earth about their roots, and continue to water them now and then in dry weather, till they begin to grow. Celery is a plant which requires much water.

Your crop of early onions sown in February, or early in March, should be hoed or hand-weeded: leave them four or five inches apart. If you intend to have some small ones for pickling, leave a bed as thick as they can stand, and do not hoe but hand-weed them.

Towards the end of the month, you may plant out endive. Set the plants in good ground, about one foot row from row, and eight or ten inches plant from plant in the rows. You need not plant out now to depend on, for at this early season they are apt to run to seed.

Hoe and thin your crops of red, white, and green beet. Leave the plants about seven or eight inches apart; if you happen to be scarce of plants, do not destroy any, but take them up where they are too thick, and plant them out in a bed, they will grow and do very well, if you give them water in dry weather till they strike root, and begin to grow.

You must take care not to keep your asparagus beds too close cut now; let a good many run, and after the twentieth of the month, you must give up cutting, or else you will hurt your beds for another year.

This is still a good time to plant slips of sage, rosemary, suthernwood, lavender, hyssop, summer savory, &c. Plant them in a shady border, and give them water in dry weather.

Plant out from the seed beds, savory, sweet marjoram, hyssop, thyme, cardus, marigolds, angelica, clary, and other aromatic and medicinal herbs which were sown in the spring.

Plant out also fennel; and sow the seeds of chervil for a succession; it is an annual plant, and dies as soon as it produces its seed, it should therefore be sown frequently. It is much used in some kitchens.

Plant out slips of tarragon. This is an herb used by some in salads.

Let all your beds of young plants be weeded, and hoe and rake every part of the garden where you can, to keep down the weeds.

Water, if you can, every thing in dry weather which requires it.

The weather is rather too warm now for mushrooms. If exhausted dryish dung from the linings of your melon beds be laid against a north wall, and spawn put in it, and covered about two or three inches thick with earth, you will have a chance to have plenty of mushrooms from it. The dung should be such as will raise no artificial heat, and it ought to be in rather a dry state, inclinable to produce mushroom spawn: to a practical person this will easily be known by its appearance and sweet agreeable smell.

If you have any melon plants which are growing under hand-lights, they may now, if the weather be warm, be allowed to run out at full liberty. The lights should be raised and supported by three bricks, which will raise the glasses three or four inches high. Train the vines out in a regular manner, and cut out any weak shoots. You had best continue to cover them with mats till about the beginning of July; and then, if the weather be warm, and not very wet, the covering may be discontinued. As the climate in this country is scarcely warm enough for the most early sorts of melons, in the warmest months of summer they will not ripen, except they are protected from heavy rains. Round the lights they may be covered at night with mats supported by stakes.

Some persons make oiled-paper frames for melons. These frames are made of thin laths or slips of wood, constructed in the manner and form of the roof of a house: they should be made light and firm. Every frame should be about ten feet long, and about four feet wide at bottom, narrowing gradually to a sharp ridge at the top, making the height about three feet.

Those who intend to cover any of the hand-light ridges with oiled-paper frames, should do it in the first or second week of this month. The melon plants for this purpose should have been ridged out under hand-lights, in the same manner as is directed last month for raising cucumbers

under hand-lights. Such kind of frames will be useful for the protection of young plants and fruit, if cold wet weather happen about the time of the setting of the fruit. They should be placed upon the ridges as soon as the plants begin to require more room than is under the hand-glasses. The hand-lights must first be taken away before the frame is placed on the bed.

In warm summers, early small sorts of melons will ripen pretty well in the south of England, by using the above-mentioned methods.

On the FRUIT-GARDEN,

For June.

Grape vines against walls will now grow fast: let them be gone over every week. Cut off all the tendrils and useless young shoots, and stop the shoots before the bunches of fruit. Train up the shoots for bearing next year straight, and to a proper length before you stop them. Keep the trees moderately thin of leaves, that the sun may shine through them on the wall occasionally, and that there may be a free circulation of air among the leaves and shoots: take care that the branches be nailed securely to the wall, for fear they be blown down by high winds.

Trees on espaliers now require attention; they produce more shoots than can be trained in: cut off all the luxuriant and superfluous ones, leaving well placed middling sized shoots to supply the place of any old branches that it may be thought necessary to cut off.

After the trees are trimmed and the shoots tied up, hoe and rake the borders; if they are kept free of weeds, it will be a mean to prevent the snails from creeping up to hurt the fruit. Cherry trees on espaliers should be netted when the fruit begins to turn red, to keep the birds from eating them.

Apricots, nectarines, and peaches will this month need much attention and labour to keep them in good order.

They should be gone over frequently, and if there is any appearance of mildew, which always begins near the extremities of the shoots, rub the affected parts with sulphur, and strew some on the leaves. The best time to do this is in a calm morning, before the dew be evaporated from the leaves.

Cut off all the luxuriant shoots from the trees, unless there be a vacancy which requires to be filled up with them; in that case, shorten the luxuriant shoots down to where you wish shoots to come from them, and they will send forth what are called midsummer shoots, which if trained, and their leaves kept moderately thin, will ripen for bearing fruit the succeeding spring.

All dead branches should be taken out, and cut away the cankered parts: if any of the shoots that are cankered be cut half through, it will not hurt them, but help the tree to cast forth its contaminated juices, and dry the inner wood, the over-dampness of which stagnates the juices that are carried up by the nature of vegetation between the bark and wood; and when these receive stagnation, they break out in gum and canker, and cause the bark to die on some parts of the tree, and will perhaps kill it, if assistance is not given to help the tree to purge itself of corroding juices drawn into it from unwholesome soil, or air contaminated.

Thin the trees of all superfluous weak shoots, leaving them regularly supplied with young wood in every part; nail the shoots in straight, in places where they do not interfere with the fruit; thin the fruit, if they are too thick on the trees, and nip off the leaves where they are crowded, so that the air may have a free circulation through every part of the tree, and that the sun may shine on the wall here and there among the fruit and branches, to warm the air about them.

In warm dry weather wash the trees out of an engine with clean water, it will refresh them, and be the means of preventing them from being infested by the red spider, which is very prejudicial to trees and fruit when it breeds and increases numerously.

Water now and then in dry weather all newly p anted fruit trees, and if they are against walls train up their shoots in a regular spreading manner. The way to train a tree of any sort on a wall, is to lead the shoots on each

side of the tree on the wall, about nine or ten inches from the ground, and lay in the rest of the shoots at regular distances between them, so that every part of the wall may be covered equally with the branches; and the walls ought not to be over-crowded with leading branches; if they are, air will be prevented from circulating duly among them, and there will not be room to lay in and ripen the summer shoots of peaches, nectarines, apricots, and some of the other kinds of trees; so that if your trees are not kept sufficiently thin, they will probably get bare of young wood towards the bottom, and become less productive.

If you have any trees of last year's budding, whose stocks were headed down last spring, the shoot from the bud should be tied to the part of the stock left above the bud. If any of them are growing luxuriantly strong, you may head them down to three or four buds; they will throw out side shoots which you may tie to stakes in a direction for future training. Suffer no shoots to spring from the stock; for if you do, they will deprive the bud of its nourishment, and hinder its growth.

Examine all the fruit on your trees carefully, and if there are any unshapely ones, pull them off, and see that no nails or shreds are too close to the fruit. The fruit should not be left nearer together than about four inches, otherwise they will not have room to swell, if they are sorts which grow to a good size.

Plum, pear, and cherry trees trained against walls should be attended to; all foreright shoots ought to be cut off, and no long shoots left but leaders, and some where there are any vacancies required to be filled up. Where the leaves over-crowd the fruit, nip some of them off, leaving only a gentle shade to them. In dry weather fruit trees would be better to be watered all over occasionally with clean water out of the engine.

Net up your cherry trees on the walls to preserve the fruit from the birds.

Young shoots must be left every where on the morella cherry tree, and trained in for bearing next year in the same way as the young wood is in a peach tree.

Currant trees trained against walls and palings should be attended to, their leading shoots are to be nailed in, and all the foreright ones cut off, leaving studs for bearing.

The strawberry beds, before the fruit begins to ripen, in dry weather will require water frequently. If the weather be hot, every other day will not be too often to give them water.

Destroy weeds among gooseberry, raspberry, and currant bushes; if the weeds have got long, rake them in heaps at each end of the rows, and carry them off. Hoe all your fruit-tree borders, and rake them; keep them clear of weeds and every kind of litter; this will be the means of preventing slugs and some other insects from coming on the trees.

Endeavour to destroy all sorts of vermin which creep upon the trees, and eat the leaves and fruit; these are slugs, snails, &c. After rains they are most likely to be found crawling, in the morning and evening, on the borders and up the trees among the shoots and leaves.

On the PLEASURE or FLOWER GARDEN,

For June.

If the auricula plants were not shifted last month, it should be done the beginning of this month; let the pots stand where they may be shaded in the heat of the day, on shelves, or on a bed of coal ashes, to prevent worms from creeping into the pots; water them in dry weather as often as they begin to get dry.

The flowering and ever-green shrubs should be examined: if they have made any strong disorderly shoots, these, either by cutting them out, or shortening them, as may appear most proper, should be reduced to order; shrubs of all kinds ought to be kept from interfering with one another, and from spreading too far to injure the more low growing plants near them.

Shrubs planted last spring, must be watered now and then in dry weather. Likewise water all the pots of scarlet lychnis, double sweet-williams, campanulas, rose campions, double rockets, &c.

Also remember to water seedling polyanthuses, auriculas, and all other seedling plants.

Look over the herbaceous, perennial, and biennial flowering plants; cut off all straggling decayed or broken shoots, and tie up any that require it. Many of the annual plants too will require tying up; and some, such as the sweet pea of different sorts, will want stakes to run up upon.

Honeysuckles of various kinds, and jasmines formed into heads for blowing, should have the luxuriant shoots, when they appear above the heads, cut in, or taken entirely out, as you see most proper.

Plants raised from the seeds of carnations and pinks, will in this month probably be fit to transplant. Dig a bed of good earth very fine, rake it smooth; make your bed about three feet wide, plant them in rows six inches apart, and put the plants about three or four inches from one another. Water them gently, and continue to do so in dry weather. In the autumn, they should be again transplanted, setting them about eight inches asunder.

Examine your pink and carnation seedlings of last year now in blossom, and mark all of them that are worth preserving. They may be increased by layers or cuttings. Those from seed bring a variety of flowers differently marked, but perhaps none like the original, nor very good ones; it, however, sometimes happens that valuable new flowers are obtained from seed, which on that account should be sown every year, for it is the only way to procure new varieties.

If the slips of carnation plants are grown long enough they may be laid. The method is, get some fine mould in readiness, and a parcel of little hooked pegs made of fern or small branches of trees; clean away the weeds and any litter on the mould about the plants; fill the pots with mould up to within half an inch of the rim; when this is done, cut a few of the leaves off the lower part of the shoot, and top those on the head of the shoot about an inch or two down, then with a sharp knife about the middle of the shoot, cut between two joints a slit half through the shoot, turning the edge of the knife upwards, cut the slit past the first joint to the middle between it and the one above it, then making a hollow in the mould, bend down the cut part of the shoot and peg it down to the

earth, turning its head upward, cover the slit part about half an inch thick with mould ;—thus proceed till you lay all the shoots that are fit ; give them some water to settle the earth about them, and continue to give them gentle waterings in dry weather, and they will strike root freely.

Tie up the carnation stems, and if you wish very fine flowers, cut off some of the buds of the smaller size, which will strengthen those that you let remain.

The flower leaves of carnations are very apt to burst forth at one side, a few days before the time of the opening of the blossoms, and if they are permitted to do so, the flowers make a very loose irregular appearance ; to prevent this, take small slips of wet bass, and tie round the middle of the pod where it is most swelled, this will prevent the flower from bursting forth at one side ; and further to enable it to blow regularly, slit the flower cup all round with a pin or sharp-pointed penknife.

Some have a stage for carnations, with a covering on it to keep the sun and rain from the flowers while they are in bloom ; this preserves the blossom long in beauty, but it is not good for the plants to be excluded from the sun and dews, therefore shading of them should not be continued too long. The plants, however, receive no injury by being shaded four or five hours in the heat of the day, and to be screened from heavy rains will do them good.

Pinks may now be increased by cuttings if the plants are in blossom. Dig a bed of good rich earth about three feet wide, and as long as you want it, set hand lights on it, you can spare them now perhaps from the cucumber ridges ; make a mark round the glasses, set them off, and dig out the mould to the extent of the mark about half a foot deep, sift it in again through a coarse sieve. Then take slips from the plants, cut the leaves off the hard lower end of them, and cut about an inch of the leaves from their extremities ; then cut a little bit off the hard end, and prick them with a little stick, into the sifted mould an inch apart, water them gently, and set the lights on them close that no air can get in ; give them a strong sun heat and no air till they begin to grow ; the sun will not scorch them if they are kept moist ; by this means they will strike quickly. If you prefer it, you may prick them into a cucumber or melon frame, they will take root fully as well in

it, as they will have a more powerful heat when the sun shines than under hand glasses.

By this method you may readily propagate almost all kinds of common plants, the closer and warmer they are kept the sooner they will take root; the hottest sunshine will make them vegetate quickly, but they must be sprinkled often with water, and covered with mats in the night. In this manner it is a good time now to propagate the china and moss roses, and any other curious sorts that are not readily propagated by layers.

By giving them a powerful moist heat and light, almost every kind of the most tender exotics may be propagated by cuttings. Make cuttings, leaving a little of the hard perfectly ripened wood to go into the earth, plant them in pots in mould suitable to their nature, plunge the pots in clumps or single in a pit or frame, in tan or leaves with heat in them, but the warmth in the tan ought not to rise above blood heat; set bell or hand lights on the pots of cuttings, give them water every morning about eight o'clock, if the sun shine, or any time of the day he breaks out; in very hot days it may be necessary to sprinkle them with water twice a day, for the air must be constantly kept moist about them. Keep the double glasses close till the plants begin to grow after they are rooted, then admit a little air to harden them. They should not be shaded in the hottest sun till you give them air, then shade them a few hours in the middle of sunshine days. They will strike in a pit or frame where the tan is near the glass without bell glasses over them. Cover them at nights with mats, if the nights are not very warm. If your heat in the tan rise above 120, it will destroy them; you had best, therefore, be on the safe side, for if it stand at 80 in the night time it will do.

You may propagate carnations by cuttings planted and managed in the same way as directed for pinks.

Also in the same manner you may propagate fibrous rooted perennial plants, such as lichnideas, double sweet-williams, rose campions, double rockets, scarlet lychnis, &c.

Autumnal blowing bulbs should now be taken up and replanted; some of these are the guernsey lily, colchicums, autumn crocus, belladonna lily, &c. After the bulbs are taken up, let all offsets be taken off and planted, each sort

by themselves; you may plant the roots again immediately or let them lie a few days out of the ground.

Take the opportunity of moist or cloudy days to plant out the different sorts of annuals which required to be forced in the spring to forward them in their growth, such as stocks, china asters, marvel of peru, china pinks, french and african marigolds, &c. plant them in little beds, or in clumps in the flower borders; keep them watered in dry weather till they have made roots.

You should now plant out in borders or into nursery beds, to be planted out in autumn or in the spring, seedlings of greek valerian, canterbury bells, rockets, scarlet lychnis, campanulas, foxgloves, hollyhocks, tree-primroses, columbines, &c. If you plant them in beds, set them about six inches apart, and give them water in dry weather till they have made roots to support themselves.

Take up curious hyacinth-roots which were laid sidewise in a bed of earth to perfect their roots. They had best be taken up in a dry day, and spread upon mats in a shady dry place for a few days, then clean them and put them in a dry airy place, till the time of planting commence.

Take up also the roots of anemonies and ranunculus as soon as their leaves are withered; these roots require a good deal of care in taking up. To get all the roots and their offsets clean out of the ground, it may be necessary to sift the earth of the beds as low as they are planted, taking it clean as you go, and search in the sieve the lumps of earth for the roots.

If their leaves are decayed, take up the roots of narcissus, tulips, and jonquils; dig them up in a dry day, lay them in a shady dry place till their tops and fibres be quite dried up, and in wet days you may pick, sort, and lay them up in a dry place on shelves or in boxes, till they are wanted to plant. These common sorts of plants may remain in the borders, without being taken up every year; but when the borders are about being dug in the autumn or spring, care must be taken not to destroy them. To prevent this, before the foliage die, small sticks may be set in the ground beside them.

All tender annual exotics, such as balsams, tricolors, cockscombs, globe amaranthus, &c. should now be transplanted; put one plant into each pot in good mould. They will do well in any of the forcing-houses where they can

have plenty of air. Give them gentle waterings when they begin to get dry; some of these kinds, particularly the egg plant, are liable to be infected with insects, therefore sprinkle them over the leaves now and then with clean water, and you may smoke the house with tobacco: a few of them may be put in the flower borders; if the summer prove hot, they will blow there very pretty.

You should now sow some of the finest kinds of hardy annuals; they will blow in the autumn, when the more forward sown ones are over.

If you have plenty of rose trees to spare, head down some of the different sorts, by which means they will probably come into blossom in the autumn, when the others have done blowing.

You may also head down some of your forced rose trees, to make them blow in the autumn. This method, however, weakens the plants, as it causes them to bloom twice in one year, contrary to the nature of them.

Seedling flower plants of all kinds should be taken care of; they ought to be kept clear of weeds, and have gentle waterings in dry weather.

Go round your flower borders and edges of plantations, and tie up all flower plants that require it, whether they be shrubs, herbaceous plants, or annuals.

In dry weather, take care and water now and then all new planted trees and shrubs.

Clip box edgings, and keep the grass edgings on the sides of gravel walks and borders in good order.

If they require it, you should clip hedges of hawthorn, beech, lime, privet, hornbeam, elder, &c.

Hoe and rake in dry days all your flower borders, keep them neat and clean at all times.

Keep your gravel walks weeded and clear of litter, of leaves, or of any thing else; roll them well, particularly when the surface is dry, after a shower of rain.

To keep your lawns and grass walks in good order, they will require to be mowed and swept once a week in dry weather, and twice a week in wet weather.

You may towards the end of the month bud curious sorts of roses, such as do not put forth suckers very freely, so as to be increased readily thereby. The best stocks for budding them on are those that grow strong, such as the damask and Frankfort kind.

On the NURSERY-GARDEN,

For June.

Towards the end of the month, you may begin to bud apricot trees and some of the forward kinds of peaches and nectarines. These are generally budded on plum stocks raised from the stones; when they are three years old they will be of a good size for that purpose. Cherry and plum trees may also be budded.

The trees which were budded the preceding year should be attended to. All shoots from the stock ought to be cut off as soon as they appear. If you are not in a sheltered situation, the vigorous growing shoots should be supported, to prevent their being broken by the winds.

If you are desirous of having young fruit trees to form heads soon for walls or espaliers, cut down the young shoots from the buds of last year to five or six inches; they will soon put forth shoots, which you may tie to stakes, in a direction for training.

Look over new-grafted trees, and where they shoot strong, endeavour to keep them from being broken by high winds. If there be any of the clay on, let it be taken off, and untie or slacken the bandages as you see most fit; and if the graft and stock be so united that it will bear it, cut the upper part of the stock with a sharp knife smooth, that the graft may cover it over easily in its growth with young wood and bark.

If the mildew begin to appear on any of the shoots, strew them with flour of sulphur, and if the green insect appear on them, scatter lime or soot on the affected parts, which will prevent the insects from feeding, and it will smother many of them. The best time to do it is in a calm morning before the dew be evaporated. Snuff is a good thing to scatter on trees infested with insects; I understand it is become a very dear article, but I am not a snuff taker.

You may now lay down the young shoots of hardy-wooded exotic trees and shrubs. Choose such branches as will easily bend to the ground, and have plenty of young shoots on them. Secure the branch with strong hooked sticks, and proceed to lay the shoots about three inches deep; fasten each of them down with a peg, cover them

with the mould, keeping three or four inches of their top above ground, and form the earth round the whole of them in such a way as to retain the water to be given them in dry weather. Give them water immediately after laying, and let it be repeated occasionally as you see need, to keep the ground moist.

Probably these young layers may be rooted by the month of November, when they may be transplanted into a nursery bed.

Roses and many other shrubs may be propagated by this method of laying.

Seedlings of arbutus, evergreen oaks, Portugal laurels, hollies, junipers, cedars, &c. should be kept free of weeds, and have gentle waterings in the evening in dry hot weather.

About the end of the month, you may bud the finer sorts of rose trees that do not take root very freely by laying, bud them on the shoots of rose trees which grow vigorous.

Towards the latter end of the month you may transplant seedling pines and firs. Dig a spot of good light ground, make it out into beds three feet wide, with alleys eighteen inches broad, and in cloudy days prick out the plants three inches apart; as soon as they are planted, water them, and continue to water them, in dry weather, till they be well rooted. They should be shaded in hot days. This may be done by putting an arch of hoops across the beds, and drawing mats on them when the sun shines warm.

If this method is practised, the plants will be well rooted in the course of the summer and autumn, and it will enable them to endure the winter better than if they were continued in the seed-bed. This method of transplanting ought not to be neglected where the seedling plants stand very thick in the original beds.

If the weather prove dry, shrubs and trees of all kinds planted late in the spring should be watered. Water also in dry weather the beds of seedlings of all sorts of trees and shrubs.

In dry days, hoe up the weeds every where between the rows of trees and shrubs. If this be done when the weeds are young, it will save labour, as the ground will not require raking, and the hoeing is much easier performed than when the weeds are suffered to grow high and strong.

On the HOT-HOUSES,

For July.

This is generally the warmest month in the year, and the pines will not, in any part of it, require the assistance of fire-heat, unless the weather happen to be uncommonly cold; but it will be necessary that a good heat be continued in the tan-bed. Examine it, and if the heat be declined so that the pots can admit of being put into the tan as deep as the rims of them, fill up the vacancies between them with fresh tan, not wet; level the pots, that they may hold water, and see that the tan be close to the sides of them, that the heat of the bed do not escape. Previous to this, set out any plants whose fruit are cut, if you have others in fruit among your successions to fill up their places.

Give plenty of air every fine day; and if the nights are very warm, let some remain at the houses during the night, in such a way, that if it happen to rain, it may not fall on the pines.

If your fruit happen to be backward in ripening, and the weather prove wet and gloomy, it may be requisite, even at this time of the year, to make a little fire occasionally; for the fruit will not come forward well, nor be good flavoured, without plenty of heat as well as air; and whenever we find a deficiency in the natural climate, we must endeavour to supply it by the assistance of art. *See* Chap. XII.

Height of the Thermometer in the Hot-House, shewing the Temperature of the Air in it, for July.

D.	M.	N.	E.	D.	M.	N.	E.
1	72	85	77	17	62	95	72
2	72	90	76	18	68	80	75
3	71	97	77	19	74	80	75
4	71	95	76	20	72	95	75
5	72	87	76	21	70	95	71
6	74	94	78	22	68	94	75
7	75	92	76	23	70	95	76
8	70	96	77	24	70	90	74
9	72	82	71	25	68	95	75
10	68	100	76	26	70	95	76
11	71	92	73	27	68	80	74
12	71	93	70	28	72	80	71
13	67	95	73	29	67	90	72
14	65	93	74	30	70	88	75
15	68	80	70	31	68	95	76
16	65	94	68				

Besides watering the earth in the pots in which the roots of the plants grow, when it begins to get dry, the leaves and fruit should be watered now and then, till they are all wetted, with clean water out of a fine rosed pot; the water should be about 80 degrees warm, or as warm as the medium heat of the air in the house.

The best time to water over the leaves, is about eight o'clock in the morning, or about four in the afternoon; though it will do them no harm to water them any time of the day, if you keep the air in the house sweet, and up to a heat strong enough for the growth of the pine plant. The plants in this month will want water about once a week, and if the weather be hot, perhaps oftener. However, it is rare that pine-apple plants require water oftener than twice a week. But if plants, to destroy the insects on them, be kept for a few weeks in an uncommon heat, occasionally as high as 110 and 120 degrees of Fahrenheit's thermometer, they may be watered once or twice a-day, or oftener. It is no uncommon thing to see all the herbs of the fields watered several times in

one day, and sometimes all day, by rain, which falls from the clouds; and no doubt but, in countries where the pine-apple grows spontaneously, rains fall abundantly. The appearance of pine-apple plants, which I have seen come in boxes from hot regions, is in proof of this observation. I have seen on the stem, above the earth in which the plants had grown, roots sprung forth. The stem of the pine-apple plant will not send forth roots unless it be in a moist state in the earth or out of it.

When any of the fruit are full swelled, do not water them over the fruit or leaves; but it is necessary even then to have the earth about their roots moderately moist, otherwise the fruit would flag for want of nourishment. It should also be observed, that after the fruit is swelled to a pretty good size, water should not be poured into the crowns of the fruit so plentifully as to stand in them above a day or two.

I would still give a caution to take care not to over-heat the roots of your fruiting pines: you had best, if you are not sure to be out of danger, have your pots stand one-third out of the tan, than run any risk with them; but you may depend that a faint heat in your bed, or in the temperature of the air in the house, will not swell off your fruit to a good size.

If it so happen that at any time you find your tan-bed getting too dry, pour water into it now and then between the pots; this will cause a fine moist heat to arise among the plants to help to nourish them, and it will likewise enable the tan to retain its heat longer than if it were suffered to become dry, for no body of vegetables will retain heat after the moisture in them is evaporated.

If you see occasion for it, support your fruit with sticks to make them stand upright.

Strong suckers will sometimes come up at one side of the fruit and bend it to the opposite side; other plants will send up three or four suckers which will so surround the fruit as to make it stand perfectly upright.

If you wish to have uncommonly large fruit, when you see the suckers coming up, destroy them by twisting out the hearts of them with an iron instrument about twenty inches long, made for the purpose. But as I have before said, this is not to be generally practised; it destroys a succession of plants, and is of no great utility.

Keep your tan-bed free of all kinds of fungous stuff, which is apt to grow out of the surface of it; and endeavour, if it breed, to destroy the spawn which runs near the surface, makes it crusty, and prevents the heat from rising freely among the plants; when you find it in such a state, loosen and break it with the hand, or with a small hand three-tined fork. See that your house is clean and free of any sort of litter that might raise unwholesome vapours in it.

Your succession plants will now demand attention, whether they be in a house, a pit, or in frames; you should take care to have a good strong heat in the tan-bed, and do not have your pots plunged too deep, nor too fast in it, if the heat be strong.

If the tan of the bed be getting too dry, pour water into it between the pots of plants, but do not make it too cold. The heat for the bottoms of the pots of pine plants to stand in, should be from 85 to 100 degrees of Fahrenheit's thermometer.

The plants will require frequent waterings. It is a good sign to see plants growing broad-leaved, and the water standing constantly in their hearts in the summer months, nor will it hurt them at any time, if there be a sufficient degree of heat kept in the house. Water them plentifully about once a-week all over their leaves with clean water, from 70 to 85 degrees warm. Give them plenty of air in fine days, and shut them down in the afternoonwith a strong heat. If the nights are warm, you may leave both at your fruiting and succession pines some air all night: leave it in such a way as, if it rain, it may not fall on the plants.

If your forwardest succession plants have filled the pots quite full of roots, you had best shift them into those of a larger size about the beginning of the month.

You should examine well the heat and condition of all your tan-beds, that you may be led to look forward to have a preparation of what quantity of tan you will want next month.

Exotic plants and cuttings in the hot-houses or pits, should be taken care of and watered when they need it.

Grape vines in the hot-house should be constantly kept in order, stop them as they want it, thin their leaves, and keep them tied up to the rafters. They ought not to be suffered to shade the pine plants. Unless there happen

to be heavy rains, give the borders in which the grape vines grow a plentiful watering occasionally.

Crowns and suckers of pine apple plants that have done fruiting, if you have got any quantity of them, may be potted. Pull off a few of the bottom leaves, put them into pots in good earth, plunge them in a pit or frame in tan where there is sufficient heat. Keep them very warm, and give them no air till they make roots and begin to grow. In very hot days, shade them with mats from between ten and eleven o'clock till about two in the afternoon. When they begin to grow, give them plenty of air, which will make them grow broad in the leaves, and stocky stout plants.

In watering your pine plants of all sizes, remember that some sorts require less water than others, the queen and sugar-loaf require more water than the black Jamaica and Antigua. *See* Chap. XII.

On the GREEN-HOUSE,

For July.

Green-house plants require frequent waterings. If the weather be hot, and the pots much exposed to the sun, it is likely they will need a gentle watering every afternoon six days in the week. Keep the pots clear of weeds, and the dead leaves should be picked off the plants whenever they appear.

As the green-house will now be at liberty, you may set into it during the summer any exotic plants you have in the hot-houses which cannot bear to stand during this month in the open air, without checking them.

Lemon and orange stocks which were raised from seeds, if they are grown large enough, may be budded. They are in a proper condition for budding when the bark of the stocks parts freely from the wood, and when the buds of the trees to be increased by this method readily separate from the shoot. Buds from shoots two years old will unite with the stock, but if you can get buds from shoots

of the present year's growth, they will be likely to unite more readily. After budding, the stocks should be set in a place where they will grow freely, either in the green-house, or in a frame in which is a gentle tan or dung heat.

Green-house plants may still be propagated by cuttings or layers.

If the pots require it, you may put fresh earth on the tops of them; loosen and level the earth on their surface, and fill them up to within about half an inch of the rim of the pots, this will leave a vacancy to hold water; press the earth down gently with the hand, and water the pots of mould with a rose on the water-pot, which will keep the earth level in them.

In this month, if any of the green-house plants stand in need of more earth to grow in, they may be shifted into larger pots at any time.

The plants should be looked over occasionally, and any straggling luxuriant shoots either shortened or cut entirely off, and any shoots that require it tied up, that the plants may constantly appear in a handsome neat condition.

This is a good time to plant cuttings of succulent plants, such as torch thistles, ficoideses, Indian figs, sedums, euphorbiums, &c. You may also increase aloes of different kinds; this is to be done by slips or suckers, which spring from the stem of the plants near the ground, and sometimes from the roots not much below the surface.

If the young fruit on orange, citron, and lemon trees, be too thick, it should be thinned before it becomes large, otherwise it will weaken the trees; the fruit should be thinned, and left thicker or thinner, according to the strength of them, observing to leave on the most promising young fruit.

Observe to keep all the pots of green-house plants free of weeds, and they should now stand in the most conspicuous sheltered situations.

Any cuttings of green-house plants which were planted early, and are well-rooted, may now be transplanted into little pots, one in each; and if you have seedlings strong enough, they may be picked out four or five in a pot.

If you have grapes in your green-house, which should never be without, if there is glass on the roof of it, stop

the vines before the fruit, tie up the shoots intended for bearing next year, and keep the plants moderately thin of leaves, that the fruit be not too much shaded.

On the FORCING-HOUSES,

For July.

The grapes in the early forcing-house will probably now be over; if they are, you may take the glasses off, for about a month or six weeks, and tie up the shoots securely, that the winds do not break them down.

The vines in your latter forcing-house will require constant attendance: stop the shoots before the bunches, and tie up carefully the shoots for the bearing wood the ensuing year. Keep them sufficiently thin of leaves; and if the berries on the bunches require thinning, let it be done carefully with a sharp-pointed scissars

The border in which the vines grow, should be watered well now and then. Admit air freely into the house every fine day, and if the nights are warm, you may leave a little at it all night.

Take care of any kind of plants you may yet have in the forcing-houses; keep them clear of weeds, and give them water when they want it. The thermometer in the morning may be about 60, and in the course of the day it may be up at from 80 to 90, if the sun shine bright and plenty of air at the house.

The peaches and nectarines in the first forced house will perhaps be ripe, or all over. If they be all gathered, the glasses may be taken off for about two months. Tie up all the shoots that require it: if there are any luxuriant or superfluous shoots on the trees, you may cut them off.

In dry weather, you should water the border, which will make the roots grow; and every part of the trees, if they are in good health, will grow, and the bearing wood for the ensuing season be brought to maturity.

If any green insects were appearing on the trees, before you took the glasses off, you should have given them a large smoking of tobacco.

Mildew is very apt to appear at this time of the year on peach trees; if you see the least appearance of it, strew some flour of sulphur on the affected parts. If the weather prove dry, wash the trees all over their leaves with water; this will refresh them, and be a mean to keep the red spider from them.

Those peaches and nectarines that are in a later forcing-house, will be coming in to succeed the first forced ones. If they have begun to ripen, do not give them water over the fruit and leaves; let the fruit be laid open from being shaded by leaves; keep the shoots regularly tied up, and give a great quantity of air in hot weather.

The cherries will be all over in the forcing-house, the glasses should consequently be off. If forced cherry trees want it, this is a good time to dig in some manure among the roots of them: very rotten dung, or vegetable mould, will do for that purpose.

The figs in your house will probably be ripe, or ripening; keep their shoots tied up, and the trees pretty thin of leaves, so that the sun may not be hindered from shining on the fruit occasionally. In fine days, give the house plenty of air, and in warm nights leave air at it all night; but in such a way, that rain, if it come, do not fall on the fruit.

In your rose house or flower-house will now be different kinds of tender annuals, such as balsams, cockscombs, egg-plants, sensitive plants, globe amaranthus, &c. and tube-roses; these should all be taken care of, by keeping them clean and free of weeds, and by giving them gentle waterings when they begin to get dry. You may smoke the house with tobacco once in ten days or a fortnight, which will destroy some sorts of insects.

If you have grapes in the rose-house, they should be well managed; if required, water the border in which they grow; let the plants be stopped, thinned of leaves, and the shoots tied up neatly under the rafters, so that they do not too much shade the plants underneath them.

Whatever seedlings or cuttings of curious exotic plants you have in any of the forcing-houses, let them be attended to, in keeping them free of weeds, and in giving them gentle waterings when they require it.

On the FORCING-FRAMES,

For July.

Melon plants will now be in full bearing, if they have had plenty of heat, and been sufficiently watered, and they will require constant attendance. Not to suffer the frames to become too crowded with shoots, the weak superfluous ones ought to be cut entirely out, and the others stopped before the fruit a joint or two; and when young shewing shoots are getting near the sides of the frame, they should be stopped before a joint that shews fruit well, and has the rudiment of a young shoot coming out beside it.

As the leaves get thick, keep cutting off the oldest of them. This ought to be done at least once or twice a week; by which method they will be nearly always in one medium state of thinness, and the plants and fruit will derive advantages which they would be deprived of were they to be suffered to become overcrowded with leaves and shoots, and then a great many cut out at one time.

The fruit should lie upon dry tiles, stones, or slates, and no leaves or shoots ought to be suffered to lie upon it. When the fruit is young, it is better to have a gentle shade of leaves; but when it is full swelled, it should be entirely exposed to the sun.

Keep the mould in the frames free of weeds and dead leaves; give the plants plenty of air in fine days, and water as often as they require it. In hot weather give them a plentiful watering about once a week; and if there be not a dew on the edges of the young leaves in the morning, sprinkle the plants with water in the afternoon, and shut down the lights with a strong heat in the frames. Indeed, melons will not come to good perfection, unless

they have a strong heat occasionally, of 85 and 90 degrees in the shade; and with such a heat, they must have a sufficiency of water.

The mildew sometimes greatly hurts melons. It is occasioned by unsweet vapours, arising from a stagnation of the dung in the bed, or from the dry rot perhaps in the boards of the frames, or from some unhealthy particles in the earth or water. *See* Chap. X.

To prevent the mildew, when the frames are perfectly dry, and at liberty in the autumn, let them be clean scraped, and painted twice over. Take care to have your bed made in a way that the water will run readily through it, and not to stand about it, but run off quickly by a descent or a drain; let your mould be sweet, by taking it from the surface of a quarter of the kitchen garden where the mould is of a rich loamy nature, or fresh rich loamy earth from the surface of a common, broken small, and exposed to the frost and air during the winter, before you use it, and never water your plants but with sweet clean water; stinking dirty water is not natural to them.

If the mildew be on melon plants, they will produce neither good nor wholesome fruit; therefore, when it happens, you had best destroy your plants, or endeavour to cure them of the malady. If you wish to cure them, get some good hot dung in readiness, by shaking it over two or three times till it be sweet, which you may know by the smell; wheel the linings away from your affected beds, leaving any of the sweet unspent dung to mix among that which is to supply the place of that which is rotten; make the sides of your bed upright, and if it be wet, make holes in the sides of it on a descent upwards, that the wet may run out of it downwards; then put a strong lining round it, and keep it, as it sinks, raised to nearly on a level with the surface of the earth in which the plants grow; when the plants are moist, strew them all over with flour of sulphur; keep as strong a heat in the air of the frames as the plants will bear, till the mildew disappear; before you shut the lights down, which may be between two and three o'clock in the afternoon, sprinkle them with water 100 degrees warm. *See* Chap. X.

Take care of the melon plants whose fruit are setting and swelling. Stop the shoots before the fruit: keep the

leaves and shoots regularly thin, and do not let the shoots get crowded about the sides of the frame; give the plants air and water as they stand in need of them; and after sprinkling in afternoons, shut them down with a strong heat.

If melons are of a large kind, no more than one or two fruit should be left on a plant to swell off at one time; if they are of a small sort, three or four fruit may be left on each plant.

At this time of the year, melons will do without heat in the linings; but I found by experience, that they do best by keeping a heat in the linings all the summer. If a heat be kept on constantly in the linings, and the plants watered sufficiently, they will continue to produce fruit till the middle of October.

Melons may be planted out about the beginning of this month; they will require no heat immediately under them: give them a very strong top heat, and water enough, till they are well rooted and begin to grow, then give them air, more or less, according as the heat of the days are. When the roots are extended to the sides of the frames, you may put a lining of dung to the beds, if you think they want it.

If you have cuttings, or seedling plants of any kind, in your forcing-frames, keep them clear of weeds, and water them when they want it.

If the summer be warm, cucumber plants will in this month be producing fruit on the open ground, and therefore the forcing method may be given up. If cucumbers have been forced on a brick bed with boxes, the lights and them may be taken off, and painted if they want it, or they may be placed over melon plants. When they are taken off, the earth of the bed in which the plants grow may be joined to the linings all round the brick-work of the bed, and the roots of the cucumbers will run into the linings if the linings be covered with a little earth. This will throw fresh vigour into the plants, and they may bear fruit in the open air till the middle of September, if the weather be warm.

In case fine clean cucumbers, free of canker or mildew, cannot otherwise be had, the forcing frames may be kept on, so that a gentle heat must be kept in one of the side linings, and the plants be managed as directed for the

former months, giving them plenty of water once a week. Unless the bees get in among the plants, the fruit must be set, the shoots stopped, and the leaves thinned. *See* Chap. IX.

Height of the Thermometer in the Melon and Cucumber Frames, shewing the Temperature of the Air in them, for July.

D.	M.	N.	E.	D.	M.	N.	E.
1	75	80	80	17	66	88	82
2	69	81	71	18	70	79	71
3	68	85	75	19	70	91	82
4	67	80	85	20	72	84	82
5	75	92	82	21	74	94	81
6	78	99	86	22	79	85	82
7	77	93	95	23	78	84	80
8	76	105	82	24	78	96	94
9	77	95	82	25	77	86	80
10	74	96	93	26	68	85	79
11	77	100	86	27	76	72	75
12	77	92	78	28	68	79	74
13	66	88	72	29	63	85	70
14	61	96	90	30	61	84	69
15	62	98	90	31	67	86	84
16	63	89	82				

Cucumber plants in the open ground, which are raised under hand lights, should be attended to. They will want water about twice a week, if the weather be hot and dry. Keep them from being over-crowded with small vines and old leaves.

On the KITCHEN-GARDEN,

For July.

As your peas and beans appear coming through the ground, continue to sow more, for a succession. The white blossom and mazagan beans are now the most fit sorts to plant, and you may sow some of the early and late kinds of peas. Hoe and stick all your former sown crops of peas that require it, and draw up earth to your beans, and stop them if they be in blossom.

Now is a good time to plant out a full crop of savoys; get a piece of good ground ready, draw shallow drills in it, about thirty inches or three feet apart, row from row; tread the drills with your foot longwise, then plant the savoys about eighteen inches plant from plant; give them water, and continue to water them in dry weather, till they have taken root and begin to grow. Plant them two or three different times in this month, as your plants are fit for it.

Plant cabbages of all sorts, for winter and spring use. If you have not ground enough at liberty, you may plant them between the rows of peas and beans; by the time the plants are struck and beginning to grow, the peas and beans will be ready to take up.

Make plantations of the early york cabbage every ten days, to have a constant supply of fine young tender cabbage.

Sow the seeds of york cabbage two or three times this month; they will be useful for colworts in the autumn and winter; sow the seeds on rich ground, and water them frequently. If they are sown on a shady border, it will be a good place for them in hot weather.

Take the advantage of showery weather to sow turnips; sow them on good ground, and roll or tread them in well with the feet; make sowings of them twice or thrice this month; hoe those that want it which were sown last month. If the weather be dry, turnips must be watered often, otherwise there is little chance of their doing well.

Sow the seeds of carrots and onions about once a fortnight, to have a constant supply of young ones. Hoe or weed the former sown crops of onions and carrots.

About the beginning of the month, plant a crop of kidney beans. Choose a piece of light rich ground for them, in a sheltered situation. If the ground be dry, after you draw the drills, which should be thirty inches apart, water them to moisten the earth before you sow them. Plant the beans about four inches apart, and cover them about two inches deep. If the weather hold warm and dry, examine them, to see if they have moisture enough to cause them to vegetate and come up; if they have not, which may be known in four or five days, you must water them. This rule should be observed in dry weather, in the planting and sowing peas and beans, and all other seeds.

Brocoli seeds should be sown in this month for a late crop. If you have got it, sow the seeds on a shady border of rich earth; tread them in, if the ground be not of a heavy nature; smooth it afterwards with a rake; and if the weather prove dry, water them when they want it.

Transplant brocoli of all sorts for a full crop. It ought to be planted in good rich ground. Draw drills three feet apart, tread them with your foot longwise, unless your ground be very strong; set the plants about eighteen inches plant from plant, in the rows; see that you put in no plants that have bad roots, or any that have not good hearts; as soon as they are planted, give them water, and if the weather prove dry, water them now and then, till they begin to grow, and in dry weather.

To have brocoli plants for a succession, transplant some into beds out of your seed beds; this is a good method on two accounts, it will keep the plants back in their growth about a fortnight, and make them grow more stocky than if they were transplanted immediately from the seed-bed into the ground, where it is intended they shall produce their heads.

If you wish to have a regular supply of cauliflower, you should plant out some every ten or twelve days. These plants will not produce large fine heads, except they be planted in deep rich ground; plant them in little drills, to hold water; put them thirty inches apart in the rows, and about sixteen inches plant from plant. Hoe up the weeds between the rows of old cauliflower plants, and give them plenty of water, especially when they are forming their heads.

Sow in the beginning of this month a few cauliflower seeds for a late crop.

Radish seed may now be sown on a shady border; give it water in dry weather.

This is a good time to sow black and white turnip-rooted radish. Sow the seeds separately in beds, in an open exposure; if the weather prove dry, give them water: and when they come up, thin them out to the distance of five or six inches.

Take up shallots to preserve for winter use. In many gardens these are found delicate plants to raise: they are very liable to rot in the ground, and therefore should be taken up as soon as the stems begin to decay. They grow best in a rich loamy sandy soil.

If all the leeks you want were not transplanted last month, this is a good time to do it. Dig a piece of good ground, draw little drills in it, about ten inches asunder: dig up the plants from the seed bed, then cut off the extremities of their leaves and roots, and plant them in the drills about five or six inches apart. Plant them an inch or two deeper than they were in the seed bed; and if the ground be dry, give them water to settle the earth about their roots.

Keep sowing the seeds of round spinach, that you may have a constant supply. You may sow it in drills between the rows of late peas or beans: if the weather be dry, you must water it, otherwise it will not grow.

If cardoons were not transplanted last month into the trenches where they are to be blanched, they should be transplanted about the beginning of this month. Make trenches for them about ten or twelve inches deep, sixteen inches wide, and about three feet and a half apart. Dig dung into the bottom of the trenches, and after trimming the roots and leaves of the plants, set them about eight inches asunder, in the middle of the trenches. Give them water to settle the earth about their roots.

Sow mustard, cress, and radish seeds, for small sallad, if it be required, in a shady border.

Now is a good time to plant a full crop of celery: choose a spot of deep ground for that purpose; dig out trenches about eighteen inches wide, ten inches deep, and three feet trench from trench; dig good rotten dung into the

bottom of them; take up the plants out of the beds into which they had been transplanted, with a spade or trowel; cut off the extremities of the roots and leaves, and plant them in rows in the middle of the trenches, about four inches plant from plant. Give them water as soon as planted, and continue to water them in dry weather, till they begin to grow, and afterwards if you wish them to grow fast and strong.

Transplant celery out of the seed-bed into beds of rich earth. Shorten the roots and tops a little, plant them into the beds about four inches apart, and give them water as soon as they are planted.

Transplant endive; it may be planted in any open part of the garden. If you are scarce of ground, you may plant it in rows on the ridges between the rows of celery. Draw shallow drills for it, and set the plants in them a foot apart. Till they begin to grow, give them water in dry weather.

Sow endive seed for a succession. You had best, if you wish a regular succession, sow some about the beginning of the month, and more about the middle of it.

The different sorts of lettuce seeds, which you wish to propagate, should be sown every ten days, that you may have a constant supply.

Transplant lettuce out of the seed beds at least once every week. Plant them in good ground, in beds, about a foot row from row, and six or seven inches plant from plant, in the rows. Give them water, and if you do not water all your lettuce plants well in dry weather, they will not be good.

If you are saving any seeds of curious esculent plants, take care to gather them before they shake out, or the birds eat them.

Now is a proper time to cut herbs for drying, for winter use. The sorts are balm, mint, pennyroyal, hyssop, marjoram, camomile flowers, marigolds, &c. Herbs may also be cut for distilling, such as peppermint, lavender, and many other kinds. They should be cut in dry weather, and laid or hung up in an airy shady place.

When crops of any kind are over, the ground should be cleared, and got ready for winter crops of different kinds.

Destroy weeds when they are young in every part of the garden. Endeavour never to suffer them to come into seed. If they are permitted to bring their seeds to maturity,

they will shake out on the ground, and it will not be easy to get them out of it again. The seeds of different kinds of weeds will lie in the ground several years, some of them growing every year, as they happen to get into that part of the ground near the surface which is favourable for causing them to vegetate.

If toward the end of the month your early crops of onions are come to their full growth and their stems dying, they should be pulled up. Spread them in the sun till their stalks be dry and perfectly withered; then cut them and the roots off, and lay the bulbs up in a dry place for winter use.

Plant brussels sprouts, jerusalem kail, green and red borecole. Set them in good ground, about thirty inches or three feet row from row, and about eighteen or twenty inches plant from plant in the rows. Give them water in dry weather. If you have no ground clear for them, you may plant them between the rows of kidney beans.

You may transplant into beds rooted slips of sage, balm, pennyroyal, winter savory, hyssop, &c. Give them water in dry weather, till you perceive they have made roots by their beginning to grow.

On the FRUIT-GARDEN,

For July.

Look over the peach and nectarine trees frequently; cut out any superfluous or luxuriant useless shoots, which they may have made; nail up straight to the wall all shoots reserved for bearing fruit next year. If the leaves are crowded, thin out some of them, so that the fruit may not be shaded too much.

In case there is any appearance of mildew, rub the affected part of the shoots with sulphur, and strew some on the affected leaves. If the weather prove dry, and dew do not fall plentifully in the night to moisten the leaves of the trees, wash them with the engine occasionally in an afternoon, early enough that they may be nearly dry before sunset.

If there be any curled or dead leaves on the trees, they should be nipped off; and if any insects are found on them which can be destroyed by the hand, it should be done.

Hoe the borders, and rake them frequently, so that they may be kept perfectly clean, and free of weeds. If the weather be very dry, the trees would be better to have water now and then poured on the border about their roots.

Examine the apricot trees, and if there are any foreright or other useless shoots on them, let them be cut off, and train in all shoots that you think may be wanted next season for a choice of bearing wood.

Pear, plum, or cherry trees against walls should also be examined, and any shoots cut off that are weakening the trees or shading the fruit. Nail in fast to the wall any branches or young shoots that require it, and let the trees be kept in a neat orderly condition at all times.

Grape vines against walls will require looking over often. Stop the shoots before the bunches of fruit: train up those shoots carefully that are reserved for bearing next year. If any of the strong shoots are displaced by the winds, let them be fastened up: and keep the trees moderately thin of leaves, so that the rays of the sun and the air may have free access among the shoots and bunches.

Fig trees against walls ought to be attended to; train up to the wall as many young shoots in every part of the trees as you think there is need of, for next season. Thin the leaves of them, that the sun may shine on the fruit some part of the day, and suffer not the shoots or leaves to lie close to the fruit.

Search about the borders, and fruit trees of all kinds, in dewy mornings, and after rains, for snails and slugs, and other sorts of insects which eat the leaves and fruit.

Earwigs are very hurtful to peaches, nectarines, and apricots, when they begin to get ripe. To destroy them, take the hollow stalks of beans after they have done bearing, cut them in pieces about a foot long, stick them here and there among the branches of the trees, and every morning take them out, and blow the earwigs or other insects that may take shelter in them, into a pot or a pail of water. As you empty each stalk, stick it among the branches of the trees again.

If the buds will come clean from the cuttings, and the bark rise kindly from the stocks, you may now bud trees of any kind that can readily be improved by that method.

Fruit trees on walls or espaliers, which do not produce good fruit, may be budded in every part of them, with such sorts as you like. In the following spring, cut off the shoots before them, and as they are able to bear it, train them in regularly, and the succeeding year you will probably have such fruit from them as you desire.

Take care and keep those kinds of strawberries that are in blossom or in fruit constantly watered in dry weather.

This is a good time to pot strawberry plants for forcing next season. Take good strong healthy plants, trim their leaves, and cut off that part of the root which has black fibres on it. Plant them in good loamy earth, in pots, four or five plants in each pot, or, if your pots are small, three plants in each; plunge them in old tan, or in some sheltered border, and give them water as often as they want it.

When the fruit is perfectly ripe, save the seeds of strawberries, gooseberries, currants, and raspberries. This is to be done by bruising the fruit and washing out the pulp from the seeds in clean water. When the seed of each sort is separated from the pulp, spread it out in a dry airy room, till it is perfectly dry, and then put it up in paper till you want to sow it in the spring.

In dry weather, hoe and rake the ground every where, between gooseberry, currant, raspberry, and other fruit trees, and clean the strawberry beds, and all other parts of the fruit-garden, of weeds, and all kinds of litter.

On the PLEASURE or FLOWER GARDEN.

For July.

Care must be taken of the carnations. They will now be in blossom or coming into blossom: tie the flower stalks to straight sticks, and give the flowers all the assistance you can to make them blow pretty. If the flower is likely

to burst out at one side of the flower cup, tie a small bit of bass round it, and open the flower cup in parts where it appears bound, with a sharp-pointed knife.

There are many varieties of carnations which are named by florists: there are what is called piquettees, the flowers of which have a white ground, and are spotted with scarlet, purple, red, or other colours; another sort is called painted ladies, these have their petals of a purple or red colour only on the upper side, and white underneath. There are also whole blowers, which consist of bizards and flakes: the bizards are those having stripes or variegations of three or four colours; the flakes are of two colours only. Of all the sorts, several varieties are raised from seeds. To have the flowers as large as possible, florists cut off all the side shoots from the stems, and allow only two or three of the principal top pods for blowing: and when the bursting carnations are intended to produce spreading large flowers, they prepare circular card papers, about three or four inches diameter, with a hole in the centre, to receive the lower part of the petals, just below the notches of the cup, for the admission of which a slit is cut for that purpose to the hole, so that the upper part of the petals may be expanded all round the card to their greatest extension, beginning at the lowest next to the card. The whole blowers need not so much attention: the only assistance they require, is when the flower cup is likely to burst by the multiplicity of petals endeavouring to expand, that a small piece of bass or thread be tied round the flower cup.

Give the carnation pots frequent gentle waterings, which will enable them to blow fine, and the layers take root kindly. If the carnations were not all laid last month, it may be done any time in this month, when the shoots are long enough for that purpose. *For the method, look back to the directions given last month.*

Those who do not choose to be at much labour with their carnations, may just only tie up the flower stalks, lay down the shoots when they are fit, and supply them in dry weather with as much water as they require. By this management they will blow well enough, though not so large or fine as when few pods are left on; and they will keep in blossom a long time without being shaded, as the upper pods begin to blow two or three weeks before the lower ones begin to open.

Cuttings of double sweet-william, pinks, rockets, &c. may still be raised by cuttings: *for the method see last month.*

Transplant now into beds or flower borders, hollyhocks, French honeysuckles, scarlet lychnis, columbines, sweet-williams, wall-flowers, pinks, stocks, and other seedling, perennial, and biennial flower plants. When you plant them out, if it be dry weather, give them water.

If the weather be warm and dry, you may remove into the open air some of the pots of cockscombs, egg plants, balsams, tricolors, &c.; tie them to sticks to keep them from being broken, and give them gentle waterings as they need it.

Late sown annual flower plants, if any remain in the seedling beds, should be planted out in patches in the flower borders. If the weather be dry, water them now and then till they begin to grow.

Pinks and carnations from seeds sown last year will be in blossom about this time; they should therefore be looked over, and all those not worth preserving may be pulled up. Those with variegated or double striped flowers ought to be particularly examined, and marked, that they may be known from others; and if there are any shoots on them that are fit, they should be laid.

Seedlings of carnations, pinks, &c. which were transplanted last month, should be weeded and watered in dry weather.

Auriculas and polyanthus sown in the autumn or the spring, should now, if they are fit, be transplanted into boxes or nursery beds; a shady situation is best for them. Plant them three or four inches apart in light mould, and give them light waterings. As the auriculas are rather tender, they had best be planted in boxes or pots, and then they can be removed under cover when requisite.

Choice auricula plants in pots should now be paid attention to. Take off all decayed leaves which appear on them; keep them in a shady situation and clear of weeds; and give them gentle watering, in dry weather, when they begin to get dry.

You may now, if the bark rise well, bud flowering trees and shrubs, such as scarlet, horse chesnut, variegated hollies, jasmines, moss roses, &c.

If bulbous flower roots of any sort remain in the ground, they may, in this month, be taken up. After they are taken up, lay them in a dry airy place, till they are sufficiently hardened, then put them up in paper bags or drawers, till the time of planting.

Crown imperials, red lilies, fritillarias, mortagons, bulbous irises, &c. require not to lie long out of the ground.

Gather flower seeds that are ripe, and cut down decayed flower stems, whenever they become so, and pull up all annual flowers which have done blowing.

Edgings of box, thyme, lavender, suthernwood, &c. should now be cut. You may also clip hedges of all sorts, such as beech, lime, hawthorn, privet, &c.

Put stakes to any flowering plants which are likely to be broken down by the winds, and if the branches of any shrubs are leaning down, either tie them up or cut them off; and let the running shoots of honeysuckles, and other plants formed into flowering heads, be cut off as low as the head, or taken entirely out, as you think most proper.

In dry weather do not neglect to water all trees and shrubs which were planted in the spring, and those planted in autumn ought likewise to be examined; for if the weather be hot and dry, they will be better of water.

Keep your gravel walks free of weeds, and roll them now and then to make them smooth; cut edgings round the flower borders and sides of the gravel walks, and mow and sweep your grass walks and lawns often enough to keep them clean and in good order.

Weed all your beds of flowers, and hoe and rake the flower borders as often as they require to keep them neat, and free of every kind of litter.

On the NURSERY-GARDEN,

For July.

If it was not done last month, you may now lay the hardiest sorts of American plants, and those from other climates which are able to bear our winters without shelter. When

the young shoots are grown eight or nine inches long, let the hard wood at the bottom of each shoot to be laid, be immediately below a joint slit a little upwards; lay these about one-third into the ground, peg them down and turn their ends upwards, putting the mould close to them, and forming a kind of bason to make the water stay about them, to moisten them and the mother plant in dry weather. The best earth for laying them in, is a light black earth taken from marsh or heathy commons.

If any beds of seedling evergreen trees or shrubs stand too thick, some of them may be drawn out and planted into beds. Plant them into beds about three feet wide, and set them in the beds about three inches plant from plant: give them water, and shade them in days when the sun shines hot.

This month is reckoned the principal season for budding fruit trees, curious flowering trees, and shrubs of various sorts. It, however, depends on the moistness or dryness of the season whether this or the succeeding month will be the most preferable, for if the weather has been very dry, perhaps the bark may not rise freely from the wood.

Peaches, nectarines, and apricots, are most commonly budded on plum stocks, which seem to be best adapted for them. They should be raised from seeds, and transplanted once: their size should be from half an inch to an inch diameter in the place where the bud is to be inserted.

Plums are budded on plum stocks, pears upon pear and quince stocks, and cherries upon cherry stocks, raised from the stones of the fruit.

Stocks for dwarfs are generally fit to bud on the third year after sowing the seeds: but when they are for standards, to bud at five or six feet high, they require longer time.

To bud trees, let the following method be adopted: get a budding knife which has a thin blade, with a sharp ivory handle, the use of which is to prepare the buds, and the handle to raise the bark of the stocks, to admit the insertion of the buds. Have some good strong bass in readiness, and good sound cuttings, taken from such trees as you intend to propagate. Let them be such as evidently have fine short buds on them; then with the knife make a cross cut in the bark of the stock, and from the middle of this cross cut, make another downward, at least two in-

ches in length, so that the two cuts together may be in the form of a T ; then take one of your shoots, and beginning at the lower end of it, cut off the leaves, leaving the stalks of them ; then about an inch below the bud or eye, force your knife into the wood and draw it under the bud, an inch or thereabout above it, and cut the piece off across the shoot ; then immediately let that part of the wood which was cut off with the bud, be separated from it, which may readily be done with your knife, placing the point of it between the bark and wood at one end, and holding the bark with your other hand, pull off the woody part, which will readily come from the bark, if the shoot from which it was cut be in a sappy state ; then quickly look at the inside of the bud to know if the eye be left ; if there is no hole the bud is left, and should be immediately inserted into the stock, observing for the reception of it to raise with the handle of your knife the bark of the stock downwards on each side from the cross cut, and thrust the bud in between the bark and the wood, applying it as close as possible. As soon as the bud is put in its place, tie it round securely with bass mat, beginning a little below the cut, and proceeding upwards till you are above the cross cut, taking care to miss the eye of the bud, just that it may be seen through the bandage of bass.

In separating the wood from the bud, if the eye or rudiment of the shoot be hurt, which may be known by its appearing hollow in the inside, it should be cast away, and another taken off from the cutting. About three weeks or a month after the stocks have been budded, they should be examined, when such as have united will appear fresh and full. Those that have not taken will appear blackish and decayed, and the stocks may again be budded in another place. When the buds are fairly united to the stock, the bandages may be taken off, which is all that is required till next spring.

Examine the trees which were grafted in the spring, and also those budded last summer, and take off any shoots that may have arisen from the stocks.

Fruit trees in the open ground, of the dwarf sort, for training on walls or espaliers, whether peach, nectarine, plum, cherry, apricot, or pear, may, with the help of stakes, be died in a direction for training, which will put

them forwarder than if they were left to ramble as nature leads them.

You may now bud rose acacias, scarlet horse chesnuts, striped hollies, jasmines, moss roses, and several other kinds of flowering shrubs, not easily propagated by layers.

Weed your seed beds and beds of layers and cuttings, whenever the weeds are so long that you can easily pull them out. Let every part of the ground between the rows of trees and shrubs be hoed and raked, before the weeds perfect their seeds.

On the HOT-HOUSES,

For August.

The pine-apples will now, if they are in a good state, be ripe, and ripening fast one after another; but it sometimes happens that too many become ripe together; if that at any time be the case, set the pots out of the house with the fruit on them, into an airy cool dry shade, and the fruit will keep a fortnight or longer, if it be set out before it is full ripe. The plants, while in this situation, should have no water given them: and it may be necessary sometimes, in order to have a succession, or constant supply of fruit for a long time, to set some of them out green, into a cooler place, to keep them back; and when you wish to ripen them, take them into the house, and plunge them in the tan again.

Excepting the plants upon which the fruit is nearly ripe, the other plants should be attended to in giving them water when they require it; about once or twice a-week in general will be often enough, though sometimes they may want it oftener. The person that manageth the plants must be the best judge when to give and when to withhold that necessary article. Fruit always ripens best in hot dry weather, and with a moderate degree of moisture to their

roots. When the fruit is not far from ripening, it will not be good flavoured if the fine tender growing roots be destroyed; which may be done by too much water at that critical time, as well as by too much bottom heat.

If you have any plants among your succession pines which have shewed fruit, as your fruiting plants are ripe, set out the pots, and take those in fruit from among your succession plants to replace them.

Keep the tan-bed in your fruiting-house still in good order, and those plants which have green fruit on them should be watered moderately as often as they require it. Let the house be always sweet and clean. Sprinkle in hot weather the paths and flues occasionally with clear water; but take care not to suffer the air to be so damp as to stagnate about the plants; if it do, the leaves of them will appear dirty and greasy. This is caused by damp air, when there is not heat enough to rarefy it, and by insects.

If you wish to have cucumbers in your hot-houses about Christmas, get some good boxes about twenty inches or two feet deep, with a few holes in the bottoms of them, to let the water pass through the mould freely: set them on bricks on the back flues of your house, or on strong shelves; fill them within two inches of the top with vegetable or other rich light mould, and set your plants in it about the middle of the month. Give them water when they require it, and you should have a trellis prepared for them to run up upon.

If you wish to endeavour to have kidney beans green all the year, you should now plant the seeds in pots of rich light earth, and set them into the hot-house on shelves or on the flues. Fill your pots nearly full of mould, after shaking it down that it do not sink much afterwards; then lay four or five good beans in a row on the surface of it, and with your finger push them into the earth just deep enough to give them moisture to vegetate: give the plants a little water when they begin to come up.

Height of the Thermometer in the Hot-House, shewing the Temperature of the Air in it, for August.

D.	M.	N.	E.	D.	M.	N.	E.
1	74	95	75	17	68	90	72
2	72	88	76	18	69	90	72
3	74	95	76	19	69	97	74
4	71	90	78	20	64	97	72
5	71	94	78	21	64	98	74
6	73	90	74	22	67	76	72
7	74	87	74	23	60	95	74
8	71	74	69	24	71	98	74
9	71	94	73	25	73	95	70
10	71	96	75	26	70	100	76
11	72	94	74	27	72	80	72
12	70	94	74	28	71	92	74
13	70	94	74	29	71	96	73
14	70	95	75	30	68	84	72
15	70	95	70	31	67	94	73
16	67	95	72				

If your succession plants are large, and have filled their pots with roots, so that the balls of mould will turn out of them perfectly whole, you should now shift them into large enough pots for them to fruit in.

Previously you should examine well the state of your bed, and if new tan be required, it should be in readiness. If the flues of your house are in want of cleaning or repairing, or if the walls of it require white-washing, or the wood in the inside painting, set your plants out into some dry airy place or house two or three days, till you get these necessary repairs completed.

As soon as the house is ready, and the tan-bed has received a recruitment of new bark, proceed to shift the plants. Having pots and mould, and other preparations made, take the plants one after another, scrape the mould and other rubbish off the tops of them, and pull off as many of the bottom leaves as you think necessary; but do not take them off farther up than the stem is well ripened ready to put forth roots. See that the holes in the bottoms of your pots be open, that the water may have a free passage

through them. Put some mould into the bottoms of the pots, and turn the plants carefully out with their balls whole; place them in the fresh pots, and fill up the vacancy with mould, covering the balls with it up to the under leaves of the plants, leaving about half an inch vacancy above the surface to hold water.

Plunge the pots in the tan nearly to their rims, and when the heat comes up in the tan-bed, give the mould in the pots about the roots of the plants a gentle watering. *See* Chap. XII.

Care however should be taken, that the heat in the tan bed do not become too strong. As it may happen to rise too violent, it is the safest way to plunge the pots of fruiting pine plants only about half way or three parts into a new made-up tan bed, till it can be ascertained what degree of heat will arise in it.

Remember to have always a preparation of rich earth ready for your pine apple plants. The summer or autumn are the best times to get it in readiness. At some convenient time in the spring or summer months, let some of the surface of a common or of old pasture land be dug up in turfs and laid up in ridges to dry, and by autumn they will be dried, and the earth of them pulverised by the influence of the sun and air; then break the turfs to pieces, which can be easily done after the rains have thoroughly wetted them. Mix this earth with about one-third of well-rotted sheep's-dung, or hog's-dung, or the dung of old hot-beds reduced into a kind of black earth. If the earth taken from a common or pasture field be of a very strong nature, let a little sand and soot be mixed among it. When sand is not required, a little soot is a very enriching manure, and it keeps worms from the roots of the pines, which sometimes are troublesome.

I would here observe, that when earth-worms are uneasy in the tan bed, and keep crawling and twisting themselves on the surface of it, it is a sign that the heat in the bed is too great.

If you have a quantity of crowns and suckers ready, let them be planted; tear off a few of the lowermost short leaves, to let the roots spring out of the stem of the plant easily; then put them in pots answerable to the different sizes of the plants; plunge them in a bed of warm tan, and give them a strong heat, and shade them two or three

hours in the middle of hot days, till they begin to grow; then give them a little water and air to make them grow strong and short-leaved.

Take care of all your succession plants not shifted this month. See that there is a good heat in the tan, and give them water as often as they require. Suffer no weeds to grow in the earth in the pots, and give them a sufficiency of air at all times when it can be done without cooling the air too much.

Examine well the state of your tan-beds, that you may foresee what preparation of tan it is necessary to make for the ensuing month.

Grape vines in the hot-houses, if the crop is over, and they be managed in the manner that all the old wood is to be cut out every year, to strengthen the long young shoots trained up for producing the crop the ensuing season, the branches which bore the crop this year may now be cut entirely off. Cut them out among the young wood, piece after piece, that you do not injure that which you mean to leave, and afterwards tie up to the rafters neatly the reserve of bearing wood. *See* Chap. IX.

Any exotic plants that happen to be in the houses you may shift, if they require it. Keep their straggling branches pruned in, let no weeds grow in the pots, and water them when they require it.

On the GREEN-HOUSE,

For August.

The grapes in the green-house, if there be any, will now be swelling fast. Stop the shoots before the bunches; tie up the shoots and bunches that want it, and keep the leaves moderately thin, that the rays of the sun and the air may have free access among them. If the bunches are too crowded with berries, thin out some of the smallest of them carefully with a pair of sharp-pointed scissars. Keep the house clean and sweet, and admit air whenever you can do it, without making it too cold.

Green-house plants that were not shifted in the former months may be shifted in this, if they require it. Any long straggling shoots should be shortened or cut off, and the plants, by tying up the shoots neatly, kept in good order. In shifting, in general, the matted part of the ball ought to be taken off with a sharp knife, and the plants put in pots suitable to their size. In the fresh pots there should be just room enough for earth to go round the balls, and cover them over about an inch deep. Give them water as soon as they are shifted, and gentle waterings afterwards when they need them.

If suckers of aloes and other succulent plants have grown large enough for the purpose, you may now plant them in small pots, one in each.

Cuttings of all kinds of green-house plants which are well struck and growing, may also be planted out in small pots. Set them in a shady place till they have recovered themselves, and give them gentle waterings occasionally.

Any orange, lemon, citron, or jasmine trees, that were inarched in the spring, if they are well united, may now be cut off from the parent plant. By placing stakes to them, they should be tied up, that they may not be broken by accidents.

The beginning of this month is a good time to bud orange, lemon, citron, and any other hard-wooded green-house plants which you may choose to propagate in that way. If any of them that were budded in July have failed, it may now be repeated on them. By budding you may have, for curiosity, growing on one tree, oranges, lemons, and citrons.

Keep all your green-house plants free of weeds, and take the dead leaves off as they appear; and if the weather is warm and dry, they will need water frequently.

Green-house plants that have stood in one place for any considerable length of time, should be removed, and the roots that have run through the pots cut from them: were they suffered to stand in one place, all the summer roots would probably run far into the ground, and derive a good deal of nourishment from it; and when pulled up and set in the green house, before winter they would flag, and perhaps lose too many of their leaves.

On the FORCING-HOUSES,

For August.

In your early forced grape-house, the fruit will have been over probably a month ago, and the glasses laid aside, or left open on the house day and night. If it is desired to try to have grapes early in the spring, you may in this month prune your vines, as the wood will be well ripened, and tie them regularly to the trellice, in that manner to which your method of pruning is best adapted. Put your house in order; and if it is necessary to dig in manure about the roots and stems of the vines, let it be done. If your border be dry, give it a good watering; and if with dung-water, at this time it will help to enrich it. When this is done, draw on your glasses, and keep the air in the house to a moderate degree of heat, and your vines will afterwards shoot out; and if they are in a fit state for bearing they will shew fruit.

If you have not plenty of vines in other houses to succeed these, it would not be advisable to begin to force at this season of the year, for there are several things that might reasonably be urged against the probability of the success of this attempt to ripen grapes early in the spring; but it may succeed, and therefore it is worth giving it a trial. By custom, the vines can be brought, as it were naturally, to shoot forth in the autumn, and their fruit may be set before the shortest days; the greatest art will then, after that, be to preserve them through the dead of winter in a lively growing state. This can be done only by much attention, in making gentle fires, and admitting an easy circulation of fresh air in the house every favourable opportunity. *See* Chap. XI.

In some of your houses the grapes will now be in perfection. Endeavour to keep them from the birds and wasps: to effect this, fix nets on the parts of the house where you admit air, and fix them in such a way as the sashes will slide backwards and forwards, either in the inside or outside of the nets. The net should be as thick in the meshes as that a wasp cannot fly through them.

Continue as your vines grow to stop them before the fruit. Tie up the bunches and shoots when they require it, and keep them moderately thin of leaves.

The peaches and nectarines in your latest forcing-house will now be ripe. If they fall down before you gather them, make some contrivance to prevent them from bruising: either lay down something soft on the border, or hang up nets for them to fall into. Tie up any shoots that may want tying, and give the house all the air you can, only prevent the rain from falling on the ripe fruit.

Examine your first forced peach house; if the weather prove dry, probably the border will be better of water; and if mildew appear on the trees, endeavour to stop its progress by sulphur, or by any better method, if you can find one out.

Examine the border of your cherry-house, and if it be getting dry, water it; and take care that the branches of the trees do not rub one against the other in windy weather, so as to hurt any of them.

The figs in the fig-house will now be ripe, and probably many of them gathered; let those that remain be covered to keep rains from them, and give the house as much air as you can.

In the forcing rose and flower-house you will probably now have cuttings and seedlings of annual flower exotics and other plants; let them be weeded, watered, and tied up when they want it.

If the weather prove dry, this is a good time to paint any of your hot-houses or others which stand in need of it.

On the FORCING-FRAMES,

For August.

In this month the fruit of the melon plant will be in the highest perfection, and the beds, frames, and plants will demand daily attendance.

If you have linings at your beds, not covered with earth, as the manner of some is, to let the roots out into,

let them be raised, if they are not very warm, as high as the mould in which the plants grow. Lay your melons, as they begin to swell, on tiles or stones to keep them dry; and move the older ones sometimes, to prevent them from getting whitish or flat on the under side.

Cut out of the melon frames all superfluous or decaying shoots. Stop the shoots a joint or two before the fruit, and also cut off the ends of the long running shoots immediately before a shewing fruit, if there is a leading shoot coming out by the side of it; for you ought to remember always in pruning melons, that a fruit will not swell well except there be a growing shoot before it; and this shoot, which is called a leader, because it leads or draws the sap from the roots to and past the fruit, should be stopped before a joint that will, if the plant is in good health, sprout out again.

Do not let your plants get too full of leaves, and cut off the oldest and worst leaves first.

If the weather is warm and dry, the melons will probably sometimes require water twice a week; if the weather is wet or cloudy they will not require it so often.

Look into your melons in the morning, and if there is a dew on them standing like little beads round the edges of the young leaves, it is a good sign; but if there is no dew on them, in the form I have described, they are not in a very prosperous condition. The air in the frames is not sweet: they either want water, or sprinklings of water, or else the heat of the air in the frames is too great in the night. In hot weather melons are better to have air left at them all night, and in very warm weather to take the glasses entirely off in the evening, and put them on again in the morning: by this means the plants will get a refreshment from the dew in the night.

It has been a matter of studious inquiry among philosophers whether dew on vegetables fall on them from the atmosphere or rise on them out of the earth, and I believe on this subject they are not agreed in opinion. But it may be observed, that in summer, if the ground be very dry, and vegetation in plants be dormant for want of rain and moisture in the earth, there is no dew to be seen on them though they be alive. I have frequently observed, that when melon and cucumber plants be in frames, and in a good state of health, the dew in the

morning stands round the edges of the young growing leaves in small drops, like the heads of small pins, which I suppose is what perspires from them, and denotes the plants to be in good health. The like may be observed upon herbs of the fields when they are in a good growing condition, and the temperature of the atmosphere suits them.

Out of the earth and all kinds of vegetables, there is a continual evaporation of moisture issuing, and in its ascension, according to the temperature of the atmosphere, more or less of it lodges on the herbage and plants of all sorts. The air being constantly mixed with moist vapour, according to the state and density or weight of the atmosphere, more or less of it gravitates to the earth, and hangs on vegetables; it would therefore seem that dew is conjointly, if not alternately, the production of the ascent and descent of moisture.

Melons that were planted last month will perhaps now require gentle linings, and of this you should consider, that you may make preparation, for what quantity of dung you will be in want of the ensuing month. *See* Chap. X.

In this month, if the weather be warm and dry, cucumber plants will be producing fruit in the open ground plentifully. If there happen to be much rain, set the hand glasses over the stems of the plants. In case the weather happen to prove hot and dry, give the plants a plentiful watering once a week.

If you keep on in frames the cucumber plants in the forcing way, let a gentle heat be maintained in the linings. In case they be on a brick bed, a warm lining at one side of it will, by means of the flues, warm the mould in which the plants grow, all round the pits. The fruit in blossom must still be set, and the plants kept moderately thin of leaves, and of superfluous shoots. *See* Chap. IX.

In this month the seeds of the cucumber may be sown in the hot-house, perhaps they may produce a few fruit in the month of December or January. Sow them in boxes filled with vegetable or other light earth, and place them on shelves in the backside the hot-house, where the sun may not be interrupted from shining on them in the short days.

Height of the Thermometer in the Melon and Cucumber Frames, shewing the Temperature of the Air in them, for August.

D.	M.	N.	E.	D.	M.	N.	E.
1	71	88	74	17	72	83	80
2	68	96	79	18	70	80	78
3	72	85	76	19	72	95	86
4	78	83	78	20	70	90	89
5	76	90	84	21	74	73	90
6	72	89	82	22	75	88	80
7	75	88	76	23	75	90	84
8	74	96	88	24	70	87	80
9	75	90	85	25	68	90	87
10	77	85	81	26	61	95	86
11	60	84	82	27	70	84	80
12	76	98	88	28	71	86	83
13	74	86	76	29	72	90	80
14	70	85	70	30	77	88	80
15	76	82	80	31	75	81	80
16	73	88	75				

If the weather has been warm, cucumber plants, which were ridged out under hand glasses, will some time in this month be producing fruit plentifully. If the weather be dry, give them a good watering once or twice a week. If their leaves and vines get crowded, thin them moderately.

You will soon want to be making mushroom beds. In the latter end of this month or beginning of next, the linings of melon beds, if there be a little heat in them, and the dung not too wet, it is very fit for that purpose.

Get dung put together in a heap to ferment, to make a mushroom bed. If it is rank new dung it will take a long time to prepare, for mushrooms do not require a great heat, but a steady, sweet warmth; it is best therefore to mix new and old dung together, or allow the new longer time to prepare.

On the KITCHEN-GARDEN,

For August.

Celery will require to be earthed up in the beginning of this month. Let two men take spades, and go opposite one another, one on each side of the row, and break down the earth fine, and put it close to the leaves of the plants. This should be repeated every week, till the plants are blanched high enough to be fit to take up for use.

Plant two or three different times in the month more celery plants: for the method see last month's directions. If the weather prove dry, they will require frequent waterings. Celery is a plant that loves much moisture and good ground to grow in. If you have any plants left in the seed beds, you may prick them out about the beginning of the month, they will do to plant in trenches next month, to come in late in the spring.

Sow corn sallad or lamb lettuce in this month. It is a hardy plant, which will stand the winter and come in for sallad in the spring.

Sow chervil, scurvy grass, angelica, fennel, &c. They may be sown in drills where they can easily be kept clear of weeds.

Sow white mustard, cress, turnip, and rape seed once a week for small sallading, it will do best now in small drills on a shady border.

Sow every ten days the seeds of salmon, short top, and other kinds of radishes. Sow them on good ground, cover the seeds well from the birds, and give them water often in dry weather.

Plant out a full crop of endive: plant it in rows a foot apart, and about eight inches plant from plant in the rows. You may make plantations of it three different times this month. Give it water in dry weather till it begin to grow. There are three sorts of endive, the batavian, the green curled, and the white. Tie up forward endive for blanching.

Sow two or three times this month different kinds of lettuce: sow those which you think are the best, or you may sow all the sorts.

To have a constant supply of good lettuce, plant some every week, and keep them well watered in dry weather, or else they will be tough, and run to seed perhaps before they are blanched white.

In the beginning of the month sow carrot seed. If the ground is not a clayey soil, tread them in, and smooth it with a rake afterwards.

You had best sow some more carrot seed about the middle or twentieth of the month. Sow them in beds three feet wide, for the conveniency of weeding. These will come in the spring.

In the first or second week of the month, get a piece of good rich deep ground in readiness, by dunging it if it want, and digging it deep for a crop of winter and spring spinach.

When your ground is dug, if it be a light soil, which is best for spinach, tread it with your feet all over, then draw shallow drills, eighteen inches or two feet apart, with your hoe flatwise; scatter the seeds of prickly spinach in the drills, and cover them two inches deep, and make the ground smooth with a rake. You should, before you fill up the drills, set a little stick up at each end of them, that, in case of dry weather, you may stretch a line between the sticks, which will shew you where the spinach is sown, that you may water the rows, if they require it. If the ground was dry on the surface, when you sowed the seed, you should have had the drills watered, before they were covered. You may sow again a few rows about the twentieth of the month.

About the tenth and twentieth of the month, you should sow cabbage seeds, to raise plants to plant out in winter and early in the spring: the battersea, yorkshire, and sugar-loaf kinds are the best. The forwardest of them will probably do to cut for coleworts in winter, and early in the spring. Sow them in beds, on good rich ground, and if it be not very heavy soil, tread them in, and smooth the ground afterwards. If the weather prove dry, you must water them, and endeavour to prevent the birds from eating them. This may be done by laying bushes on the beds, till the seeds come up; or, which perhaps is better, stick feathers into packthread, and tie it to stakes, above the beds near the ground; these, by the influence of the air, will keep in motion, which will frighten the little animals.

In this month, the whole cabbage tribe are liable to be much injured by the caterpillar; the best way is to set boys or women to pick them off every day: they may be put into a garden pot with lime in the bottom of it, and destroy them as soon as possible.

At two or three different times this month, plant out the several kinds of brocoli. For this purpose, choose an open spot of rich deep ground; draw shallow drills, about thirty inches apart, and set the plants, about sixteen or eighteen inches asunder, in the rows; if the weather prove dry, give them water occasionally, till you perceive them begin to grow.

Destroy the weeds among the former planted crops of brocoli; and if the weather be wet, that they do not die, you should rake them off. When the brocoli plants have grown strong, draw some earth to the stems of them.

About the middle of the month, and also towards the latter end of it, sow the seeds of cauliflower to stand the winter; sow them on a little bed of very rich earth, rake the seeds in neatly, and clap the earth of the bed down with your spade flatwise; give them gentle waterings in dry weather, and after they come up, keep them free of weeds.

Plant out, in rich ground, stout cauliflower plants, about the beginning, and again about the middle of the month; set them nearly thirty inches row from row, and about sixteen inches apart, plant from plant; put them in shallow drills, and give them water in dry weather. From these plantations, you will, perhaps, have cauliflowers in October, November, and December.

Sow the seeds of turnip two or three times this month, tread or roll the seeds in, and if the weather prove dry, they would be better to be watered. Hoe and thin the former sown crops of turnips. If insects begin to appear on the leaves of your turnips, sow lime or soot over them, and in dry weather water them.

If it was not done the latter end of last month, dig some good ground the beginning of this month, to sow onions for winter and spring use; it should be rich ground, on which onions have not grown the last two years. Divide it into beds three feet broad, with alleys of about sixteen inches wide; sow the seeds, and if the ground be light, tread them in, and smooth it afterwards with a rake,

and give them water, if the weather prove dry, to cause the seeds to vegetate and come up. When they are sprung up, keep them perfectly free of weeds. Some winters destroy the plants of common onions; therefore you should sow the seeds of the Welch onion, which endures the hardest winters.

The beds of seedling asparagus ought to be kept perfectly clear of weeds. The old beds also, and the alleys between them, should be weeded and hoed occasionally, to prevent the weeds from ripening their seeds.

The stems of those artichokes that have done bearing, should be cut down, and the ground among the plants hoed, and kept free of weeds.

Cardoons in trenches should be earthed up to blanch; let one person keep the leaves together, and another put the earth, being first broken small, round about close to them: repeat this as often as they appear to want it. Hoe the ridges in each side of them, to destroy the weeds.

If your crops of onions are swelled to their full size, and their tops decaying, pull them up, and spread them out to dry and harden. When the stems of them become dead, gather them up in a dry day, cut off the roots, and long withered stems, and lay them up in a dry room, for winter and spring use.

If you have saved any kinds of superior esculent vegetables to produce seed, gather them before they are over ripe, to prevent the birds from eating them, and before they shake out.

You may still plant out well-rooted slips, cuttings, or seedling plants of aromatic sweet herbs, such as hyssop, sage, savory, marjoram, thyme, lavender, &c.

If it was not done last month, take up the roots of shallots, garlic, and rocambole; they should be dried, and hung up in bunches in a dry room, for winter and spring use.

Plant out for spring use, green and red borecole, brussels sprouts, jerusalem kail, &c.; plant them in rows, from two feet to thirty inches asunder, and set them about sixteen inches plant from plant in the rows; give them water to settle the earth about their roots, and more occasionally till they begin to grow.

Cut all sorts of herbs, which you wish to dry, in winter, such as sage, balm, pennyroyal, mint, marjoram, tansey,

wormwood, &c.; they should be cut when they are in full blossom, and in a dry day. Lay them in a shady dry place, and when they are in a state fit to keep, put each sort by themselves, and lay them up in a dry room till they are wanted.

Take up all the stalks of peas and beans that have done bearing, clear the ground of weeds, and prepare it, by dunging and digging, for the reception of other crops.

Hoe up the weeds every where, and if the weather is not dry to kill them, rake them off. Draw earth to all sorts of cabbages, brocoli, borecole, &c.

In the beginning of the month, get a heap of hot dung in preparation for a mushroom bed, and be looking about in old dunghills for mushroom spawn, if you have not got plenty in possession.

On the FRUIT GARDEN,

For August.

The grapes on the vines against south walls will now be swelling fast; look over them frequently, and stop the shoots that require it; nail any shoots to the wall that may be hanging from it, and thin the leaves, so that the sun may shine on the bunches, and on parts of the wall among them. If the shoots and leaves are so crowded, that the sun cannot warm the wall to which they are nailed, the grapes will not ripen well.

Peach and nectarine trees will now demand attention; go over them, and cut off all midsummer shoots that are crowding the trees, and nail in carefully those shoots that are reserved to choose bearing wood from among the ensuing spring. Suffer not the leaves to be too thick on the trees; the leaves ought not to lie on the fruit; the sun should have the opportunity of shining on the fruit at least some part of the day, unless you wish to keep it back.

Examine the trees minutely, and if the mildew make its appearance, rub the affected parts of the shoots with sulphur, and dust the infected leaves with it.

If the weather be dry and warm, and the fruit not begun to ripen, you may continue to wash the peach and nectarine trees with clean water; and if it is not done already, cut the hollow stalks of beans about a foot long, and stick them here and there among the branches, and take them down every morning; blow the insects which have taken shelter in them, into a pail, pot, or bottle of water, and stick the stalks up again till next morning.

To keep the wasps, and some other insects from the fruit, take fine clean wool, and spread a thin coat of it over the surface of the fruit. A handy careful person will cover many fruit in this way in one day.

Another method which I have found serviceable, to preserve from the wasps, peaches, nectarines, plums, pears, grapes, and other fruit, is to cover the trees with nets, letting them hang hollow from the trees; the wasps are afraid of being entangled in the nets. Wasps nests should be destroyed early in the season, if possible; and wasps may be destroyed by hanging up phials, in which are treacle, sugar, and beer mixed; but by hanging them on the walls among the fruit, it entices the wasps to come among them.

Go over the fig trees, and cut off superfluous shoots, and nail the remaining ones to the wall neatly, and nail them to parts where they do not touch the fruit; thin the leaves so, that the sun may shine on the fruit some time in the day.

By hoeing and raking, keep all your fruit-tree borders perfectly clear of weeds and all kind of litter.

If the weather be very dry, peach and nectarine trees, if the ground be light, will be better to be watered; trees planted in the spring would not do well without it.

Trees that were budded last month should be examined, and if the bandages pinch the stocks too much, they should be loosened. If any of the buds appear dead, bud the stock in another part, for this is a good time to bud trees if the bark rise well.

If you have peaches, nectarines, apricots, &c. on the walls, which are a kind you do not like, if they are healthy trees, you may put into the different shoots, all over them, buds of different trees, the fruit of which you prefer; and in the spring, if the buds have united, cut off the shoots before them, and train them to the wall in summer; and

you will have a chance of having fruit on them the succeeding year.

Currants against walls or palings should now be covered with mats, which will preserve them to a late time of the year.

Stocks budded last year and also those grafted in the spring should be looked over, and if the shoots from the buds and graft are alive, cut off any shoots that may have arisen from the stocks.

Strawberry beds in bearing ought to be constantly watered in dry weather.

Plantations of strawberries may now be made; they will get strong and fit to bear fruit next season. Dig a spot of good loamy ground, tread it all over, and smooth it with a rake; mark out beds three feet wide, leaving two feet from bed to bed for alleys; make four rows in each bed one foot apart, and set the plants a foot apart in patches; three or four plants in each: put them firm in the ground, and keep them moist till they have made good roots. You may plant runners if they are strong, or old healthy plants, from beds that bear well, will do, by cutting the old black roots from them, and planting those only that have fresh strong fibres. It is a good method, which should not be neglected to get a change of plants every two or three years; and by sowing seeds every year, new varieties and some good sorts may happen to be obtained.

You may now plant strawberry plants for forcing next spring; they should be strong ones, and put in pots of any size you think most suitable for the places you have to force them in; they ought to be planted in good loamy earth, free of grubs and hurtful worms.

Examine all your wall and espalier plum, pear, apple, and cherry trees; see that the branches are all secured to their places, that they be not broken down by the weight of fruit or high winds, and cut off all superfluous or dead shoots that may happen to be on them.

Hoe and rake the ground between your gooseberry, currant, and raspberry bushes, and clear your strawberry beds, that have done bearing of weeds, old leaves, and all kind of litter.

On the PLEASURE or FLOWER GARDEN,

For August.

When your carnations have done blowing, cut down their stems close to the plants, and as soon as the layers are sufficiently rooted, cut them from the mother plants, and plant them in good earth in small pots, three or four plants in each pot; give them water and set them in a frame, shading them, in warm days, till they are able to bear the sun. Keep your carnation pots free of weeds, and water them gently when they begin to be dry.

This is a good time to plant slips of auricula and polyanthus plants; set the auriculas in small pots, and set them in a shady place till they begin to grow. The polyanthuses may be planted in pots, or in a shady border. Seedlings of this kind of plants may now be pricked out, and, if you choose, you may now sow the seeds of them; they will come up very well, if they are moistened with water in dry weather, though sometimes they will lie in the ground till the spring.

You may now propagate the different sorts of saxifrage; these are propagated by offsets, which arise from the sides of the plants. The common sorts may be planted in clumps in the borders: the pyramidal saxifrage should be planted in pots; it makes a beautiful appearance when in blossom.

Towards the latter end of the month, if the weather be not too dry, is a good time to increase most sorts of herbaceous plants: this is done by parting and slipping the roots. They may be planted in beds, or in the flower borders among the shrubs, planting the lowest growing ones next the edge. Before they are planted, the roots should be trimmed, and water given them immediately after planting, to settle the earth about their roots.

Support your annual flower plants in pots with stakes, and give them water when they require it.

Your perennial and herbaceous flower plants in pots, if they have done blowing, should have their flower stalks cut down; weed them, and give them water occasionally in dry weather.

If you have not carnations enough laid, the beginning of the month is not too late to lay them. You may also lay double sweet-williams, and any other plants of like nature, that are commonly propagated by this method.

There is the tree carnation, which makes a beautiful appearance when in bloom. It is propagated by layers and cuttings, which may be done now, or earlier in the season.

You may now transplant bulbous-rooted plants, such as crown-imperials, martagon lilies, irises, fritillarias, pionies, &c.; they should be transplanted soon after the leaves are decayed, before they make fresh fibres.

In this month, you may sow the seeds of bulbous flowers. Sow them in boxes or pots, that they may be moved, at any time, to such situations as are thought most genial for them; cover them nearly an inch deep in good earth, and keep them moderately moist; perhaps they may not come up before the spring. It will be several years before some bulbous roots, raised from seed, come into a flowering state. It is, therefore, the curious only, that will wait patiently till that period. They are most readily propagated by offsets from the full-grown bulbs.

Perennial and biennial seedling flower plants, such as sweet-williams, columbines, wallflowers, scabiouses, stocks, &c. may now be planted out in clumps on the flower borders, or into beds, to be transplanted in the spring; endeavour to plant them in cloudy days, and if it do not rain, give them water.

Prick out mignionette in pots to stand the winter; put two or three plants in each pot, in light rich earth; give them water, and set them in a shady place, till they begin to grow. You should also sow the seeds of mignionette in pots, and when they are fit, you may transplant them into other pots, leaving two, three, or four, in each pot to blow. If they run up with one shoot, stop them, which will cause them to put forth several shoots near the surface of the pots.

When ripe, gather the seeds of flowers, spread them in a dry place in the sun till they be hardened, then rub them out, and put them up in boxes or paper, till the season in which you want to sow them.

Go over your shrubberies and flower borders, and head down, or cut out all straggling irregular branches; and

those that interfere with one another, or are hurting low plants of any kind near them, should either be cut off, or tied up.

Pull up annual flowers that have done blowing, and cut down the decayed stalks of herbaceous plants. Hoe and rake the flower borders, and keep the grass edgings neat, and free of long grass.

If the weather prove dry, trees and shrubs planted in the spring, would be better of water; let the earth about their stems be formed so as to hold the water, till it sink in among the roots.

Clip box edgings, and all kinds of hedges, such as thorn, holly, hornbeam, lime, elm, elder, honeysuckle, beech, yew, syringo, &c.

Sweep your gravel walks, keep them free of weeds, and roll them occasionally to make them smooth.

Mow grass walks and lawns frequently; sweep the grass off them, and other litter, that they may appear neat at all times.

Look forward, and consider if you shall be in want of fresh earth from heaths and commons, for your American and other curious exotic plants, as this is a good time to get it brought to the parts where you may want to use it.

Ridge up and prepare beds of ground for planting ranunculus, tulips, jonquils, hyacinths, anemonies, narcissus, &c.

If wanted, you may likewise trench and prepare ground for planting trees, shrubs, and herbaceous plants of all sorts.

On the NURSERY-GARDEN,

For August.

If the weather be hot and dry, water the beds of seedling trees and shrubs, and keep them free of weeds; and those transplanted late in the spring would be better to be watered in dry weather.

Go over your trees and shrubs of all sorts, and cut off any shoots near the ground that may be robbing the upper

parts of them of the necessary juices; and take out or shorten any strong growing shoots in your shrubs, so as to form them into regular neat heads, in the manner you think most proper.

Train out with stakes in the open ground such peach, nectarine, apricot, plum, pear, and apple trees, as you intend for walls and espaliers. This method will forward them in a way, that when they are planted where they are to remain, they will easily be brought into subjection, and trained in any form you may chuse to adopt.

Look over the stocks that have been budded about three weeks or a month; and if it is necessary untie the bass, that the parts about the bud may not be pinched too hard.

If you have any vacant pieces of ground, if it has not got too hard by the influence of the dry weather, you may trench them, to be in readiness to plant, when the time comes, with such plants as you think fit. The ground may be laid up in ridges that it may be meliorated with the influence of the sun and air.

In moist or cloudy weather, you may transplant, if your beds are too crowded, evergreen seedlings of any sort. After transplanting, they should be watered and shaded in hot days till they have taken root. The beds also, out of which they were drawn, if the weather prove dry, would be better of water.

Look over the trees which were budded the former year, as well as those grafted in the spring, and cut off all shoots produced below or above the place where they were budded or grafted.

Let the ground between your trees be hoed and raked occasionally in dry days, to keep the weeds from injuring the trees; and by weeding, let your seedling beds be constantly clear of weeds.

About the beginning of this month, fruit-trees of various sorts, and of shrubs, may be budded. *For the method of budding, see last month.* If any of those plants which were budded last month, have failed in the uniting of the bud with the stock, a bud may be inserted now in another part of the stock.

Some persons reckon budding preferable to grafting. Budding is commonly practised upon all sorts of stone fruit; such as cherries, plums, peaches, and nectarines, and also upon orange and lemon trees. Most kinds of shrubs

and trees may be propagated by budding. When apple and pear trees fail from being grafted in the spring, the young shoots which arise from the stocks may be budded in this month, with the sorts required.

The time for budding different kinds of fruit-trees and other plants is from the middle of June till the middle of August, according to the forwardness of the season and the particular kinds of trees to be propagated. The time to bud trees may be known by trying whether the bark will rise easily and clean from the wood. It is the general practice in budding of trees, to divest the bud of that part of the wood which was cut from the shoot with it: but in many sorts of tender trees, it is best to preserve a little wood to the bud, which becomes a means of preventing their failing. Perhaps it is for want of not observing this, that some people conceive that certain kinds of fruit and other trees cannot be propagated by budding.

In regard to what trees will unite and thrive by being budded, grafted, or inoculated upon each other, all such trees which are of the same genus, that is, which agree in their flowers and fruit, for instance, all the stone fruit-bearing trees, under which may be reckoned the peach, the apricot, the nectarine, the almond, &c. These agree exactly in their general characters, by which they are distinguished from other trees. Nut-bearing trees of all sorts may be safely budded or grafted on each other. The cherry may be budded or grafted on the laurel, or the laurel on the cherry.

I believe it is by the methods of budding and grafting, that several kinds of exotic trees are rendered hardy enough to endure the cold of our climate in the open ground. Exotic tender fruit-trees, by being budded or grafted upon stocks of the same kind, which are of a more hardy nature, are in some degree rendered more able of enduring the cold of our climate. Let the shoots of apple-trees, which grow fine in the south of France, be grafted or budded on the crab apples in England by way of experiment.

When fruit-trees are raised from seeds taken out of the fruit, the plants from those seeds are mostly degenerated. They in general are not so good as the parent trees: for this reason, all fruit-trees in our country are propagated by grafting or by budding, in order that no degeneracy may take place, but that the fruit may be equally as good as the

original. But, notwithstanding the practice of budding and of grafting, it is complained of in cyder countries, and in other parts of England, that the best sorts of fruit-trees are growing worse, and that many will be soon worn out. It is said, that the golden-pippin, the red-streak, and other fine sorts of apple-trees and of pear-trees, are in an extreme state of decay and degeneracy. This degeneracy is assigned to different causes. Some say they are corrupted by a mixture of various farina, when good sorts in orchards have had bad varieties planted among them.

Some time since, a Mr. Knight published a treatise on the apple and pear, and some other tracts on gardening, and on the nature of plants. This gentleman conceives, that the degeneracy of fruit-trees flows from a constitutional cause, dependent on the age to which the species will live and flourish. He thinks the apple-tree lives, on an average, two hundred years, and that when any particular variety has been successively propagated by grafts, from trees originated about two hundred years ago, the last grafts of the shoots of the original tree begin to decay, because they are partakers of the old age and decline of the parent; of which, however, in an accurate point of view, it is not the offspring, but only one of the extreme last produced shoots of the last grafted tree. That this can be the cause of the degeneracy of fruit-bearing, budded, or grafted trees, is, I apprehend, mere theory, without a probability. But be it as it may, fruit-trees should be grafted on good healthy flourishing stocks, of the same genus with themselves; and if they be planted in good ground, and taken care of, there needs to be no fear of their degenerating. However, if the seasons be unkind, the fruit may not be always very good; because the trees may become diseased, let them be ever so well cultivated, in the best of soil.

New and good sorts of fruit trees may be obtained by chance, from the seeds of fruit trees which generally bring varieties. The seeds of apples, &c. may be sown in the spring on a bed of good ground, or in a frame, with lights to protect them while in an infant state. For this purpose, select the seeds of the best sorts of fruit trees, make the earth fine, smooth the surface of the bed, and sow the seeds about one inch apart, and cover them about half an inch thick with fine rich earth; when the plants come up, thin them, and keep them weeded, and watered when they

want it, during the summer. In the spring following, if they be strong enough, they may be transplanted and managed as other young plants. When they produce fruit, it will then be ascertained, whether any of them be worthy of further cultivation.

With regard to fruit trees, or their fruit, being corrupted and degenerated by the farina of bad sorts, I think the idea is futile. Were it the case, cherry trees in the course of time might produce plums, and plum-trees peaches; wheat might be degenerated by barley, rye, and so on. But the Almighty Creator of all things hath otherwise ordered it. Nevertheless, the ingenuity and artifice of man does improve trees and their fruit, and man may be the mean of degenerating them.

On the HOT-HOUSES,

For September.

The greatest part of the pine-apple fruit will probably now be over; and if the number you have remaining to ripen be not many, you had best take them out of the fruiting-house, and put them into a small hot-house, or pit, in a gentle heat, that you may be able to prepare your fruiting-house for the reception of the large fruiting-plants intended to produce fruit next season.

Having your hot-house cleared of all sorts of plants, and a sufficient quantity of new tan in readiness, begin and carry all the exhausted tan out of the pit, leaving that only which has a heat in it, and is not quite rotten. The tan which you carry out, if it is worth it, may be sifted, and that which does not run through the sieve, carried into the house again; then fill up your pit with new tan, which is to be well mixed with the old left in the pit. The depth that it will require to be mixed, depends on the size of your pit, the strength of your tan, and the distance the flues are from the sides of the pit. Some have a cavity of from four to six inches only, between the sides of their tan-

pit and the flues; when that is the case, so great a body of tan is not required, during the time fires are made, as if the flues were farther from the pit; but the tan is sooner exhausted, on account of the heat communicated to it from the flues. I prefer having paths round the tan-pits and the flues, at least two feet distant from the sides of them; the heat of the tan in the pits is then more steady and more durable, than when the flues are almost close to them.

I have found that when a tan-pit is about six feet wide, and three feet deep, filled with good new and old tan in nearly equal quantities, it is enough to raise and retain a sufficient heat for the growth of the pine-apple for about half a year, with the addition of as much new tan as will keep it up to its original height; at the expiration of which time, the exhausted part of the tan is to be taken out, and the bed recruited with new bark, as I have directed to be done in February or March. *See also* Chap. XII.

Having mixed your old and new tan well together, and levelled the surface of the bed, tread it all over, and level it again; and if you find it too low, lay some fresh tan on the top of it, to raise it to its proper height, and dig it with your tan forks twice over, to mix the new and old tan together as well as possible.

When this is done, clean out every part of your house thoroughly; get the flues cleared of soot and repaired, and likewise the glass mended, if any of it be broken, and the inside of the timber work of the house painted, or clean washed with soap and water, and all the walls and flues washed with lime and water.

When the house is ready, if your plants were shifted last month, plunge them in rows a sufficient distance apart; but you had best not plunge them to the rims, till you have ascertained what degree of heat rises in the bed: if they will bear being up to the rims, you can easily afterwards fill up the vacancies about them with tan well prepared. If your plants are not shifted, proceed to do it in the manner directed last month. But if they have not filled their pots very full of roots, and are rather small for fruiting, which will sometimes happen, you had best not shift them till after they have shewn fruit in the spring. *See* Chap. XII.

If this month happen to be cold, it may be necessary to begin to make fires, and especially if newly made tan-beds do not begin to ferment kindly, or plants be backward, either in size or in ripening off their fruit.

Height of the Thermometer in the Fruiting-House, shewing the Temperature of the Air in it, for September.

D.	M.	N.	E.	D.	M.	N.	E.
1	64	95	73	16	67	94	75
2	62	97	74	17	75	90	74
3	65	100	70	18	70	92	74
4	64	103	70	19	70	90	70
5	65	102	79	20	64	85	74
6	70	102	78	21	72	95	75
7	65	100	76	22	72	90	72
8	64	102	76	23	65	75	67
9	61	100	74	24	66	80	70
10	70	94	75	25	69	96	73
11	73	82	75	26	71	94	73
12	78	92	78	27	71	95	75
13	76	92	75	28	73	75	72
14	70	80	73	29	65	80	73
15	69	80	70	30	65	80	72

Besides the plants which you have set in your forwardest fruiting house, unless it be a large one, you will probably have more fruiting plants of a lesser size, for a succession of fruit. These should be taken care of, and now shifted into larger pots, or else let remain in their present ones till they shew fruit some time in the spring, or beginning of summer. But it should be recollected, that whatever number of plants you intend for fruiting, they ought not to be all alike forward; for if they all shew at one time, you will have a flush of fruit and a scarcity afterwards. This sometimes will happen with the best of gardeners, and if they chance to live in families who see much company, they are occasionally at a loss to know what to do for a pine-apple, when it is expected from them.

Pay good attention to all your pine plants; see that a good bottom heat be kept at them, pick the weeds out of the pots when they appear, and give them more or less water as they require it. No rule can be laid down for watering, a gardener must be guided, in this respect, by his own judgment; the best way is to imitate and assist nature. I have, in hot weather, and when there was a great heat in the tan-bed, kept pouring water all over a bed of pines for an hour together, out of water-pots with roses on the spouts, as fast as it could be handed to me; at other times, even in hot weather, I did not give them a drop of water for the space of ten or twelve days; and I have often watered plants twice and three times in one day.

As the weather is generally not so warm as in the preceding months, the pine plants will not require quite so much water as they then did, unless the heat of the house be kept up high, which in some years is necessary, when the fruiting plants are backward.

All the crowns and suckers that you have obtained from your plants, should now be planted: have a frame or pit ready for them; pull off some of the bottom leaves, and put them in pots, and plunge them to the rims in the tan, give them a great heat and no air till they begin to grow, then give them a little water and air constantly in fine warm weather.

In watering pine plants it ought to be remembered that some sorts do not require so much water as others. The queens, the ripley, the sugarloaf, and some other sorts require a little more water than the antigua, the black jamaica, and a few more sorts of the large growing kinds.

If you have grape vines in any of your hot-houses take care of them. If you practise that method of pruning by which the wood that bore the crop this season is to be entirely cut down to the bottom, and long shoots trained up of this year's growth for next season, from the lower part of the main stem, you may now cut out your old wood, unless the vines be very strong; this will strengthen the wood for bearing the ensuing year.

The kidney beans which were planted in pots last month should be weeded and watered when they want it, and if you mean to try to have fruit all the winter, you should plant more this month.

Let all kinds of exotic plants which you may have in the hot-houses be kept clean, and watered occasionally as they begin to get dry.

On the GREEN-HOUSE,

For September.

Orange, lemon, and citron trees, unless they stand in warm sheltered situations, had best be removed into the green house, about the middle of the month; and if in the green-house you have any tender exotics which require the hot-house in winter, you should remove them into the hot-houses, that your green-house may be ready for the whole of your plants.

Most kinds of green-house plants, may in warm sheltered situations in the south of England, stand out till about the middle of October; but as sharp frosts, some years, happen early in that month, it is the safest way to house them about the latter end of September.

Before the plants are taken in, tie up any of them which stand in need of it, cutting off or shortening any of their shoots that are not wanted, to make the plants appear handsome and regular in their appearance. Cut off the roots that have run through the pots, scrape off any rubbish and unlevel earth from about their stems, cover the surface of earth in the pots neatly with fine mould; then clean the outsides of the pots and carry them into the green-house, beginning with the tallest ones first in the backside, and finish with the shortest ones in the front. As you place each row of pots, water them gently with a rose on the water pot, to settle the earth on the tops of them level, and give them gentle waterings afterwards when they begin to get dry. Give them, in fine days, as much air as you can, and leave air at them all night unless the nights are very cold.

Cuttings of green-house plants not well rooted, should be put into a frame where you can give them as much heat as they require.

The grapes in the green-house will now be ripe, tie up the shoots and thin the leaves if they want it; this should be done before the plants are taken in.

Grapes in the green-house will hang to be good in November, and sometimes till Christmas, if they are kept dry, by making fires to warm the air, and by keeping the house continually well ventilated to let the damp air pass out.

Keep the green-house clean and sweet, and pick the weeds out of the pots, and the decaying leaves off the plants when they appear.

On the FORCING-HOUSES,

For September.

The grape-house, if you began to force it last month, must be carefully attended to. If the vines are in good condition, they will in this month be pushing forth young shoots and shewing fruit. Give them air in fine days, and if the nights are mild, leave a little at them all night, at the same time making a gentle fire in the evenings, that the thermometer may not be below 60, nor higher than about 65 during the night. It should rise in the course of the day to 70 and 75 degrees. Keep the border in which the vines are planted in a sufficiently moist state, and the air in the house constantly sweet. *See* Chap. XI.

In some houses you will probably now have grapes in perfection, and by keeping the houses cool and dry, you may preserve them till late in the season. There are some sorts, such as the black muscat of jerusalem, the syrian, tokay, and some others, will keep a long time after they are ripe.

If the crop is entirely over on any of your vines, you may cut out the superfluous old wood; this will be the means of strengthening the bearing wood for the ensuing year. Keep the borders clear of weeds, and if the weather be dry they will be better to be watered.

In case you think it necessary to manure any of your vine borders, this is a good time to do it, if the fruit be over. Good rotten dung is the best manure, and you may pour into the borders rich dung water, run from the melon beds or dung-hills, when they are in a fermentation.

Your cherry-house will now lie open. Keep the border in which the trees are planted, by hoeing and raking it occasioually, perfectly free of weeds; and if it stand in need of manure, dig in some good rotten dung among the roots of the trees.

In the fig-house your fruit will be all gathered. The glass should be taken off till December, if the weather do not set in very frosty before that time. If the weather prove dry, water the border, and keep it clean of weeds.

All the wood work of the forcing houses, and the sashes, if they stand in need, should now be painted before the short damp days come on.

The rose-house, if you choose it, may be filled with exotics, or with late flowering plants of any kind; keep them all free of dead shoots, decaying leaves, and weeds, and give them moderate waterings when they begin to be dry; give the house plenty of air in fine days, and if towards the end of the month the nights get very cold, make a gentle fire occasionally to prevent the damp from affecting the tender plants.

Be looking forward and considering what materials of any kind you may stand in need of when you begin to force any of your houses. See that all your flues are cleared of soot, and them and the fire-places put in good repair, while the weather is fine, that the brick-work and plaster may be perfectly dried before the frost and damp weather set in, when fires must be made.

The peach-houses will now be uncovered; look after the trees occasionally, and tie up shoots that may want tying, and cut off foreright ones. If the leaves are over crowded, thin them, and water the borders in dry weather.

Make preparation of roses, and of all other shrubs and flowers intended to be forced in the winter and spring months.

On the FORCING-FRAMES,

For September

Look after your melons carefully; many of the plants will still be in a vigorous state, and plenty of fruit on them; but it is probable they will not now require so much pruning and thinning as they did in the former months. They will, however, if they are getting very crowded of shoots and leaves, be better to be thinned occasionally. The fruit should lie dry, and not suffered to be too thick on the vines.

At this time of the year, if the plants are in a good condition, the fruit are apt to set very thick; they ought therefore, to be looked over often, and the most unpromising ones cut off, taking care to leave the fruit on the plants of such sizes as, in ripening, there may be a probability of having one to succeed the other, so that you may, if possible, never be in want of a constant supply of ripe fruit.

If you intend to have fruit as long as there is a sufficiency of sun to ripen them tolerably well, you had best put linings of warm dung to some of your beds. These, if applied in time and kept on, will cast a fresh heat into the beds, and with other necessary assistance the plants will grow as long as you want them.

Take out of your frames all dead shoots and withered leaves. Give the plants air every fine day, taking care to shut them down in the afternoon, with a strong heat in them; if the nights be warm, give a little air all night. If they require it, water them in moderation; they will not now require so much as in the former months.

In changing your linings, the dung that is taken from them, if not too much exhausted or too wet, will do well for mushroom beds.

If you have any frames and sashes at liberty, it is a good time to paint them.

Consider what quantity of warm dung you will be in want of next month, that you may make preparation accordingly.

Cucumbers in the open ground will continue to bear fruit for some time in this month, if the weather happen

to be warm and not rainy. Except the plants want a little water it is of no use to do any thing more to them, only, if any fruit were left to produce seeds, they may be exposed to the sun by cutting some off the leaves.

In case you have kept on forcing cucumbers on the brick or dung bed, and intend to continue to do so through the month, the heat in the linings must be increased as the length of the days and heat of the sun decrease. A little fresh rich earth may be put all over the surface of the bed among the branches of the plants, which will encourage the roots. If the nights be cold, the lights should be covered, to have the heat in the bed in the morning about 65 or 70 degrees. The plants should be kept moderately thin of shoots and leaves, and the shewing fruit in blossom set. Water about 70 degrees warm must be given to them when they want it.

Height of the Thermometer in the Melon and Cucumber Frames, shewing the Temperature of the Air in them, for September.

D.	M.	N.	E.	D.	M.	N.	E.
1	73	74	73	16	75	94	83
2	74	83	74	17	73	83	74
3	70	80	79	18	77	80	74
4	69	82	81	19	80	81	74
5	70	86	82	20	79	90	76
6	72	86	78	21	78	88	75
7	70	87	84	22	76	75	76
8	73	82	82	23	76	77	74
9	72	84	80	24	76	85	97
10	70	82	80	25	74	100	84
11	71	86	81	26	74	90	85
12	71	84	81	27	74	90	83
13	76	92	83	28	76	85	78
14	78	90	78	29	78	84	75
15	78	86	90	30	75	83	72

When the weather begins to get cold in this month, strawberries of the alpine kind in pots may be set in a forcing-house or brick frame; and if they be in good

health, they will produce fruit for a considerable time. They require only a gentle heat of from 50 to 60 degrees: give them water occasionally, but as there is constantly blossom and fruit on them, they need not be watered all over broad-cast. Give them great plenty of air; they only require protection from heavy rains and cold weather.

On the KITCHEN-GARDEN,

For September.

Spinach for winter and spring use, may yet be sown in the beginning of this month, if enough was not sown last month. Sow it in drills two feet apart, and scatter in regularly the prickly sort of spinach; if the ground be dry, water the drills before you cover the seeds, cover them about two inches deep, and if the ground be of a light nature, tread it all over, and smooth it with a rake afterwards.

Continue to plant out lettuce, that you may have a constant supply of good ones; put them in ground well enriched with dung, otherwise they will not do much good. The black-seeded green coss, the brown Dutch, Silesia, and white cabbage, are, I think among the best sorts; but you may propagate any kinds that are most desirable to those who are at the expence of raising them.

Sow the seeds of lettuce about the beginning, middle, and twentieth of the month. These will do to plant on warm borders and in frames, to stand the winter.

Now make plantations of the largest plants of Battersea and early York cabbage. Plant out some in the beginning of the month, and more about the middle of it. They will be fit for use in November and the following winter months. They should be planted in ground well manured, a foot row from row, and about six or seven inches plant from plant. If the weather be dry, give them water, and hoe them when the weeds begin to appear.

In the forepart of the month, make more plantations of brocoli to succeed those planted last month. The plants

should be set in rich ground in drills, about two feet apart, and about fifteen inches plant from plant in the rows. Give them water to settle the earth about their roots. Hoe and earth up your brocoli which was planted in the former months; if the weeds have got long, and the weather happen to be moist, you had best rake them off.

Brocoli, and all other plants of a similar kind, are liable, about this time of the year, to be eat by the caterpillars. The most effectual method to destroy them, is to have them carefully picked off every day by women or boys.

Cabbage plants, which have risen from seeds sown last month, will, many of them, be ready to prick out in beds, to be transplanted in the course of the winter and in the spring, to produce cabbages early. Plant them in beds three feet wide, and about four or five inches plant from plant.

You may yet sow carrot seed for young ones in the spring. Sow the seeds in beds; and if your ground be light and dry, tread them in, and smooth it afterwards with a rake.

About the middle or twentieth of this month, the cauliflower sown last month will be fit to prick out from the seed bed. Choose a bed of rich earth, dig it fine and rake it smooth, then make it out about three feet wide, and as long as you want it; draw the largest of your plants, nip the decaying leaves from them, and cut a little of the top root off, and plant them carefully about four inches apart, and water them gently to enable them to make roots.

If it be not showery weather, water the cauliflower plants which were planted out last month, or in July. Let them be kept clear of weeds by hoeing and earthing up; and if the caterpillars appear on them, examine them and pick them off every day.

Two or three times in this month make plantations of endive. Hoe and clean that formerly planted; and tie up to blanch, every week, as many as are sufficient to keep you constantly supplied with blanched endive.

About the beginning, and again in the middle of the month, plant out in trenches more celery. Make out trenches as directed in the former months; but as it will not grow so large as that planted earlier in the season, the trenches may be made nearer together; after the trenches are ready, take up the plants with a spade, that you do not

strain their stems or roots; trim the tops and roots a little, and plant them four or five inches apart, and water them well.

As your celery, which was planted the former months, advances in growth, continue to earth it up. Break the earth fine, and put it close to the plants on each side, keeping them perfectly upright.

Earth up cardoons as they advance in growth; tie the leaves of each plant by themselves with strands of bass, so that you can conveniently earth them up; then with a spade break the earth fine, and lay it close to their leaves; repeat this as often as they appear to want it.

In the beginning of the month you may sow chervil, and corn sallad seeds; they may be sown in drills or broadcast. They are easiest kept clean when sown in drills.

Prepare dung for mushroom beds by turning it over, and mixing well the outside and that in the inside of the heap together. If you have any dung in a fit state to make up into a bed, let the bottom of it be marked out about six feet wide, tapering it up gradually to the top in such a way as earth can be laid on the sides of it; and as you proceed in making, shake the dung well, and either beat it hard with the forks, or tread it now and then with your feet.

When the heat of your mushroom bed has declined to a degree not too warm for the spawn, take the spawn in small pieces, and put it in rows in the surface of the bed, so that the spawn and earth to be put on may meet. For fear of too strong a heat, you had best spawn it only half-way up on each side, leaving the upper part unspawned till you are certain that the heat is not too violent. When your spawn is in, take good rich earth of a loamy nature, and cover the spawn with it about two inches thick, beginning to lay it on at the bottom of the bed, beating it firm with your spade. The earth should be in a pliable state, not too wet nor over dry. *See* Chap. XV.

The heat that a mushroom requires to make it grow, is on a medium about 55 or 60 degrees. They grow well in the natural ground from about the middle of August till after the middle of September, during which time you should examine the neighbouring old dunghills, and mill-tracks, where spawn is frequently found in large quantities after a

dry summer; which evinces the propriety of having the dung, with which a mushroom-bed is made, tolerably dry. If it is wet, though there be a good heat in it, you have reason to be doubtful of your success. Mushrooms will not grow well on a bed if it be not in a sweet state.

When any of your melon beds have done bearing, you may take the earth off down to the dung; and if you find the dung of the bed in a sweet dry condition, you may level it and spawn it: laying about two inches of earth on it, press it down, and cover it with a little hay or short straw; put the lights on, and give air in warm days, and probably you will have a crop of mushrooms.

Mushrooms love to grow in the dark, therefore all beds ought to be covered, whether they are in a shed or in the open air.

In the beginning of the month, plant out strong plants of savoy, cabbage of different sorts, red and green borecole, Brussels sprouts, Jerusalem kail, &c. They should be those that have been transplanted. If they do not come in for use in the winter, they will be useful in the spring.

The turnips sown in the former month should now be hoed in a dry day: let the plants be hoed out regular about seven inches apart, and cut the weeds up clean.

In the beginning of the month, and again about the middle of it, sow radishes for a late crop. Sow them on rich ground well dug, rake the seeds in lightly, and water them, if the weather prove dry.

If it be required, continue to sow rape, white mustard, turnip, and cress for small sallading. Sow it in small drills in an open spot of ground.

The stems of artichoke plants which have done blowing should be cut down, and the ground about the plants cleared of weeds. Also in fine days, hoe and clear the ground among all kinds of vegetables; and in every part of the kitchen-garden, take care, if possible, not to suffer any sort of weed to bring its seed to maturity.

If it was not done last month, take in your onions in a dry day; and you may, if necessary, in the beginning of the month, sow the seeds of onions. The Welch ones will do best now, as it is a very hardy sort, which will stand the winter.

Any seeds of curious esculent vegetables that are ripe, should be gathered in a dry day. The birds are very fond of several kinds of garden seeds; you must try to keep them off with nets, or by setting up scare-crows to frighten them.

Dig up potatoes, and lay them in a dry dark place, where the frost cannot get at them, or you may bury them in the ground where the frost and wet cannot penetrate.

On the FRUIT-GARDEN,

For September.

In the course of this month, fruits of different kinds may be gathered for present use as well as for keeping. It is a sign that they are ripe when they begin to drop from the trees. You may know when apples, pears, &c. are fit to gather, by cutting some of them; and if the seeds begin to look brown and ripe, you may gather the fruit. Do it in a dry day, and lay them in a dry place, spread out so thin that they may not get into a sweat. There are some sorts of apples and pears which must not be gathered till some time in the month of October.

Look over your grape vines on the open walls: in this month they will be ripening their fruit, if the summer has been hot. See that the branches are all kept close nailed to the walls, cut off any superfluous shoots, and thin the leaves, that the sun be not hindered from shining on the bunches. If the wasps or birds begin to take them, you must hang nets over them. To preserve them from these animals, some are at the expence to put the bunches into crape, hair, or paper bags.

Peaches, nectarines, and plums, will now be ripe in plenty; and to preserve them from insects, it will be necessary to use the same means as recommended in last month's directions. Hang nets over them, to defend them from birds and wasps. Take down the bean stalks in mornings, and blow the insects out of them into a bottle of water to

destroy them. Keep your borders perfectly free of weeds, and if any shoots on the trees hang from the walls, nail them in, and cut off any that there is no room for. Any fruit, that are hid among the leaves to keep them back from ripening, you may open up when you wish them to ripen.

In this month you may make new plantations of strawberries, if they are required. The best ground for them is a strong rich loam mixed with rotten dung. Most sorts of strawberries should be planted in an open situation. Take the opportunity of moist or cloudy weather to plant them. If the weather prove dry, they must be kept watered till they begin to grow.

For the conveniency of managing and gathering the fruit, strawberries are often planted in rows along the borders of the kitchen-garden; and some sorts, as the wood and alpine, will do on shady borders, where many other plants do not prosper.

The alpine strawberry will, if the weather happen to be mild, be still in full bearing, if you have a good sort of it, and your ground be well adapted for its culture. You must continue to water the beds; for if they are deficient of that necessary article, they will not continue to produce fruit.

If required, plant strawberries for forcing. Take up strong healthy plants, and plant them in strong loamy soil, three, four, or five plants in each pot, according to the size of the pots you put them in; or you may take up a cluster of plants with a ball of earth at them, and put them in such sized pots as will admit of earth being put round the balls. As soon as they are potted give them water, and continue to water them in dry weather.

If you intend to make plantations of fruit-trees, make preparation for them. In case your border is entirely new, it should be trenched over not less than two feet deep; and if it is necessary to manure it, it should be done with rotten dung, or vegetable mould. The dung for that purpose ought to have been laid in a ridge for at least one year, during which time it should have been turned and broken, so as to make it as fine as vegetable mould, after being run through a screen or sieve. If the border have a wet foundation, drains ought to be laid to carry the water off. And remember that the border should be made deep and broad enough, that the roots of the trees cannot run into bad soil. Paving the bottom of borders for peach and

nectarine trees is, in some places, practised; but I consider the former method best adapted for the prosperity of fruit-trees. *See* Chap. III.

Be looking forward, and consider what quantities of fresh earth and manure you may have need of in the course of the following year, and prepare accordingly.

Figs on the common open walls will now be ripe and ripening. Keep their shoots to the walls, and the leaves thinned in such a way, that the air and sun-beams may have free access among the fruit.

By frequent hoeing and raking, keep your fruit borders free of weeds, and all sorts of litter. Hoe and rake between your gooseberry, currant, and raspberry bushes.

Dress and manure the strawberry beds which have done bearing, and keep them free of weeds at all times.

Weed your beds of seedling strawberries, gooseberries, currants, and raspberries.

Preserve the seeds of all sorts of fruit which you wish to propagate plants from, by sowing them in the spring. Gather them in dry weather, and expose them a few days to the sun till they be hardened, then put them up in paper till you want them.

On the PLEASURE or FLOWER-GARDEN,

For September.

The stalks of carnations that have done blowing should be cut down, and if any of the layers remain on, they are now to be cut off and potted. Those of them that are not strongly rooted, should be potted and kept by themselves. Put them all in small pots, three or four plants in each; vegetable mould, with a small mixture of loam, is good at this season of the year to plant them in. When they are potted give them water, and place them in a melon or cucumber frame, and keep them warm without any air till they have struck root, which may be known by the appearance of the plants holding their leaves erect. When they begin to grow, give them air more or less as you think necessary.

Take care of those layers or pipings of carnations which were potted out last month. They may stand out in the open air, and receive gentle waterings in dry weather.

The stools of carnations, if there are any shoots that could not be laid, left on them, should be weeded, and fresh mould laid about them on the surface of the mould in the pots; they will do for forcing next spring. Give them water in dry weather.

In dry weather the auricula plants in pots should be watered occasionally, and kept free of weeds. Towards the latter end of the month, they should be removed from their summer situation, and placed where they may have the sunshine at all times of the day; and they had best be set into a frame or other place of protection, that they may be defended from heavy rains and very windy weather.

Auricula seeds may be sown in boxes or pots of fine light mould. Sprinkle them with water in dry weather; and in heavy rains they may be set in houses or frames, to prevent the mould from being driven off them.

You may also sow the seeds of bulbous-rooted plants, such as tulips, ranunculuses, anemonies, &c.

Prepare beds of earth for your hyacinths, tulips, anemonies, narcissus, &c. These roots do best in a sandy soil, mixed with vegetable mould, or very rotten dung.

You may now plant out and increase many kinds of herbaceous, perennial, and biennial flowering plants, such as irises, lychnis, pionies, fraxinellas, rose campion, leonurus, golden rod, with a number of other kinds. Take off rooted slips from them, and plant them here and there in the borders where there are vacancies, or in beds to transplant in the spring.

Plant out also from the seed beds stocks of different sorts, wall-flowers, columbines, sweet-williams, French honey-suckles, &c. If the weather be dry, water them to settle the earth about their roots.

Plant out mignionette in pots to stand the winter. Put three or four plants in each pot; give them water, and set them in a shady place till they begin to grow, then set them in a sheltered situation; and when cold wet weather comes, they should be plunged in old tan in frames, and the glasses put on in cold frosty nights, and rainy snowy weather.

Seedling stocks may likewise be pricked out in pots, and preserved in the green-house, or in other houses or frames, where the heat is not great, all the winter.

If required, you may now plant box edgings. Where edgings of box have grown clumsy and thick, they ought to be taken up and replanted. Divide the plants, having roots at each of them, into slips, get the edge of your walk or border in readiness, and plant them only as thick as the shoots touch one another, so as to form a close edging, immediately after planting give them plenty of water. This work had best be deferred till the latter end of the month, unless the weather be moist and cloudy.

Box edgings and all sorts of hedges may be clipped any time this month.

Go round the flower borders, and cut down the stems of all sorts of herbaceous plants which have done blowing, and pull up all annual flower plants that are dead. Tie up to stakes shrubs that are likely to be broken down by heavy rains or high winds, and cut off straggling useless shoots.

Hoe and rake all your flower borders, that they may be clean and appear neat.

Towards the latter end of the month, if it be required, you may transplant several kinds of flowering and evergreen shrubs; as soon as they are planted give them water.

Mow and sweep grass walks and lawns once or twice a week, and weed and roll gravel walks as often as they require it.

If your cuttings of pinks were not transplanted last month, let it be done now. Dig a spot of ground, and if it be not of a strong nature, tread it all over and rake it smooth; then make it out into beds three feet and a half wide, and leave eighteen inches between them for alleys. Take up your plants carefully, and plant them in rows in the beds six inches apart, and set the plants in the rows six inches asunder. Plant each kind of pinks by themselves, and as you plant them give them water. You may plant some of them in the flower borders; and in the spring take up every other row, and every other plant in the rows, and plant them here and there about the shrubberies and flower borders; those left in the beds will then stand one foot asunder; they will make a fine shew and

beautiful appearance when in blossom, and they will be handy to take cuttings or pipings from to propagate more plants next season.

If you have any flower seeds worth saving, if they are ripe, this month is a good time to gather them in. Gather them in a dry day, and spread them out till they are sufficiently hard, then put them in paper bags or drawers in a dry room.

On the NURSERY-GARDEN,

For September.

Deciduous seedling trees and shrubs, which cast their leaves early in the autumn, if the weather be moist, may, towards the end of the month, be transplanted from the quarters or seed beds where they have grown too thick; and likewise the young stocks intended for budding or grafting, raised from suckers or seeds in the spring, may be advantageously transplanted about the end of the month, if the ground is in such a moist state that it can be easily dug.

A variety of young tender trees and shrubs in pots, about the end of the month, should be removed into a sheltered situation, that they may be protected during the winter from the inclemency of the weather.

If the weather prove dry in the forepart of the month, seedling trees and shrubs should be watered, and they ought to be weeded occasionally, to prevent the weeds from hurting them.

Layers of trees and shrubs laid down last year or in the spring, that are strongly rooted, may, if the weather happen to be moist, be separated from the parent plant, and planted in an open spot of ground.

Trees and shrubs of different kinds should now be laid down for propagation. They will make good roots in the course of next summer, and may be taken off, and planted out the latter end of the year.

When the ground is got thoroughly moist, various kinds of shrubs, forest, and fruit trees, may be propagated by

planting the cuttings of them. Currant and gooseberry bushes are propagated by this method. Of the sorts most esteemed, take well ripened shoots of the present year's growth, avoiding luxuriant ones arising from the roots of the parent plant. Cut them to about ten inches or a foot long, and having stripped the leaves off the lower part of them, plant them about six inches deep, in beds about three feet wide, and set the plants about seven or eight inches asunder. When they are planted, if the weather be dry, give them water. These will strike root early in the spring, and be fit to transplant in the autumn following.

In a shady border you may plant cuttings of common and portugal laurels, honeysuckles, jasmines, and a variety of other shrubs.

If the young shoots be well ripened, you may plant cuttings of lime, beech, elm, hornbeam, &c.

Pears, plums, apples, medlars, &c. may also be propagated by cuttings. To do this, take well-ripened shoots of the present year's growth; cut them off with about half an inch of the preceding year's wood at the bottom of them; make it smooth with a sharp knife; let the cuttings be about a foot long, not of luxuriant wood, nor yet too weak; plant them in beds of good earth, about six inches deep, and give them water to settle the earth about them.

The plants raised in this way will not grow so strong as those grafted or budded; but they will do well for dwarfs to plant in places where low-growing trees of the fruit kinds are required.

In case the weather prove moist, towards the end of the month, young plants of evergreens of most kinds may be transplanted with safety; water them well to settle the earth to the roots of them, and they will probably make new roots before winter.

If you have any vacant pieces of ground that require manuring, trenching, or digging, to prepare it for plantations of young fruit trees, this is a good time to do it, if the ground be not too hard with dry weather, which sometimes happens in this month.

By hoeing the ground wherever you can, destroy all sorts of weeds; and if the weather be showery, that they do not die, you had best rake them off, otherwise many of them will take root and grow again.

On the HOT-HOUSES,

For October.

About the beginning of this month, if the weather be cold, it will perhaps be necessary to make gentle fires in the evening, and probably a little in cold mornings; but in this you will be regulated entirely by the weather, and the state of your tan-bed. Fires are not now required to force the pines, but only to keep the damp out of the houses; and it sometimes happens, that after a tan-bed has been made to retain heat during the winter, a great heat rises in it; and in that case, if the hot-house be a well-built one, low in the ground, and in a sheltered situation, the heat rising out of the tan will probably warm the air of the house so that fires may not yet be wanted, even though the weather be rather cold.

It sometimes may happen that several pine-apple fruit do not ripen till some time in this month; when that is the case, they had best be set together in a part of the house by themselves. At this season of the year they should not be watered much, just only enough to keep the earth in the pots in a moist state, and they ought not to be watered over the leaves and fruit.

You should examine well the heat of your tan-bed, and take care that your fruiting plants for the ensuing year are not in too great a heat. If you apprehend that the heat of the bed is getting too strong, draw some of the tan from among the pots clear off the surface of the bed; or if it will do, to save labour, make a hollow in the tan round about each pot, to let the great heat pass off. However, if you observe to go by the directions which I have laid down for preparing a tan-bed and plunging the pots, I am inclined to think you will avoid having the trouble of lowering the tan among the pots, or of raising the pots in the bed.

But if ever so good care be taken in making the bed, it may happen that it will become too hot, and at other times the bed may not heat sufficiently, so that in such cases means must be taken that the plants be neither over-heated nor checked for want of heat. *See* Chap. XII.

If your fruiting plants were not moved last month into the fruiting-house, this month is a good time to do it in.

Prepare the house for the plants, by making up the tan-bed according to the directions given in the former months. Clear the flues thoroughly of soot, and repair them and the fire-places. Let a bricklayer wash the walls and flues with lime and water. Repair what is wanted in the glass-work and putty; and if it require it, get all the wood-work in the inside of the house painted once over. If it do not want painting, wash it clean with soap and water.

Height of the Thermometer in the Hot-House, shewing the Temperature of the Air in it, for October.

D.	M.	N.	E.	D.	M.	N.	E.
1	74	97	72	17	59	63	65
2	64	93	70	18	63	88	65
3	68	96	72	19	61	66	66
4	65	90	70	20	63	84	65
5	67	80	70	21	63	75	64
6	67	75	70	22	60	72	64
7	72	75	70	23	62	95	63
8	71	92	70	24	61	65	64
9	66	82	69	25	60	65	60
10	64	94	70	26	63	84	64
11	64	90	68	27	60	88	64
12	62	70	69	28	60	80	67
13	65	90	68	29	72	90	68
14	62	94	70	30	64	80	68
15	63	93	66	31	66	90	66
16	60	92	65				

If there be much sunshine in this month, and the thermometer stand above 55 in the morning, fires will not be wanted, if the plants be in as forward a state as is desired.

Keep your house clean and sweet, and admit air into it every fine day. The plants will not require much water this month, especially if they have been lately shifted; and when they are watered, give it to them in moderation.

The quantity of water they will require depends somewhat on the condition of the tan in which the pots are plunged. If the tan be in a dry state, and a strong heat in it, they will require more water than when it is moist, and a less heat in it; so that, in giving water, the person who manages them must be able to conclude how often and what quantity of water the plants will need.

To keep your succession pine plants on in a growing state, they will demand attention and labour. If it was not done last month, let the tan be renewed. Take out all the small rotten tan out of the pits, filling them up to their proper height with new tan, then work the new and old left in the pit well together about three feet deep, tread it all over the surface, and dig it up again, about eight inches deep, that you may be able to plunge the pots easily in it. Having prepared your bed, plunge them immediately in it up to the rims, and give them no water till the heat come up in the tan.

If the weather be cold, make a little fire in the house occasionally, or if you work them with dung heat, you may put a gentle lining to one side of the pit.

Some of your crowns and suckers which were planted in July or August, if they have filled the pots so full of roots that the balls will turn out perfectly whole, should now be shifted into pots a size larger. If this be not attended to, and the roots get much matted in the pots, perhaps they may run to fruit next spring, which will make you short of fruiting plants the ensuing year.

Any crowns and suckers which you may have by you, if they are well ripened, may be planted in small pots, or two or three in each pot, and plunged in a good heat to make them take root, about the beginning of the month.

If the nights are cold, cover the pits or frames in which you have pines with mats; take them off in the morning about eight o'clock, or as soon as the sun shines on them.

The kidney beans and other exotic plants in the hothouse should be attended to, to keep them free from weeds, and to give them water when they begin to get dry. To have a succession of kidney beans, let some seeds be planted in pots. If you have got new seed well ripened, it will grow more vigorous than old seed. Plant them in rich light earth, four or five seeds in each pot; and when the plants come up, give them a little water.

On the GREEN-HOUSE,

For October.

In case the green-house plants were not set into the house last month, they ought to be removed into it the beginning of this month. Shorten or cut off any straggling irregular shoots that happen to be on them, and tie up in a neat manner, but not too close together, any of the branches that require it. Clear the surface of the earth in the pots, loosen it a little, and lay on what fresh mould is wanted to raise it to within about half an inch of the top of the pots. Pick all the dead and decaying leaves from the plants, cut the roots off that have grown through the bottoms of the pots, and make the outsides of them clean. Bring your collection of plants to the house, and arrange them in regular order, so that they may appear to the greatest advantage. The tallest plants should be placed in the back row, and the others according to their degrees of height follow in regular gradation till you finish in the front of the house with the smallest ones.

Give the green-house plenty of air in fine days; and if the nights are not cold, leave some at it all night.

Any cuttings of green-house plants in pots, and not yet shifted, should remain all winter in the same pots; you may keep them in the green-house, or any of the forcing-houses, where the heat is not too great for them.

Tie up your vines in the green-house, and thin the leaves if they are too crowded. Keep the grapes that are on them as dry as you can, and you will probably have them good next month, and perhaps in December.

Young china roses, mignionette, stocks, carnations, double sweet-williams, and other sorts of flowering plants in pots, may be set into the green-house on shelves, to preserve them through the winter.

Look over your green-house plants every week, and pick off all the dead and decaying leaves that appear on them. Pay attention also in giving the pots water, when they begin to get dry. Some sorts of plants require water oftener than others.

On the FORCING-HOUSES,

For October.

If you began to force grapes in the month of August, in the course of this month they will be in blossom, and probably their fruit set or setting. All possible care must be paid to the regulation of the heat of the air in the house. It will be necessary to make fires in the evening, so as to endeavour to have the thermometer about 60 in the morning, and the heat should rise up in the course of the day from that to about 70, and a little higher if the sun shine. If the days are cold and gloomy, fires should be made in the morning, to warm the house, so that a free circulation of fresh air may be admitted without making the air too cold.

Keep the border in which the vines grow moderately moist, and let your house be clean and sweet at all times.

Probably in some of your forcing-houses you will now have a crop of grapes in perfection. Let the house be kept clean; and in order to prevent damps, and to keep the grapes perfectly dry, fires should be made occasionally, at the same time having plenty of air at the house, that the effluvia from the flues may not affect the grapes, and that the air may be as cool as possible, taking care that the lights be left in such a manner that rain cannot fall on the grapes.

Let the shoots be kept tied close to the trellis, and keep the leaves of the plants thin, that they do not lie on the bunches. If any of the berries begin to rot, cut them out immediately, that they do not affect the others. This should be particularly attended to; and when you want grapes, leave the bunches uncut which are most likely to keep longest.

Vines whose crop of grapes is over, should have all the superfluous old wood cut off; and if the glass frames have been taken off in the former months, they should now be put on again to keep the vines dry, giving the house as much air as you can, unless the frost set in severe, when it will be best to shut it up close.

Keep your vine borders clear of weeds; and if you think they would be better of manure, dig into them some rotten dung; and you may water them with dung water from the melon beds, or with that which has run from a dunghill when in a state of fermentation.

Your cherry-house may continue to lie open. Keep the border free of weeds; and if you think the trees require manure, dig into the border about their stems some good rotten dung or vegetable mould, mixed with sand.

When the frost begins to set in hard, cover in your fig-house, and lay a sufficient covering of long litter on the border, to keep the frost from the roots of the plants.

Examine the peach-houses, and if the leaves are decaying and loose, they should be taken off and carried out, and the house and trees cleared of all sort of rubbish. Cut out of the trees any luxuriant and evidently superfluous wood. Inspect the trees in every part minutely, and if you perceive the bark dying, or the gum oozing out of any part of them, cut off the bark as far as it is dead or decaying; and if the branches be strong, that you cannot well effect it with your knife, take a chisel with a semicircular edge, and a mallet, and cut out the wood as far as you see it is affected: you need not be afraid of hurting the tree even if the branches or main stem are cut half away. I have cut sometimes more than half of the stems of standard trees away from the ground farther up than where the branches began to separate, which was the means of saving them alive. This method exposes the old wood to the sun and air, by which it is dried, and the tree is thereby assisted in casting off the unwholesome juices, or those kept in it too long for want of a more dry, genial climate.

If the weather in this month begin to be wet and foggy, put the lights on the peach houses to keep the trees dry, but give them all the air you can in fine days, and in the nights, only prevent the rain from falling on them.

In this month make preparation to force roses, and any other sorts of shrubs and flowers intended to be brought into blossom early next spring. Roses may now be planted in pots in good earth, as before directed, and you may also pot other flowering shrubs, and herbaceous and perennial flower plants of various sorts.

For the same purpose, bulbous roots, such as hyacinths, tulips, jonquils, and narcissus, may also be potted; put

them in sandy rich earth, and cover them about an inch deep. Plunge them in light earth or old tan, till you want to set them in to force.

The rose or flower house may now be filled with late-blowing flower plants of different kinds. Keep them clean, and watered gently when they want it. *See* Chap. VII.

On the FORCING-FRAMES,

For October.

If you intend to keep on forcing the old cucumber plants all this month, if they be on the brick bed, you must clear the flues of earth all round the sides of the frame, and put some fresh mould among the branches and about the stems of the plants. A good strong sweet heat must be kept in the linings, and the plants in all respects managed as they are in the spring of the year. As the roots in clearing the surface of the flues must be shortened, their cut ends should be covered with earth. If old plants on a dung bed be forced this month, they must be treated in a similar way, that is, by making a strong lining all round the bed, and taking out some earth round about the insides of the boxes, to allow the heat of the linings to warm the air among the plants.

If you intend to have cucumbers very early next year, sow the seeds about the middle or twentieth of this month: they may be sown in pots, and set on the flues of the brick cucumber bed: or if that be not at work, you may make up a bed of dung for a one light box, to raise them in. The plants will come up in a few days, and when they are beginning to shew the first rough leaf, transplant them into small pots, three plants into each; give them a little water, and set them into the hot-bed, where they may remain till they be well rooted, and fit to be planted in the bed where it is intended they shall bear fruit. *See* Chap. IX.

Instead of raising cucumber plants from seed, they may be raised from cuttings in the following manner: cut off

from the old plants young shoots, having three joints on them; plant them in pots of rich earth, inserting the ends of them, cut close to a joint, about one inch deep, into the earth; set them into a good strong heat, keep them moist, and they will soon make roots and begin to grow.

Height of the Thermometer in the Melon and Cucumber Frames, shewing the Temperature of the Air in them, for October.

D.	M.	N.	E.	D.	M.	N.	E.
1	73	75	72	17	74	84	72
2	71	79	70	18	67	71	71
3	69	80	73	19	71	75	68
4	72	77	75	20	69	75	70
5	80	90	86	21	78	90	82
6	78	90	79	22	80	82	75
7	80	101	89	23	80	84	78
8	78	79	72	24	74	80	68
9	79	90	80	25	77	69	68
10	81	86	80	26	80	80	74
11	70	81	79	27	81	80	72
12	79	89	83	28	76	91	75
13	77	87	78	29	70	75	68
14	70	85	78	30	70	80	70
15	64	97	84	31	74	84	70
16	69	75	70				

In this month, before frost come on, alpine strawberries in pots may be set into a forcing-house or brick frame. If the weather happen to be fine, they will continue to produce fruit for some time; they will only require a moderate heat, on a medium of about 55 degrees, and to 65 in sunshine. As they keep constantly blossoming and bearing fruit, their leaves, blossoms, and fruit should be kept dry, and the earth about their roots in a moderately moist state.

If the weather prove fine and the sun shine frequently, melons will continue to ripen. In case there be warm linings at any of your beds, keep them up to a proper height. If the brick beds that I contrived are in practice,

you may with a lining of dung give them as much heat as you please. Keep the fruit dry by laying the melons on tiles or stones, and put the leaves and shoots from them, that they may have the full influence of the sunshine.

Clear your frames of melon stalks which have done bearing; and if it be required, you may put the earth in preparation by digging and raking, and set lettuce plants in them. If you plant them on brick beds of my contriving, you may force them with a gentle lining of dung any time when you please in the spring.

Endive plants may be laid in frames to blanch and preserve them from the frost.

Make preparations of earth for melons and other plants which you intend to force next spring. If you have collected fresh earth from fields or commons, if you think it is not rich enough, mix some well-rotted dung among it, or vegetable mould. *See* Chap. X.

Be looking forward and consider what dung and other necessaries you think you will be in want of next month, and make preparations accordingly.

Any melon or cucumber boxes or frames which are at liberty should be repaired and painted in dry weather, if they want it.

If you intend to force asparagus plants next month, cut down the stems of those you intend for that purpose about the beginning of this month, and have a heap of dung in preparation to make a bed for them, unless you intend to force them with fire heat.

On the KITCHEN-GARDEN,

For October.

In this month cabbage plants of the early kinds should be planted out, to come in early in the spring. Make choice for this purpose of a piece of ground in a warm situation: give it a good coat of dung, and dig it deep and fine; then, if it be light ground, of a dry nature, tread it all over, and draw little drills in it one foot apart, and

plant the cabbages in them, about seven or eight inches apart: if the weather be dry, give them water to settle the earth about their roots. In the course of the winter, or early in the spring, draw out every other row, and every other plant in the rows: these will do for planting out, or to be used as coleworts. The plants left will then stand two feet apart, row from row, and about fifteen inches asunder in the rows.

If you have any large cabbage plants in seed-beds, plant them out in rows; they will do to use during the winter, and prick out the small cabbage plants about four inches apart, to stand the winter.

Now prepare a piece of ground in a warm situation to plant cauliflowers, to be protected by hand glass during the winter. The ground for this purpose should be well manured, and dug deep and fine. When this is done, make lines or marks on the ground, four feet apart; and in these lines, at four feet distance, in a little hollow place, plant five or six cauliflower plants, about five or six inches apart, give them a little water, and set the hand-lights on them; keep the lights shut down for a few days till the plants have made roots, which may be known by their leaves standing erect; then give them air, and in fine days set them entirely off.

Transplant young cauliflower plants into frames to stand the winter, to be planted out in the spring in the open ground.

Prick them into the frames, about four inches apart, give them a sprinkling of water, and shut the glasses down till they have made roots; then give them air: protect them from heavy rains, and shut the lights down in frosty weather.

The large cauliflowers that may be in flower or coming into flower, endeavour to protect. Earth them up well; and if the nights are frosty, lay cabbage leaves on them to keep the frost from the flowers. If they are nearly large enough for use, dig them up, and lay their roots in sand in a shed or a cellar.

In light warm ground, in sheltered situations, young cauliflower plants will sometimes stand the winter on a south wall border. In hard frosts, if hoops and mats are put over them, they will still stand a better chance to survive the winter.

Plant out on warm borders lettuce plants, to stand the winter. The green coss, silesia, and cabbage lettuces are reckoned among the hardiest sorts; but as hard winters are apt to destroy the most hardy kinds of lettuce, it is best to have a reserve in frames.

Set some frames on a bed of good light rich well-dug ground, plant in them good lettuce plants, about three or four inches asunder, water them gently to settle the earth about their roots, put the lights on, give them air in fine days, and shut them down in frosty weather.

Spinach sown in August, or the beginning of September, should be hoed and raked clean, and the weeds picked out among the plants.

Clean your endive beds, and in dry days tie up some of it to blanch: if there be the appearance of frosty weather, some of it may be covered up with fern, or long straw litter, to preserve it from the frost. It may also be preserved by taking it up when it is pretty dry, and laying it in earth in a close shade, or in melon or cucumber frames, where it can be covered in hard frosty weather.

Hoe and earth up cabbages, savoys, brussels sprouts, borecole, brocoli, &c. Draw the earth up to their stems as high as it will lie.

If brocoli be tall in the stems, it may be laid to one side, and the earth laid on the stems of it with a spade, and some of it may be dug up and laid into trenches where the stems can be wholly buried. These methods will be the means of keeping it from being destroyed by severe frosts. When it is covered with snow, the frost does not hurt it.

Take the opportunity of dry days to earth up celery; break the earth fine, and put it close to the plants in each side of them.

Cardoons will also require to be earthed up: tie their leaves up with bandages of straw, rushes, or bass; and push the earth close round about each plant, that they may be properly blanched and preserved from the frost.

If a constant supply of small sallading is wanted, you must begin to sow it in pots. Take pots, and fill them within an inch of the top, after being pressed down, with perfectly rotten fine tan, or vegetable mould; sow the seeds thick, and cover them lightly, half an inch deep; set them into the hot-house, and the plants will come up and be fit for use without giving them any water.

Carrots and parsnips may now be dug out of the ground, their tops cut off, and themselves buried among dry sand in a place where the frosts and rains cannot come at them.

Beet, salsafy, scorzonera, hamburgh parsley, and skirrets, may likewise be taken out of the earth, and laid among sand in a dry place, that they may be preserved and easily come at in hard frosty weather.

If hard frosts begin to come on without snow, lay some light dry litter, such as fern, on your rows of parsley. This will be the means of preventing the frost from destroying the leaves of it.

Potatoes that remain in the ground should now be taken up, and laid in some dry place, to preserve them for winter and spring use. If you happen not to have room for them in a dry shed or cellar, where frost cannot get at them, lay them in a ridge on dry ground, cover them over with earth, and thatch it, that neither the frost nor rain get at them. Dig a trench round about the ridge to carry off the rain water, so that it do not run into the bottom of the heap of potatoes.

Beds of sorrel, tansey, mint, balm, &c. should have their stalks cut close down, and be cleared of weeds, and the alleys between them dug.

About the latter end of the month, you should cut down the stalks of asparagus, and carry them away. If you wish to save the seeds of them, now is the time to do it. When the stalks are all cleared away, hoe the beds and rake off the weeds clean, then lay a layer of rotten dung on the beds, and dig as much earth out of the alleys as will cover the dung over about three or four inches deep.

A late author disapproves of this method; but I apprehend he will not get many gardeners to agree with him. During the winter the juices of the dung sink down among the roots of the plants and feed them; and the roots being cut in the alleys every year, and the alleys filled up again in the spring with the dungy earth meliorated on the beds by the winter's frost, the roots of the plants grow vigorously in it, and are enabled to send up strong shoots.

The author whom I have just mentioned, says, "asparagus beds should not lie above eight or ten years." I have seen asparagus beds which, to my knowledge, had been in bearing upwards of twenty years, and continued to

produce plentiful crops of fine asparagus; and I have had asparagus cut sixteen years from beds of my own planting, and they continued to produce as large crops of fine grass at that age, as they did when they were only ten years old.

Balm, tansey, sorrel, &c. may now be planted. Take up suckers from the sides of the old plants, and plant them in beds, or in rows on the edges of borders.

Radishes may now be sown on warm borders; perhaps they may stand the winter, by laying fern or straw on them in frosty weather; and if they do, they will come in early in the spring.

If you intend to force any sort of herbs, they should now be potted: mint, balm, tarragon, &c. may be taken up with balls of earth at their roots, and put in pots; and when you wish to make them grow, set them into the forcing-house or a hot-bed.

When they begin to decay, cut off the stalks of seedling asparagus, clear the beds of weeds, and spread two or three inches thick of rotten dung on them, the juice of which, during the winter, will sink down about the roots, and make the plants grow strong.

Toward the end of the month beans should be planted to stand the winter. The early sorts, such as the mazagan, are the best. Plant them in a warm sheltered situation, in drills, three or four inches deep; draw the drills three feet apart, and plant the beans about four inches asunder.

Peas may also be sown on a warm border; sow them in drills about four feet apart, draw them four inches deep, scatter the peas in regularly, and cover them three inches deep. These will be forward, so that they are not to be depended on, they may be cut off by the frosts; therefore you must sow again in the following months. The early frame and hotspur kinds are the best to sow for an early crop.

The mushroom beds which were half planted with spawn, if they are become cool enough, should now be finished. Set the spawn into the surface of the bed, in little pieces, about three inches apart; then cover the bed about two or three inches thick, with rich loamy earth, and make it firm, that the spawn may have a steady substance to run in, and produce the fruit to be used.

Mushroom beds may now be made of sweet moderately dry dung, which has been strongly fermented, and the heat

in it considerably declined. Make the foundation about six feet wide, and as long as you choose; taper it gradually from the foundation to the top, so that earth may lie on the sides of it: as you proceed in making it, shake the dung well, and beat in the bed, as you go on, firm with your forks, or which, if your dung be light, is better, tread it with your feet now and then.

When your mushroom beds are spawned, lay straw or some dry litter on them to keep them dark, and the heavy rains from them; but take care that you do not make them too warm with heavy coverings. *See* Chap. XV.

Clear your artichokes of weeds and all sorts of rubbish, and cut the stems of them close down; and in this, or early in the following month, something should be done to them, to keep the frost from their roots. If the rows of plants are at least four feet apart, lay a little covering of dung on the plants; then, exactly between the rows, dig out about eighteen inches wide of earth, and lay it on about the plants, forming a gentle ridge with it; dig out the earth so deep as to cover your plants well, that the frost do not get at the roots of them. Taking out the mould to cover them makes a deep trench, which drains the water from the plants during winter, so that the roots are preserved from too much wet, as well as from frost.

If your artichokes stand close in the rows, you had best cover them well with long litter, to keep the frost out during winter, instead of making trenches between the rows.

On the FRUIT-GARDEN,

For October.

In this month, look over your peach, nectarine, and apricot trees, and cut from them any decaying branches, and luxuriant useless shoots made the bye-past season. If you observe the bark beginning to decay on any of the branches, or on the stems of them, cut it off; and if the wood under it be rotting, or appear black, cut it out with your knife, or with a semicircular chisel, till you come to sound wood of

a right colour; and likewise open up those parts where the gum is oozing out in the same manner, to prevent the canker and rot from proceeding farther. Let the hollow parts made in the trees be cut sloping, that the rains may run easily from them. If the branches are any of them pinched by the nails or shreds, unnail them.

Cherry, plum, pear, and apple trees, if the leaves are fallen from them, may be pruned and nailed. Cut out all useless shoots and branches, and do not let the bearing spurs get too far from the wall. If the bark on any of the branches or stems of the trees be dead, cut it off, and also cut out the decaying wood, as it is directed to be cut out of the peach and nectarine trees. Nail the shoots and branches firm to the wall, taking off all unsound rotten shreds, but do not put more shreds and nails on the trees than what is just sufficient to secure them to the walls.

If the leaves are fallen from them, gooseberry and currant trees may be pruned; cut out any weakly old branches, and leave strong young shoots from the bottom in their room. Cut off all the shoots made last summer, excepting the studs and the leaders to the bearing branches, and shoots to fill vacancies; and they should be shortened according to their strength.

After the bushes are pruned, clear away the cuttings; and, if they require manuring, spread some dung round them, and dig it into the ground among their roots cleverly.

To propagate gooseberry and currant bushes, cuttings may now be planted of them, in the manner directed last month.

About the end of the month, plantations of currant and gooseberry bushes may be made. For this purpose trench a piece of ground two feet deep, level it, lay a good coat of rotten dung on it, and dig it in a spit deep: then plant the trees five or six feet row from row, and put them four feet apart in the rows; if the weather be dry, give them water to settle the earth about their roots.

If the weather be moist, this is a good time to plant raspberries. Plant them in good well manured ground, four or five feet row from row, and about three feet bush from bush in the rows. Take up good well-rooted suckers from about your old plants, trim their roots, and plant three or four in a clump, about five or six inches apart.

All the old branches which produced fruit last summer may now be cut out of your raspberry plantations; but the shoots for bearing, the succeeding year, had best not be shortened before the spring.

If it was not done the preceding month, the strawberry beds should be cleared of all superfluous plants and leaves; and if they want manure, dig in some rich strong loamy earth among them with a small spade, and dig the alleys afterwards.

If they are wanted, plantations of strawberries may yet be made. Plant them in a loamy good soil if you have it. Dig the ground fine, tread it all over, then make it out into beds, with alleys about twenty inches or two feet wide; set your plants in rows, three or four in clusters, about a foot apart, and, if it do not rain, give them water just after they are planted.

This is a good time to be making preparations for planting fruit trees. If you have any borders on the walls that want replanting, trench them two feet or thirty inches deep, or as the depth of your soil may allow, picking all the old roots out of them. Manure them with a little soot or lime, and vegetable mould, or perfectly rotten dung. Let these be well mixed among the earth by chopping it fine; then level your border, which should be at least ten or twelve feet broad, and plant your trees any time when it is most convenient in the course of the winter.

If you wish to make for trees a new border of good earth gradually, dig out holes against your wall about three feet deep, of a semicircular form, four feet wide; fill these holes up with good earth, a little higher than the old border, that when the earth is thoroughly settled, it may stand rather higher than the original border. Tread the earth on the surface, and loosen it again to let the rains sink into it. When it has lain to settle well, the trees may be planted in it. Borders thus made last year should now have an additional quantity of fresh earth put to them; and continue to do so every year after, as the roots of the trees require, till the border be made sufficiently wide.

If you have wall trees of good sorts, which you are desirous to improve, make a mark in a semicircular form, about two, three, or four feet distance from the stems of them; then in the outside of the mark, dig out a trench, three or more feet wide, and three feet deep; fill up the

space with good fresh earth, of a loamy, but not of a binding nature. The roots of the trees will grow into this fresh earth, which will enable the branches of them to grow more vigorously, and send forth new shoots. Additions of fresh earth should be added yearly, as it appears necessary. Fruit trees of any kind, whose shoots are ripened, may be transplanted towards the end of this month.

Pears and apples not gathered last month, should now be taken off the trees, and spread in a dry room, to preserve them for winter or spring use.

Any grapes that are yet on the trees against walls, may be preserved from the frosts by covering them with mats.

The borders of fig trees may now be covered thick with long litter of any sort, to keep the frost from their roots; and when the weather begins to set in severe, cover the trees over with mats, straw, or fern.

Take care of your peach, nectarine, fig, strawberry, and other plants, which you have in pots for forcing in the spring. Keep the pots free of weeds, and plunge them in old tan or light mould, which will preserve their roots from the frost.

On the PLEASURE or FLOWER GARDEN,

For October.

If it was not done last month, auricula plants in pots should be removed into a dry sheltered situation. They will keep very well, during the winter, in melon or cucumber frames, if they are covered up in severe frosty weather with mats, or any other sort of covering.

Let carnation layers in pots be kept free of weeds, and they must stand all winter under coverings of glass, to defend them from heavy rains, hard frosts, and cutting winds; give them water, if they begin to get dry, or let them have a gentle shower of rain.

All kinds of fibrous-rooted hardy flower plants may now be transplanted, and increased by slipping and dividing their roots.

Various sorts of soft-knobbed rooted plants, may also be transplanted and increased, such as irises, lily of the valley, solomon's-seal, pionies, &c.; they may be planted here and there in the flower borders, and small sticks set beside them, that in digging the borders they may not be injured.

Flowering shrubs may be pruned when their leaves are decayed and fall off. Cut out all the irregular, unsightly, and superfluous branches, and head down those sorts that require it, forming them into handsome bushes, so as not to interfere with one another, nor injure lower flowering plants that may grow near them. Put stakes to any of them that require support, and let the stakes be covered with the shrubs, that they may appear as little as possible.

Pull up the stalks of annual flowers that have done blowing, and also the stalks of herbaceous and perennial flowers that have no blossom on them. Clear the flower borders of all kinds of litter. If the flower borders require manuring, spread some vegetable mould or rotten dung on them, and dig it in carefully among the plants.

Evergreen shrubs of most kinds may now be planted, if the ground is in a moist state. Some of the sorts are the pyracanthus, alaternus, laurels, sweet bay, lauristinus, evergreen honey-suckles, junipers, striped hollies, &c.; firs, cypresses, cedars, yews, evergreen oaks, &c. may also be transplanted.

In the latter end of the month, deciduous trees and shrubs may be removed. Some of these are the plane, sycamore, elm, horse-chesnut, ash, alder, poplar, oak, beech, lime, maple, larch, spruce firs, weymouth pine, laburnum, &c.; and of shrubs, lilacs, syringos, althea frutex, spirea frutex, honey-suckles, roses, cytisus, jasmines, persian lilacs, mezercons, viburnums, scorpion sena, &c.

When trees or shrubs are planted, make the holes so large, that the roots may have free liberty to extend themselves in every direction. When the roots of the plant are trimmed, place it in the hole in an upright direction; then holding it, whilst an assistant with a spade covers the roots, shake the tree occasionally, to admit the earth between the roots, and tread the whole over to keep the plant steady.

When arbutuses, china arborvitæ, kalmeas, magnolias, and other such like tender plants, are transplanted, they should be removed, with balls of earth about their roots.

If new plantations are making in continuation, or in clumps, the height of each plant, when full grown, and the mode of growth, should be considered, that every one of them may be so planted, that they may appear conspicuous and to full view; also regard should be had to the distance they ought to be planted from each other; for some sorts naturally spread out their branches in an horizontal direction, while others, having an upright tendency, do not so much interfere with one another: observe, that the tall growing ones should be planted most backward, and those of low growth nearest the front. Shrubs should be planted alternately, so that each plant may readily be seen. When they are planted in clumps, they should rise gradually, from the sides to the middle of them.

Towards the end of the month, tulip and hyacinth roots may be planted. Plant each variety in beds by themselves, and the inferior sorts may be planted in the borders, about a foot from the edge, in a straight line. A good soil for these roots is a light mellow earth, of a dry rich sandy nature. Dig the earth very fine, and make the beds about three feet wide; plant four rows in each bed, eight inches apart, and put the roots six inches asunder in the rows; mark out your bed in rows, and with a round blunt-ended dibber, such as makes holes to plant potatoes, make holes in the rows six inches apart, and about five inches deep; put a little sand in each hole, drop the bulbs in, and let a little sand fall on them, and cover them about three or four inches deep.

The beds on which fine hyacinths and tulips are planted, should be situated in a dry part of the garden, in a southern aspect, sheltered from the north and east winds by trees or buildings, at a distance from them. If they are near walls or hedges, the beds should be five or six feet distant from them, and the drip of trees ought to be avoided.

Those who wish to make a noble appearance with their tulips and hyacinths, should plant six or seven rows in a bed, making the beds about four feet wide.

Tulips and hyacinths may now be put in pots, that they may be made to blossom, during the winter, in frames or

forcing-houses. Pot them in light rich sandy earth, and cover them not deeper than an inch. Till you want to force them, plunge them in rotten tan, or light earth.

Plant ranunculuses either before or after cold weather. They may be planted the latter end of this month, or in November. If the situation and soil is cold and wet, they had, however, as well not be planted till the latter end of January or February. A fresh loamy pliable soil is best for all kinds of ranunculuses: dig the ground very fine, make it out into beds, about three feet and a half wide, rake the beds fine, then draw drills about six inches apart, and set the ranunculus roots in them four inches asunder, and cover them over about two inches deep.

The roots of ranunculus will remain several days in the ground after planting, before they begin to vegetate; during which time, they swell very much, and are, in this state, very easily hurt by the frost, more so than when vegetation has taken place; therefore, as soon as they are planted, if there be the appearance of frost, cover the beds with fern or straw, and if the frost come severe, the covering must be augmented accordingly; but the coverings should be taken off, when the frost does not penetrate into the ground.

About the middle of the month, anemonies may be planted. They require the same mode of culture as ranunculuses, only they are more hardy, and do not require much covering in winter. Plant them in drills, about six inches apart; some sorts may be planted only about one or two inches apart in the drills.

Plant narcissus of different kinds; they should be planted in beds of light rich earth. Set them in rows about six inches apart, and put them about four inches asunder in the rows, and cover them three or four inches deep. Small roots not come to their full size, may be planted closer together in the beds.

Narcissus may be planted in clusters in the flower-borders, and they may be potted for forcing in the winter.

All sorts of bulbous roots may now be planted, such as snowdrops, jonquils, fritillarias, irises, ornithogalums, musk hyacinths, gladioluses, martagon lilies, pancratiums, crown imperials, white lilies, and all other sorts of bulbous roots which blow in the spring, or in summer.

Plant crocuses; these may be planted in clusters round the borders, or in continued lines, about a foot from the

edges of grass or gravel walks. They may be planted with a dibber, or in a drill, and covered about two inches deep; they may likewise be planted in beds, about three inches apart, and two inches deep in the ground.

Plant rose-trees in pots for forcing. Take good loamy earth from a quarter of the kitchen-garden, mix it with very rotten dung, and run it through a coarse screen or sieve; or rich earth, which melons have grown in, is well adapted for rose trees; get pots of a good size in readiness, and take strong plants out of the flower-borders or beds; cut off any straggling shoots, trim their roots a little, and plant them in the pots, taking care to let the mould fall in between their roots, pressing it with your hand so firm as to keep the plants steady in the pots. If you want them, they may be forced the ensuing spring; but it is best to pot them a year at least before they are forced; they will, after that period, be able to produce fine strong rose-buds.

In the autumn, water your rose trees in pots occasionally, with dung water, which will help to enrich the mould about their roots.

If you have any walls or palings which you wish to hide, plant against them laurels, phillireas, lauristinus, or other evergreens.

On account of its beautiful clusters of berries, the pyracanthus is a pretty shrub to plant and train up against a wall. In autumn, its berries are ripe, and they make a very agreeable appearance.

In this and the two following months, the arbutus, or strawberry-tree, makes a beautiful appearance when it is in blossom, and, at the same time, loaded with fine red round fruit, like large strawberries. They may now be planted; but cover them in hard weather in winter, otherwise, being newly planted, the frost may kill them. This plant will only grow well in the open air in the southern counties of England, and in France, and in other warm climates of a like temperature.

Layers of trees and shrubs may now be laid down to propagate, and cuttings of various kinds of them planted, and layers of last year taken off and planted in nursery beds.

If the ground be moist, this month is a good time to make edgings of dwarf box. Edgings of suthernwood, lavender, thyme, pinks, daisies, thrift, &c., may also be planted.

This is also a good time to plant hedges of phillirea, lauristinus, yew, holly, aleternus roses, sweet brier, privet, hawthorn, &c.

Now is the time to gather and preserve the seeds of several kinds of flowering shrubs, such as hawthorn, portugal laurel, sweet brier, roses, &c. The seeds of trees may likewise be gathered; these are laburnum, sycamore, ash, mountain ash, acorns of oak, cones of firs of different kinds, beech, horse chesnut, sweet chesnut, walnut, &c.

Mow and sweep grass walks and lawns, and roll them frequently to keep down the worm cast.

Weed and sweep gravel walks often, and roll them to keep them smooth and neat.

On the NURSERY-GARDEN,

For October.

In the beginning of this month, common laurels, portugal laurels, lauristinus, aleternus, phillireas, and all other sorts of evergreen plants, may be transplanted into nursery beds; if the weather be dry, give them water as soon as they are planted.

Transplant into nursery beds, layers and cuttings of last year, which are well-rooted. If they are not well-rooted, and the wood sufficiently ripened, this work may be deferred till the latter end of the month, or till another season.

Young forest trees may be pruned in the latter end of this month. It is not proper to strip the stems of these bare of all the shoots; small ones should be left here and there on them; but those that are cut off, should be cut close and smooth to the stem, that the bark may easily cover the parts from which the branches were cut, so that no blemish may be in the wood. As the trees grow up, the stems of them may be gradually stripped of all the side shoots, beginning at the lower part first; cut them close to the stem, for the reason above assigned.

Forest trees in plantations, after they are grown from six to twelve or fourteen feet high, are often, after that,

left to nature; and as they grow up, the stems are much excluded from the air, and the side branches on them die, beginning nearest the ground first. This is natural, and in this case, nature may be much assisted, to the great advantage of the timber. To assist the trees in producing sound timber, they should be gone over every year, in the winter or spring months, and the shoots cut from their stems as the trees advance in height, and they ought to be cut off close to the stem of the trees perfectly smooth, that the bark may easily cover those parts where the shoots were cut from. In this pruning, the rotten branches ought not to be excepted. In this manner the trees may be treated till it be thought proper to leave them to nature.

To convince any person that this method of pruning forest trees should be adopted, let them look at timber, after it has been sawn into planks or boards, and they will see in some of it the branches from near the heart go out through the wood, in form as if a hole had been bored with an instrument, and a peg of wood exactly fitted to the hole driven into it. This is frequently very discernible in fir timber, and is called knots by some people.

The seeds of horse-chesnut, ash, beech, sycamore, laburnum, and of some other sorts, may be sown in this month. Dig a piece of ground fine, make it out into beds, and sow the seeds in drills or broadcast, covering them about two or three inches deep.

The seed of hawthorn, holly, yew, &c. may also be sown some time in this month. They should be buried in the ground three inches deep. These, however, lie in the ground more than twelve months before they vegetate; on that account, the most general practice is to bury them a year in the ground before they are sown; and for this purpose a trench is dug in the ground, level at its bottom, and the seeds deposited in it, and covered over with earth about six or seven inches deep; in which situation they remain till the following October, when they may be sown in beds, or kept where they are, and sown in the succeeding spring of the year.

Walnuts, and the acorns of the oak, may be sown as soon as they are ripe. Make beds three or four feet wide, draw drills, about six inches apart, put the nuts in them, and cover them two or three inches deep. Or you may rake the mould off the beds to the depth you intend to

plant them, and sow the acorns over the surface, two or three inches asunder; press them down with the spade flatwise, and spread the earth equally over them.

In this month you may sow cherry and plum stones for stocks. Sow them in beds, and cover them with earth two or three inches thick.

Stocks for budding or grafting on, whether from seeds, cuttings, layers, or suckers, may now be planted out in rows, about two feet or thirty inches asunder, and the plants set in the rows, about sixteen inches apart. Small ones, not fit to be planted in rows, may be bedded out about five or six inches plant from plant, till they get another year's growth.

Trees and shrubs of various sorts may now be propagated by laying. Medlars, mulberries, figs, &c. may be increased in this way. *See* Chap. V.

Cuttings may now be planted of currants, gooseberries, vines, laurels, honeysuckles, jasmines, elders, willows, privet, and a great number of other sorts of trees and shrubs.

In this month vacant pieces of ground should be prepared by trenching, manuring, and digging, for planting trees and shrubs of different kinds. If there is time for it to lie to meliorate, it may be laid up in ridges.

New planted evergreen shrubs, if they are large plants, will probably require stakes to support them; tie them to the stakes with bass, or any other soft bandages that will not hurt them.

On the HOT-HOUSES,

For November.

The fruiting pine plants will now, it is probable, be established in the tan-bed for the winter, if every thing has gone on according to expectation. Examine the heat of the bed, and if the warmth of the tan be moderate, and your plants not plunged into the rims of the pots, you may put in some well-prepared tan among the pots; let it be done carefully. If you cannot reach to the middle of the bed among the pots with your hand, take a wooden hoe, or a round-headed stick, to push the tan in with. Set the pots level, and see that the tan be close to their sides, that the heat of the bed do not escape through vacancies.

During this month, the plants will require but little water; the greatest care should be taken, that the heat of the tan-bed be not too violent; for if the roots of the plants be destroyed by too much heat, too much water, or by any means whatever, the fruit will be but small, and it would probably keep the plants back from fruiting till May or June. In this month and the following, there is little or no natural heat, to assist in causing the plants to send forth young roots from their stems; and therefore, if the old roots are now injured, the plants must remain in an almost dormant state, till new roots spring from the stems, or unhurt roots, into the mould, and that will not take place, but in a very small degree, before the latter end of January or February. *See* Chap. XII.

If there happen to be any pine apple fruit in the house, green, or not fully ripe, they must get but little water, save only enough to keep the plants from flagging, and no water should be let fall on the fruit, nor on the leaves of the fruiting plants at this season.

If any thing occurred to hinder the tan-bed from being made up for the winter, till this time, it should be done as soon as materials can be procured: at this time of the season it is best to avoid, if it can be avoided, making the bed all of fresh tan, on account of the great moisture in it. It is best to have new and old tan mixed together,

in about equal parts of each. In this month it may be well to have a few plants start into fruit, which may come in at an early and very acceptable season. In the course of this month several of the fruiting plants may probably be forming their fruit in the hidden part of them; therefore the heat, both in the bed and in the air of the hot-house, should be kept in a steady moderate manner. In the course of the month the plants may want a little water two or three times; but it is best not to water them much all over their leaves in this month, unless a strong heat be kept in the air of the house. If the weather happen to be fine, give the plants a little fresh air occasionally.

Make gentle fires in the evenings, and in cold dull mornings. Let the house be kept in a clean sweet state. If you have french beans or exotic plants in it, keep them clean, and give them gentle waterings when they begin to be dry.

Height of the Thermometer in the Fruiting-house, shewing the Temperature of the Air in it, for November.

D.	M.	N.	E.	D.	M.	N.	E.
1	64	80	67	16	65	70	64
2	64	72	66	17	61	66	64
3	63	68	64	18	60	72	66
4	62	68	64	19	67	75	65
5	59	65	65	20	64	85	65
6	63	80	65	21	61	67	65
7	62	78	64	22	61	68	64
8	62	84	64	23	62	67	63
9	60	80	64	24	60	66	64
10	57	80	64	25	61	67	64
11	64	68	65	26	61	67	63
12	64	67	65	27	59	84	62
13	63	84	64	28	60	68	62
14	64	74	66	29	59	72	65
15	65	72	65	30	63	68	65

Attend carefully to the succession plants. If the beds have not been made up for the winter, it should now be done. Take all the rotten exhausted tan out of the pit, and if it is rough and worth sifting, run it through a screen or sieve; cast the round tan into the pit and level it, then fill it up to its height with fresh bark, and work the old and new well together, about three feet deep, level it, and tread it all over the surface, and dig it up again a spit deep, and plunge your plants in it up to the rims of the pots. Make the fires a little larger than usual, till the heat come up in the tan-bed. *See* Chap. XII.

Let the house be kept sweet and clean constantly; make gentle fires in the evenings, and in cold gloomy days.

Pine-plants in pits or frames, without fire heat, must have a gentle lining at them in cold weather, and cover them up at night with mats.

Grape vines in hot-houses may now be pruned, and tied up close to the rafters.

To have kidney beans early, plant some now in pots, in the manner directed in the former months. Plant them in moist mould, and they will not need to be watered till after they come up.

Cucumber plants in the hot-houses, sown in August, should be kept clean, and watered when they begin to be dry.

Take care of exotic plants in the hot-houses; keep them free of weeds and dead leaves, and give them gentle waterings when they want it.

If you have any crowns or suckers of the pine-apple kind not planted, hang them up in the hot-house till the month of March.

On the GREEN-HOUSE,

For November.

Look over the plants carefully every other day, to see if any of them stand in need of water, and if you perceive any of them beginning to be dry, give them a moderate water-

ing. Pick off from the plants all the dead and decaying leaves, and suffer no weeds to grow in the pots. If the nights are cold and damp, make gentle fires in the evening, and in very cold days, just to keep the house dry, that damp may not affect the plants or bunches of grapes that may yet remain on the vines. Give the house plenty of air in fine sunshine days and in mild weather; and when you have fires, keep a draft of air constantly at it, even during the night, which will prevent the effluvia that arises from the flues from injuring the ripe grapes, if there be any, and from damping the plants.

If you have green-house plants, or cuttings of green-house plants of any kind in frames, give them air in fine weather; and if the nights are cold, cover them up with mats.

If you have any room in the green-house, set in young china roses, mignionette, stocks, and any other kinds of flowering plants in pots that may require protection from the cold weather in winter.

The bunches of grapes, if you have any remaining in the green-house, should be examined frequently; and if any of the berries begin to rot, cut them out, that they do not affect the adjoining ones; and the leaves on the vines, when they decay, should be taken off.

If you have any unsightly myrtles, or other hardy green-house plants, you may turn them out of their pots into the ground in a sheltered situation; prevent the frost from getting at their roots by mulching, cover them with mats in hard frost, and perhaps they may survive the winter.

The month of November is some years mild, but the air is mostly damp, and frequently foggy; so that to keep the green-house plants in a good condition, it is the best way, though there may be no frost nor cold weather, to make gentle fires to dry the flues, and keep the plants from catching the damp in their leaves, and succulent shoots, which most sorts of geraniums and some other sorts of plants have.

On the FORCING-HOUSES,

For November.

If grape vines were begun to be forced in August, probably the fruit will be set on them some time in this month; and if that be the case, they will require a great deal of care and good management: fires will be wanted every evening; and endeavour to make them steady, that in the morning the thermometer may stand about 60, or not lower than 55, and if it be not sunshine in the morning to raise the heat of the house, it will be necessary to make a fire to raise the heat, in the course of the day, to 65 and 70, admitting a little air during a part of the day. When the sun shines, the heat should rise a little higher, observing to have a free draught of air coming in and going out of the house, when the thermometer rises to above 65. If the border, or any part of it, be in the inside of the house, keep it in a moderately moist state. When such early forcing is attempted, the stems of the vines at least ought to be planted in the inside of the house. I am of opinion, that forced vines had best always be planted in the inside of the house, when it can be done conveniently, and their roots should have liberty to run out; for this purpose, I have advised the building a forcing-house with openings in the front wall. *See* Chap. XIV.

You will observe to stop the shoots at a sufficient distance before the fruit, and train up young wood for the next year's crop.

If the roots of the vines run into the border in the outside of the house, cover it, to a considerable distance from the house, with long dry litter of fern, stubble, or straw, just so thick as to prevent the frost from freezing the surface of it.

Late grapes in houses will require attention; go over them frequently, and if any of the berries begin to rot, cut them carefully out of the bunches, that the others may not be affected by them. When the leaves begin to decay, take them off. Keep the house in an airy cool state. If the weather be wet, damp, or foggy, which it mostly is at this time of the year, make a fire occasionally to keep

the grapes dry; but keep air constantly at the house, while there is heat in the flues.

If any grape-houses are uncovered, put the glasses on them in the beginning of the month, to keep the wood dry, and the frost from affecting the plants, observing to open the sashes to admit air every fine day.

The vines in forcing-houses, where the grapes are over, may now be pruned. The manner of pruning must be suited to the strength of the vines, and to the method you have adopted. If you practise the spurring method, and your main branches be about two feet or thirty inches apart, if the vines are in a vigorous state, the bearing spurs may be left about a foot asunder, leaving only one or two good buds on each spur: but if your main branches are farther apart than three feet, the spurs may be left a little closer together. *See* Chap. XI.

It may be necessary, in a small house, sometimes to train a vine in one single branch the whole length of the house, and longer by turning it back again; if that should happen to be the case, and the plant strong, the spurs may be left on, only seven or eight inches apart. However, the pruning of vines, and of fruit trees of all kinds, in regard to the quantity of bearing wood to be left on them, must be according to their strength, and submitted to the judgment of the person who is entrusted with the management of them.

In pruning vines, if what is termed the old method be used, the young shoots should be shortened to three or four eyes; and if the new method be practised, cut down to the bottom all the wood that bore the crop the preceding season; and also cut down, to near the lower part of the stem, a young shoot or two, to send forth a supply of long branches to succeed the present ones. Leave on each plant, according to the age and strength of your vines, one or two of the best budded long shoots produced last summer, and lay them in, at such lengths as you conceive the plants are able well to support with a burden of fruit on them.

By some writers on gardening, much stress is laid on the modes of pruning and training; but I am of opinion, that to have good crops of grapes much more depends on the soil they are planted in, and the climate in which they are

kept, than on any methods of pruning or training that have been, or ever can be adopted.

The chief thing in pruning fruit trees is to leave on a sufficiency of bearing wood, and to keep the trees moderately thin of shoots and leaves during the growing season. This requires art; but it will not do, unless the trees are planted in soil suitable to their nature, and the climate in which they grow be a genial one, neither too hot nor too cold, nor over dry, or too full of moisture. *See* Chap. XI.

In case severe frost comes on before you begin to force your grape vines, lay a covering of any kind of litter on the border, to keep the frost from the roots, and shut the house close during the frosty weather, except in days when the sun shines.

I have been informed by a native of Germany, that in some parts of that country, before the severe frosts set in, they lay the branches of their vines down and cover them with earth, to preserve them during the winter.

In the south of England, I have known vines greatly hurt by frost when the borders were bare of snow, and destitute of any kind of covering, to prevent the frost from penetrating far into the ground.

I do not approve of taking vines out of hot-houses, after they have ripened their fruit, and letting them remain out during the winter, or any part of it; though the vines may sometimes do well when this method is followed, it is not imitating nature. If they are left out, they should have some kind of protection. They may be stretched out on the border, warmed by the influence of the heat from the flue near the front wall, or covered with mats in frosty weather.

Cherry-trees in the cherry-house may continue fully exposed, till within a fortnight or three weeks before you begin to force them. Cherry-trees are very hardy, I have never known them to be injured by the most severe frost.

The border in which the trees of the fig-house grow, should be covered with long dry litter of some sort, to keep the frost from their roots; and either the glasses must be put on the house, to keep the hard frosts from the branches of the trees or they should be covered with mats or straw.

To keep the wood of trees dry, the glasses should be on your peach-houses. Give them all the air you can, only prevent the rains from falling on them. Examine every part of the trees, and cut off any decaying shoots that may appear, and if any dead bark, canker, or gum, be observable on them, open the parts and cut out the affected wood in the manner as directed last month.

Those that have a hot-house solely appropriated for forcing roses, and other sorts of flowering shrubs, and flowering plants of different kinds, should now begin to prepare the house and other things for commencing that business, which may be begun about the twentieth of next month. Get the flues made perfectly clear of soot, and repair them, taking care to secure them with plaster, that no smoke can come through them into the house among the flowers. Paint the inside wood-work once over, or else wash it clean with soap and water, and get all the walls in the house washed with lime and water.

Roses, and various other flowering shrubs and perennial and herbaceous plants, may be potted for forcing, any time this month.

Bulbous roots may likewise be planted in pots, to set into forcing houses or frames, to bring them into blossom at an early period.

On the FORCING-FRAMES,

For November.

Cucumber plants, the seeds of which were sown last month, should be transplanted about the beginning of this month, into the beds where they are to produce their fruit. If preparation was made last month according to the directions therein given for forcing cucumbers, about the middle of this month, the plants will be grown large enough for planting in the bed where it is intended they shall produce their fruit. The bed should therefore be previously got in readiness for their reception. If the plants are to be forced on the brick bed, the pits under each light should be filled up with good rich earth (that

from leaves of trees I think is best) a little higher than the flues, as it will sink to their level in the course of the winter, nor should the earth be laid in very loose, for fear of its sinking too much. Then under the middle of each light on the surface of the earth already put in, make a hill of earth in the same form as is usually done in the common way of forcing cucumbers on a dung bed. When this is done, make a lining of hot dung all round the bed, higher than the flues; and as soon as the heat of the linings have warmed the bed sufficiently, let the plants be turned out of the pots with the balls of earth about their roots entire, and set into the hills of earth in the bed.

If the plants are to be forced on a bed of dung, observe the directions given for its management in Chap. IX.

Height of the Thermometer in the Melon and Cucumber Frames, shewing the Temperature of the Air in them, for November.

D.	M.	N.	E.	D.	M.	N.	E.
1	71	80	68	16	65	69	64
2	70	91	80	17	62	79	67
3	78	85	80	18	65	71	61
4	74	84	76	19	71	65	64
5	65	92	79	20	66	75	67
6	62	78	72	21	64	66	63
7	69	71	70	22	59	74	65
8	67	75	65	23	74	69	64
9	80	76	72	24	70	65	61
10	70	74	67	25	72	68	65
11	67	73	70	26	75	66	65
12	77	85	74	27	81	71	67
13	68	74	68	28	82	70	66
14	70	75	64	29	80	90	75
15	70	69	63	30	82	68	66

If there be any strawberries in pots in the forcing frames, keep the earth about their roots moderately moist, but do not at any time water them all over the leaves, if there be either blossom or fruit upon them. They will require a mild heat of about 55 degrees to ripen their fruit, which perhaps may ripen, if the weather be not cloudy and cold.

Those who wish to have asparagus in winter, may in this month begin to force it. The common way to do it, is, having a quantity of good dung well prepared, by putting it together in a heap to ferment, that the rancidity of it may be evaporated, by turning and mixing it several times when there is a strong heat in it; make it up into a bed about three feet high, and four or five inches larger all round than the size of the frames, which are to be set upon it. When it is made, set the boxes and glasses on, and let it heat and stand till it is sweet, which may be known by the smell of it; then tread it level, and loosen up the surface again, that the heat may have free liberty to arise. After this is done, lay on the surface of the bed from six to eight inches of vegetable mould, or any other sort of light earth that the heat may easily ascend through, and of such a texture as does not retain water. Take up plants, no matter what age they are, which produce fine asparagus, trim their roots, and place them in rows on the beds; when one row is laid, strew a little fine mould among the roots, then proceed in the same way with one row after another, keeping them on a level, as the surface of the bed at first lay, till you have finished planting them; then lay among the buds and roots some fine vegetable, or other light rich mould, working it in among them with your fingers, and cover the buds over about one inch thick, and above that lay three inches in depth of vegetable mould not very rotten, but such as the water will run quickly through. If you have not got vegetable mould of this description, old tan, not very fine, will answer the purpose equally well. If there is a strong heat in the bed, let the glasses remain off till it begin to decline.

When the asparagus bed has, after planting, stood two or three days, when the heat will have begun to warm the roots, give the plants a sufficient watering; pour it out of a pot with a rose on it, to imitate a shower of rain; let the bed have enough to moisten the mould well, and to wash it in among the roots. As the surface of the dung in the bed is loose, it will pass into and through it freely, without creating a stagnation in the mould, or any part of the bed. When the heat of the bed begins to decline, put on the glasses; and if the bed be in good condition with regard to heat, much air need not be given, till the buds of grass

are nearly about coming up, when it should be admitted more plentifully.

Give the plants now and then a watering, as before directed; and in case, after planting, you should find the bed getting too hot, which will sometimes happen from the mildness of the weather, pour water plentifully all over the surface, letting most fall on the middle, which will cool and sweeten the bed, and enable the plants to send up fine shoots.

The outsides of the bed will become cold before the middle of it; to remedy this, when it is necessary, lay some dry litter of straw, stubble, or fern, all round it; and when the heat begins to become too little, remove the temporary linings, and make a gentle lining of dung at one side of the bed, and when it declines in heat, make one at the other side of it, and so on alternately.

When the asparagus is about two or three inches above the mould, it is fit to cut, which may be done carefully with an asparagus knife, or it may be broken off from the roots with the finger and thumb; but whichever of the methods is practised, care should be taken not to injure the buds that are coming up.

A late writer on gardening, in giving directions for forcing asparagus, when the bed is about to be planted, orders "to cover the whole with squares of turf." By this method, he says "a rank steam is effectually prevented. which is of no small importance in the forcing of asparagus." If the bed contain rank unhealthy steam, to prevent it from contaminating the air in the frame, it would have been more reasonable to direct the whole surface of it to be covered with sheet lead, or some other metal, through which certainly the steam of dung could not penetrate. This, in effect, he seems to acknowledge, for he afterwards says, "it sometimes happens that a little will rise, if the dung did not undergo a proper fermentation." After dung has undergone a proper fermentation, the steam arising out of it will be sweet, which instead of hurting asparagus, or plants of any other kind, will nourish them, if it be properly applied.

Laying turf on hot-beds, for forcing asparagus, melons, and cucumbers, is strongly recommended by the writer on forcing which I allude to. He says, that the turf

keeps down the rank steam from injuring the plants, and prevents the heat of the bed from burning their roots. Long experience, however, in managing hot-beds, has convinced me that turfing the surface of them has a different effect. The method is an old one, and is, as far as I know, now justly exploded, and unpractised by every good gardener; and yet, strange to tell, the most modern writers on gardening recommend it, which surely must mislead whoever follows their rules. It is a method practised fifty years ago, and it makes it a puzzling business to raise cucumbers or melons early by such a method.

Turf laid on the surface of a hot-bed prevents the water from sinking freely into it, and if there be a sufficient heat in it for winter forcing, unless it receive water, it must become dry and husky; and, when in that state, vapours uncongenial to the plants arise out of it, and the detention of the water on the surface of the bed among the mould, by means of the turf, causes a stagnation, which sours the earth and contaminates the air, so that neither the earth, nor the air in the frame, is well adapted for the growth of plants, especially of tender ones.

If there be unhealthy contaminated air in a hot-bed, instead of endeavouring to confine it down in the bed, the surface of the dung in the frame ought to be frequently loosened, to give the foul air free liberty to rise and pass out of the frames; and as it is impossible for those who force asparagus, melons, cucumbers, &c. on beds of hot dung, to have the air arising in the frames continually sweet, they should take care to leave the lights in such a way, that the external air may at all times have a free ingress and egress to the plants. *See my treatise on the cucumber, where this subject is more largely commented on.* Chap. IX.

Those who have got brick beds, such as are described in the former part of this work, may force asparagus on them by the help of linings only, where no steam can enter the frames to injure the plants.

Asparagus may be forced by the assistance of fire heat, with a gentle heat under them, raised by leaves of trees, oldish tan, or dung, in which is a mild heat. The flues should be above the surface of the bed, after the plants are in and earthed up.

The melons will, by this time, be over; take the lights off the boxes which are unemployed in protecting lettuce, cauliflowers, or any other kinds of esculent vegetables or flowering plants, and set them into a dry shed till they are wanted. If any of the boxes or sashes are in want of repairing and painting, let it be done when they are dry.

Clear away all the stalks of the melons, and all other kinds of litter from your old melon beds, and take the opportunity of frosty weather to wheel away the old rotten dung.

The mould in which the melons grew, being rich, should be laid in a heap somewhere; it will do for fruit trees, or for many kinds of flower plants. But if you have not fresh mould for your melons next spring, you may expose it in a small ridge, during the winter, to the frosts, rains, and air, turning it several times, and it will do to plant your melons in next spring; but fresh earth is best, which may be got in any part of the kitchen garden, if not, from a common.

If you have at liberty a melon brick bed, on the plan I have mentioned, you may dig the earth fine in which the melons grew, and plant lettuce in it. By a gentle lining you can force them in the spring, if you are able to spare the bed from other uses.

In this month, collect leaves of trees to rot for vegetable mould, or to make hot-beds; they answer well to mix among long horse dung. Let them be put together when they are in a wet state.

On the KITCHEN-GARDEN,

For November.

The mushroom beds that were spawned the former months will now require attention. They should be examined every two or three days, for the heat in them will be affected by the variableness of the external air. In windy or frosty weather they will require larger coverings

than in mild weather, particularly if they are in the open air. They should be uncovered about once a week, and the surface of them cleared of any damp litter or mouldiness that may happen to be on it. The mushrooms of those that are in bearing should be gathered before they are too old, and the beds must be covered up according to the heat found in them, or to suit them to the temperature of the weather. If the heat in the beds be nearly gone, and the weather very cold, they will require a thick covering; sometimes perhaps a foot or eighteen inches deep. *See* Chap. XV.

Any mushroom beds not finished, if they are become cool enough, should be spawned. Put the spawn in very thick, if you have got plenty.

Cut down the stems of asparagus, if it was not done last month. Clear the beds of weeds and litter of all sorts. Spread rotten dung on the beds, and earth them up in the manner as directed last month.

If artichokes were not dressed and secured from the frost last month, it may be done any time this month before hard frosts come on. Cut down the stems and leaves to the ground, and cover them four or five inches thick with earth dug from between the rows, or with litter of any sort, to prevent the frost from freezing the roots of them.

Earth up cardoons, if they require it. The leaves of each plant should be tied together with bass, hay, or straw bands; and fine earth put up close to them to blanch them and preserve them from the frost.

In a dry day, tie up endive to blanch; also fern, or any other long litter not too heavy, may be laid on some beds to keep the frost from the plants, and blanch them. If you have a dry cellar or shed, you may lay some in, or into melon or cucumber frames, which can be covered up in frosty weather; the glasses will keep the plants dry.

To have a constant supply of small sallading, sow rape, mustard, cress, &c. once or twice a week in pots, in the manner as directed last month, and set them into the hot-house.

Lettuce plants may yet be pricked out in frames to preserve them through the winter; and if you wish to bring them to perfection early in the spring, by the assistance of artificial heat, you may plant some in such brick-beds for

melons as are described in the former part of this publication. By applying a lining of dung, the bed can be warmed whenever you choose it. Lettuce in frames, if they have taken root, should have the glass taken off, or plenty of air given them every fine day.

Continue, as they require it, to earth the rows of celery up in fine dry days, if such happen to be at this season of the year.

If you have any potatoes yet remaining in the ground, they had best be taken up before hard frost comes on; or if the ground be dry, you may let them remain, and cover them up with long litter to keep the frost from them, and take them up as they are wanted.

Dig up carrots, parsnips, red beet, salsafy, scorzonera, skirrets, hamburgh parsley, turnip-radish, horse-radish, &c. and lay them into sand, in places where the frost cannot get at them.

Lay a thin covering of fern or straw on some of your rows of parsley, to preserve it in hard frosts when there is no snow on the ground.

If you sowed any radish seeds last month, to stand the winter in the open ground, lay a light covering of dry straw on them in frosty weather.

In this month, you may sow peas in a warm sheltered situation. They will have a better chance to stand the winter than those which were sown last month. Draw drills for them about four feet asunder, and four inches deep; sow the peas of early sorts, and cover them three inches deep.

Plant early kinds of broad beans; put them in rows about three feet asunder, about three or four inches deep in the ground, and as far apart, bean from bean.

If it was not done last month, you may prick out cauliflower plants to stand the winter in frames; set them about three inches apart, and keep the lights close till they have struck root.

The cauliflower plants under hand-lights should have air in fine weather; and keep them free of dead leaves and weeds.

Look over autumn cauliflowers frequently, and when the heads begin to appear, lay large cabbage leaves over them, or the leaves of themselves to protect them from frost and

heavy rains. The full-grown heads may be taken up, and their roots laid into earth or sand, where they can be sheltered from bad weather, if required.

When the weather is open, cabbages may be planted any time in this month. Stir and hoe the ground between the rows of cabbages planted the former months.

Brocoli and all kinds of cabbages should now have the earth drawn up as high as it will lie to the stems of them.

Hoe and rake the ground between the rows of spinach, and keep the plants perfectly clear of weeds.

Trench and manure vacant pieces of ground, that it may be ready to plant or sow in the spring.

On the FRUIT-GARDEN,

For November.

Plum and cherry trees against walls, and espaliers, may now be pruned and nailed. Cut out any dead or superfluous shoots, and if the studs or bearing spurs are getting too far from the main branches, shorten them in judiciously, making your cuts clean and smooth. If there are any vacancies, lay in young shoots to supply them. Take off all rotten shreds, clear the trees of dead leaves or other litter, and nail or tie the shoots steady to their respective places, but it is best not to put nails and shreds thicker on them than is necessary to prevent the winds from tearing them down.

This month is a very good time to prune gooseberry and currant bushes. Thin them out as directed last month, and when they are finished, clear off the cuttings and dig the ground between the rows, laying some manure on it first, if the plants require it. *See* Chap. VIII.

If it is wanted, make a new plantation of gooseberry and currant bushes; and it is a fit time in open weather, to propagate these plants by cuttings.

Go over the peach, nectarine, and apricot trees on the walls, and take off from them most of the nails and shreds, leaving only as many as can keep them to the wall, so that

in windy weather, the branches do not rub one against the other. Inspect the trees carefully, and if you perceive gum or dead bark on them, open the parts thus affected, and cut out the dead or infected wood as directed in the former months. Also cut off any decaying, or luxuriant superfluous shoots. Make your cuts smooth and sloping, in such a manner that the wet may not lodge on them; and whatever shoots are cut from the branches in any part of the tree, let them be cut close to it, that the bark may easily cover the parts from whence the shoots were cut.

Clear your trees of all dead leaves, cobwebs, &c. which hang about them, and take all sorts of litter from the borders. *See* Chap. III.

Pear and apple trees, either on walls or espaliers, may be pruned and fixed to their places any time this month. They require the same mode of pruning and training as plums and cherries do.

In pruning cherry trees, it ought to be remembered that the morella requires nearly the same method of pruning as the peach tree, only the young shoots are not to be shortened, unless to cause them to put forth more shoots to cover the wall.

If they are wanted, make plantations of raspberries. Take strong well-rooted suckers from the old plants. Plant them in good deep rich soil, about four feet row from row, and put three or four plants in clusters in the rows, three feet apart.

If the weather be open, this is one of the best months in the year for planting peach, nectarine, apricot, pear, plum, cherry, and apple trees. They should be taken up carefully, without straining or injuring the roots but as little as possible. Make holes for them that the roots may have room to stretch out in every direction; and do not plant them deeper than to cover the roots immediately proceeding from the stems about three inches deep. In planting, break the mould fine, that it may fall in among the roots, so that no vacancies may be left; and in filling up the holes, shake the trees occasionally to cause the earth to intermix with the fibres, and when the hole is filled up to the top, tread the mould moderately firm.

Secure new planted trees from being blown down by tying them to stakes; or if they be planted against a wall, fasten them with nails and shreds.

Plant walnut trees in places where there is room for them to expand their large spreading heads. These are generally planted in parks or orchards, not less than twenty or thirty feet asunder.

Nuts, and filbert trees of all sorts, may now be planted. These will prosper in almost any soil or situation, and may be trained either as dwarfs or standards.

Mulberry trees may be planted as standards in the orchard, or park, or as dwarfs, against walls or espaliers. If they are for standards, they should, before planting out where they are to remain, be trained with an upright stem, five or six feet high or more, according to the distance the branches are required to be from the ground, and then suffered to branch out at the top. If they are intended for walls or espaliers, their stems should only be about a foot high before they are allowed to spread their branches horizontally.

Quince, medlar, and barberry trees, should now be planted; the two former require nearly the same room as apple trees; the latter require no more room than filberts.

Before the frost sets in hard, the borders of fig trees should be covered with litter of any sort, so thick as to keep the frost from the roots of the trees, and their branches should be covered over with mats; otherwise, if severe frost comes, it will destroy the young shoots.

Standard fruit trees of all sorts may now be pruned. Cut out dead or decaying branches, and where they are getting too crowded, take out some of the worst of them. Make the cuts clean and close to the branches from whence they are taken, that the bark may the more easily cover the wounded parts.

If there remain on the trees any apples or pears, they should be gathered in the beginning of the month.

On the PLEASURE or FLOWER-GARDEN,

For November.

If it was not done last month, auricula plants in pots should be removed into a sheltered dry situation, that they may be protected from heavy rains, and cold frosty weather. If you have not a place for this purpose, they will do well enough in a melon or cucumber frame. Let the plants be kept free of dead leaves and weeds, and if they begin to get dry, give them a little water.

Carnation layers in pots in frames should be attended to. Give them air in fine days; keep them clear of weeds, and give them gentle waterings when they begin to be dry.

All sorts of bulbous roots may now be planted; such as hyacinths, tulips, ranunculuses, anemonies, and narcissus. Plant them in beds or borders, as directed in the former months. Beds of the finer sorts of ranunculus, hyacinths, and tulips, would be better to be protected in heavy rain and hard frosts, by some kind of coverings. The beds may be arched over with hoops, and canvas or mats laid over them to defend them from the effects of inclement weather.

The different kinds of flowering shrubs may now be planted. Those of them that have heavy heads, should be tied to stakes, so that high winds may be prevented from blowing them down, or loosening them too much about the roots.

Oak, elm, beach, birch, ash, sycamore, alder, plane, poplar, larch, fir, pine, and all other sorts of hardy evergreens, and deciduous trees and shrubs, may be planted. If they are large, most of the evergreens will require to be tied to stakes.

Various sorts of herbaceous, perennial and biennial flowering plants, may still be transplanted; they may be planted in beds, or in the borders, in a diversified manner.

Flowering shrubs and evergreens, may now be pruned. When they are pruned, clear the borders of all sorts of litter; and they may be dug or remain till after Christmas, when leaves of all sorts from trees or shrubs, will be perished

or raked up, so that they will not make a litter after the borders are dug.

Tender exotic plants about in the borders or in beds; such as rhododendrons, azaleas, magnolias, halmeas, and many other sorts, will be better of mulching about their roots; and some of the more tender ones will require, in very hard frosty weather, to be covered with mats. The china rose, also, and some others of a delicate nature, should be mulched up about the roots, and covered with some sort of covering, if the frost be very severe, without a large covering of snow on the ground.

If the crocuses were not planted last month, they may be planted any time in this month. Plant them about two or three inches deep round the edges of borders, or in beds, about three feet wide.

See that mignionette, stocks, and all other sorts of flowering plants in pots, be protected from severe weather. They should be set in the green-house, or in some other houses or frames, where the air is nearly of a heat capable of preserving green-house plants during the winter.

When you have time, get earth from heaths or commons, and prepare by turning and breaking it occasionally in frosty weather.

This is a good time to plant hedges of hawthorn, beech, hornbeam, privet, hazel, &c. Box edgings may also be planted: and hedges of all sorts of hardy trees or shrubs, clipped at any time in this month.

Let gravel walks be swept and rolled occasionally.

If the weather happen to be mild, grass lawns and walks will probably require to be once mown in this. Keep them clear of leaves and other litter, and of wormcast, if you can.

On the NURSERY-GARDEN,

For November.

All sorts and sizes of trees and shrubs which are of the hardy kind, may be transplanted, and planted any time in this month, if frost and snow do not prevent.

Stocks from the nursery, or seed beds for budding or grafting on, may now be planted out in rows about two feet or thirty inches apart, and the plants set in the rows about fourteen or fifteen inches asunder. Those plants in the seed beds which are too small to be planted out in rows, should be bedded in beds about three feet wide, and the plants set about four or five inches apart.

Tender sorts of American plants should be protected by mulching their roots, and covering their branches or heads with mats or other coverings in severe frosty weather. All kinds of tender plants in pots, should be set into frames or pits, and plunged in old tan or light mould; and in hard frosts, coverings of mats, straw, fern, &c. may be laid over them.

Forest trees of all sorts may now be pruned. Short weak shoots only should be left on the stems, and those that are cut, unless it is designed that they should shoot again, should be cut off close and smooth to the stems, that the bark may not be hindered from covering the cuts as quickly as nature can effect it.

Beds of tender seedlings should have some protection in hard frosts, cold windy weather, heavy rains and snow. For this purpose, hoops or wooden frames may be set over them, and covered with mats at those times when protection is deemed necessary.

The ground between the rows of trees and shrubs which are not intended to be removed in the winter or spring may be dug.

Prepare by trenching, manuring, and digging vacant pieces of ground to be in readiness to plant the ensuing months, with any sort of plants you think proper.

On the HOT-HOUSES,

For December.

THIS is generally the most gloomy cold month in the year; the pine apple plants will therefore demand attention to keep them in a gentle growing condition. Inspect the heat of the tan-bed minutely. By a person not well experienced, this may be done by plunging the bulb of a thermometer as deep in the tan-bed as the bottom of the pots; and if the heat of the tan raise the thermometer above 100, it is rather too great; which should be lowered by drawing from among the pots some of the tan, so that they may not stand so deep in it. If the heat be below 85, it is too little, and in order to increase it, lay good tan among the pots, so that they may be deeper plunged in the bed, which will give the roots more heat.

A person well acquainted with the heat that the roots of a pine apple can bear, will have no occasion for a thermometer in the tan-bed; thrusting down the hand in the tan, or having watch sticks in the bed to pull out and feel occasionally, will enable him to determine whether the pots ought to be plunged in the tan to their rims or to stand out of it a little. But let it be remembered that the heat of the tan at the bottom of the pots had best be seldom above 100 degrees of Fahrenheit's thermometer; nor should it be long so low as 80, if you choose to have the pine apple plants grow vigorously. Certainly it is better that the roots of pine apple plants be for some time in heat of 80 or lower, if they be not killed with cold and wet, than to be killed with too much heat. If pine apple plants have too little bottom heat, and a sufficient top heat, it is likely, if they be succession plants, that it will start them into fruit, at an untimely season. By this means I have had suckers on old plants show fruit by the time the fruit on the mother plant was ripened.

In case there happen to be any pine-apple fruit, of a good size, unripened, keep them in the warmest part of the house. Give them no water over the fruit or leaves, and let the earth about their roots be moderately moist.

Fires must be made every evening in the hot-house, and also in the morning, and continued all day, unless the sun shine to warm the houses: but fires should not be made stronger than to keep such a degree of heat as to prevent the plants from being altogether in a dormant state.

If the heat of the tan at the bottoms of the pots come down to 85 or below, very little, if any water, will be required during this month. The earth, however, about the roots of the plants ought to be in a moderately moist state.

In case the tan-bed was made up in the former months, according to my directions, I apprehend, if the tan was good, the medium heat of the bed, at about eight or ten inches below the surface, will not, during this month, be less than about 85 degrees of Fahrenheit's thermometer.

If the tan be moist, perhaps the plants may not want watering in this month: but if the tan be dry, they may require water once or twice in a moderate quantity.

Height of the Thermometer in the Hot-House, shewing the Temperature of the Air in it, for December.

D.	M.	N.	E.	D.	M.	N.	E.
1	64	68	65	17	59	58	60
2	61	64	63	18	59	57	59
3	61	68	64	19	59	66	59
4	60	64	63	20	56	64	60
5	59	63	63	21	54	60	60
6	64	65	64	22	55	72	58
7	66	64	64	23	52	75	60
8	60	60	62	24	60	60	61
9	60	64	64	25	58	80	61
10	60	63	63	26	58	65	60
11	60	64	64	27	57	65	58
12	60	62	60	28	56	85	59
13	62	60	63	29	56	75	62
14	59	56	60	30	57	62	60
15	60	55	60	31	55	85	60
16	58	64	60				

Attend to the succession pine plants, and whether the air be kept to its heat by means of fire or dung, let it be kept during this month about the same height as that in the fruiting-house. See that the pots are up to their rims in the tan, and that no vacancies are about their sides, to let the heat of the bed escape.

Pines in pits or frames warmed with dung heat should be covered up about three or four o'clock in the afternoon, and uncovered in the morning about eight or nine. In very cold weather, it may be necessary, sometimes, not to uncover them in the daytime, only as far as to give them a little light; gentle linings should be kept at them, and in hard frosts raised up as high as the walls, if it is found requisite to keep the air to a sufficient degree of heat. No danger need to be apprehended to arise to the plants from the steam of the dung getting in among them. *See* Chap. XII.

To have a regular succession of kidney beans, they should be planted at two different times this month.

Take care of the kidney beans that were planted in the former months; keep their leaves moderately thin, and the mould in the pots free of weeds, and examine them every day, to see if they want water, and give them some when they want, about 70 degrees warm.

All sorts of exotic plants in the hot-houses should be looked after, and weeded and watered when they want it.

Towards the end of the month, if you have room, some sorts of fruit and flower plants may be taken into the house to force. Roses and carnations will bear the pine-apple heat. Perhaps, at certain times, the heat of the fruiting-house may be too powerful for them, but that requisite for the succession plants will suit them. Figs, &c. may also be put into the hot-house, and managed in the way pointed out in the former part of this work.

Sow seeds to raise small sallad in the manner directed in the former months; to have a constant supply, sow them twice a-week.

Set in once a-week, to force, pots of mint, &c.; if you observe this rule, you will have a constant supply, if the plants grow well.

Cucumbers in the hot-house should be attended to. They are very liable in a hot-house, at this time of the year, to be affected by the red spider and mildew; when

you observe it beginning, rub sulphur on the infected parts. Keep the plants free of dead leaves, and give them water not less than 70 degrees warm, when they begin to get dry.

If the grape vines in the hot-house were not pruned last month, it should be done now: prune them so, that their shoots may be trained up under the rafters, or in the back side of the house above the path. Pines will not do well if they are shaded; it is therefore not a bad method, if vines are planted in the front, to train them up the rafters with bare stems, and let them produce their fruit in the highest part of the house, where they do not shade the pines. But, I think, letting them bear fruit under the the rafters, is a preferable way.

On the GREEN-HOUSE,

For December.

The weather being very uncertain at this time of the year, and the days short, the green-house will require particular attention. The flues must be warmed with fire-heat every evening, and also in cold gloomy mornings; the weather is sometimes in this month so cold, that it is necessary to have gentle fires all day. If possible, the temperature of the air in the house should never be below 40 degrees, and occasionally in winter as high as 60.

Take the opportunity of every mild or sunshine day to open the glasses, to let a circulation of fresh air into the house among the plants, which will be a mean to keep them in good health.

In very severe frost, if it happen to be a little on the leaves in the morning, it will not hurt them; but if the earth on the top of the pots be frozen, it is too severe for green-house plants.

Look over the plants frequently, and take off all dead and decaying leaves; suffer no weeds to grow in the pots, and give them gentle waterings when they appear to need it: at this time of the year they had better be too dry than too wet; but extremes should be avoided; no plant ought

to be suffered to flag for want of moisture in the mould, from which it derives its chief nourishment. Succulent plants, such as the different kinds of aloes, sedums, and ceruses, and many soft-wooded green-house plants, do not require much water during the short days in winter.

If any grapes remain on the vines in the green-house, or in other houses, examine them frequently, and if any of their berries begin to rot, cut them out. When you perceive that the bunches will not keep, the best way is to cut them off and eat them.

Pick all the decaying leaves off the vines, and suffer no litter to remain in any part of the green-house.

On the FORCING-HOUSES,

For December.

In this month grapes set and swelling will require particular attention. The flues in the house must not be suffered to become quite cold, therefore the fires will demand attendance very often, and it must be by a skilful steady person. If the weather be very cold, fires must be kept on gently all day, and attended to till ten or eleven o'clock at night, when they should be well smothered with ashes in the front to keep them in all night. The person that attends the fires ought to be up in the morning about six o'clock. Endeavour to regulate them so that the thermometer in the morning may be about 60, but not below 55, and let it rise gradually in the day-time to nearly 70, and if the sun shine, a little higher, observing to admit air every favourable opportunity.

Stop the shoots and thin the leaves as they stand in need of it, and keep the shoots tied neatly to the trellis. Give the border in the inside of the house water when it it requires it, and sprinkle it occasionally with clean sweet water, which will raise a moisture in the air of the house suitable to the plants.

If there be a tan-pit in the grape-house, which is sometimes the case, let the tan in it be sweet; it ought not to be suffered to become husky and dry by a great heat, for

if it is in that condition, the effluvia rising from it will not be sweet, and consequently not well adapted for the growth and prosperity of the tender vine. A tan-bed may be kept from becoming too dry, on account of the great heat in it, by pouring water on it occasionally.

Whatever sorts of plants are in the grape-house besides the vines, let them be attended to. Peach and nectarine trees in pots will do well in it, after their fruit are set and as large as small nuts. Fig trees in pots may also be set into it; and the heat in it will force roses and different kinds of flowering plants.

If you have good success, the grapes will be ripe at a period when they are counted great rarities; and if you fail, you must console yourself with having used your best endeavours.

In the forcing-houses, if you have ripe grapes on any of the vines, keep as much fire heat in the house as to prevent the grapes from damping.

Grape vines intended to ripen their fruit in May and June, should, about the middle of this month, be begun to be forced. Having the flues cleared of soot and put in good order, and the inside of the house painted or washed, if the vines were not pruned last month let it be done now; then make the house quite clean and begin to make fires. At first keep the heat up to about 55 and 60, and increase it to imitate nature as much as you can. If the vines are in a good state, they ought to shoot in January. In this house you may set pots of peaches, nectarines, figs, &c.

Those who wish to have peaches and nectarines ripe in May, should begin to force them about the beginning or middle of this month. Having the flues cleared of soot, and the house clean in every part, begin to make fires, and for some days keep the air in it a little above freezing, the thermometer varying from about 40 to 50 degrees, and when the sun shines, a little higher, having a constant draft of air at the house. When the days begin to lengthen, which is after the twentieth of the month, increase the heat to about 55, and in January it may be kept up to 60, and in sunshine a few degrees higher, taking care to have a free circulation of air from without.

When the shoots and flower buds on the trees begin to swell, then prune them. Cut off all useless superfluous shoots or branches, leaving a regular supply of bearing

wood in every part of them, and leave neither the very strongest nor the weakest young shoots, but those that are well ripened and have their buds not too far apart. Lay in the branches and shoots a sufficient distance apart, that there may be room for training in the young wood necessary to be left for the succeeding year.

The shoots of peach and nectarine trees are in general better for being shortened. The length which they are to be laid in at, must ever depend on the strength or weakness of them; and it should be remembered that there must always be a leading young shoot before the blossom, otherwise it is of no use: and therefore it is found requisite to lay the young shoots of some trees in at full length, because young shoots on them break out only a little before the former year's wood from which they sprung, and from these to the extremities are mostly blossom buds, and few, if any, shoot buds among them. Peach trees that form their bearing wood in this manner resemble the morella cherry, whose young shoots should never be shortened, unless to cause a more abundant number of shoots to come out, to cover the wall they are trained on.

The cherry-house may lie open till a week or fortnight before you begin to force it.

If the fig trees in your forcing-house are not yet covered, it should be done before sharp frosts come on, and the roots of them ought to be covered that the frost do not get at them.

This is the time to begin to force roses to have them early. Choose some strong healthy plants that have prominent buds on short well-ripened shoots, mould them up and set them into the house, and you had best not prune them, (except you be so well acquainted with roses that you are able to know the buds which will produce blossoms), till the buds begin to swell; when, in pruning, leave those buds that appear round and most prominent.

If after they begin to blow, which will not be before the middle of January, and perhaps not so early, you mean to have a constant supply of roses, you must take in plants once or twice a week. The number you take in weekly must therefore be proportioned to the size of your house, and you may allow at least four out of a dozen to fail of bringing roses till the taking in after January.

You may also, if you have room and it be desired, set in other kinds of flowering shrubs, perennial and herbaceous plants, and bulbous roots of different sorts.

When the house is in order, and such plants as you mean to force early, set in, begin to make fires. Let the air in the house, for the first week or ten days, be from 45 to 55 degrees warm, and after that increase the heat gradually, so that the plants may be made to send forth their tender buds vigorously. After the twentieth of the month, they will require as great an atmospherical heat as the pine-apple does. Rose trees will blossom very well by setting pots of them in the pine-apple stove on the kirbs of the pit; but the pine-apple house should not be crowded with such sorts of plants.

Keep the air in the house sweet, and water the plants occasionally to keep the earth about their roots constantly moist, and when the roses begin to shoot, look over them once or twice every day, to see that no grubs or insects hurt them. If the green insect begin to make its appearance, fill the house full of tobacco smoke, which will effectually destroy all of them, for it is strong enough to sicken a dog, though it will do the plants no injury, because it cannot get to their heart nor lungs.

On the FORCING-FRAMES,

For December.

The cucumber plants sown in October, will by this time be planted in the frames where they are to produce their fruit. Attend to them in keeping sufficient heat in the linings, in giving them air and covering them up at night; these things must be proportioned according to the temperature of the weather. The heat in the morning, when the lights are uncovered, should not be lower than about 70; and if there be air left at the lights all night, there is no danger of its being too high, as the roots of the plants cannot be hurt by the earth becoming too hot. If a suffi-

ciently strong heat be kept up, the plants will require a little water about once a week, and the earth all round against the hot flues ought to be kept constantly in a moist state by frequent waterings. When an augmentation of heat is wanted, do not remove the linings all round in one day, but only at one side of the bed, and in doing which, carry away only the exhausted part of the dung, leaving the unexhausted part to be mixed up in making the lining with fresh dung. Let the fresh dung be that which has been in a state of fermentation for some days, and then there will be no fear of pernicious steam being drawn into the bed by the current of air. If the plants require it, stop the shoots to form them regularly for extending in all directions. *See table below, and* Chap. IX.

Height of the Thermometer in the Cucumber and Melon Frames, shewing the Temperature of the Air in them, for December.

D.	M.	N.	E.	D.	M.	N.	E.
1	68	64	62	17	84	70	63
2	70	65	63	18	77	67	65
3	70	64	59	19	81	73	67
4	76	70	60	20	70	66	65
5	72	65	64	21	58	65	66
6	83	67	65	22	80	67	60
7	70	69	64	23	72	77	68
8	76	75	69	24	77	60	62
9	70	64	67	25	78	75	71
10	80	67	63	26	65	63	58
11	72	68	62	27	80	70	68
12	78	68	62	28	70	70	64
13	74	68	65	29	76	73	69
14	77	74	70	30	76	77	70
15	85	73	68	31	80	75	65
16	88	73	68				

If cucumber plants be on a dung-bed, *for their management see* Chap. IX.

Asparagus beds should be attended to: give air to them every fine day, and if there be a good heat in the beds, leave a little all night. If the weather be frosty, they must

be covered in the afternoon, and uncovered about eight or nine in the morning. Linings should be applied to the sides of the bed, if the heat in it be much declined.

New plantations of asparagus must be made on warm beds every fortnight, if you intend to have a constant supply of it during the winter and spring months, till it come in in the natural ground.

Give the asparagus plants water now and then, if you have a sufficient heat in the bed, and the water which you give them had best not be colder than 60, nor warmer than 75. It may be warmed by setting it into the hot-house one night near the warm flues, or if you set a pot or two of water on the hot flues, cold water may be mixed with it.

Look forward and have a sufficient quantity of dung in preparation. If you force asparagus on dung, you will want a good deal; if you force it on brick beds with linings, or in pits with fire heat, a less quantity will be required, because linings only or fire heat are wanted.

Those who have no hot-houses, may raise small sallad, mint, &c. on hot-beds of dung or leaves of trees, but on these it is very apt to catch the damp in the winter months.

In frosty weather clear the melon ground of dung, wheeling it to such quarters of the kitchen-garden as may require manuring. It may be laid in heaps till the ground is cleared of certain vegetables in the spring.

Cauliflower plants in frames should be kept clear of weeds, and have air in fine days. If the sun shine, the glasses may be taken off during the time that the sun shines on them, and if the nights are not frosty, leave air at them all night. Cauliflowers also under hand-lights must be attended to; weed and pick the dead leaves off, and give them a little air in mild or sunshine days.

In this month collect leaves of trees for making hot beds; the oak and beech are the best on account of their durability, but a mixture of all sorts will do, if they are brought together when they are not too wet. They may be thrown up in large heaps till the spring, and made up in beds without mixing them with any thing besides, or they may be mixed with dung.

Prepare, turn, and mix mould for pines, melons, cucumbers, fruit trees, and for different kinds of exotic and flower plants.

If you have any melon or cucumber frames at liberty, get them cleaned, repaired, and painted in dry weather if they want it.

Radishes may now be sown on a gentle hot-bed; when they are coming up, give them a good deal of air, that they may not be drawn up long-shanked. In fine days take the glasses entirely off; thin the plants when they have expanded their seed leaves.

If you have a frame for preserving peas in winter, and to bring them in early, the beginning of this month is a good time to sow them.

On the KITCHEN-GARDEN,

For December.

Peas should be sown, if the weather be open, in the beginning of the month; if these come up before the frost destroy them, there is a probability that they will survive the winter. Sow them in some sheltered part of the garden. Draw drills for them four feet apart and four inches deep, scatter the peas of the most early sorts regularly in the drills, and cover them up lightly about three inches deep; if there is the appearance of hard frost without snow, lay two or three inches thick of light old tan or vegetable mould on them to keep the frost off. When the peas have vegetated, before they come up to the covering, draw with a hoe or rake the covering to one side of the rows, and when the peas are come up or coming through the ground, if the weather be severe, it can be scattered on again.

The peas sown in the former months, should have some light earth, vegetable mould, or old tan, laid to the stems of them.

If you have got a close paling or wall, about three or four feet high to spare, stretching from east to west, you may sow a row of peas on the south side of it, and if you can contrive to defend them from hard frosts and heavy rains, by training them up against it in the spring, you may obtain peas very early.

For fear the former sowings do not stand the winter, you should plant more broad beans of the most early sorts.

Draw up earth lightly to the stems of those beans which are risen above the ground.

It is not too late to do up your asparagus beds, if any thing prevented you from doing it in the former months.

Take care of cauliflower plants sheltered by glasses or coverings of any kind, take off the coverings or give them air in fine days, and keep them free of weeds and dead leaves.

Lettuce plants under hand-glasses should have plenty of air in fine days, and be weeded when any begin to appear, and all the dead leaves taken from among them.

In open weather earth up the celery as high as it will bear, break the earth fine and lay it up light. If frosty weather begin to set in, take peas-haulm, or any light litter, and cover the rows of celery which require no more earthing up; this will preserve it from the frost, and you will be able to take it up, when the ground is hard frozen, without breaking it.

Earth up cardoons if they want it, and lay long litter of any sort on them in frosty weather, when the snow does not cover the ground.

Protect endive by putting it under cover, or by laying light coverings of fern or straw on it.

If the weather be open, cabbages of any sort may be transplanted.

Mushroom beds must in this month be well looked after. About once a week or ten days uncover them, take off carefully all the damp litter, gather the mushrooms if there be any on them, and put a covering of dry hay next to the beds, and lay a thick covering of straw and mats above the hay, thick enough to keep out the frosts and rains.

If you have a close shed for a mushroom bed, and a flue in it to warm the air in cold weather, make a fire now and then to keep the air in it from 50 to 60 degrees warm. After the bed has begun to bear, examine it when you gather the mushrooms; and at any time, if it appear to want water, after the fruit are gathered, water it with a fine rosed pot till it is moderately moistened. The water ought to be about the same degree of heat as the air in the house which surrounds the bed. Keep the bed covered with hay about four or five inches thick.

In open weather, draw earth to the stems of brocoli, savoys, and all sorts of cabbages that require it.

Artichoke plants not covered last month with earth or long litter, should not be deferred longer than the beginning of this month. If frost be in the ground to hinder you from laying earth, from between the rows, on and round the plants, cover them with litter of any sort not too wet.

This is a fit time to trench and manure vacant pieces of ground.

Take up and lay into sand, carrots, parsnips, and all other sorts of tuberous rooted plants.

Cover with light litter, rows of parsley, to preserve it from severe frosts.

On the FRUIT-GARDEN,

For December.

In open weather, fruit trees of all sorts may be transplanted. Rotten light dung should be laid round the stems of new-planted tender trees, to protect their roots from severe frosts.

This is a good season to manure fruit borders which require it. Dung perfectly rotten, or vegetable mould, may be dug into them; or if they be of a light kind of soil, marl or rich loamy earth may be mixed with them; dig the borders deep two or three times over, which will mix the manure and earth sufficiently together.

If strawberry beds have not in the former months been cleaned and dressed, it may now be done in open weather. Clear away from the principal plants all runners and small plants, and lay some rich loamy earth between the plants, and dig it in neatly; after the beds are thus finished, dig the alleys, and the work is done.

See that the roots of fig trees are secured from the frost, and their branches covered with mats, or thatched with straw.

Prune gooseberry and currant trees; clear away the cuttings, and dig manure in round about them. These kinds of fruit trees, or cuttings of them, may be planted in open weather.

Plum, pear, cherry, and apple trees of all descriptions, may now be pruned; and those against walls and espaliers, in fine days, should be nailed and tied to their places where they are to remain during the ensuing season.

If peaches, nectarines, and apricots were not unnailed the former month, let it be done in this month; leave as many nails and shreds on them, as will prevent the branches from rubbing one another in windy weather.

Cover with litter the roots of grape-vines against walls, to keep the frost from them; and if the frost come very severe, the branches would be better to be covered with mats. The vines may now be unnailed, but the pruning of them had best be deferred till February or March.

Young fruit trees in orchards or plantations, where hares can go, should have bushes tied round their stems, that the hares may be prevented from gnawing the bark off.

Any time in the course of this month, if the weather be open, is a good season to manure, to dig, or to trench the ground about apple trees, and about other kinds of fruit trees in orchards. Before this is done, the trees had best be pruned, if they want pruning. Cut out all the rotten or decaying parts of the wood, whether on their stems or branches. Let it be cut away in the same manner as I have directed it to be done in Chap. III. Scrape off clean from the stems and branches of the trees, all moss and rough parts of the outward bark, which serve only to harbour insects, that breed on them plentifully.

To destroy insects on the stems of fruit trees, and prevent them from creeping up and breeding on them, you may use the following method:

Take a strong knife with a sharp point, and a crooked sharp hook-like iron made for the purpose; with these scrape clean off all the moss and outside rough bark, and with the knife pick out or cut away cankered parts of the bark and of the wood, in such a slanting manner that water cannot lodge in the sides of the stems of the trees. Having cleared the trees in this manner, make up a mixture of lime, soot, and sulphur; put these ingredients into a pail

or tub; pour boiling water upon them, and with a stick stir and mix them well together. When this strong mixture becomes cold, and about the thickness of white-wash, take a brush, dip it among the mixture, and smear the stems and large branches of the trees with it, dabbing it well into the hollow parts of the bark.

This mixture being of a harmless nature to the trees, doing them neither evil nor good; only, together with scraping off the rough bark and moss, and cutting away the rotten decaying parts of the wood, it destroys insects, and prevents them from creeping up and breeding on the trees: it may be safely and successfully applied for the said purpose, at any time of the year, to trees of any sort.

There is a white soft numerous tribe of insects, which infest and greatly hurt not only the apple tree, and some other sorts of fruit trees, but also some forest trees, such as the larch.

On the PLEASURE or FLOWER-GARDEN,

For December.

Take care of auricula and carnation plants in frames. In severe frost, the glasses should be kept close, and in the night-time covered with mats; keep them free of weeds and dead leaves, and when they require it, give them a little water.

Flower plants in pots, such as double rockets, scarlet lychnis, double wallflowers, and herbaceous plants of various kinds, to blow early next season, should be protected in cold weather; plunge them in tan or rotten leaves, and put glasses over them.

In open weather, most kinds of flowering shrubs may be transplanted with safety. Put stakes to those that are likely to be blown down by the winds.

Attend to beds of choice ranunculuses, tulips, hyacinths, and anemonies; arch the beds over with hoop sticks, and cover them in bad weather with mats.

Forest trees may be planted any time in this month, when the weather is open; if they are tall, they will require

to be tied to stakes, that high winds may not displace them.

Shrubs of all kinds may now be pruned, and the borders dug. Cut out all rambling luxuriant shoots that appear to be superfluous, and form the plants so that they may appear in a regular manner, and not crowd one another. Several sorts will require stakes to support them, and the stakes should be covered with the branches, that when the leaves are expanded they may not appear. Clear the borders of all sorts of litter, and dig them neatly.

The roots of tender shrubs should be mulched with light dung, to keep the frost from them; and several sorts of exotic plants, such as the magnolia, rhododendron, azaleas, and kalmeas, in hard weather, will be better to be covered with mats.

Many sorts of shrubs may be increased by suckers; the lilac, syrengo, spirea frutex, and several kinds of roses, put forth suckers plentifully. They may be taken up and planted in nursery-beds five or six inches apart, and in a year or two transplanted to where they are wanted.

Hedges of hawthorn, beech, hornbeam, blackthorn, &c. may now be clipped. If hedges have been suffered to grow irregular, and their bottoms become bare and naked, they ought to be plashed down: this is to be done by cutting the branches half through near the ground; they will then bend easily in an horizontal direction, twisting them with some of those ones which are left upright. When this is done, top at the proper height the whole line of the hedge, that it may appear uniform.

Where they are wanted, hedges of various kinds of trees and shrubs may be planted any time this month, when the weather is open.

Prune forest trees of all sorts which require it; the method of pruning them may be seen in the former months, and in page 399, &c.

Trench or dig any ground you intend to plant with shrubs or flowering plants of any kind, the ensuing months.

Bring from commons and heaths, such kinds of earth as is suitable for different sorts of delicate plants; and in frosty weather, it may be broken small and laid in ridges to meliorate; and for some sorts of plants, some of it may be mixed with vegetable mould or rotten dung.

Clear lawns and grass walks of leaves and litter of every kind, that the grass may not be injured. If they are rolled occasionally, it will do them good.

Box edgings may now be planted along the sides of gravel walks, or wherever they are wanted; and gravel walks may be laid at any time when the weather will permit.

Collect leaves of trees of all sorts, and lay them in large heaps to rot for vegetable mould. If you intend to make hot-beds of them, they should be raked together when they are not over wet; but if you intend them for rotting only, they may be brought together as wet as possible.

On the NURSERY-GARDEN,

For December.

To propagate trees and shrubs, layers and cuttings of them may now be put into the ground, and some sorts of them propagated by suckers.

In open weather, transplant young trees and shrubs of all sorts, excepting those that are delicate and tender; and hardy trees and shrubs may be pruned at any time in fair weather.

Take care of tender exotics in pots, such as the arbutus, cedar of lebanon, china arborvitæ, cypress, and many others; during the winter, they should be plunged over the pots in old tan or light earth, to preserve their roots from the frost; and in hard weather, they would be better to be covered with mats.

Transplant in open weather all kinds of seedling trees and shrubs which require it.

Vacant pieces of ground should be trenched, to be in readiness to plant or sow. If it is to lie during the winter, it should be laid in ridges, to have the advantage of the frosts to meliorate it.

In frosty weather, prepare and mix compositions of earth for tender plants of various kinds.

Hedges of privet, yew, and other evergreens, may be planted to protect tender plants in windy weather, and hedges of most kinds of trees and shrubs may be clipped and plashed, if they require it.

Stocks to bud and graft on may be planted: set them two feet or thirty inches row from row, and from twelve to sixteen inches plant from plant in the rows.

The month of December is a good season to transplant large trees of any sort, with large balls of earth about their roots. They may be taken up in the same way as I directed for transplanting peach trees in page 18. Dig a wide circular trench about three feet from the stem of the tree, as deep as to allow its roots to be all cut; then, with a pointed stick, reduce the earth round the stem, so as the tree may be removed to its assigned place. When large trees are transplanted, they must be kept well watered in the spring and summer months.

ON THE

MANAGEMENT OF TIMBER TREES.

TIMBER is one of the necessaries of life; no nation nor family could do without it. I apprehend every country in the world, where the earth produceth food of any kind for the sustenance of man, produceth, or by culture may be made to produce, timber sufficient to supply the necessities of its inhabitants in that respect; indeed we gather from history, ancient and modern, that in every part of the known world (excepting on the sea coast in very cold climates, where the few inhabitants live on fish, and reside in caverns), where the climate and soil are suitable for the residence of mankind, the earth produced timber for their use before they were created, and before they multiplied and were scattered over the face of the globe.

To those who have travelled and examined the earth, it is obvious that in every county of Britain there had formerly been extensive woods of different sorts of trees, especially in vallies, more than sufficient to supply the country with timber for every necessary purpose: and surely it must be attributed to the thoughtlessness or negligence of our ancestors to do any thing for the generations to succeed them, that our nation in the present day is obliged to depend on foreign countries for a supply of timber. I am informed, that the duty of customs which was paid upon timber and wood, imported in the year ending the 5th of January 1812, was £683,699, exclusive of £63,761 upon mahogany and dying woods.

Large tracts of land in the king's forests, and of hilly and moorish lands belonging to private persons and to the community, not capable of being brought into a state of cultivation to produce grain of any sort, but would grow different kinds of timber, are now lying waste; and vast numbers of trees which had been planted many years ago,

together with those that sprung up naturally in different parts of the kingdom, have not come to such a degree of maturity as in all probability they might have attained had they been well managed.

That forest trees have been greatly neglected, we need only to refer to the state of growing timber trees in the new forest of Hampshire, and in Windsor forest, and Epping forest, and in Hainault forest, and in other forests at a greater distance from the metropolis. In these may be seen, without number, trees which after planting have been entirely left to nature, or unskilfully lopped and pruned; great numbers of them in these forests are now in a state of decrepitude on account of disease and age, and for want of having been pruned and lopped in a timely proper manner. Many of them are of an age, and in such soil, that had they in the early periods of their growth been well managed, might have now been in a state of maturity for building ships, or for any other purposes to which their sorts and sizes be adapted; but instead of that, they are now scarcely useful for any purpose whatever, excepting for fire wood; they are encumbering the ground, which had best be gradually cleared of them and made useful, either by being planted afresh, or by cultivation turned to agricultural purposes.

In some of these forests are a great number of trees called pollards, which are trees headed off, after having been planted a number of years, about eight or nine feet from the ground, which causeth them to put forth numbers of branches; the only use of which is to be cut down every seven or eight years for fire wood and peas stakes, which might be and in many places are obtained in a more profitable way; that is, by planting thickets of wood of different sorts, and cutting it down once in seven or eight years, close to the ground. In my opinion, all pollards should be cut down close to the ground, or trained up into trees for timber. There are also, in many parts of the country, large woods and plantations of forest trees in a similar state, belonging to private persons.

In England, especially in the southern counties, there is much wood land in pieces, belonging to different proprietors, which in many parts are intermixed with arable, meadow, and pasture land, and are usually let on lease together with other land; the tenants of which are allowed to cut

down for their own profit, the underwood once in so many years, the landlord reserving to himself the right to cut down and carry off the grown timber, and to have left every time when the underwood is cut, as many young plants of it as he thinks fit to grow to produce timber, provided he leave them not so thick as to injure by their shadow the growth of the underwood. When the tenant is about to cut down his underwood, the landlord sends his agent to mark plants or saplings to stand for timber; and it appears that some of these agents are not skilful enough to choose the fittest plants for the said purpose. A similar method is followed in the selection of saplings left in hedge-rows, which in England are numerous; and if all hedge-rows, where the fields are of a good size, were stocked with forest trees, at a proper distance one from the other, they would produce much fine timber, of a better quality than they do in the way they are commonly managed; and they would also be less hurtful to the land on each side of them, than when they are allowed to grow with wide spreading heads.

At the time when underwood in copses is cut down, in the selection of young plants to grow up to produce timber, the general custom is to leave those plants only that appear as if they had sprung from seed, or from the roots of the plants at a distance from their stem. These are generally drawn up weak, and their roots have not a good hold of the ground, so that when they are left by themselves naked of their former shelter, it is some years before they make much progress, and sometimes they die by being blown down by the wind. Now, instead of making choice of these sort of plants, I would advise that good stout plants sprung from the stems of them which had been cut close down in the previous cutting of the underwood, should be chosen, and left to grow up for timber. These proceed from the mother plants, which are well-rooted, and therefore cannot be affected by the winds. And besides this, the young plants derive plenty of sustenance from the mother plants; and if the top of each mother plant be cut close to the stem of the young plants, it will in the course of a few years be completely covered over with the new wood of the young plant, in the same way as the end of the stock of a graft is covered by the wood of the graft, through the gradual force of vegetation.

When underwood is cut down, there should be at least double the number of saplings left for a year or two, than what is required to be finally left for timber, by which time it will clearly be seen which are the best plants, so that the worst ones may then be cut off.

At the time when young trees come from the nursery-garden, they are seldom seen in a bad state of management; but in land where they are planted to grow up for timber, care is not always taken to see that they are well planted; and after they are planted, they too frequently are neglected. In the first summer after trees are planted, they should be watered in dry weather; but it too often happens that, after forest trees are planted, they are left entirely to nature. When forest trees are well planted, and otherwise well managed, they grow quickly, and of course arrive sooner at a state of maturity fit for use, than when proper attention is not paid to them.

The want of attention or deficiency of knowledge in the management of forest trees, is not only a loss to the proprietors, but also to the nation at large. One reason why great numbers of forest trees are not in a good state, is because those to whom the superintendance has been entrusted, have not acquired an experimental practical knowledge of the nature and manner of the growth of trees. Not a few have published books on the management of forest trees, which have been useful to some; but these authors in their publications have differed so greatly in their opinions, that proprietors of woods and plantations are at a loss which of their methods, so strongly recommended by each of them, is the best to be carried into practice, for the growth of timber, in the different kinds of land and climate which are capable of producing wood of any sort.

Forest trees in hedge-rows should be left at a distance of about twenty feet apart; and when saplings in them are left to grow into trees, they should be selected and managed in the manner which I have directed for the selection and management of those left in copses among underwood: the timber trees in hedge-rows ought never to be suffered to spread their heads as those in parks for ornament, and for a shade to cattle in hot weather in summer, but all their side branches should be lopped once in four

or five years. When timber trees in hedge-rows are thus managed, the only injury they do to the fields is drawing the moisture from the earth, as far as their roots are allowed to extend. I think no pollard trees ought to be suffered to stand in hedge-rows, excepting for fuel, neither themselves nor their branches are of much utility; and as their branches are generally allowed to stand uncut off for at least seven or eight years; their shadow hurts the fields a little as well as their extensive roots.

Plantations of forest trees intended to produce timber for general use had best be allowed and also induced by pruning to grow in different shapes, some of them with long straight stems, and others branching out in all directions and forms. Trees intended to make long straight stems should be left thick in the plantations. In this state the stems of them are shaded by each other from the sunbeams, and from a free circulation of the air, by which shoots are prevented from springing from their stems, which would exhaust the sap in going up to the extremities of their branches, on which the sun and atmosphere have free access to operate and excite the sap to flow from the earth, by means of their roots, through every part of the tree, which extends and augments its substance in every part thereof.

When forest trees are intended to be allowed and caused to branch out at some distance from the ground into several leading stems and crooked boughs, they should be left thin in the plantation; and if they send not forth a sufficient number of boughs, let them be headed down, which will cause them to send forth as many and perhaps more than wanted, which may be easily remedied by lopping off the superfluous ones.

In pruning forest trees intended for timber, as they grow up, the young shoots which spring from the stem must not be suffered to extend much in length; and as the leading branches appear able to receive all the sap which is drawn into the plant by its roots, the shoots on the stem should be cut off close to the stem, beginning nearest to the ground; and as the trees which by nature or lopping, or heading down, spread out their boughs and grow large, the stems of each leading branch ought to be served in the same way, that is, by cutting off close to the stem the small side shoots.

Whenever any branches of forest trees are observed to be in a weak sickly condition, which may be known by their ceasing to put forth shoots and leaves vigorously, they should be cut off close to the stem. The cutting off branches or shoots close and smooth to the stems of trees, gives the bark free liberty to cover over the part made bare of bark by cutting off the shoot; and when the bark meets, and is united by the effect of vegetable life, the stem of the tree becomes round again, and appears as if no branch had been cut from it; whereas when the branches of trees, whether by decaying, or by lopping or cutting, are left at a distance from the stems, the bark cannot close till the part of the branch left decay and fall off, or the tree increase in size so as to enable the bark on it to cover the end of the shoot left on the stem of the tree; but if in such a case it happen that the part of the branch left upon the stem of the tree take to rotting, it may cause the rot in the tree, which frequently occurs in old trees, neglected to be properly pruned; the inside wood becoming rotten, moulders away, so that the stem of the tree is left hollow, in which squirrels and other animals make their nests.

That the manner which I have described for the pruning of trees is the best method, any unprejudiced person may conceive themselves, by observing the method and its effects which is practised by nurserymen in pruning and training the stems of trees, whether of the forest or fruit-bearing kinds.

In the pruning of trees observe carefully if any parts of them be beginning to rot or be cankered, and cut the parts in such condition clean off in such a way that rain water cannot lodge in the sides, nor in any part of them, but that the air may have free liberty to dry the parts of the wood of the trees from which the rotting or cankered parts were removed.

When lateral branches are cut from a tree and the parts from which they be cut made smooth and even, the live bark on the tree having no obstruction comes together and unites on the stem, which then becomes sound and round, and in a few years no appearance of the wound is to be seen. This is the sole effect of vegetable life and vegetation. I know not any tree whose stem does not grow round, but as I have in the beginning of this publication

treated on these things, I shall not resume the subject at the end of it.

Plantations of scotch fir, larch, birch, alder, hazel, and willow, might be greatly increased throughout the kingdom: they will grow in soil unfit for other kinds of forest trees. In many parts of England, but especially in Scotland, there are extensive tracts of moorish and hilly land lying waste, in which the plants I have mentioned would grow well. I have lately observed in travelling about through the country, in different parts of it, that proprietors of woods are cutting down and selling at a good price, annually, numbers of trees planted by their forefathers; but though they have plenty of waste ground capable of producing the same sorts of timber, they are neglecting to plant it, which if they did plant, though certainly it would not benefit themselves, it would do good to their successors, and to the nation at a future period, if the world exist another century.

ALPHABETICAL LIST of KITCHEN GARDEN PLANTS.

ARTICHOKE
- French
- Globe
- Jerusalem

BASIL
- Sweet
- Bush
- Balm

BEAN
- Mazagan, early
- Portugal
- Longpod
- Windsor
- Spanish
- Sandwich
- Red blossom
- White blossom

KIDNEY BEAN
- White, early
- Speckled, red
- Speckled, black
- Yellow
- Black
- Canterbury

CLIMBING SORTS
- Scarlet
- White
- Black

BEET
- Red
- Turnip-rooted
- Green
- White

BORECOLE
- Red
- Green
- Fringed

BORAGE

BROCOLI
- Roman
- Early red
- Cauliflower
- Late purple
- Branching
- White

BURNET

CAPSICUM
- Long pod
- Bell-shaped
- Cherry-shaped

CABBAGE
- Red
- York, early
- Small dwarf
- Sugarloaf, early
- Large do.
- Scotch, winter
- Large hollow
- Russia
- Imperial, early
- Drum head
- Turnip-rooted
- Turnip-stalked
- Sea

CARROT
- Orange
- Horn, early

CARDOON

CAULIFLOWER
- Early
- Large white

CELERY
- Solid
- Upright
- Red-stalked

CHERVIL

CAMOMILE
- Single
- Double

CHIVES

CLARY

CORN SALLAD

CORIANDER

CRESS
- Curled
- Broad-leaved

CUCUMBER
- Short, early
- Long prickly
- Long green
- White prickly
- White turkey
- Patagonian

DILL

ENDIVE
- Green curled
- Batavian
- White

FENNEL

GARLIC
- Large-rooted
- Small-rooted

GOURD
- Orange
- Round
- Long

HYSSOP

LEEK
- London
- French

LOVE APPLE
- Red
- Yellow

LAVENDER

LETTUCE
- Green coss
- Black seed
- Spotted cos
- Silesia
- Egyptian
- White cabbage
- Brown cabbage
- Imperial
- Prussian

MARJORAM
- Sweet
- Winter

MARIGOLD
- Lemon-coloured
- Orange-coloured
- Double blossom

MELON
- Cantelupe
- Rock do.
- Orange do.
- Scarlet do.
- Green
- Netted
- Smooth
- Persian
- Water

MINT
- Spear
- Pepper

MUSHROOM

MUSTARD
- White
- Brown

NASTURTIUM

ONION
- Portugal white
- Spanish white
- Deptford
- Spanish red
- Portugal red
- James's
- Welch

ORACH

PARSLEY
- Common
- Curled
- Hamburgh

PARSNIP

PEAS
- Frame, early
- Charlton
- Golden
- Leadmans dif.
- Marrowfat
- Rose
- Patagonian
- Rouncival
- Sugar
- Egg
- Hotspur
- Spanish
- Marrowfat dif.

PENNYROYAL

POTATOE
- Dwarf, early
- Kidney, early
- Champion
- Manley, early
- Round white
- Red
- American

PURSLAIN
- Golden
- Green

RADISH
- Yellow, early
- Short-topped
- Salmon
- Red
- Turnip, white
- Turnip, black
- Horse

RHUBARB

RAPE

ROCAMBOLE

RUE

ROSEMARY
- Green
- Variegated

SCORZONERA

SALSAFY

SAGE
- Red
- Green
- Broad-leaved
- Small-leaved

SAVOY
- Green
- Yellow

SAVORY
- Summer
- Winter

SHALLOT

SKIRRETT

SORREL
- Common
- French

SPINACH
- Round
- Prickly

SPROUTS
- Brussels
- Scotch
- Jerusalem

TANSEY

TARRAGON

THYME
- Common
- Lemon

TURNIP
- White, early
- Round
- Norfolk
- Red
- Russia
- French
- Yellow
- Oblong
- Swedish

WATER CROSS

A LIST of some HOT-HOUSE PLANTS.

Adam's needle
Chocolate tree
Madagascar rose
Palm tree
Brasilian myrtle
Barbadoes flower
Robinia
Sugar cane
Bastard hellebore
Barbadoes cherry
Indian mango
Perennial martinia
Allspice tree
Screw pine
Cabbage tree
Dragon tree
Pome rose
Superb lily
Logwood tree
Ceylon nickar tree
Melon thistle
Star apple
Seaside grape
Wake Robin
Mahogany tree
Double nasturtium
Cinnamon tree
Pepper tree
Lead wort
Guava tree
Soapberry tree
Indigo tree
Cardinal flower
Cape mallow
Bread tree
Humble plant
Arabian jasmine
Asphodel lily
Sago palm
Coral tree
Indian fig
Cotton plant
Peruvian tree
Silk cotton tree
Lily thorn
Balsam tree
Coffee tree
Custard apple
Indian tamarind
Onion tree
Passion flower
Jamaica dogwood
Red jasmine
Shrub trefoil
Indian mastic
Malabar nut
Scarlet campion
Manna tree
Indian chesnut
Plantain tree
Olive tree
Tallow tree
Indian spurge
Cassuava plant
Cap jasmine
Oriental grewia
Sand box tree
Guinea pepper
Snowberry
Ginger tree
Mountain ebony
African aloe
Jamaica liquorice
Indian waltherea
Jamaica dogwood
Barbadoes olive
Ethiopian brunea
Caper bush

Dwarf palm
Fiddle wood
Bamboo cane
Amaryllis lily
Sensitive plant
Jamaica volkameria
Silvery tomentous
Barbadoes flower
Mammee tree
Love flower
Indian vervain
Spreading browallia
Indian shot
Papaw tree
Cocoa palm
Calabash tree
Ethiopian flag
Guinea lily
Spotted alstremaria
Indian agrimony
Tree house leek
Great portlandia
Scarlet flower
Brazil plum
Elephant's foot
Colt's foot
Japan rose
Wild sena
Jesuit's bark
Cocoa nut
Cashew nut
Ethiopian gourd
Indian bondue
Elm turneria
Glossy ranvolfia
Trumpet flower

A LIST of some GREEN-HOUSE PLANTS.

Orange
Lemon
Citron
Silver tree
Oleander
Blue lobelia
Loblolybay
Silvery coronella
Caper shrub
Shrubby burnet
Jerusalem sage
Rest harrow
Lion's tail
Geranium
Heliotropium
Ragwort
Dittany
Canary lavender
Injuba tree
Persian cyclamen
Indian clutia
African sumach
Milk wort
Virginia silk
Moon trefoil
Camphire tree
Diosma, sweet
Winter cherry
Chrysanthemum
Myrtle
Candy tuft tree
Shrubby gorteria

Adrangea
Staff tree
Sorrel tree
Mediterranean heath
Sparrow wort
Climbing mediola
Lantana sage
African keggelaria
Scented gnaphilium
Shrubby foxglove
Scarlet colutea
Canary flower
Long buflea
Birth wort
Indian jasmine
Ethiopian bupleurum
Milk vetch
Silver bush
Verbena, sweet
Catalonian jasmine
African honeysuckle
Euphorbia
Goldy locks
Ethiopian arum
African aster
Ragwort arctotis
Silvery convolvulus
Thyme-leaved brunea
Swallow wort
Aloes of sorts
Jupiter's beard
Althea hermania
African bladdernut
Naval wort
Ilex clefortia
Shrubby marigold
Tree asparagus
Ethiopian flag
Shrubby scabious
Golden rod tree
Tree wormwood
Rock rose
Germander tree

A LIST of FRUIT TREES.

Peaches.

Royal george
Montaubon
Nobless
Early ann
Red magdalen
French mignone
Galand
Old newington
Admirable
Early avant
Chancellor
Nivette
Late newington
Double swalsh
Double montague
Teton de venus
Early newington
Late violet
Red nutmeg
Incomparable
Millets mignone
Catharine

NECTARINES.

Fair child's, early
Scarlet
Roman
Newington
Elruge
Temple
Golden
Violet
Murray
Early nutmeg
Brugnion

PLUMS.

Early morocco
Early damask
Orleans
Green gage
Primordian
Black damask
La royal
Great damask
Egg plum
Apricot ditto
Catharine
Red imperial
Drap d'or
Imperatrice
Damson
Winesour
Violet perdrigon
Blue gage
Bullace

GRAPES.

White muscadine
Black ditto
White sweet water
Black ditto
Black hamburgh
Syrian
Royal muscadine
Early july
White muscat
Black ditto
Black frontinac
White ditto
Grizzly ditto
Red hamburgh
Tokay
White muscadel
Black ditto
Black cluster
Miller grape

PEARS.

Jargonel
Green chissel
Windsor
Chamontelle
Colmar
Catharine
Beury de roy
White beury
Winter beury
Orange bergamote
Gansels ditto
Summer ditto
Autumn ditto
Summer bonchretien
Winter ditto
St. Germain
Hamden's bergamote
Virgou leuse
Brown beury
Cadilac, baking
Worster ditto
Parkinson's baking

CHERRIES.

Early may
May duke
White heart
Black ditto
Bleeding ditto
Ox ditto
Corroune
Archduke
Carnation
Kentish

Amber
Turkey
Portugal
Morella
Common black

Apples.

Dutch codlin
Common ditto
Juneting
Golden pippin
Ribston ditto
Nonsuch
Nonpareil
Golden rennet
Aromatic pippin
Lemon pippin
Loan's pearmain
Winter ditto
Kirton ditto
French ditto
Summer queening
Winter ditto
Royal russet
Wheeler's russet
Golden russet
Aromatic russet
Redstreak
Stone pippin
Quince apple
Newtown pippin

Apricots.

Masculine
Moor park
Peach
Brussels
Breda
Turkey
Algiers
Orange
Transparent
Alberge
Portugal

Figs.

Black ischia
Early white
Brown malta
Marseilles
Common blue
Large white
Genoa
Brunswick
Brown ischia

Gooseberries.

Early red
Early black
Smooth green
Hairy green
Amber
Hairy red
Dutch red
White crystal
Large hairy red
Large yellow
Green gascoin
Rough yellow
Lancashire, many varieties

Currants.

White grape
Common white
Common red
Champaign
Black

Raspberries.

White-fruited
Large red
White antwerp
Red antwerp
Double-bearing
Red cane

Mulberries.

Black
Red
White

QUINCES.

Pear
Apple
Portugal

WALNUTS.

Double, late
French
Round
Thin-skinned

FILBERTS.

Cob nut
Red-skinned
Barcelona
Cluster
Hazel nut

MEDLARS.

Dutch
English
Oriental

BARBERRIES.

Scarlet
White
Stoneless

STRAWBERRIES.

Scarlet
Red wood
White wood
Carolina
Chili
Hautboy
White pine apple
Red pine apple
Alpine
Prolific

A LIST of PLANTS cultivated in GARDENS for DISTILLING, or MEDICINE.

Angelica
Anise
Lavender cotton
Bugle
Solomon's seal
Cat mint
Suthernwood
Camomile
Stachys
Comfrey
Tarragon
Mother of thyme
Tansey
Dwarf elder
Wormwood
Feverfew
Hyssop
Lavender
Baum
White lilies
Liquorice
Lovage
Marjoram
Marshmallow
Marigold
Spearmint
Thyme
Dill

Tobacco
Elecampane
White poppy
Rosemary
Roses
Sage, red, tea
Sage of virtue
Savory
Carduus
Saffron
Sweet sicily
Scurvy grass
Clary
Peppermint
Dragons
Parsley
Pennyroyal
Violets
Fennel
Rue

A LIST of TALL-GROWING DECIDUOUS TREES.

Acacia
Beech
Chesnut
Hornbeam
Maple
Poplar
Sycamore
Willow
Ash
Elm
Larch
Neckar tree
Plane
Tulip tree
Dogwood tree
Alder
Birch
Hickory
Lime
Oak
Service
Walnut
Cork tree

A LIST of DECIDUOUS TREES and SHRUBS, of a smaller growth.

Almond
Angelica tree
Bladdernut
Buckthorn
Cinquefoil shrub
Elder

Guelderose
Halesia
Laburnum
Medlar
Wild olive
Pomegranate
Robinia
Scorpion sena
Spindle tree
Syrengo
Varnish tree
Agnus castus
Altheafrutex
Azalea
Broom
Catalpa tree
Coral tree
Filbert tree
Hawthorn
Honeysuckle
Lilac
Mountain ash
Mock orange
Buckthorn
Roses
Rose acacia
Snowball tree
Spira frutex
Tamarisk
Viburnum
Elder
Andromeda
Barberry
Sweetbrier
Christ's thorn
Dogwood
Fringe tree
Hazel
Jasmine
Magnolia
Moonseed
Passion flower
Sassafras tree
Snowdrop tree
Sumach
Tulip tree
Virgin's bower

A LIST of EVERGREEN TREES and SHRUBS.

Andromeda
Aleternus
Box
Coronella
Germander
Holly
Arborvita
Bay
Cedar
Cytisus
Groundsel tree
Horsetail
Arbutus
Bignonia
Rockrose
Fir
Hartwort
Honeysuckle
Jasmine
Knee holly

Lauristinus
Moontrefoil
Phlomis tree
Purslain tree
Rododendron
Spurge laurel
Sweetbrier
Juniper
Kalmea
Lotus tree
Oak
Pine tree
Pyracantha
Roses
Suthernwood
Tutsan
Ivy
Laurel
Magnolia
Phillyrea
Privet
Ragwort tree
Savin
Stonecrop tree
Widow wail

A LIST of TREES and SHRUBS which may be raised from SEEDS.

Acacia
Angelica tree
Arborvita
Ash
Bay
Bladdernut
Rose tree
Cistus
Cockspur thorn
Dogwood
Honeysuckle
Hypericum
Larch
Maple
Almond
Adrachne
Arborjudæ
Azalea
Beech
Bignonia
Cedar
Chesnut
Coral tree
Cypress
Fir
Hornbeam
Juniper
Lilac
Mezereon
Andromeda
Annona
Arbutus
Azarole
Bird cherry
Broom
Celestrus
Carnation cherry
Cork tree
Citisus
Hawthorn
Holly
Laburnum
Lime tree
Mulberry

A LIST of HARDY HERBACEOUS, PERENNIAL, and BIENNIAL FLOWER-PLANTS.

Aconite
Asclepias
Aster
Bachelor's button
Birthwort
Carnation
Campanula
Celandine
Chrysacoma
Day lily
Great fleabean
Everlasting pea
Feverfew
French willow
Fellwort
Blue daisy
Hollyhock
Iris
Lily of the valley
Laserwort
Lotas
Meadow sweet
Monk's hood
Water lily
Orchis
Alyson
Arum
King's spear
Borage
Verbascum
Ox eye
Cardamine
Canterbury bell
Chelone
Columbine
Daisy
Sea holly
Figwort
Fraxinella
French honeysuckle
Crane's bill
Hypatica
Hydrangea
Candytuft
London pride
Loostrife
Lichnis
Mallow
Mothmulein
Tree primrose
Butter vetch
Apocynum
Milk vetch
Angelica
Bee larkspur
Buglas
Cardinal flower
Catchfly
Christmas rose
Cyclamen
Dropwort
Gnaphillium
Foxglove
Seaheath
Fumatory
Cornflag
Dame's violet
Knapweed
Lady's slipper
Dead nettle
Honesty
Lychnidea

Monarda
Monky flower
Rest harrow
Ragwort
Tod flax
Pink
Lungwort
American sunflower
Side-saddle flower
Scabious
Rock catchfly
Solomon's seal
Sweet-william
Speedwell
Wallflower
Piony
Polyanthus
Pasque flower
Rocket
Lizard orchis
Helmet flower
Snapdragon
Stock
Spiderwort
Heart's ease
Winter cherry
Sea daffodil
Primrose
Crowfoot
Rosecampon
Saxifrage
Houseleek
Soapwort
Sunflower
Valerian
Virgin's bower
Adam's needle

A LIST of TUBEROUS and BULBOUS ROOTED HARDY FLOWERING PLANTS.

Amaryllis
Crocus
Fumatory
Fretillaria
Lily, white
Star of Bethlehem
Colchicum
Gladiolus
Muskhyacinth
Jonquil
Guernsey lily
Narciss
Snowdrop
Molly
Cyclamen
Chequer'd tulip
Hyacinth
Iris
Daffodil
Tulip
Martagon lily
Belladonna lily

A LIST of TENDER ANNUAL FLOWERS.

Amaranthus
Trecolor
Humble plant
Ice plant
Sensitive plant
Cockscomb
Globe amaranthus
Marvel of peru
Snake melon
Bicolor
Balsam
Egg plant
Stramonium
Martynia
African marigold
Chrysanthemum
Pericaria
Ten week stock
Love lies bleeding
Red zenia
Tree amaranthus
Convolvulus
China aster
French marigold
Palmachristi
Love apple
Indian pink
Sultan flower
Indian corn
Cap marigold
China hollyhock
Indian pink
Thorn-apple
Capsicum
Gourd
Mignionette
Nolena
Basil

A LIST of HARDY ANNUAL FLOWERS.

Adonis
Amethystea
Cap marigold
Lobel's catchfly
Convolvulus
Spiring cucumber
Hawkweed
Jacobea
Larkspur
Lychnis, dwarf
Oriental mallow
Nolena
White blossom pea
Poppy
Virginia stock
Sweet sultan
Venus glass
Rose larkspur

Princes feather
Moldavian baum
Candituft, red
Catterpillars
Blue bottle
Devil's bush
Hedgehogs
Scarlet bean
Lavatera
Marigold
Mignionette
Heart's ease
Winged pea
Scabious
Sunflower
Toad flax
Snapdragon
Painted lady
Alyson, sweet
Belvidere
Candituft, white
Clary, red
White bottle
Fumatory
Honey wort
Bledderketmia
Lupins
Curled mallow
Nasturtium
Crown pea
Peas, sweetscented
Stock July flower
Strawberry spinach
Tobacco
Xeranthemum
Navel wort

A LIST of PERENNIAL and BIENNIAL FLOWER PLANTS which may be raised from SEED.

COLUMBINE
- Double
- Canada
- Variegated

HONESTY

VERONICA
- Hungarian
- Welch
- Longspiked

SWEET-WILLIAM
- Painted lady
- Red

STOCK, JULY-FLOWER
- Brompton
- Queen
- White
- Purple
- Ten week
- Scarlet

GLOBE THISTLE

CLARY
- Red-topped
- Purple

SWEET ALYSON

BEAR'S BREACH

CANTERBURY BELL
- Blue
- White

HOLYHOCK
- Red
- Yellow
- Variegated

French honeysuckle
Red
White
Tree primrose
Wallflower
Bloody
Double
Single
White
Campanula
Pyramidal
Common
Auricula
Tree mallow
Horned poppy
Dragon's head
Pasque flower
Agremony
Bee larkspur
Blue
Purple
Valerian
Green
White
Red
Scarlet lychnis
Rose campion
Pink
Varieties
Monk's hood
Blue
Yellow
White
Polyanthus
Piony
Double
Single
Gentian
Sweet scabious
Balm of gilead
Sowbread
Foxglove

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E.

F.

THE END.

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